IUCN The World Conservation Union SSC Species Survival Commission

ANTELOPE SPECIALIST GROUP

GNUSLETTER

Volume 29 Number 2
April 2011

FROM THE EDITOR...

Welcome to the first **GNUSLETTER** edition in 2011. This volume is particularly full of information due to numerous activities by the ASG membership and others, and in part because of our Special Edition of **GNUSLETTER** presented in July 2010, which did not contain our standard information format. I'm sure you will find the various antelope and giraffe information pertinent including nearly a year's span of projects, reports and news.

The year promises to be full as ASG members continue to apply themselves to gather related antelope information and reach project objectives. Of special interest is the upcoming November 2011 antelope symposium hosted by ZSL *(see proposed program page 4*) which intends to gather experts to look at potential antelope conservation strategies across a broad range. It is proposed that ASG should take advantage of the gathering and meet at some level in London at that time.

Of note in Volume 29 #2 is the brief report by Naftali Honig regarding antelope bushmeat in the Republic of Congo. A number of organizations are concerned with bushmeat issues in Africa, including the Bushmeat Crisis Task Force and PALF. It has recently been suggested that ASG could be more active in helping gather information and focusing on antelope bushmeat issues and we welcome continued dialogue with those interested and involved in these issues.

Finally, **GNUSLETTER** and the ASG Chairs encourage you and your colleagues to send us your project news and reports, and to please send us a PDF copy of your related peer reviewed publications as they are published. Sharing your valued efforts with the ASG allows us to continue to document and promote the body of antelope and giraffe conservation work being implemented across Asia and Africa.

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From the ASG Chairs...

Antelope Taxonomy, D. Mallon

The description of a new duiker species *Philantomba waltheri* by Colyn et al. (2010), reported briefly here on page 13 may indicate a welcome increase in antelope diversity, but also raises the issue of when and how a newly described species is formally recognised by ASG and subsequently included in the IUCN Red List. This issue is likely to occur more often as the increasingly sophisticated techniques of molecular genetic analysis generate further taxonomic revisions based on DNA sequences. This may therefore be an appropriate time to set out ASG's policy on antelope taxonomy.

ASG currently takes a cautious approach to antelope classification, in line with the following statement from the 2008 Global Mammal Assessment (GMA): "Because the taxonomy of mammals changes continuously, with new species discovered and old species revised, incorporating taxonomic changes in the Red List of mammals will require tight rules and strong coordination".

In addition to the IUCN Red List, species units form the basis for CITES Appendices and related legislation, the Convention on Migratory Species and other international treaties, national legislation, official lists of threatened taxa and are also widely used for conservation priority setting at global, regional and local scales. Retaining some stability and clarity in taxonomic arrangements is therefore useful in several ways.

Further reasons for caution are: (1) Experience shows that assigning some taxa to a specific or subspecific rank is open to interpretation of the available evidence and therefore depends to some extent on subjective judgement. (2) In other cases, taxa in the early stages of evolutionary divergence may not fit easily into clear-cut taxonomic categories, and a final decision may be largely arbitrary.

The 'khting vohr' *Pseudonovibos spiralis* provides a good example of the danger in a rushed approach. *Pseudonovibos* was identified as a new species of bovid on the basis of horns found in markets in Southeast Asia (Peter & Feiler 1994). It was quickly red listed as Endangered, before it was shown that the horns on which the identification was based were fakes, and most scientists regarded the 'species' as invalid (Brandt et al. 2001). It is no longer included in the IUCN Red List.

The standard taxonomic reference for mammals used for the IUCN Red List is Wilson & Reeder (2005) and for antelopes, the chapter therein on the Artiodactyla by the late Peter Grubb (Grubb 2005), with a small number of amendments where there is strong evidence to support the change. This taxonomy relies on the traditional Biological Species Concept (BSC) which is rooted in the principle of reproductive isolation. Alternative species definitions, such as the Phylogenetic Species Concept (PSC), and the Monophyletic Species Concept (MSC) map species boundaries at an earlier stage in the evolutionary process, so tend to recognize a larger number of species. For a useful discussion on species definitions, and proposed new criteria for defining species boundaries in birds, see Tobias et al. (2010).

The current antelope classification thus reflects a conservative view of taxonomy, but it is not regarded as fixed. All proposed revisions to antelope taxonomy and nomenclature, published in peer-reviewed journals, and regardless of the conceptual basis, will be considered carefully by ASG and a decision on whether to recommend acceptance will be made in consultation with the Global Mammal Assessment team based at the Sapienza University of Rome. An ASG Taxonomy Working Group will be established to develop a consistent and transparent procedure for dealing with these issues and advise on specific cases. All decisions will be communicated in Gnusletter.

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Crisis in Tunisia Protected Areas, P. Chardonnet

Monsieur le Ministre
Ministère de l'Agriculture et de l'Environnement
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Tunisie

Paris, le 4 février 2011

Objet : Menaces actuelles sur les Parcs Nationaux en Tunisie

Monsieur le Ministre,

Suite aux récents évènements en Tunisie, nous avons été alertés de dégradations récentes dues à des pillages incontrôlés dans un certain nombre de Parcs Nationaux de Tunisie (dont notamment
Bou Hedma, Dghoumès, Ichkeul, Chaambi et, dans une moindre mesure, Sidi Toui). Il semblerait que ces actes menacent les milieux naturels uniques et protégés, la faune et la flore, dont des populations sauvages d'espèces très menacées (comme l'addax, l'oryx algazelle, la gazelle dama, la gazelle de Cuvier, etc.), ainsi que les équipements et le matériel, voire le personnel des Parcs dans des situations extrêmes.

Nous sommes bien évidemment très préoccupés par cette situation, et ce, pour les raisons suivantes :

La Tunisie s'est dotée d'un système de Parcs Nationaux qui est aujourd'hui reconnu au niveau international comme une réussite. Ces Parcs Nationaux apportent une contribution internationale
unique à la conservation du patrimoine naturel tant pour les espèces menacées qui s'y trouvent que pour les écosystèmes qui y sont protégés. Ils sont d'ailleurs un héritage commun et un patrimoine inestimable du Peuple Tunisien et des générations futures, ainsi qu'un atout économique indéniable pour le tourisme et la valorisation des ressources naturelles.

Ce réseau de Parcs Nationaux a demandé au cours des dernières décennies de gros investissements de la Tunisie, ainsi que de nombreux partenaires, dont la communauté internationale. Le personnel de la DGF et des CRDA, qui assure au quotidien la gestion de ces
Aires Protégées, est motivé et dévoué, et a bénéficié de formations et d'échanges dans le cadre de projets d'appui internationaux.
Il serait donc dramatique que tous ces efforts, fruits de dizaines d'années de travail, soient réduitsà néant aujourd'hui par des actes inconsidérés de colère ou de pillage.

Nous souhaitons attirer votre attention sur ces menaces qui touchent directement à l'intégrité des Parcs Nationaux tunisiens et comptons donc sur votre soutien et votre intervention énergique et rapide pour éviter ce drame.

Nous sommes bien entendu à votre disposition pour étudier les mesures éventuelles à mettre en place afin de garantir cela et de soutenir la Tunisie dans ses efforts.

Nous vous prions de croire, Monsieur le Ministre, à l'expression de notre considération distinguée.

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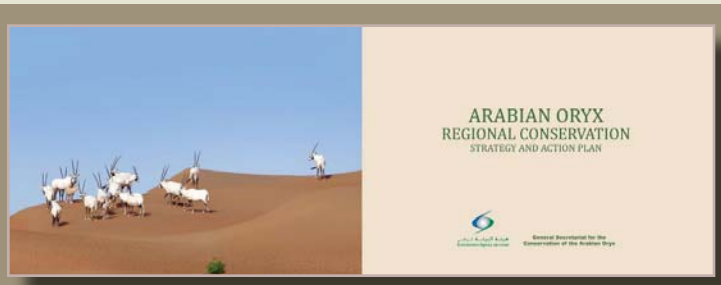
ZSL and ASG are organizing a 2-day ZSL symposium entitled "Antelope Conservation in the 21st Century: From Diagnosis to Action". (http://www.zsl.org/science/scientific-meetings). The meeting is to be held on 17-18 November 2011 in the meeting rooms of the Zoological Society of London in Regent's Park. Booking and registration details will be circulated later. The agenda will cover a range of broad themes and case studies and speakers will include leading experts in their fields.
Below is the proposed agenda for the symposium:

Day 1		
Session	Topic	Content
	WELCOME	
i: Introduction	The fascination of antelopes: an introduction to antelope diversity	- why are antelopes charismatic? - why don't they attract as much conservation attention as some other mammalian taxa?
ii: Current Status	The current status of antelopes - a global overview	- patterns in threat - urgency vs. priorities
	Antelope systematics: does it matter for conservation?	- principles of classification -proposed changes and their motivation - consequences for threat assessment -implications for reintroductions and captive breeding
	COFFEE	
SESSION I: TURNING HABITAT LOSS INTO CONSERVATION-FRIENDLY LANDUSE	The challenge of preserving dynamic savannah ecosystems	- what should be the goal of (antelope) conservation? - what is needed to preserve ecological diversity? - what is the role of NP's in contrast to other conservation-friendly landuse types? - when are habitats completely lost to conservation?
	Hands on or hands off? Contrasting approaches to management	- what are the options for management/interventions of protected areas? (Could contrast eastern and southern African management approach) - when are various management options justified?
	Case study: lessons learnt from the diversity in conservation status among the subspecies of hartebeest	- past and current threats to subspecies - lessons learnt - NB frame in light of when habitat loss matters relative to other concerns
	LUNCH	
	Preserving antelope migrations in a world of landuse changes	- what are the special challenges facing conservation of migratory antelopes? - how can they be accommodated in management/ action plans?
	Case study: challenges facing conservation of Southern Sudan's unique antelope migrations	- past and current threats - are they being overcome? How? - lesson learnt
	Community-based conservancies: a strategy to counter the rapid antelope declines in Masai Mara	- includes consideration of the following general questions: 1. why are community-based conservancies important for conservation? 2. how is community engagement achieved? 3. lessons learnt (how should communities be involved and when will it work?)
	TEA	
SESSION II: DEALING WITH HIDDEN THREATS	the impact of climate change on antelope conservation	- what are the relevant climate change scenarios? - can we predict how they affect conservation status of antelope species? (could be analysed in relation to factors regulating populations) - what are the implications hereof for conservation action?
	The impact of disease on antelope conservation	- how severe is the threat of disease to antelope conservation? - how can it be mitigated?
Facilitated discussion		focusing on the threats, habitat loss, climate change and disease, and pros and cons of National Parks & Community-based Natural Resource Management

Day 2		
Session	Topic	Content
SESSION III: HOW TO COUNTER OVERHARVESTING	Causes and consequences of bushmeat hunting - an overview	- describing drivers
	How to render bushmeat hunting sustainable	- focusing on solutions
	Overharvesting saiga for meat and non-meat products	- past and current threats - management options - what is being done? The future?
	Game ranching as a tool in antelope conservation	- what are the pros and cons of game ranching? - when is it a good tool in conservation? - how should it be managed for optimal conservation impact?
	COFFEE	
SESSION IV: SPORT HUNTING - A THREAT OR A SOLUTION?	Antelope conservation in West Africa: is trophy hunting or ecotourism the solution?	to include consideration of the general questions: - what are the pros and cons of sport hunting? - when is it a good tool in conservation? - how should it be managed?
	the role of porfessional hunting in antelope conservation in Tanzania	- the role of ecotourism vs. hunting concessions in Tanzania
	Case study: factors promoting and hindering conservation of the endangered mountain nyala	- past and current threats - recommendations for conservation - NB framed in context of sport hunting
	LUNCH	
SESSION V: REINTRODUCTIONS- WHEN AND WHEN NOT?	Guidelines for reintroductions	- what are ther pros and cons of reintroductions? - when should they be undertaken? - when is assisted migration to be recommended? - genetic considerations (link with systematics talk?)
	Case study 1: Reintroduction of scimitar-horned oryx (SHO)	- lessons learnt from the wild extinction of the SHO - reintroduction of scimitar-horned oryx in Tunsia - a success?
	Case study 2: Factors promoting and hindering conservation of the critically endangered giant sable	- the past and current threats to the giant sable - account of reintroduction considerations - has it been a sucess? The future?
	Case study 3: The decline of the desert antelopes: addax and dama	- the jeopardy of mutiple threats - what are the management options and what is being done? - pros and cons of reintroductions: implications for conservation of critically endangered spp. - the future?
	TEA	
Summary and Facilitated discussion		Initially focusing on bushmeat management, game ranching, sport hunting, reintroductions (the topics of day 2), then broadening to a general discussion aiming at identifying priorities

"In spite of providing some of the most fascinationg wildlife spectacles on earth, antelopes have received far less conservation attention than many of thier mammalian relatives. However, the Living Planet Index has recently singled out antelopes as particularly severely affected by the drastic decline in wildlife populations since 1970, and in the absence of immediate action, several species are in imminent danger of joining the scimitar-horned oryx as recent extinctions in the wild. This meeting aims to clarify current trends in global antelope biodiversity, understand what drives the major threat processes and, on this basis, highlight conservation priorities. Not only does the meeting address an urgent conservation concern, but because antelopes demonstrate pronounced variations in morphology, ecology and behaviour, they offer an exceptional opportunity to identify how threat processes operate in general and hence elucidate issues which are relevant to other taxa facing similar challenges."

Regional Rundown



The Conservation Strategy Workshop

At the meeting of the Coordinating Committee for the Conservation of the Arabian Oryx held in Wadi Rum, Jordan in April 2007, it was agreed that the Environment Agency – Abu Dhabi, alongside its partners, would lead the development of a regional conservation strategy for the Arabian Oryx. All the range states present, endorsed this decision. The meeting further recommended that a workshop be held in Abu Dhabi to develop this regional strategy.

The Arabian Oryx Regional Conservation Strategy Workshop was held August 20-22, 2007 and was sponsored by the Environment Agency– Abu Dhabi (EAD). More than 40 delegates attended, representing Arabian Oryx range states, regional captive breeding centres, and other stakeholders. The workshop was facilitated by the IUCN/SSC Antelope Specialist Group and consisted of three parts: (1) Status Review; (2) Problem Analysis; (3) Strategy Development.

To see the full publication of Arabian Oryx Regional Conservation, visit: www.ead.ae/_data/global/arabianoryxstrategy.pdf

Interest Groups

Giraffe Conservation Foundation
&
IUCN International Giraffe Working Group

1st 'Wild' Giraffe Indaba: 4 - 7 July 2011
Etosha Safari Lodge, Namibia

Giraffe: The Forgotten Megafauna

Hosted by the Namibia Nature Foundation

The Giraffe Conservation Foundation (GCF) together with the IUCN SSC ASG International Giraffe Working Group (IGWG) invites all scientists, students, wildlife managers, and decision-makers in the field of giraffe research, conservation and management to attend the first ever 'wild' giraffe Indaba (conference) in Africa at the Etosha Safari Lodge, Namibia, from **4 to 7 July 2011**, including a **half-day seminar** on **7 July 2011**: '*The Conservation and Management of giraffe in Africa – looking forward*'.

The venue, situated adjacent to the world famous Etosha National Park and approximately 400 km north of Windhoek, the capital of Namibia, is an appropriate setting for this valuable conservation event as the Namibian giraffe population continues to increase while others appear to be dwindling.

The theme of the Indaba is: **'Giraffe: The Forgotten Megafauna'**. Despite a general fascination for this species, giraffe have so far received little scientific attention and as such are truly Africa's forgotten megafauna.

A range of sub-themes have been proposed for the Indaba, however the event is open to new, innovative and interesting presentations and posters.

SUB THEMES

- ✓ Ecology
- ✓ Taxonomy and genetic structure
- ✓ Veterinary medicine
- ✓ Physiology
- ✓ Conservation management
- ✓ Captive management in support of the wild world

To find out more about the Indaba, please go online and download the conference package at: www.giraffeconservation.org

Or you can contact us directly at: giraffe.indaba@gmail.com

We look forward to seeing you all in Namibia in July 2011!

Tall Order, Reprinted from Africa Geographic, October 2010

First catch your giraffe… Not as easy as it may sound, this is an exercise with many pitfalls, any one of which could result in the death of a West African giraffe, a subspecies that the 2008 IUCN Red List classes as Endangered, with high conservation priority. But to conserve it effectively you need to learn more about it,and for this a satellite collar is invaluable – and that, explains **Andy Tutchings**, *brings us back to catching your giraffe.*

"Attention, Attention", in a dreadful French accent that only an Englishman is capable of – was the warning for the team to strengthen their hold on the fully conscious giraffe we were restraining and look out for its flailing, plate-sized hooves. It was one I uttered only if I felt the animal's immensely strong neck muscles tense up, to pre-empt by a second or two its bid to break free and regain its footing.

The action was taking place some 60 kilometres east of Niamey, the capital of Niger, and we were fitting satellite collars to eight West African giraffes *Giraffa camelopardalis peralta*. The most endangered of all the giraffes, this subspecies is believed to have once ranged from Senegal across north-western Africa as far as Chad, but by the mid-1990s barely 50 individuals remained. Against all odds, its seemingly terminal decline has been halted – at least for now – and there has even been an increase in the population: according to a 2009 survey conducted by Jean-Patrick (J-P) Suraud, the scientific manager for the Association pour la Sauvegarde des Girafes du Niger (ASGN) and a research associate of the Giraffe Conservation Foundation (GCF), it now stands at some 200 animals.

A fragile coexistence. Some of the world's rarest giraffes feed peaceably just metres from the huts of local villagers in Niger.

An ongoing continent-wide study of giraffe DNA (see 'Giraffe Research Vehicle: Do Not Follow' in the April 2010 issue) has confirmed that the West African giraffe is genetically unique and suggests it may even be a distinct species rather than a subspecies. The research, which is being carried out by the International Giraffe Working Group (IGWG) and GCF, shows that it continues to exist only in Niger but, because the animals live outside protected areas and share their environment with the local people, its long-term survival hangs in the balance. We therefore need to gain a better understanding of the range and the habitat and forage requirements of the remaining individuals.

Working closely with Julian Fennessy, the world authority on giraffes, Suraud is conducting a complete genetic analysis of this isolated population as well as studying its dynamics and home range. It was agreed that the most efficient means of doing this would be GPS satellite technology – and that's where we came in.

Anaesthetising and capturing giraffes and then fitting satellite collars to them has only been done once before, as part of Fennessy's research in the rugged desert of north-western Namibia (see Africa Geographic, June 2003). Given the precarious state of Niger's extremely valuable population and that giraffe capture is a potentially dangerous business for all concerned – not least the animals – it was essential that we employ as much experience as possible. So Fennessy and I once again took our lead from Namibian wildlife vet and gamecapture expert H.O. Reuter, and were also fortunate to have with us Philippe Chardonnet, Chair of the IUCN Antelope Species Specialist Group.

Complex manoeuvring is required to bring the darted giraffe down safely, and all are hoping the drug has taken sufficient effect.

With the collar on, all we need to do is let go – and keep clear of the animal's flailing feet.

Suraud decided that the eight collars available would best be fitted to relatively young, non-pregnant females. Finding suitable candidates presented its own problems, but once they'd been selected the real adventure could begin.

The following extract from the expedition blog explains the capture procedure:

'…even the calmest of giraffes will start to run once the drug begins to take effect. The problem is that if the drug is allowed to completely knock out a giraffe, this is likely to be fatal, so once the drug has taken sufficient (key word!) effect, the "fun" is tackling the giraffe and applying an antidote ASAP. To do this we use a rope to tie up the animal's legs. The plan is for the capture team to drive alongside and then ahead of the running giraffe, alighting from the vehicle at the right moment and effecting a capture. This requires one person with one end of the rope to run in front of and then around the giraffe, where he is to be met by his supporting team (who ran behind it). The other end of the rope is held by the rest of the team and the rope is ideally "held" at giraffe thigh height (a man's shoulder/chest height), with two teams of about three people

running alongside the giraffe before crossing over behind it, effectively lassoing its legs and making it fall… The antidote is applied immediately while the animal is restrained – and then, of course, we have a fully alert giraffe trying to get up again! To prevent this we put on a blindfold, insert cotton wool in its ears and apply a little muscle power too…'

It sounds straightforward, doesn't it? Indeed, when all goes smoothly the entire process, from firing the dart until the giraffe is back on its feet, takes about 25 minutes. Some of the captures went almost exactly to plan but, not surprisingly, there were also missed tackles, sidestepping giraffes, tyre blow-outs, rope burns, spectacular falls and an array of cuts and bruises (only for the team, I should add – all the giraffes were fine). A highlight was demonstrating our procedure, fortunately successfully, to government minister Issouf Baco and his entourage one morning. Less heartening was having to spend a day and most of a night modifying all the collars after some giraffes had managed to 'throw' them.

Despite the fun caused by the capture team's atrocious French pronunciation – it raised many a grimace among our locally recruited, French-speaking crew, especially Kimba, our giraffe guide extraordinaire, who would have us all laughing as he mimicked us perfectly – we were acutely aware that just one fatality would have constituted the loss of some 0.5 per cent of this fragile population. So it was with tremendous relief that we observed all the giraffes regain their feet and wander off to feed, unaware of the importance of their new accessory and the essential information it was already contributing to the long-term future of their species.

Unfortunately it turned out that the collars did not fit correctly and three months later Suraud decided to remove them. Thanks go to South African vet Peter Morkel for flying up to Niger and helping out at short notice, and to the French Fund for the Environment (FFEM), African Wildlife Tracking and GCF for their quick response and support. The data collected in even that short period provided Suraud with extensive and essential information on the giraffes' dry-season range and movements. And, while the design of the collars and the incorporation of new technology are being urgently reviewed, he and his team are continuing their field observations and adding to their knowledge of this extremely rare species.

What was all that about? A newly collared giraffe wanders off somewhat bemusedly, then turns to look back at us.

The author would like to express the team's gratitude for the invaluable support of the project's sponsors (FFEM, GCF and Fondation GF) and the collaboration of Niger's Environment Ministry and the Giraffe Guide Association. To read the entire expedition blog and follow Suraud's ongoing research in Niger, go to www.giraffeconservation.org/our_projects.php

Antelope in the News

Reprinted from Kenya Wildlife Service releases

Conservation planning for the Mountain Bongo (*Tragelaphus eurycerus isaaci*)

Bongo ranges extend from rainforests of Central Africa from Sierra Leone, Liberia, Ivory Coast, Cameroon, Central African Republic Congo and Zaire, Sudan, Kenya, Uganda, Tanzania and Ethiopia. Two sub-species are known; the Western or Lowland Bongo and the Eastern or Mountain Bongo.

In Kenya there are isolated pockets of the mountain bongo hosting various meta-populations. These include Aberdare ranges, Mt. Kenya, Mau south west forest reserve and Eburru. Bongo are believed to be locally extinct in Londian and Cherangani forests.

Various causes have been documented as having led to the bongo antelope decline, namely; habitat fragmentation, poaching, predation pressure, disease and human factors. However the genetic effects on the bongo have not been fully accessed. It is more probable that a combination of genetic, physical and biological factors led to the drastic decline of the bongo.

The Aberdare forest is the bongo stronghold in the country with an estimated population of 100 individuals. This represents an 80% decline in numbers that were estimated to be 500 in 1975. Recent and ongoing surveys in the country have estimated 7 individuals in Mount Kenya, 9 in Eburru forest and 9 in Mau forest. There also exist about 64 individuals in a semi-captive facility on the slopes of Mount Kenya (*calves from this group shown below*).

Bongo conservation presents a major challenge to Kenya Wildlife Service and an expert think tank known as the National Bongo Conservation Task Force was constituted in 2008 to spearhead efforts to conserve the species. The task force has been consulting ever since to piece together a national bongo conservation strategy.

The efforts of the task force are now bearing fruit as a national stakeholder's workshop to put together the national action plan for bongo was held at the end of July 2010.

Conservation planning for sable antelopes commences

Sable antelopes have been eliminated from large areas of their former range due to a combination of factors. These include disease, drought-caused food shortages, and habitat loss and degradation compounded by inter-species competition. Subsistence hunting poses an additional threat and its powerful stature and imposing horns have also made this species a prized trophy animal to many big-game hunters.

In Kenya, the sable antelope has declined considerably in its former range in the last 30 years and is only found in Shimba Hills National Reserve. Currently, the population is estimated to be 70. This is an alarming decline compared to 265 individuals in 1960. This sub-species coastal range previously extended as far north as Mwangea Hill near Malindi and as far south as Mrima Hill near the Tanzania border.

As such sable antelopes are of considerable conservation concern at the national level in Kenya because, within their 'natural range' their numbers are low (far lower than in the recent past); population is dwindling and localized.

In recognition of the threats facing the remaining population of sable antelopes in Shimba Hills, Kenya Wildlife Service found it prudent to initiate a conservation planning process for them. A national sable antelope conservation task force is championing the process of developing a national conservation strategy for sable antelopes and held the first meeting in May 2010 to chart the way for a the strategy.

Conservation planning for roan antelopes kicks off

The roan antelope *Hippotragus equinus* was once widely distributed through the savannah woodlands of east, central, southern and western Africa, but during the last 40 years it has declined rapidly throughout much of its range. Originally roan occupied fairly large areas of southern Kenya, occurring from Lake Natron to Lake Victoria and north to Mt Elgon and the Cherangani Hills, as well as in two pockets centred around Thika / Kitui and an area to the east of the Chyulu Hills. By the early 1960s the distribution had become much reduced, and the species was declining further in most of the scattered localities in which it persisted. In the last decade there have been no confirmed reports of roan from either the eastern Mara and Oloolol (or Isuria) Escarpment, or the Mt Elgon region, and the last known refuge of the species in Kenya is the Lambwe Valley, in Ruma National Park. The population at Ruma National Park has declined from 202 individuals in 1976 to about 50 individuals today.

The decline in numbers and shrinkage in distribution of roan antelopes in Kenya has necessitated the formation of a national roan antelope conservation task force that will steer the process of formulating a national conservation and management strategy. A meeting to initiate the conservation planning process for roan antelopes was held at Kisumu KWS offices in April 2010.

The national conservation strategy is expected to give guidance to efforts to conserve roan antelopes in Kenya by exploring all the options that are available to ensure the species thrives in perpetuity.

Conservation planning for giraffes kicks off

To many people, giraffes may not seem to be in need of focused conservation attention. However, giraffes are facing increasing pressures that have impacted on their numbers and distribution in Kenya and elsewhere across the continent. There are currently a total of nine sub-species of giraffes naturally occurring in the African continent. Kenya is the only country with three of these sub-species present. Other countries have either one or two sub-species. Therefore, Kenya is the epi-centre for giraffe speciation.

Over the past decade, giraffe numbers in Africa have suffered at least a 30% drop in population as a direct result of habitat encroachment, habitat loss, habitat fragmentation, severe poaching, increasing human populations and human-wildlife conflicts.

Rothschild's giraffe

The Rothschild's giraffe (*Giraffa camelopardalis rothschild*i) is the second most endangered giraffe sub-species with less than 670 individuals remaining in the wild. Once wide-ranging across western Kenya, Uganda, and southern Sudan, it has now been almost totally eliminated from most of its former range and now only survives in a few small, isolated populations in Kenya and Uganda.

Kenya is home to about 60% of the global population of wild Rothschild's giraffe with Ruma National Park having the single largest meta-population (130 individuals) in the country. Lake Nakuru National Park has 65 individuals, Soysambu Conservancy 63, Kigio Wildlife Conservancy 32, and Giraffe Manor-Karen, Mount Elgon National Park, Murgor Farm in Iten, Mwea National Reserve, Sergoit-Kruger Farm in Iten, Kitale Area Farm and Nasalot Game Reserve all with populations of less 20 individuals.

Reticulated giraffe

Reticulated giraffes (*Giraffa camelopardalis reticulata*) are widely found in northern Kenya and in Somalia. Data on the number and range of reticulated giraffe is limited and incomplete, with as few as 3,000 - 5,000 individuals remaining in the wild. This estimate represents a small fraction of the 28,000 reported to have existed only a decade ago suggesting that the sub-species has recently suffered a major and rapid decline giving rise to concern about its long-term persistence. As an example, estimates for Laikipia District are consistent with a pattern of decline: 1977 - 6,398; 1990 - 5,419; 1994 - 2,118; 1997 - 2,903.

Masai giraffe

The Masai giraffe (*Giraffa camelopardalis tippelskirchi*) occur in southern Kenya i.e. Amboseli, Tsavo and the Masai Mara ecosystems and throughout Tanzania. The Masai giraffes have relatively stable populations compared to the other sub-species in Kenya although reports that their numbers have also suffered in recent years have been highlighted. Current surveys and recent estimates are being compiled for the Masai population and hopefully some more positive news will prevail.

Conservation planning for giraffes

Given Kenya's heritage in terms of giraffe diversity and speciation, it is fitting that we develop a national conservation strategy dedicated to giraffes.

The National Giraffe Conservation Strategy for Kenya will provide national guidance on the conservation and management of all three sub-species across Kenya. The guidelines will define the role of the government, conservation partners and other stakeholders whilst raising awareness about the plight of giraffe and highlight the generally declining population trends occurring within Kenya.

Kenya Wildlife Service constituted a National Giraffe Conservation Task Force (NGCTF) to steer the process of formulating the National Giraffe Conservation Strategy. The NGCTF has held two meetings to discuss the key features of the Strategy, specific challenges and risk factors facing each of the sub-species. A two day retreat of the NGCTF was planned for July 2010 to further consolidate the background information for the sub-species and set the stage

for a national stakeholder's workshop. The national stakeholder's workshop was expected to take place towards the end of 2010. The workshop will develop a vision, goal and strategic objectives for the Strategy. The workshop will also provide an opportunity to update numbers and distribution of giraffes in Kenya, as well as incorporate the inputs and views of stakeholders. Activities, indicators and timelines will also be outlined against each strategic objective.

The conservation planning process is supported by funding from Kenya Wildlife Service (KWS), Giraffe Conservation Foundation (GCF) and African Fund for Endangered Wildlife (AFEW).

Male antelopes deceive females to increase their chances of mating

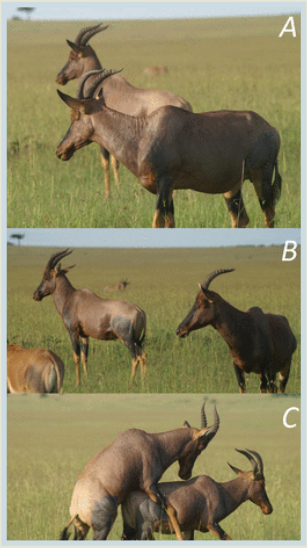
Public release date: 19-May-2010, EurekAlert!

Scientists at the University of Liverpool have discovered that male topi antelopes deceive their female counterparts in order to increase their chances of mating.

The study of topi antelopes in Kenya's Masai Mara National Reserve Park found that male antelopes snort and look intently ahead if an ovulating female begins to stray from their territory. This type of behaviour suggests to the female that there is predator danger ahead. Typical predators of the topi include lions, cheetahs, leopards and humans. When scientists examined the behaviour closely they discovered that the male antelope's snort and intent look were a false call made to keep the female in his vicinity and there was no danger nearby. Rather than risk any danger of a predator the female stays within the male antelope's territory, which increases his chances of mating with her.

This type of intentional deception of a sexual partner has not been documented before in animals. Previous studies have shown that animals do deceive each other but mainly in hostile situations or to protect themselves. For example, the plover bird feigns injury in a - `broken wing display'- in order to stop a predator finding their nest; certain bird species use false alarm calls to distract competitors away from food sources; male vervet monkeys use false alarms to dissolve conflicts between groups, and chimpanzees make false alarm calls to fool rivals and thereby gain access to mates.
The research, carried out by carried out by Dr Jakob Bro-Jorgensen at the University of Liverpool and Wiline Pangle at Michigan State University, studied the topi antelope over a four year period. Dr Bro-Jorgensen said: "Our study showed that males quite frequently pull this trick on the females in heat and one might ask why females keep responding to alarms at all. The answer seems to be that females are better off erring on the side of caution, because failing to react to a true alarm could easily mean death in a place like the Masai Mara where it is full of predators."

"This study reveals a new weapon used by animals in the battle of the sexes: whilst it is well known that males sometimes use their superior strength to force unwilling females, it is a new discovery that they may also actively falsify signals to get their own way."



Deceptive use of alarm snorts. *A*, A topi male (in background) has just emitted a false alarm snort close to the boundary of his territory and stares into the distance as if a stalking predator has been detected. A receptive female (in foreground) who was heading toward the alleged danger stops and looks ahead alertly. *B*, As she turns to move away, the male quickly shifts his attention toward the female, as revealed by the change in the orientation of his ears and his gaze. *C*, Shortly afterward the male succeeds in mating with the female. Another example of a male obtaining matings after false snorts.

The research is published in journal The American Naturalist. Video footage is available at http://www.journals.uchicago.edu/doi/video_original/10.1086/653078/movie.mpg

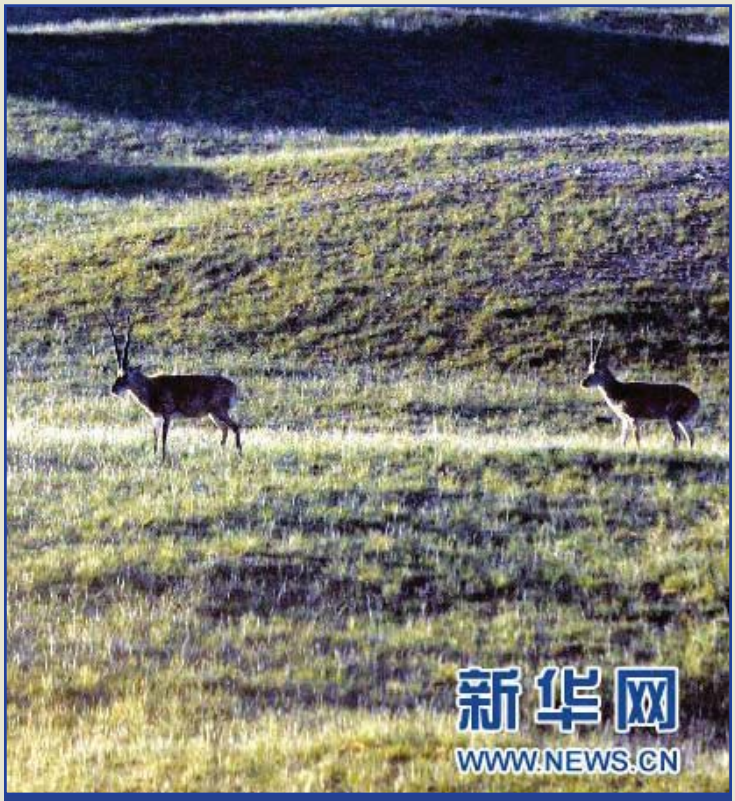
Tibetan antelope population hits 200,000 in Tibet

Xinhua, January 21, 2011

The population of Tibetan antelopes, once a critically-endangered species, has risen to 200,000 in southwest China's Tibet Autonomous Region, a specialist on plateau forestry studies said Friday.

Liu Wulin, president of the Forestry Survey and Planning Institute in Tibet, said the figure was calculated on the basis of a precise census carried out in 2006, and an average annual growth rate of 7 percent.

In the 2006 census, Liu and his team found about 150,000 Tibetan antelopes in a 710,000-square-km area in Tibet.



In the photo taken on July 30, 2010, two Tibetan antelopes walk in the Hoh Xil. About 80 percent of the total population live in northern Tibet, while the remaining 20 percent roam the Hoh Xil, China's largest uninhabited area in neighboring Qinghai Province.

The team of 119 researchers had studied the species and the plateau ecology for 18 years, focusing on antelope habitats, distribution, natural enemies, food, population density, migration, reproduction and growth rate, said Liu.

Their research project won national award for scientific development this year.

Tibet used to have millions of Tibetan antelopes, but excessive hunting and human encroachment on their habitat caused their population to plummet in recent decades.
International traffickers hunted the antelopes to make shahtoosh shawls, a luxury item that required three to five pieces of antelope fur to make just one shawl.

Since 1979, the animal has been recognized as an endangered species and protected under the Convention on the International Trade in Endangered Species.

Tibet tightened supervision and patrols of antelope habitats in 1998.

Tibetan antelopes are mostly found in Tibet, Qinghai Province and the western part of Xinjiang Uygur Autonomous Region.

About 80 percent of the total population live in northern Tibet, while the remaining 20 percent roam the Hoh Xil, China's largest uninhabited area in neighboring Qinghai Province.

South Africa - Bad news for critically endangered giant sable 11 Nov 2010

The giant sable is one of Africa's most spectacular large antelope, characterised most strikingly by its impressive horn length and shape. But highly localised distribution and interbreeding with its congener the roan antelope has led to this subspecies, (*Hippotragus niger variani*) being described as critically endangered on the Red List of Threatened Species.In an article published in the South African Journal of Wildlife Research, the authors note that before 2006 it was thought that the animals had been wiped out in the Angolan civil war. However, in 2006, a hidden camera took photographs of individuals of two very small populations, comprising a total estimated size of fewer than 250 animals.

Although considered to be restricted to the central part of Angola, between the Cangandala National Park and the Luando Integral Nature Reserve, sightings of antelope resembling the giant sable have been reported over a much larger area in recent years. This prompted speculation by conservationists that animals found in western Zambia, looking almost identical to the Angolan group, were also giant sable that could significantly boost giant sable numbers. Unfortunately, research at Stellenbosch University, which compared the genetic composition of these animals, proved that despite their physical similarities, the two populations differed genetically.

Professor Bettine Jansen van Vuuren, a researcher who worked on this project and an author of the research paper, says their latest genetic tests show that although the west Zambian antelope, also with dark faces and hide colour, bear a strong resemblance to the rare giant sable, they belong to the same subspecies as the more reddish southern sable antelope (*Hippotragus niger niger*), which also occur in South Africa.The latest Stellenbosch study shows that there are great external differences in the various populations of southern sable antelope that occur right across southern and central Africa."It's not only genetics that determine what an animal looks like; the environment in which it occurs also plays a role," empha-

sises Prof Jansen van Vuuren.Genetic testing is therefore a more accurate indication of type than external phenotypical characteristics are, the researchers say.

The findings also hold implications for the conservation of sable antelope and highlight the need for immediate active management and direct intervention, without which the future of this spectacular antelope remains bleak.

Sources: Western Zambian sable: Geographic extension of the giant sable? – South African Journal of Wildlife Research Vol. 40, No. 1, April 2010, by Professors Bettine Jansen van Vuuren, Terry Robinson and Conrad Matthee of the Department of Botany and Zoology at Stellenbosch University in collaboration with Mr Pedro Vaz Pinto of the Universidade Catolica de Angola and American scientist Dr Richard Estes.Contact Engela Duvenage at the Stellenbosch University, faculty of science on science@sun.ac.za.
Source: farmersweekly.co.za

Strange Antelope in the News

Dear Steve,
I am the Executive Director of Wildlife Direct.
I draw your attention to a very bizarre hairy Thomson's gazelle photographed by Paolo Torchio in the Masai Mara.

http://baraza.wildlifedirect.org/2010/08/13/strange-antelope-in-the-masai-mara/

I wondered if anyone in the Antelope Specialist Group had ever seen anything like it to or if anyone would venture an explanation? You may be interested in carrying it in your newsletter.

Kind regards,
Paula Kahumba
Executive Director Wildlife Direct
P.O. Box 24467 - 00502
Kenya
cell: 254-722-685-106

Recent Publications

Discovery of a new duiker species (Bovidae: Cephalophinae) from the Dahomey Gap, West Africa

http://www.mapress.com/zootaxa/list/list2010.html

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Abstract
Among the two most widely distributed duiker species, *Philantomba monticola* (Thunberg, 1789) and *Philantomba maxwelli* (C.H. Smith, 1827), the latter shows geographic variation in pelage color and body size. This issue was not investigated in detail so far, especially in the eastern region of its distribution area, notably due to the lack of material from the Dahomey Gap. We undertook a species-level revision of *Philantomba* in West Africa, notably including a series of specimens collected in Togo, Benin and Nigeria. Using morphological measurements (craniometry) and genetic data (two mitochondrial and three nuclear markers), we describe a new duiker species occurring in the Dahomey Gap (Togo, Benin) and the Niger delta, Philantomba walteri sp. nov. This discovery highlights the importance of the Dahomey Gap for the evolutionary history of the West African forest faunas. It also has conservation implications given that the new species is one of the main targets of the local bushmeat trade.

Zootaxa 2637: 1–30 (2010)
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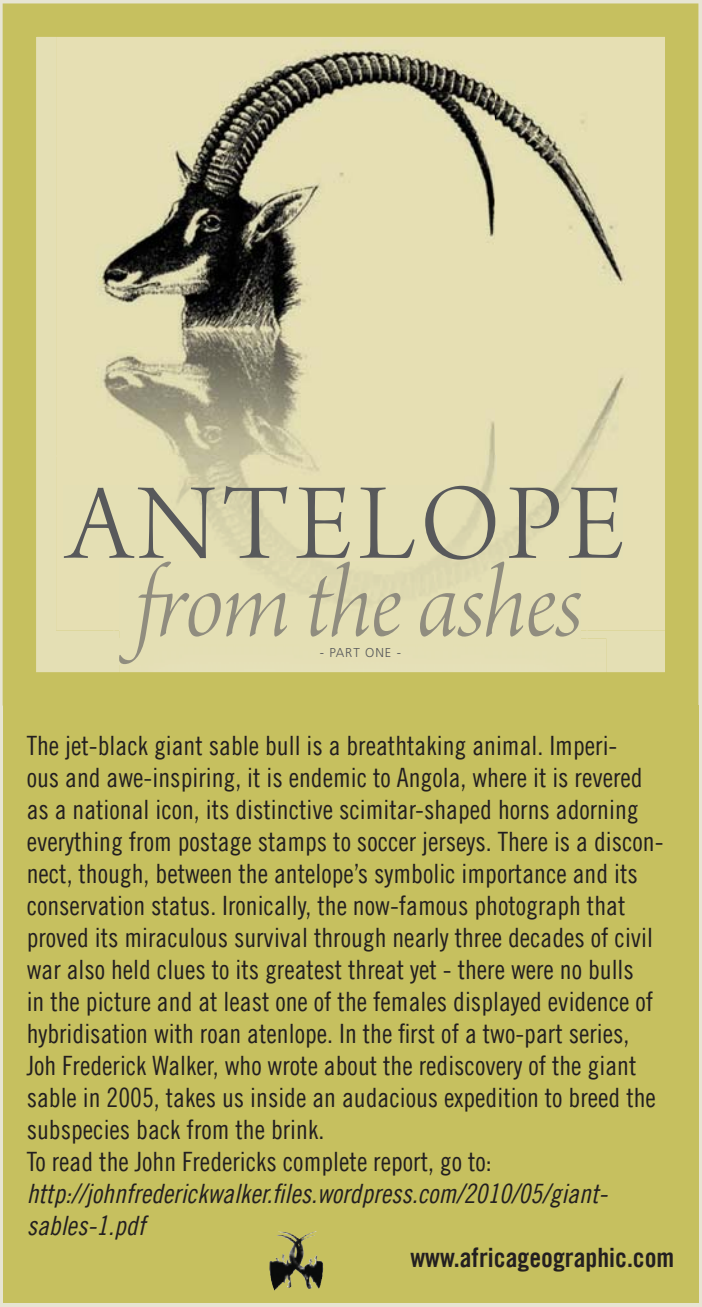

The jet-black giant sable bull is a breathtaking animal. Imperious and awe-inspiring, it is endemic to Angola, where it is revered as a national icon, its distinctive scimitar-shaped horns adorning everything from postage stamps to soccer jerseys. There is a disconnect, though, between the antelope's symbolic importance and its conservation status. Ironically, the now-famous photograph that proved its miraculous survival through nearly three decades of civil war also held clues to its greatest threat yet - there were no bulls in the picture and at least one of the females displayed evidence of hybridisation with roan atenlope. In the first of a two-part series, Joh Frederick Walker, who wrote about the rediscovery of the giant sable in 2005, takes us inside an audacious expedition to breed the subspecies back from the brink.
To read the John Fredericks complete report, go to:
http://johnfrederickwalker.files.wordpress.com/2010/05/giant-sables-1.pdf

www.africageographic.com

Recent Reports

A rough population estimate of large ungulates in the Akagera National Park, Rwanda

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Introduction

The consequences of the civil war in 1994 on wildlife in Rwanda and its recovery have been little reported. The consequences of the Rwandan civil war on national parks and reserves are particularly important, in a country where the human pressure on these areas was already high prior to the civil war. Both the Mutara Game Reserve (300 km2) and a large part of the former Akagera National Park (2,500 km2) were devoted to grazing for around 600,000-700,000 cattle of refugees returning from Uganda in 1995 (Kanyamibwa, 2009). In 1997, the Mutara Game Reserve and the northern and western sections of the former Akagera N. P. were degazetted (Williamson & Ntayonbya, 1999). The area of the park was reduced from 2,500 to 732 km2, meaning that the park lost two-thirds of its original size. Since 1997 only a few environmental impact assessment studies were carried out in the area (Kanyamibwa, 2009). However, assessments of biodiversity in the reduced park (new Akagera N.P.) and in the degazetted areas (Mutara G.R. & former Akagera N.P.) have revealed a considerable loss of wildlife (Chardonet & East, 1995; Williams & Ntayombya, 1999) and dramatic changes have occurred in the land use system. Grasslands are being put under the plough, trees felled, and wildlife virtually disappeared from degazetted areas. This study reports on the first (preliminary) survey of ungulates in the new, reduced Akagera N.P. since 1997/98 (William & Ntayombya, 1999, 2001).

Methods

In this study, we used data obtained from a road count along existing tracks in the new Akagera N.P.. Due to time constraints, only a small portion of the farmlands adjacent to the Park (degazetted parts of the old Akagera N.P.) could be included in our survey, but will be considered in future surveys conducted in the area. The count was carried out during four consecutive days in April 2010 (13.-16.4.2010). In total 156 km were traveled during the survey, including 14.7 km in flood plains, 72.4 km on moderate slopes, 4.0 km on steep slopes, 39.1 km in forest, and 25.9 km on plateaus. Habitat types were defined according to Vande weghe (1990) and William & Ntayombya (1999). The distance driven in each habitat type was determined during the count using a GPS (Garmin III Plus). Perpendicular distances to each animal sighting were estimated and later tallied for belts of increasing distance from the count line, i.e., 20m intervals (0-20 m, 20-40 m, 40-60 m, etc.). Thereafter, the number of all species in each belt was inspected and the 'fall-off' point was determined as 80% of all sightings resulting in a fixed strip width of 60 m on each side of the road for all species in all habitats (Norton-Griffiths, 1978). The strip width was then multiplied by the total length of the count route resulting in the total survey area. Estimates of numbers for each species in the terrestrial part of the Park (483.4 km2; William & Ntayombya, 1999) were calculated using the equation: $N = n*H/h$, where n is the number of animals actually seen during count, H is the size of terrestrial part of the Park and h equals the size of the survey area covered during count.

In another approach a visibility profile was established for two species (impala, topi) in each habitat type to overcome a bias coursed by the fact that the road system was not representative of the presence of habitat types (flood plains [6.7 km2], moderate slopes

[270.8 km2], steep slopes [140.3 km2], forest [9.7 km2], plateaus [55.9 km2]; William & Ntayombya, 1999). Here, the number of each species in each belt was inspected and the 'fall-off' point was determined as 80% of all sightings resulting in varying strip widths for each of the two species in each habitat (Norton-Griffiths, 1978). Estimates of numbers for each species in the terrestrial part of the Park were then calculated using the above equation. Numbers of sightings for the other ungulate species were too few to obtain meaningful estimates by using a variable strip width.

Ground counts and particularly road counts are prone to considerable bias and can give only approximations when trying to estimate population sizes in large areas. Road counts should be avoided unless absolutely necessary or when cross country driving is impossible and if aircraft are not available (Norton-Griffiths, 1978). However, this study was designed to establish a simple, cost effective method to roughly estimate large ungulate populations in the new Akagera N.P. and adjacent farmlands. The field methodology and the methods of data analysis need to be easily repeated by inexperienced staff members and students of the Umutara Polytechnic in Nyagatare, Rwanda. In our study we therefore used the most simple approach, i.e., fixed strip width, since the visibility profile method is open to many sources of bias that are difficult and laborious to correct and lead to considerable overestimates of density, especially when used during road counts (Norton-Griffiths, 1978; Bothma, 2002). This was confirmed by our extrapolations (using variable strip widths) for impala and topi, which resulted in even higher estimates than applying a fixed strip width (Table 1).

Results

Estimated populations of ungulates in the Akagera N.P. based on fixed and variable strip widths are presented in Table 1. Only for impala, topi, waterbuck, buffalo, zebra and warthog estimates were calculated. For the other species there were too few sightings to make meaningful population estimates. However, minimum numbers observed during the four days survey are also presented in Table 1, but do not represent population estimates. Elephants and rhinoceros were not encountered during our survey. Species confined to the papyrus swamps and lake system (i.e. sitatunga and hippopotamus) were also not encountered during our survey.

Discussion

As a result of major vegetation changes due to heavy grazing pressure from cattle and the destruction of natural vegetation by cultivation and tree felling, the populations of large ungulates in the Akagera Ecosystem had decreased drastically after the former Akagera N.P. was largely degazetted in 1997 (William & Ntayombya, 1999, 2001). Despite the beginning habitat degradation, ungulate numbers in late 1998 were still higher on adjacent farmlands (degazetted, settled part of former Park) than in the reduced, new Akagera N.P. (William & Ntayombya, 1999, 2001). Our findings show that this pattern has changed. The ungulate numbers outside the protected area have decreased to a very low level (at least during the sampling period in April 2010), while the numbers inside the Park have recovered to a level higher than that reported for the period 1997/98. It appears that large numbers of ungulates formerly inhabiting the degazetted part of the old Park have moved into the protected area (new Akagera N.P.). No doubt, our figures repre-

Species	Former Akagera N.P., 1991[1]	New Akagera N.P., 1997/98[2]	Degazetted area, 1997/98[2]	New Akagera N.P., 2010[3] (fixed strip width)	New Akagera N.P., 2010[3] (variable strip width)	Degazetted area, 2010
Impala	30,000	1,890	3,770	16,140	23,320	220*
Topi	7,500	770	1,250	4,240	7,140	14*
Waterbuck	1,600	80	270	1,640	-	14*
Zebra	3,800	580	2,470	1,550	-	16*
Buffalo	10,000	680	1,580	100	-	0
Warthog	1,500	240	140	150	-	5
Bushbuck	na	na	na	7*	-	0
Klippspringer	na	na	na	4*	-	0
Eland	325	59	44	4*	-	0
Roan	145	na	na	1*	-	0
Reedbuck	1,890	na	na	0	-	1*
Oribi	2,650	440	180	10*	-	0
Giraffe	na	na	na	5*	-	0

TABLE 1. Estimated populations of ungulates in the former and the reduced Akagera National Park prior and after two third of the protected area were degazetted in 1997.
**Species for which there were too few sightings to make population estimates. Numbers shown are minimum numbers of individual sighted, na = no information available, [1]Vande weghe & Dejace (1991), [2]William & Ntayombya (1999, 2001), [3]this study*

sent a clear overestimate of most ungulate species (particularly that of impala, topi and waterbuck), while others (zebra, buffalo) seem to have decreased or were underestimated. The bias in both directions is most probably due to the crude sampling method applied, but a positive trend for impala, topi and waterbuck, however, can be observed for the new, reduced Akagera N.P.

William & Ntayombya (2001) predicted that the decline in wild ungulates outside the reduced Akagera N.P. will further decrease due to the loss of habitat, the expansion of agriculture, illegal hunting, and the competition with livestock for water and pasture. However, they also predicted that most ungulates of the new Park can recover, albeit to a lower population level than that reported for the former, larger Akagera N.P.. Given the fact that the former National Park was reduced by about 75%, it is surprising that at least impala, topi and waterbuck numbers have approached a level equivalent to that of the former Park (see Table 1). Wildlife is today, as suggested by William & Ntayombya (2001), excluded from the settled area adjacent to the Park, and is largely confined to the new Park. Moreover, during our survey no cattle was observed inside the protected area, indicating that proposed conservation strategies for the new Park (i.e., increase and rehabilitation of management authority's staff, improved law enforcement, removal of human settlements and cattle from the new Park and improved infrastructure for tourism) were successfully implemented. Also the creation of a buffer zone was realised, although it seems that the width of that area (about 200 m) was not sufficient, since local communities seem to consider this part as a good grazing ground for livestock. However, wild ungulates were observed up to 7 km outside the Park's border along the flood plains between Colline Bganga and Rwenjara, north-west of the new Akagera N.P..

As concluded by William & Ntayombya (1999, 2001), the new Park is still of great value for the conservation of biodiversity and has considerable potential for tourism. This is reflected by the fact that roan and eland antelopes (this study) as well as elephants and rhinoceros (pers. com., Akagera rangers) still persist in the reduced Park. Apart from that, the Park has an immense importance for the populations of sitatunga and hippopotamus, especially since their habitat was not affected by habitat degradation and destruction.

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Swayne's Hartebeest

Antonínová, M., Vymyslická, P., Hecjmanová, P. and Froment, J-M. 2008.

Review on Swayne's hartebeest (*Alcelaphus buselaphus swaynei*) status in Ethiopia with special focus on Nech Sar National Park. *Gazella* 35: 35-56 (in English and Czech) (publication of Prague Zoo – Zoo Praha).

Swayne's hartebeest (*Alcelaphus buselaphus swaynei*) was formerly distributed quite widely in Ethiopia and parts of Somalia. It has now been reduced to small populations at three sites in Ethiopia. Nech Sar National Park (size variously estimated as 400, 514 and

752 km^2), Mazie NP (202 km^2) and Senkelle Swayne's Hartebeest Sanctuary (54 km^2). They no longer occur in Awash NP or Yavello Sanctuary.

In 2008, more than 500 Swayne's Hartebeest were estimated to occur in Senkelle, compared to 2350 in 1991 and 150 in 1995. In Nech Sar, they are confined to the Nech Sar Plains, an area of about 200 km^2 but only 35 animals were counted there in 2007. A population of 250 Swayne's Hartebeests was estimated in Mazie NP in 2006 but the area has not been surveyed in detail. The total population is now estimated to number a few hundred at most, and the subspecies may be approaching the threshold for Critically Endangered on the IUCN Red List.

Somaliland, D. Mallon

A rapid assessment of current antelope status, funded by the Mohammed Bin Zayed Species Fund, was conducted in July 2010 by David Mallon (ASG) and Abdi Jama (Nature Somaliland). The survey covered 2000 km, from the border with Djibouti south towards the Ethiopian border and east to Daallo Forest Reserve. Eight antelope species were seen: Soemmerring's Gazelle *Nanger soemmerringii*, Speke's Gazelle *Gazella spekei*, Dorcas Gazelle *G. dorcas pelzelni*, Gerenuk *Litocranius walleri*, Beira *Dorcatragus megalotis*, Klipspringer *Oreotragus oreotragus*, Salt's Dikdik *Madoqua saltiana*, and Guenther's Dikdik *M. guentheri*. Local reports and tracks of Lesser Kudu *Tragelaphus imberbis* were recorded at Gaan Libaax, but the animals were not seen. No records of Dibatag *Ammodorcas clarkei* were made. Local people in the 'red sand' country south of Qorilogud, close to the Ethiopian border, reported that Dibatag were last seen there around 50 years ago. There were no signs or reports of Beisa oryx *Oryx beisa* or Swayne's Hartebeest *Alcelaphus buselaphus swaynei*.

Speke's Gazelle were seen in small numbers (30 groups, 120 individuals in total) from the Ban Tuyo plains eastwards; the westernmost occurrence was some 200 km farther west than the previously reported locality. Soemmerring's Gazelle appears now to be restricted to the Giriyaad Plains in the north-west. Dorcas Gazelle is still found along the arid coastal strip. Gerenuk were seen at six locations and appear to be widely but thinly distributed. Beira were recorded in stony hills east and west of Hargeisa and on rocky ridges in the coastal hills east of Berbera. Salt's Dikdik was common in all habitats, while Guenther's Dikdik was recorded at only one site in the south. A full report will be produced soon.

Azerbaijan, D. Mallon

A project to reintroduce Goitered Gazelles *Gazella subgutturosa* to former sites the country began in late 2010. So far animals have been released in Ak Gol NP in the centre of the country, Gobustan in the north-east, and the Ajinour Steppe in the north-west. A further 100 animals are due to be released in 2011. Gazelles for release are sourced from Shirvan National Park where the population is increasing and possibilities for dispersal are very limited. The project has high-level support form the government and the President of Azerbaijan.

Saiga meetings

A Memorandum of Understanding on saiga conservation under the Convention on Migratory Species came into force in September 2006. The Second Meeting of the Signatories to the CMS MOU on Saiga Conservation took place from 7-10 September 2010, in Ulaanbaatar, Mongolia. As with the first meeting, the formal sessions were preceded by a technical workshop, attended by saiga experts and government representatives, to review progress and revise conservation action. On behalf of the CMS Secretariat, the Saiga Conservation Alliance and IUCN/SSC Antelope Specialist Group prepared the documents for the meeting: a saiga status overview report and progress made on implementation of the Medium-Term International Work Programme (MTIWP) developed at the First Meeting of the Signatories. A revised MTIWP for the period 2011-2015 was discussed and agreed.

A significant outcome of the meeting was agreement that the MOU should be extended to cover the genus *Saiga* rather than only the nominate subspecies as previously. Thus, Mongolian saiga *S. t. mongolica* is now included in the MOU, which the Mongolian government signed at the meeting.

The Saiga Conservation Alliance and the Association for the Conservation of Biodiversity in Kazakhstan, jointly took up the Secretariat's challenge to provide a coordination mechanism for the MOU.

An international workshop on conservation and sustainable use of saiga was held in Urumqi, China on 27-29 September 2010. This was organised jointly by the CITES Management Authority of China, and the secretariats of CITES and CMS.

There are full reports on both meetings in the latest issue (12) of Saiga News, which can be downloaded from www.saig-conservation.com and all the documents form the CMS meeewitng are available at www.cms.int/species/saiga

Evolution of Horns in Female Bovids – a Functional Perspective

Richard D. Estes,

The following comment presents an alternative hypothesis to that of Stankowich and Caro, Evolution of weaponry in female bovids, published in *Proc. R. Soc. B* doi: 10.1098/rspb.2009.1256

I wrote a critique/rebuttal of this paper and submitted it as a "Comment" to Proc.R. Sc. B. It was sent for review to the authors, an original reviewer who approved their article, and one independent referee. Their responses persuaded the Editor' not to publish my comment. Consequently, readers of the PRS will remain uninformed of the flaws and mistakes I found in S & C's paper, and of my alternative hypothesis developed in two symposium papers (Estes 1991b, 2000). Readership of the Gnusletter *may be smaller than readership of the Proceedings but it is a much more-targeted audience. I invite antelope specialists to judge which of these two evolutionary scenarios is more plausible: that female bovids evolved horns for self- and offspring defense (Stankowich and Caro), or to mimic the horns and other male secondary sexual characters of their sons as a way to reduce male despotic competition toward developing males, thereby enabling them to remain in female herds until the benefits of leaving outweigh the costs of staying (my andromimicry hypothesis).*

I have no doubt that female mimicry of male secondary characters has played a major role in the evolution of female horns and other originally male secondary characters, as detailed in Estes 1991b and 2000. However, testing the hypothesis depends on getting reliable data on the stage at which male offspring separate from female herds for many different species, and on data that can be used to test the difference in survival rates of offspring of horned and hornless females. I am not in a position to pursue this research, both on account of my advanced age (83) and on the labor of writing a book on the behavioral ecology of the Serengeti wildebeest population. But if any antelope specialist or other biologist is interested in looking at a promising but largely overlooked field of research, I urge him or her to contact me: richarddestes@gmail.com.

Estes (1991b) advanced the hypothesis that females of various herd-forming species evolved horns to disguise the sex of male offspring. When females are hornless, breeding males treat young males as potential rivals once their horns become conspicuous, and drive them from female herds and territories. Higher male mortality begins when male offspring are expelled from female herds, leading to skewed adult sex ratios in all sexually-segregated societies. When young of both sexes bear similar horns, horns cease to be sex badges. Selection for females to keep sons in female herds until they have grown to the stage where they benefit more from joining bachelor herds promotes mimicry of male horns and other male secondary sexual characters (e.g. markings and coloration — Estes 2000)

As horns are permanent structures essential for male breeding success, masking the sex of male offspring requires both sexes to grow similar horns. Significantly, when both sexes are horned, horns emerge within the first few months, but much later when only males have horns, as Darwin (1874) remarked, comparing eland (*Tragelaphus oryx*) and kudu (*T. strepsiceros*). Female mimicry thereby enables the earliest possible development of the essential weapons of sexual competition, another fact suggesting the weapon functions of female horns are secondary.

Stankowich and Caro paraphrased several sentences in Estes (1991a) which advanced this hypothesis. But it is not mentioned again, although the original paper (Estes 1991b) was referenced in the same paragraph. Instead, as their paper's title indicates, the authors set out to test the hypothesis that females evolved horns as weapons – an idea with understandable appeal to behavioral ecologists whose research has focused on predators and their prey (e.g., Packer 1983).

In their introduction, Stankowich and Caro observed that, ". . . attempts to explain the varied presence of female horns between taxa have continued to flounder owing to lack of clear predictions, failure to pit alternative hypotheses against each other [*emphasis added*], and absence of phylogenetic controls." They overlooked the Antelope Introduction in Estes (1991a) which shows correlations between habitat preference, morphology, anti-predator strategy, and social organization of the 75 African bovids. Comparison of conformation and coloration of solitary antelopes that live in cover and rely on concealment with gregarious species that live in the open and rely on flight to avoid predators (Table 2.2), showed fundamental differences in the development of sexual dimorphism, mainly in horn development.

More detailed, tribe-by-tribe and species-by-species socioecological analysis was also presented in Estes (1974 and 1991b). E. g., I pointed out major differences in development of sexual dimorphism between gregarious bovids with territorial and male rank-dominance mating systems. In comparison, Stankowich and Caro's analyses of horn presence and body size, openness of habitat, territoriality, and group barely scratched the surface. They simply concluded that, "Conspicuousness and territoriality hypotheses explained nearly every instance of horns in female bovids. . ." Further, they maintained that "simple understanding of basic anti-predator and social strategies can explain the presence and absence of defensive weapons in this taxon."

Examination of Stankowich and Caro's Figure 1, Phylogenetic tree of the Bovidae, raises questions about their assignment of species to the categories of exposed and unexposed, territorial and non-territorial. The takin (*Budorcas taxicolour*), classified as "exposed" in their Figure 1, lives mainly unexposed in montane forest (R. D. Estes, unpublished observations). Like the forest-dwelling bongo (*Tragelaphus [Tetraceros] euryceros*), both sexes are horned and live in herds. Whether two little-known Bovini, *Bos (bubalis) mindorensis* and *B. depressicornis,* classified as territorial actually are, is doubtful, as all known species of the tribe Bovini are non-territorial with male dominance hierarchies (Estes 1991a). The female bush duiker (*Sylvicapra grimmia*), listed as horned and territorial, is the one duiker with hornless females.

More to the point, 9 antelopes they classified as "unexposed" all frequent habitats where they are readily visible. I would classify them as exposed (Estes 1974, 1991a). All but one depend on flight in the open, unlike most of the "unexposed" bovids). As detailed in Estes (1991a) species accounts, the impala (*Aepyceros melampus*) inhabits the woodland-grassland ecotone; the Vaal rhebok (*Pelea capreolus*) and mountain reedbuck (*Redunca fulvorufula* are gregarious species that live in montane grassland; Bohor reedbuck (*R. redunca*), which do hide from predators in high grass, nonetheless form large aggregations on floodplains after annual burns. Kob (*Kobus kob*), puku (*K. vardonii*), lechwe (*K. leche*),and waterbuck (*K. ellipsiprymnus*) all live in the open, while the Indian blackbuck (*Antilope cervicapra*) is a quintessential plains antelope. The fact that females of all these species are hornless and live in open habitats challenges the authors' weaponry hypothesis.

Although Stankowich and Caro stated that there are "numerous examples" of female bovids defending themselves or offspring against predators, they failed to present any evidence that horned females and their offspring have higher survival rates than hornless females of comparable size and habitat. In fact, only females of the few bovids that have developed a group defense (buffalo S*yncerus caffer* and other Bovini, and the muskox (*Ovibos moschatus*) regularly defend themselves against their main predators (Walther 1966, Estes, 1991a, 1991b). Flight is the primary anti-predator strategy of open-country bovids, with self-defense their last resort (Estes 1991b). Males also use their horns opportunistically to defend themselves against predators, yet it is generally accepted that males evolved horns in response to sexual competition. Why then assume that self-defense explains the evolution of female horns?

Female mimicry of male secondary sex characters, which I have termed andromimicry (Estes 1991b, 2000), provides a robust alternative explanation for the evolution and degree of horn development in female bovids. Under this hypothesis, females mimic male horns and other secondary sex characters only up to the stage where the benefits of associating with females – chiefly female vigilance – cease. But males keep growing. Degree of bimaturism accounts for the tremendous variation in sexual dimorphism in size and horns across taxa. In male rank-dominance taxa, (e.g., Caprinae and Bovinae) males grow for years longer than females, and female ability to track male secondary sex characters is limited accordingly. Thus, female horns are tiny compared to massive male weapons in many Caprinae, whereas mimicry of males is so complete in Oryx spp. that adult males can live in herds dominated by a single breeding bull by looking – and acting – like cows. The idea that male offspring stop associating with females when their sex becomes obvious is testable: Although data are limited, Figure 1 in Estes (1991b) shows that males of 25 spp of caprines, bovines, and antelopes join all-male groups when their horn length exceeds that of females.

Andromimicry also explains the presence of head gear in the other female ruminants cited by Stankowich and Caro. The bony growths (ossicones) of female giraffe are clearly not designed for combat and are never used as weapons (Estes 1991a). However, they are effective in obscuring offsprings' sex into their third year, when differences in development and behavior expose males, who then join bachelor herds. In pronghorns (A*ntilocapra americana*), casting the exclusively male outer horn sheath used in reproductive competition leaves them looking much like females – whose rudimentary spikes resemble early male horn growth (Estes 1991b). Caribou/reindeer (*Rangifer tarandus*) is the only cervid whose females grow antlers. Between-sex similarity in antler development enables male offspring to stay in female herds for a second winter. Females and young males are so alike "not only in antlers but also in breeding pelage. . . that the only way to determine their sex up to two years is to observe the genitalia or the urination posture" (Kelsall 1968).

Stankowich and Caro speculated that the absence of horns in female Tibetan antelope (*Pantholops hodgsonii*) "indicates one potential case of horn loss" because they "have large bodies, live in open deserts and grasslands, and would appear to be highly exposed to predators in this landscape." The authors suggest that their habit of digging and lying in depressions so reduces their exposure to predators that it "may have tipped the balance in favour of crypsis and relaxed the need to evolve or maintain weaponry in females of this species." (N. B. Kiltie [1985] found no overriding or unifying adaptive factors governing the evolutionary development of horns or hornlike organs in females.) However, chiru lie in depressions not for concealment but for protection from the elements and react to predators like any gazelle – by fleeing (G. Schaller, pers. comm.). So the most parsimonious conclusion is that chiru females never evolved horns in the first place.

A more plausible example of female horn loss is Thomson's gazelle (*Gazella [Eudorcas] thomsonii*), where females give up copying males' horns after the first few months and few have intact, matching horns (Brooks 1958, Estes 1967, 1991b,). Notwithstanding, hornless mothers defend their young against jackals as vigorously as horned ones, and jackals are indiscriminate (Estes 1967). Considering all the predators of this small antelope, it is hard to imagine a bovid more in need of weaponry.

Finding correlations between open habitats, size, and presence of horned females hardly requires elaborate statistical models to confirm what is already self-evident: that most horned females are found among the gregarious bovids adapted to those conditions. Natural and sexual selection induced the profound changes in conformation, size, social organization, and sexual dimorphism in the bovids that emerged from hiding into the open plains and savannas (Estes 1974). Lineages of both horned and hornless females had to depend on flight, not self-defense, to escape predators.

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Are East African conservancies too small and isolated to maintain migratory bovid populations?

by Rasmus Heller, *University of Copenhagen, Denmark*; John B.A. Okello, *McMaster University, Canada*; Hans R. Siegismund, *University of Copenhagen*, Denmark.

Background

The Cape buffalo (*Syncerus caffer caffer*) is a widespread generalist sharing its distribution with many antelope species throughout eastern and southern Africa. It is found in most types of habitat where water is available. Evidence suggests that the Cape buffalo (along with many other savannah adapted bovids) is a highly mobile species relying heavily on being able to migrate to more suitable habitat in response to environmental conditions, mainly rainfall patterns (Halley et al., 2002). The ecological versatility combined with the dispersal behaviour has caused the buffalo to show little genetic structure on a continental scale, with populations in southern and eastern Africa being relatively genetically similar (Simonsen et al., 1998; Van Hooft et al., 2003). These observations are in agreement with a historically ubiquitous distribution throughout sub-Saharan Africa. However, although sub-Saharan Africa still holds considerable tracts of suitable habitat for the buffalo, the species now mainly exists in protected areas, sometimes confined to such areas by fences or high human population density surrounding them (East, 1997). This fragmentation is typical for many of the African large mammals. Habitat destruction and fragmentation is known to be one of the main global threats to biodiversity, and they work by reducing actual population sizes as well as disrupting the exchange of genetic material between habitat patches, which would otherwise help maintain genetic variation in affected species (Frankham et al., 2002). In this way, genetic diversity is decreased in fragmented landscapes, leading to a risk of lower evolutionary potential and inbreeding-associated detrimental effects.

East Africa is a key region for African bovids with a large number of nature conservancies protecting significant populations of savannah-adapted species (East, 1997), but the region suffers from high rates of human population growth and diminishing availability of areas suitable for wildlife. The distribution of buffalos along with many other large mammals has hence been reduced considerably within the last century in East Africa, and protected areas play an increasingly vital role in the conservation of a range of large mammals. The effect of this on the genetic diversity is not well known. For example, it is unknown whether habitat fragmentation and range reduction has been severe enough to affect the genetic structure of large mammals, and to what extent species are able to maintain gene flow between isolated conservancies. The buffalo is an interesting model species in this regard because of its mobility, and patterns observed in this species may serve as a good baseline among the community of large savannah-adapted mammals.

Genetic structure and effects of habitat fragmentation

In a recent study (Heller et al., 2010), we analysed the pattern of genetic structure as well as the genetic diversity of the African buffalo in ten study areas in Uganda and Kenya. The study localities differed in size from the small Nairobi national park (117 km^2) to the huge Mara conservation area (28,600 km^2 including adjoining Serengeti). What we observed was a very clear correlation between the size of the protected area and the genetic diversity of the inhabiting buffalo population (Fig. 1A). This means that there is a tendency for smaller conservancies to harbour less diverse buffalo populations. We also found a clear negative correlation between the level of genetic differentiation and the conservancy size (Fig. 1B), indicating that populations in small conservancies had diverged (or drifted) further from the other populations than those in larger conservancies.

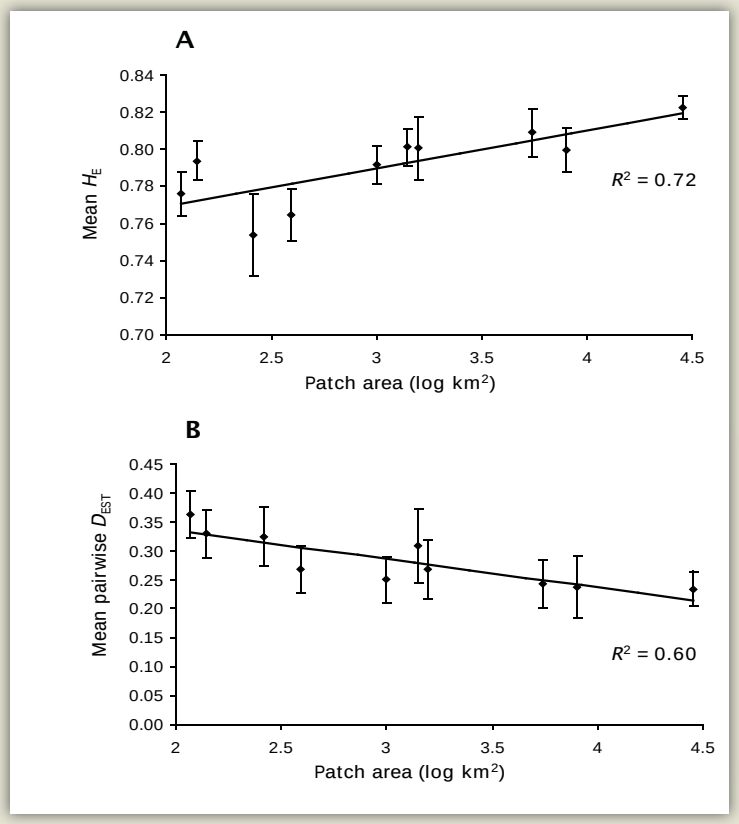

Figure 1: Correlations between conservancy size and measures of A) genetic diversity and B) genetic differentiation for 10 Cape buffalo populations in Uganda and Kenya.

These results indicate that smaller parks actually sustain buffalo populations of lower effective population sizes (a proxy of the genetic diversity found within a population). Importantly, this tells us that buffalos really are restricted by the area of habitat set aside for conservancies, and protected populations are apparently to a large extent isolated from each other by habitat fragmentation. Such results, although in agreement with theoretical expectations, are rare in studies of wild populations, where confounding factors and compensatory mechanisms often obscure clear-cut correlations. This is bad news for the range of savannah-adapted bovids that habitually disperse widely in response to the availability of food and water.

As could be expected, the Victoria Nile formed a natural geographic divide partitioning the study populations into one genetic cluster on either side of the river. However, within these clusters most of the study populations formed distinct genetic entities. Hence, even though we only looked at a small subset of the entire continental distribution of the buffalo, individual populations were as genetically different as populations in southern and eastern Africa. We interpret this as evidence that some factor has acted to create the same amount of genetic differentiation on this regional scale as evolution has created between the most distant populations of Cape buffalo on the continental scale during hundreds or thousands of years of separation. This factor is likely to be human induced habitat fragmentation, as the observed pattern of genetic structure was intimately correlated with the size of the conservancy inhabited by each population.

Conservation implications

The results of this study have led us to warn that many conservancies may be too small and isolated to maintain genetically healthy populations of migratory bovids. Keeping in mind that the buffalo is among the most mobile of the large African mammals, other species with lower dispersal potential or narrower habitat requirements might be presumed to be even more in danger of suffering genetic consequences of habitat fragmentation. We suggest that further research on other species is warranted. If the pattern is confirmed, this could mean that small and isolated conservancies are of limited value for the conservation of large mammals unless active management is undertaken to ensure exchange of genetic material. We highly recommend the retention of at least some large and protected areas of undisturbed habitat as well as the creation of migration corridors for large mammals in East Africa.

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Emerging Evidence of Beisa Oryx Decline in Parts of Northern Kenya

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Background

Following local concerns about declining status, we reviewed densities and distributions of beisa oryx (*Oryx gazella beisa*) across Samburu, Laikipia and parts of Marsabit and Isiolo Districts in northern Kenya using aerial survey data collected in November 2008. Within this area, the species tended to be clustered in and around protected areas, and appears to be in decline in the wider environment.

The beisa oryx was once widely distributed across bush and grasslands in northern Kenya, south-east Somalia, Ethiopia and in parts of Uganda, Sudan, Djibouti and Eritrea. Information on the current numbers and distribution of the species is extremely limited. The most comprehensive review was undertaken a decade ago and was largely based on aerial surveys carried out in the early 1990's. At the time, at least 25,000 beisa oryx were thought to exist throughout their entire range. Of these, the Kenyan population was thought to number ~17,000 individuals, with a further 4-5,000 in Ethiopia. Previous density estimates for beisa oryx varied from 0.05 to 0.20 / km² across their range. Only 17% of the population was thought to occur within protected areas (East, 1999).

Beisa Oryx in Northern Kenya

According to Kenya's Department of Resource Surveys & Remote Sensing (DRSRS), beisa oryx occupied much of their historic range in the North and East of the country during the early 1990's. However, compared to estimates from the 1970's and 1980's, the species was clearly in overall decline (Blench, 2004).

More recently, conservation managers in Samburu District raised concerns about reductions in beisa oryx numbers (Juliet King, *pers comm*.). The only contemporary empirical data on the status of beisa oryx in Northern Kenya is derived from incidental counts and locations arising from a joint national Grevy's zebra / MIKE elephant survey (Low *et al*., 2009) conducted in November 2008. Although limited in extent, covering just a fifth of species' historic Kenyan range, the survey nonetheless provides some comparison with previous numbers and densities of beisa oryx.

Results from the 2008 aerial survey corroborate the perceived decline of oryx in Samburu District. Even allowing for undercount bias, the total of 169 beisa oryx (0.01 / km²) recorded, including those found within Samburu National Reserve, compares very poorly to the previous estimate of 1,150 (0.06/ km²).

The situation in Marsabit and Isiolo districts is less clear as the 2008 aerial survey only covered small portions of these extensive areas. Nevertheless, it did sample areas where beisa oryx sightings were previously clustered (De Leeuw *et al*. 2001). Densities of oryx in the surveyed part of Marsabit of 0.04 / km² were considerably below the previous values for the district of 0.11 / km². Meanwhile, beisa oryx sightings in the West of Isiolo District occurred within or in close proximity to Buffalo Springs and Shaba National Reserves, with very few recorded in the wider landscape.

In contrast to the severe decline of beisa oryx in Samburu District, the species appears to be stable or even increasing in Laikipia. Here, the recent beisa oryx density of 0.12 / km² compares favourably with early 1990's figures of 0.08 / km². However, these findings, which are anomalous in the context of the wider environment, are explained by the protection afforded to beisa oryx across Laikipia where they occur within a network of private ranches.

Outside of the known population of beisa oryx associated with Sibiloi National Park, there has been no recent assessment of the status of species elsewhere in Northern Kenya. Incidental sightings suggest that they at least persist in places that are inaccessible to livestock or in conflict zones (e.g. Woodfine et al, 2009), but with widespread insecurity, prospects for the species in the far North of Kenya are gloomy.

Threats to beisa oryx

Poaching is thought to be the single biggest factor in the decline of the beisa oryx in northern Kenya (Ian Craig, *pers comm*.), although the extent of utilisation across the region and amongst different communities has not been documented. More generally, there is evidence of disturbance from encroachment of settlements, with presence of oryx significantly reduced with proximity to livestock, especially close to water sources (de Leeuw et al, 2001). Indeed, oryx were not present in large parts of Samburu District where high livestock densities were recorded in the 2008 survey.

Given these pressures it is perhaps unsurprising that the clustering of oryx within or close to protected areas was a notable feature of their recent distribution, highlighting the significance of state, private and community-based initiatives for the conservation of the species.

Conclusion

In the absence of more recent data, the beisa oryx is categorised as 'Near Threatened' in the IUCN Red List (IUCN SSC Antelope Specialist Group, 2008). If repeated elsewhere across its range, the credible anecdotal reports and data from Samburu and surrounding areas suggest the species is in more serious decline.

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Wildlife Law Enforcement: Different Techniques in Central African Ungulate Conservation,

Naftali Honig, PALF

It has long been known that ungulates in Central Africa are under extreme pressure from the prominence of the bushmeat trade. Modern hunting techniques vary immensely from traditional techniques, including the use of metal snares, firearms, and networks of roads with vehicles that make access into remote corners of the forest far less burdensome to bring meat home from. Urbanization keeps the demand growing, and even as prices exceed those of poultry or beef, the cultural demand keeps the supply coming.

In the Republic of Congo for instance, the environment for antelopes is riskier than in eastern or southern Africa where wildlife conservation is much more advanced. Interestingly, the Republic of Congo's national laws for the protection of wildlife include substantial deterring punishments that should safeguard protected species. The problem is thus that these laws, while looking good on paper, are not effectuated in practice, so dealers and poachers feel a level of impunity all too high to protect the country's biodiversity.

For two years, PALF (Project for the Application of Law for Fauna) has worked in the Republic of Congo, based out of its capital, Brazzaville, to aid the Congolese government in applying these laws. PALF is a replication of LAGA (Last Great Ape Organization) which started a movement of wildlife law enforcement in 2003 in Cameroon. Now the idea is spreading to Central African Republic and Gabon as well. In Republic of Congo, there is potential to use this tool in the conservation of a number of even-toed ungulates that should benefit from the national laws. At the highest level of protection, "integrally protected species," the list of protected animals includes water chevrotains, hippos, bongos, and Southern reedbuck. A secondary list of "partially protected species" offers protection to a number of other Artiodactyls, including buffalos, waterbuck, red river hogs, giant forest hogs, bushbuck, sitatunga, and a number of species of duikers.

One preliminary concept in antelope conservation is the "inventory" carried out in regions to determine which species are present. In the past, certain studies have used local bushmeat markets to aid in the census. The work of PALF can aid with such data, for example, recently a man was arrested with PALF's help, in Dolisie, trying to sell a fresh carcass of a Southern reedbuck (*Redunca arundinum*). This is a grim suggestion of the local presence of the Southern reedbuck, even though the populations are drastically diminished in Republic of Congo. The Niari savannas are thought to hold the last populations, isolated from southerly populations in Angola or DRC by the Congo River.

But the real goal of PALF is to deter criminals from dealing in the protected species. The reedbuck carcass, once confiscated, was burned on local television to demonstrate that no one would be benefitting from the confiscation and to show that the government of Congo stood behind the protection of this species through application of national law. In addition to local media, the images were broadcasted on national television as well, and articles appeared in a number of prominent newspapers for readers around the country. This particular seizure also including the burning of two smoked mandrill (*Mandrillus sphinx*) carcasses and a smoked water chevrotain (*Hyemoschus aquaticus*) carcass. These species may not have stood out as prominently as other iconic protected species like elephants or gorillas, but now the individual dealer who was arrested is far less likely to sell these species, and the general population should be much more wary as well. The results were real for once, and the species' high level of protection on paper was backed up by an arrest by the gendarmerie and a message televised t o the local population by the Departmental Director representing the relevant ministry in charge of protecting wildlife.

Real consequences mean real caution on the part of wildlife dealers, although surely some will plunge underground and continue to sell, just more discretely. On the other hand, others will lose courage and hopefully the supply end will ultimately respond if the enforcement can be carried out on all levels, from village to city. It may be too late for antelopes like the Southern reedbuck, and reintroduction might be the only viable solution for this species in Congo, but it is certainly not too late for the partially-protected yellow-backed duiker or the integrally-protected bongo for instance. A sound system of enforcement of wildlife law is an essential element of the larger concerted effort to conserve the biodiversity of the Republic of Congo.

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Update on the status of Aders' duiker and a significant range extension for blue duiker on the east African coast.

By Sam Andanje, KWS , Raj Amin ZSL, Andrew Bowkett, WWCT, Tim Wacher ZSL

The Aders' duiker *Cephalophus adersi*, an attractive small duiker of the east African coastal forest, is currently listed as critically endangered (IUCN SSC Antelope Specialist Group 2008). It has long been a cause of conservation concern, particularly because of its very limited known distribution. For many years all records on the continental mainland were restricted to very infrequent sightings in a limited area of the Arabuko-Sokoke forest in Kenya, between Mombasa and Malindi, with a better known population associated with the islands of Zanzibar in Tanzania (East 1999).

However in 2004 this pattern was altered when a single individual was observed on the main route between Boni and Dodori forest reserves in north eastern Kenya, some 200 km north of the known distribution limit and across both the Sabaki and Tana rivers (reported in Gnusletter 23 p 4-5). This sighting, together with news of other unusual mammals and evident growing development threats, prompted Kenya Wildlife Service (KWS) to make a concerted effort to define the wildlife resources of this little known coastal forest for the first time.

Working in collaboration with supporting partner organisations, each with a history of conservation activity in the area (Whitley Wildlife Conservation Trust, World Wide Fund for Nature, Zoological Society of London) a KWS led programme of camera trapping research in the north Kenya coastal forests, focused on Boni-Dodori forests and surrounds, is now underway. In September 2008 a pilot study using an opportunistically placed network of camera traps obtained images of Aders' duikers from 12 of 27 camera-trap sites, and on 44 out of 152 camera trap days in total. A detailed review of these results has been accepted for publication as a short communication in a forthcoming issue of Oryx. (Andanje et al in press).

Since 2008 the KWS camera trapping team and partners have expanded the research by organising camera trap sampling onto formal 2x2km systematic grid arrays of 20 cameras at a time, using cameras of standard make and specification (Reconyx) and leaving them in place on each grid for periods of 90-100 days. In this way a total of more than 15 years of camera trap sample time was accumulated through 2010, spread over three sites north of the Tana River and one site within Aders' duiker traditional habitat in the *Cyanometra* forest of Arabuko-Sokoke south of the Sabaki River. The results have comprehensively confirmed the importance of the Boni-Dodori forests for Aders' duiker as well as providing valuable insights into the coastal forest antelope communities and other rare mammals.

Preliminary analysis shows that Aders' duiker is the most frequently recorded antelope in the camera grids at Boni-Dodori with >3300 Aders' duiker events (in this data set a new 'event' has been recorded for each set of photos occurring after a lapse of 30 minutes or more for a given species) recorded in a mainly diurnal/crepuscular pattern. Aders' duikers were present at 51 of the 52 camera sites (allowing for camera failures) set up in this region. By contrast, at Arabuko–Sokoke forest, Aders'duiker appeared on only two occasions, at separate camera sites, in a 20 camera grid in place for 100 days.

Besides Aders' duiker, other significant antelope observations indicate some interesting patterns in community composition across the trap grids. Suni *Nesotragus moschatus* are almost as frequent as Aders' duiker in the Boni-Dodori data set (note that IUCN Redlist indicates northern limit of Suni as 'lower Tana River'), but also appear to maintain this high profile at Arabuko-Sokoke forest where they are the most frequently recorded antelope. Harvey's duiker *Cephalophus harveyi* occurs at similar but low frequencies in both Arabuko–Sokoke and Boni-Dodori data sets, with a total of 118 events in the three grids north of the Tana River. Photographs suggest possible differences in facial pattern for this species that will be explored in more detail in the future.

Another major finding from these surveys is the presence of blue duiker *Philantomba monticola* in low numbers north of the Tana River. This is a significant range extension with reference to published distribution maps (Kingdon 1997; East 1999; IUCN SSC Antelope Specialist Group 2008). The distance from the nearest known population is over 200 km, the same as that revealed by the Aders' duiker discovery in 2004. Interestingly, blue duikers have only been recorded at a small number of camera sites and at a low frequency (<10 identified events north of the Tana) compared to Arabuko–Sokoke. It should be noted that identification of all small forest antelopes in black and white images, especially under infrared illumination, is not always straightforward in some awkward views. This is particularly true when distinguishing partial views of suni and blue duiker. Nevertheless the number of uncertain cases is not sufficient to significantly affect the overall pattern of event rate frequencies. In the case of blue duiker the implied low density north of the Tana appears to be linked to the species' ecology rather than human factors given the high camera-trap rates for other forest antelope.

The Kenya Wildlife Service and partners plan to use the new information on Aders' duiker and other important findings from this research (e.g. an unidentified, possibly new, giant sengi, Andanje et al.2010, and species rich communities of large and small carnivores and herbivores living in a comparatively undisturbed environment) to gain support from key stakeholders and develop effective strategies to conserve and protect these areas in the face of rapidly evolving regional development plans

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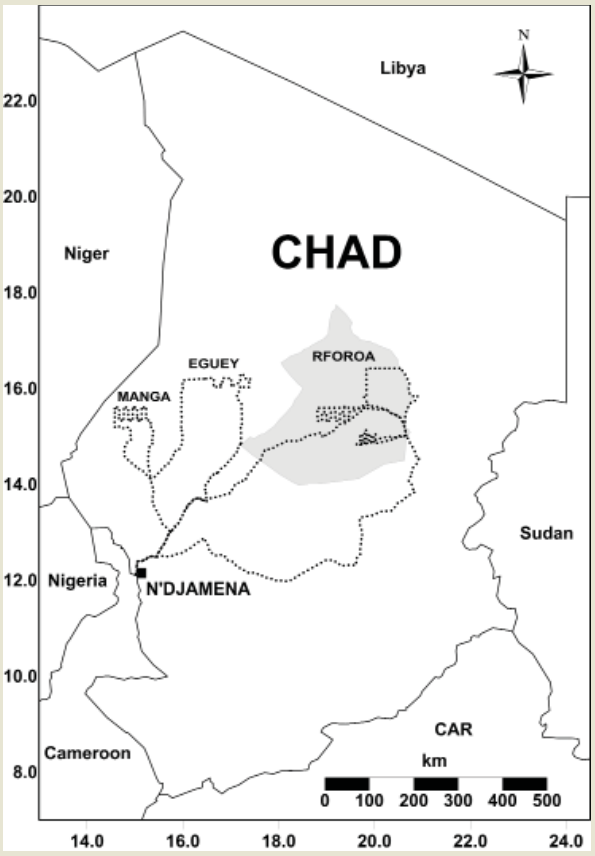
NEWS FROM CHAD

John Newby and Tim Wacher,
Sahara Conservation Fund, Zoological Society of London

Since 2010, the Sahara Conservation Fund (SCF) has been carrying out a series of wildlife surveys under its 'Pan Sahara Wildlife Survey' (PSWS) project with the aim of updating information on wildlife and land use in selected areas of biodiversity importance across the Saharan and Sahelian habitats. Antelopes often constitute flagship species attracting attention to these regions. The PSWS operates by conducting extensive fieldwork in close collaboration with national agencies in several countries and by developing recommendations for achievable conservation action emerging from survey results. The field work is being done in collaboration with the Zoological Society of London and is funded by H.H. Sheikh Mohammed bin Zayed Al Nahyan, Crown Prince of Abu Dhabi (United Arab Emirates).

In close collaboration with the Chadian Direction des Parcs Nationaux, Réserves de Faune et de la Chasse (DPNRFC), two major surveys in Chad have been completed during the last 12 months. Key objectives were to update information on the status of dorcas gazelle, addax and dama gazelle and conduct a preliminary assessment of potential to restore scimitar-horned oryx to its last known stronghold in the Ouadi Rime/Ouadi Achim area.

Background and methods in the Manga and Eguey: A three week survey to the Manga and Eguey regions in west central Chad took place during the rainy season in August 2010, targeting dama, dorcas and addax in the antelope component of the work. The survey team comprised Felix Ndoassal Banlongar and Sadock Zeubobe Bourtchiakbe of DPNRFC with John Newby and Tim Wacher (Wacher and Newby 2010). Drawing on information from the Sahelo-Saharan Interest Group survey of 2001 (many dorcas seen, 15 dama in the Manga, 2 addax in Eguey, Monfort et al 2004) and a follow up survey in 2005 (9 addax in Eguey, CMS, SCF and APF survey, Nov. 2005) a vehicle based survey of eight 40km long, north-south transects across an c. 80km x 40km survey block of the Manga and a systematic reconnaissance of Eguey was completed. Data on all antelope sightings were collected in line transect format using range finders as often as possible. Within the Manga transect grid, an additional thirty 500m transects on foot to observe tracks and other details were scattered semi-randomly at a rate of one per 10km. Provisional population estimates reported here are based on a stripwidth approach using only sightings within 150m of the transect mid-lines.



Map of Chad showing SCF/ PSWS survey routes and target locations, 2010 and 2011.

Background and methods in Ouadi Rime/Ouadi Achim: In the cool, dry season of January 2011 the SCF/DPNRFC team re-united to run a four week survey to the Reserve de Faune de l'Ouadi Rime - Ouadi Achim (RFOROA). Gazetted in 1967 and covering nearly 78,000 km2 of the central grasslands of Chad, the RFOROA was the last stronghold of the scimitar-horned oryx before its disappearance during the 1980s due to increasing hunting pressure, major civil unrest, drought, expanding livestock development and near abandonment of meaningful reserve management. Although not recorded in the 2001 SSIG survey, or for many years before that, during 2010 the SCF/DPNRFC team received local reports that dama gazelle were still present in the reserve, with consistent indications that they were limited to a small area in the south-west. Following preliminary enquiries to establish the best location to find dama, an initial 1100km^2 survey block was defined and a survey route of 8 transects spaced at 5km intervals plotted. A second, 3200km^2 survey block was then surveyed in the central part of the reserve, as far as possible from permanent human settlement (80x40km zone with 10 transects at 10km intervals). The northern sector of the reserve was visited subsequently, although time was insufficient to complete a full sample survey in this sector. As in the Manga, within survey blocks one 500m transect on foot to observe tracks and signs was completed at a semi-randomised spot at +/- 10km intervals along each vehicle transect.

Results in the Manga and Eguey: A total of 634 dorcas gazelles was seen during the wet season survey of Manga and Eguey, with dorcas present in all 8 half degree (lat/long) grid squares traversed between latitudes N15^o-N16^o north of the town of Mao and a few additional animals north and south of this region.. The transect survey data for the final 3300km^2 block sampled in central Manga returned a density of 2.7 dorcas / km^2 with an associated population estimate of 8760 (95% confidence limits 7102 – 10820).

A remote camera captures two of Termit's dama gazelles (Photo: Project ASS/CMS/EU/FFEM/SCF)

In the Manga, fifteen dama gazelle were seen in six groups, including a fine group of 8 adults and sub-adults. Coincidentally, this is exactly the same total as recorded in 2001. In view of sampling circumstances (very small sample size, extreme clustering of these observations in corner of the survey zone on the last two transects, and the fact that although all were seen from transects, 12 of them were seen at extremely long distances), a population estimate has not been extrapolated from these data.

No addax were seen in the Eguey sector in 2010, although discovery of a resting site with 9 fresh addax dung piles, plus a single older dung pile 50km further on, confirms that a small population still persists in this area.

Results in the Ouadi Rime-Ouadi Achim: In the RFOROA during January and February 2011 in the southern survey block (1100km^2) the first evidence found of dama gazelle presence was fresh tracks. Ultimately dama tracks were recorded at 15 locations on 5 of the 8 transects in the survey block. Next a recent skull (without body) of a fine middle aged adult male showing cut marks at the back of the cranium was found. On the fifth transect we saw an immature dama gazelle running hard across our transect line on recently burnt grassland at midday in company with 3 dorcas. The next day we encountered 4 dama together in the late afternoon. They were in an area of rich grassland sward on undulating fixed dunes characterised by small thickets of Balanites and some Acacia trees in the dune hollows. Abundant tracks and dung middens in the vicinity suggested they had been using the area for a while. Later on, outside the southern transect block, the team were further surprised to discover an intact skull and skeleton (with a substantial amount of pelage still attached) of a mid-aged adult female dama gazelle, some 160km north of the live animal sightings, along the Ouadi Hawach. This is the region where scimitar-horned oryx had been captured for western zoos in the 1960s. In this case the intact skeletons of several dorcas were also present, and all signs were that these animals had died naturally, perhaps within the previous 2 years, while sheltering deep under isolated thicket forming trees. As for the Manga, the sample of dama on the southern transect block is too small to translate into a worthwhile population estimate.

A total of 1752 dorcas gazelles was counted over the whole survey (compared to >16,000 camels). The small, more intensively sampled southern block (1100km^2) returned a density of 6.2/km2 for a local population estimate of 6874 (95% cl 5656 – 8355), while the larger central survey block (3200km^2) where camels and other livestock were noted to be far more prominent, returned a local density of 0.95 dorcas/km2 and population estimate of 3066 (95% cl 2216-4234). Projecting these sub-sample estimates to the wider RFOROA area should only be undertaken very conservatively, but it can be noted that while the detailed survey zones from which these estimates derive overlap with 7 0.5x0.5 lat/long degree grid squares, the survey overall verified presence of dorcas in 13/14 half degree grid squares that were traversed during all travel within the reserve.

Conclusions: In Chad, both the Manga area and the Ouadi Rime-Ouadi Achim hold very important populations of dorcas gazelle and critically endangered dama gazelle in 2010-11. The known current distribution of dama gazelle in Chad is very thinly spread over a 550km belt between these two areas. The Eguey addax population is still present but further field work and aerial survey is needed, particularly to understand its relationship with the addax population that inhabits the Termit/Tin Toumma area in Niger, some 600km to the west at a similar latitude.

Although clearly known to local people, these are the first formal records of dama persisting in the Ouadi Rime-Ouadi Achim for

many years. They are direct indicators that large ungulates can still live in the region, and of the continued conservation significance of this protected area. We hope this information will be persuasive in encouraging the conservation community to look again at the high potential of the region for imaginative restoration of Sahelian fauna, especially the scimitar-horned oryx, in the near future.

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SCIMITAR-HORNED ORYX POPULATION MANAGEMENT (PN Sidi Toui) AND ADDAX MONITORING (PN Djebil and Senghar)

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Introduction

This note summarises some results from a recent visit to Tunisian scimitar-horned oryx and addax projects carried out in October 2010, under an ongoing collaboration between the Tunisian Direction Générale des Forêts (DGF) and the CMS/FFEM Projet Antilopes Sahélo-Saharienne, supported by additional funding from The Mohammed Bin Zayed Species Conservation Fund and the Zoological Society of London.

Background

The oryx and addax populations in Tunisian National Parks have been restored through reintroduction activities between 1985-2007. Broad objectives of the October 2010 mission were to support Tunisian conservation objectives for Scimitar-horned oryx and Addax at three fenced protected areas. The activities undertaken were to address a long standing imbalance in the adult sex ratio that has developed in the small oryx population at PN Sidi Toui by translocation of female oryx from PN Bou Hedma to Sidi Toui, support and initiate a full time study of addax (PNs Djebil & Senghar) and develop monitoring studies and record keeping work at all three parks.

Sidi Toui National Park

The Scimitar horned Oryx population at Sidi Toui National Park was founded in 1999 under collaboration between Tunisian DGF, and partners (coordinated by Bratislava Zoo and Marwell Zoo under the umbrella of UNEP/CMS funded by the Flemish Ministry of Environment). Ten founder animals (1 male, 9 females) were transported and released into the 6000ha fenced protected area. Original plans to follow up with transport of additional animals to manage the genetic composition and sex ratio of the founder population were never executed due to changes in personnel and finance.

Regular monitoring visits conducted since 1999 (Molcanova 2006) have maintained continuity in recording Scimitar-horned oryx social organisation and small population demography in a fenced area, taking advantage of the favourable landscape to find and view groups of oryx.

Particular advantages at Sidi Toui include the exactly known history of founders and existence of a full record of major developments in population structure. It is possible to identify every member of the population, and the area they inhabit is large enough for relatively natural patterns of behaviour to develop.
The monitoring visits have revealed a persistent problem with a heavily male-biased adult sex ratio in recent years (Fig.1). Although there may be subtle biological effects associated with the use of only one founder male affecting this herd, the rapid switch from heavily female biased to heavy male bias must also have been influenced by disproportionate direct losses of females in a small population. Two adult females were translocated deliberately from Sidi Toui to Oued Dekouk in 2003 while the population was still very small. This was compounded by the unplanned and unexplained loss of 7 females and 1 male in 2006. Fig. 1 shows the diminishing proportion of breeding age females over time and associated stagnation in population growth after a peak in 2005. In response a management intervention to augment the adult female population has been recommended.

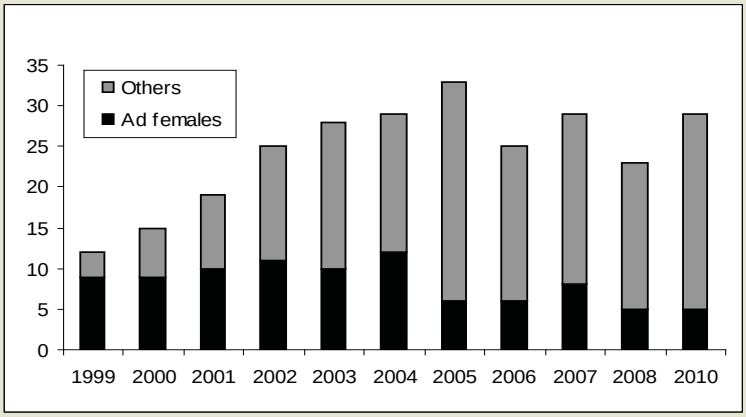

Fig. 1 Annual changes in population size with proportion of adult females; Scimitar-horned oryx at Sidi-Toui NP, Tunisia, 1999 - 2010

In 2010 a total of 29 oryx were recorded during field work at PN Sidi Toui. Overall the sex ratio of the whole population (17:12) has improved since 2008 because there had been healthy recruitment of

surviving young females since 2008. However the adult sex ratio is still heavily male based. Oryx were observed in the group sizes varying between 1–11 individuals. The following social units were found:

- Mixed sex group based on adult female core (adult, sub-adult and juvenile +/- up to 2 adult males)
- Mixed sex group based on young female core (sub-adult, immature and juvenile +/- up to 3 adult males)
- Adult male group (2-4 individuals)
- Solitary males

A tendency for breeding females to group preferentially with each other while non-breeding females do the same has been recorded before at Sidi Toui. This is not an absolute division and it was seen that one of the young non-breeding female moved between both female groups during the October study.

Adult males were found in mixed sex groups, as solitary males and for the first time at Sidi Toui adult males were seen in temporary single sex groups of 2-4 different individuals. The preliminary observations of these 'bachelor' groups showed that they were of changing membership, with each individual seen moving widely across the whole park over a short period of time.. This has occurred at a period of extreme male bias in the adult sex ratio.. The observation that 6/14 (43%) of the adult males at Sidi Toui displayed at least one broken horn in October 2010, may be an indicator of conflict and social pressure in this population.

A notable result was confirmation of consistent long term territoriality (3-4 yrs) by some individual adult males known continuously since 2007, Examples from four of the oldest males who keep to the same general areas of the park and who are characterised by a high frequency of sightings alone are shown in Fig. 2. During October 2010 observations were made of both breeding and non-breeding female groups moving across different parts of the territory system. In both cases the identity of accompanying adult males joining the herds changed with geography as the females moved from one territory to the next. All of the males shown in Fig.2 were joined by a female herd for part of the observation period in October 2010, and all of them were seen alone when the females were not on their preferred zone.

A complete photographic database of all oryx from the Sidi Toui herd was updated and supplied to Park Staff and DGF and park staff encouraged to allocate local names to known oryx to facilitate record keeping.

In order to improve the adult sex ratio at PN Sidi Toui two adult female oryx were successfully translocated from PN Bou Hedma. Due to notable differences in one of the Bou Hedma female's appearance, a series of pictures were taken to document and facilitate close comparisons with other oryx. Particular points noted were the extensively two-toned neck colour, brown rather than oryx rufous on the lower neck, completely lacking a typical white throat stripe, and unusually dark face markings for an adult female oryx. It also appeared that the body size was unusually massive and elongated. Concern over morphological difference arises due to the fact that over 25 years at Bou Hedma, oryx and addax have shared the same space and accepted cases of hybridisation have occurred. One well-known male in particular has been held mainly in isolation for many years. Thus there is a circumstantial case to be additionally cautious about unusual phenotypes. At the same time it is noted that because Bou Hedma and Sidi Toui oryx populations both derive from very small founder groups, it is possible that this background alone might account for these differences in appearance. As result, it was decided by all partners that the two translocated females should be temporarily held apart form the main Sidi Toui herd, pending the result of steps being taken to obtain comparative genetic information from them and discuss the situation more widely before mixing them with other oryx at Sidi Toui.

Djebil National Park

The addax now living in 7,700ha fenced area at Djebil derive from 28 founders; 15 (5, 10) transported from Haddej (PN Bou Hedma) with support of CMS/FFEM in February 2007 and a further 13 animals (4.9) transported from Europe and USA in December 2007 under a joint SSP/EEP initiative to support re-introduction of addax to Tunisia.

Over a three day visit in October 2010, 25 of the 28 original founders were identified alive in the enclosure. Of the three remaining animals, park staff records showed two males had died, in the months after translocation (one from each translocation group) while the third had been seen in good condition very recently, but was not found in the three day period. Thus survival has been very similar for the two founder groups; >90% over the first two years

In the course of field work at least one of the Djebil rangers demonstrated excellent ability to recognise individually marked founder addax. In most cases he was able to quote name or ear tag colour and number at long range by body conformation and general appearance alone, long before these details were visible Because the addax, particularly the founders, are still strongly habituated to close approach by vehicles, it was possible to verify the identifications by close inspection and supporting photographs.

During the visit addax were seen in groups ranging in size from 1 to 14. Although the only artificial supply of surface water available is at the acclimatisation pens near the main gate and ranger station in the north, the addax were nearly all staying in the south during this visit Fig. 3. A Reconyx camera trap left for three days and nights at the central water trough recorded only one visit by the DGF's camels during this period. Tracks of a single addax visiting the tap supplying water to the Poste Forestier in the north-west corner of the enclosure (Draa Dhaoua) was the only evidence of addax accessing artificially supplied water. Nevertheless Park staff confirmed that addax do visit the water trough area. No food supplement was being supplied to the addax over the 3 day observation period.

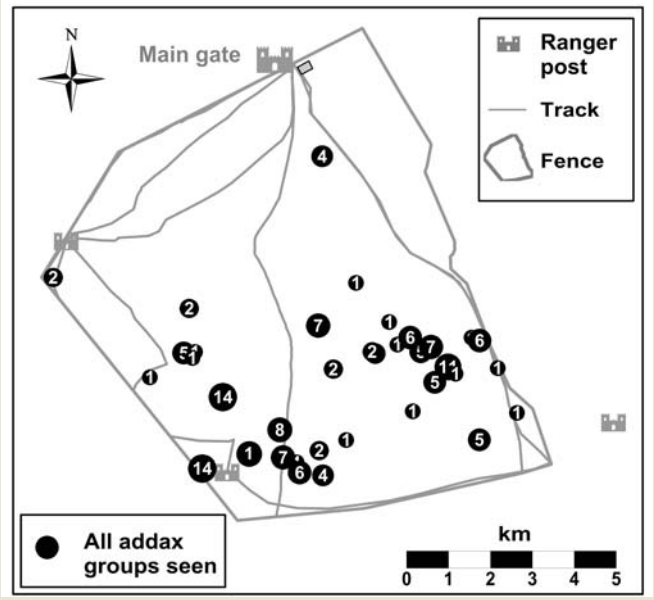

Fig. 3 Distribution of all addax groups observed at PN Djebil, October 2010

Some animals, mainly females, were thin at the end of a summer season with little natural green vegetation and apparently little use of supplementary support. Feeding was frequently observed on large dry tussocks of *Stipagrostis pungens*, but some browsing on dwarf shrubs was also noted. Overall animal condition ranged from average (mainly males) to poor. Tick burdens were prominent on some individuals.

No detailed attempt was made to estimate the population size though a provisional minimum estimate of 45 individuals was derived from daily observations. The park staff estimate is close to 56 addax based on net population size predicted from all recorded births and deaths.

Record keeping by park staff, has been encouraged by the Tunisian DGF with training contributions from several supporting institutions. The monthly pattern summarising all 34 addax births recorded by the ranger team at Djebil is summarised in Fig. 4, showing births in every month of the year. Four cases of peri-natal mortality indicated in the record are included in this data set and every birth to date is attributable to identifiable dams from which calving interval and variation in individual contributions to the gene pool can be derived. The information indicates that over the first three years of this project the 10 females originating from Bou Hedma have contributed 16 calves surviving the first few months of life, while the 9 females from the EAZA/AZA group have contributed 14 surviving calves.

During the visit Djebil staff requested assistance with marking individuals from the first Djebil- born generations in order to help them maintain this close monitoring effort. A return visit under the CMS/FFEM program is scheduled in 2011 with the objective of supporting continued ranger monitoring work and hopefully initiation of a more detailed study of addax breeding behaviour, space use and feeding in the park by a Tunisian M.Sc. student.

Senghar National Park

Addax at PN Senghar are derived from two shipments. Five young animals were transported from PN Haddej (Bou-Hedma) with support of CMS-FFEM project in February 2007 and 6 more transported from Bou Hedma by DGF staff in 2008. The Senghar herd is currently based on an effective founder group of 10 (3.7) because one young male of the first group died within a few weeks of arrival and left no offspring. All 10 surviving founders were alive and in very good, body condition in October 2010. One adult female was limping heavily on the front left leg, reasons unknown. Three of the four surviving animals from the first transport still carried their tags, although the tag on one adult male is broken and likely to fall out. The animals of the second transport have not been tagged.

This was the first survey visit by a joint DGF/CMS/FFEM team since completion of the new perimeter fence around the enlarged addax zone at PN Senghar. In October the fence line and all management infrastructure associated with the addax project (2 new observation posts giving full visual coverage of the enclosed area) was mapped by GPS. Results indicated a 2650has enclosure straddling the lower end of Oued Zebbes where it ends in a relatively densely vegetated drainage sump, blocked by the dunes of the Erg Oriental, , Fig. 4.

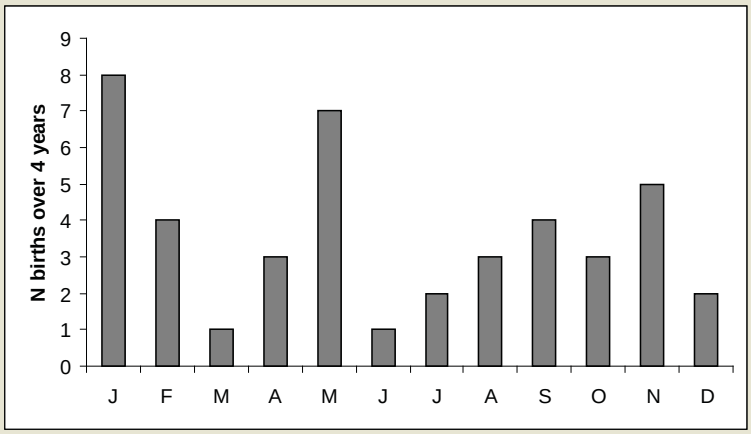

Fig. 4 Monthly frequency distribution of 34 addax births from 19 translocated female addax at Djebil National Park, Tunisia, 2007- 2010.

A total of 20 addax were present at Senghar in October 2010, with the 10 founders joined by 10 surviving young between 2 days and 18-24 months of age. The overall sex ratio among the surviving calves was 7.3, giving an overall sex ratio for the herd of 10.10,

Addax have been free to roam the entire 2650ha enclosure area since its completion in April 2009. Daily supply of food (a straw in October 2010) is maintained within the 0.5ha original acclimatisation pen at the centre of the greater enclosure. According to the park staff Senghar addax are currently managed in a fairly stable routine. All 20 animals enter the acclimatisation pen each morning on a daily basis, promoted by the ranger patrols and the food allocation. Although the gate is always left open, the addax tend to feed socialise and rest most days for several hours at the acclimatisation pen, before wandering out to feed along the Oued Zebbes in the afternoon and overnight. The staff are battling to control

problems with mobile barkan dunes along the south-west sector of the perimeter fence, which create temporary sand 'bridges' as they drift through the fence line, potentially enabling addax to walk out over the fence.

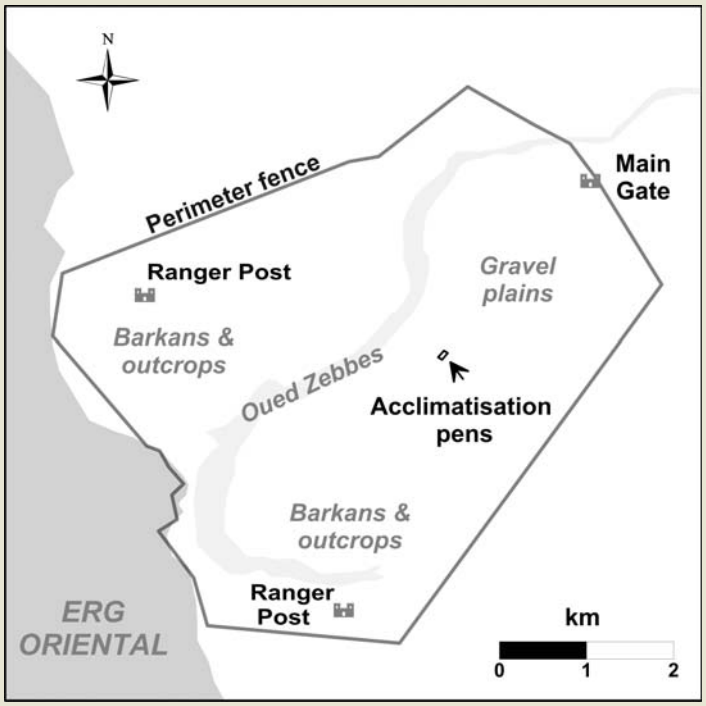

Fig. 5 General layout of addax enclosure at Senghar National Park, Tunisia, October 2010

During the October visit Addax were observed feeding in the early morning in groups of one to five in Oued Zebbes at the southern end of the main enclosure where large tussocks of *Stipagrostis pungens* were evidently being selected, similar to observations at PN Djebil. By 1030 am all 20 were back in the acclimatisation pen, including a 2 day old calf. The rangers reported that this recent birth had taken place inside the acclimatisation pen.

Among the three adult males it is a male from the second transport that is considered to be clearly dominant by the staff. Observations in the small space of the acclimatisation pen supported this, with all three males present, but two of them completely submissive to the one individual courting, displaying and guarding the recently calved female at one end of the enclosure. The situation suggests the possibility that intensive management and clustering of addax at the feeding station promotes the breeding success of a reduced number of males, as noted elsewhere for fenced scimitar-horned oryx.

A copy of the original technical report with full references is available on the Sahara Conservation Fund website at http://saharaconseration.org

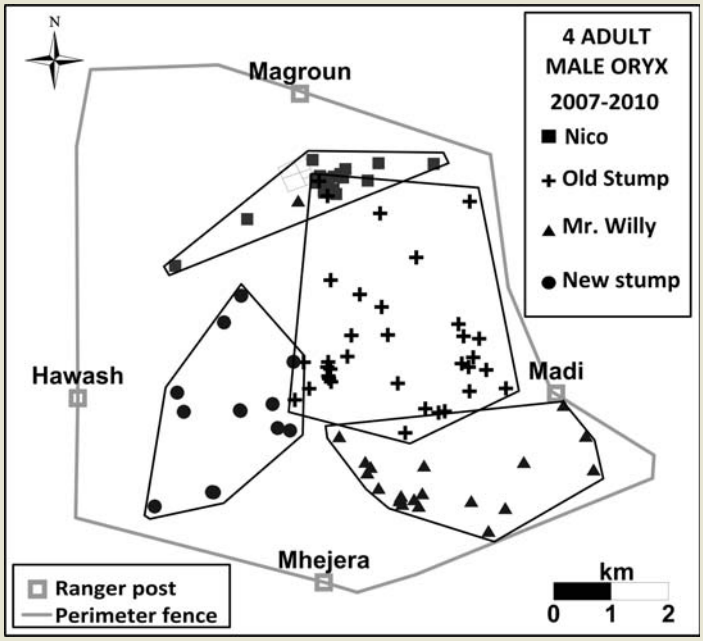

Fig. 2 Hand-drawn convex polygons around all observations of four adult males recorded over 4 10-15 day visits to Sidi Toui National Park, Tunisia, 2007-2010.

Scimitar horned oryx, Sidi Toui NP, Tunisia

Addax, Djebil NP

Note from Richard Estes: " Last Wednesday Runi and I took the giant sable head that hangs in our front hall to the dentist's office to have a tooth extracted by our dentist and good friend, Dr. Paul Jane (who took out another tooth over ten years ago). This trophy mount, known as the Curtis head was shot back in 1925 in central Angola, home of the coveted subspecies. We inherited it thirty years ago following the death of Anita Curtis, who had been our neighbor in Manchester by the Sea. Amazing but true, a sample of the animal's individual DNA can obtained from teeth so brittle they are extracted in fragments. DNA from the Curtis head, combined with samples from other giant sable, living and dead, have established that the giant sable is a unique subspecies distinct from the three other races. The trait that makes the giant sable one of the most sought-after trophies is horns in the adult male a good foot longer than in the other races."

GNUSLETTER

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