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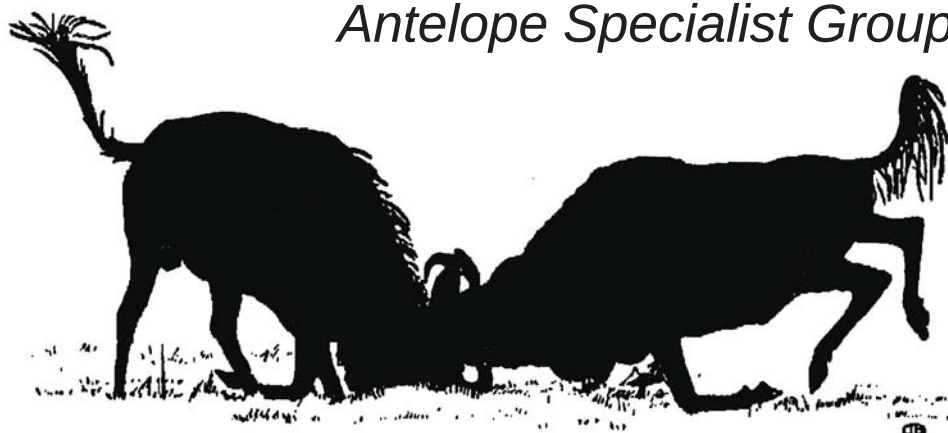
FROM THE EDITOR...

This issue of GNUSLETTER represents a milestone for the Antelope Specialist Group, heralding the next quadrennium for the Species Survival Commission including, the re-appointment of ASG Co-Chairs Mallon and Chardonnet, and the publication of the ASG Antelope Red List Assessment. As the ASG members mobilize to tackle antelope conservation issues in the coming crucial decade, the capable ASG leadership and the important assessment tools will help guide and prioritize our efforts. GNUSLETTER will continue to encourage and support the ASG through timely reports showcasing your work. Congratulations to the Co Chairs for their reappointment and best wishes to the Antelope Specialist Group in meeting ongoing and future antelope conservation challenges.

Steve Shurter
Gnusletter Editor

*Tin Toumma addax — the last viable
population in the wild on earth
(Photo: Thomas Rabeil/SCF)*

Antelope Specialist Group



GNUSLETTER

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From the ASG Chairs...

Dear ASG Members,

As you know, the new IUCN quadrennium was launched end of last year in Barcelona. Together with the new Chair of the Species Survival Commission (SSC), Simon Stuart, we would like to acknowledge the huge work accomplished by the former SSC Chair, Holly Dublin. Despite time and Chairs changing, the Antelope Specialist Group (ASG) is still there and both of us have been retained as ASG Co-Chairs. We would like to really thank both the former and the new Chairs of the SSC for their trust in our Group.

With some delay due to administration constraints, the time came to appoint or reappoint ASG members according to IUCN procedures. That process has been conducted smoothly and is nearly completed now. The functioning of our Group has not been affected by the turn of quadrennium: Steve Shurter is still voluntarily committed to edit our newsletter **Gnusletter**, Pascal Mésochina is still dedicated to maintain our website, David Mallon is still the Red List authority for our Group, and the usual active ASG members never stopped to provide information.

We have been thinking of organizing an “antelope specialists gathering” within the timeframe of the new quadrennium (2009-2012), with a few options already under consideration, however if you have ideas and proposals, please let us know. Your activities in respect to conservation of antelopes (plus African Buffalo, Giraffe and Okapi) are certainly worth being known by our ASG network and the international community, please do not hesitate to contact us for publishing news, brief items and papers either in *Gnusletter* or on the ASG website.

We need to feed the world with information on challenges we take up, difficulties we face and results we obtain. The IUCN press release on antelopes Red Listing (see next) is interesting in this regard. Yes, a quarter of antelope taxa are in danger of extinction (if we consider 3 RL categories: Critically Endangered, Endangered and Vulnerable), and this is an encouragement for us to be more active and efficient. Yet also, three quarters of antelope taxa do not belong to the three mentioned categories, this is as well an encouragement for us to keep going with more strength and goodwill...

We are happy to inform ASG members and all antelope fans of the outstanding success story which just happened in Angola: a team led by Pedro Vaz Pinto (ASG member) and Cardoso Bebeca (Cangandala National Park Warden), together with Pete Morkel (DVM), Jeremy Anderson (ASG member) and Richard Estes (ASG member and former ASG Chair), has successfully rescued some of the last individuals of Giant Sable (*Hippotragus niger variati*)!

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David Mallon [d.mallon@zoo.co.uk]



Antelope Specialist Group News



Press Release

Quarter of antelope species in danger of extinction

Gland, Switzerland, 4 March, 2009 (IUCN) – A quarter of all antelope species are threatened with extinction, according to the IUCN Red List of Threatened Species.

The results, compiled by the Antelope Specialist Group of IUCN's Species Survival Commission, show that out of 91 species of antelope, 25 are threatened with extinction. The last complete assessment of all antelopes in was conducted 1996.

“Illegal hunting, whether for meat or trophies, and human encroachment on their habitat are the main threats facing antelopes,” says Dr Philippe Chardonnet, Co-Chair of the IUCN Antelope Specialist Group. “Most antelopes are found in developing countries which is why it's critically important that we work with local communities there to show them that it's in their own interest to help preserve these animals.”

Five species of antelope are in the highest category of threat, Critically Endangered, including the Dama Gazelle (*Nanger dama*), Aders' Duiker (*Cephalophus adersi*), the Saiga Antelope (*Saiga tatarica*), Hunter's Antelope (*Beatragus hunteri*) and Addax (*Addax nasomaculatus*). The Scimitar Horned Oryx (*Oryx dammah*) is already Extinct in the Wild.

A further nine species are in the next category of threat, Endangered, and another nine are classified as Vulnerable on the IUCN Red List of Threatened Species.

Nearly 70 percent of antelope species are not threatened with extinction and some areas of the world are doing better than others in terms of antelope populations. India, for example, is home to four species of antelope, three of which are unique to the Indian subcontinent.

“India has a population of nearly 1.2 billion people, but despite this, antelopes do very well there,” says Dr David Mallon, Co-Chair of the IUCN Antelope Specialist Group. “It is no coincidence that there is no tradition of hunting in India and gun ownership is virtually unheard of.”

Overall, populations are stable in 31 percent of antelope species and decreasing in 62 percent of antelope species. The Springbok (*Antidorcas marsupialis*) is the only antelope species with a long-term increasing trend.

THE IUCN RED LIST OF THREATENED SPECIES™



Antelope Database – Species level: Most threatened species

Family	Subfamily	Genus	Species			
			Latin name	Common name	Status	Criteria
Bovidae	Antilopinae	Gazella	<i>Gazella bilkis</i>	Queen of Sheba's gazelle	Extinct	
Bovidae	Antilopinae	Gazella	<i>Gazella saudiya</i>	Saudi gazelle	Extinct	
Bovidae	Hippotraginae	Hippotragus	<i>Hippotragus leucophaeus</i>	Bluebuck	Extinct	
Bovidae	Hippotraginae	Oryx	<i>Oryx dammah</i>	Scimitar-horned oryx	Extinct in the wild	
Bovidae	Hippotraginae	Addax	<i>Addax nasomaculatus</i>	Addax	Critically endangered	A2cd; C1+2a(ii)
Bovidae	Alcelaphinae	Beatragus	<i>Beatragus hunteri</i>	Hirala	Critically endangered	A2cd
Bovidae	Cephalophinae	Cephalophus	<i>Cephalophus adersi</i>	Ader's duiker	Critically endangered	A4cd
Bovidae	Antilopinae	Nanger	<i>Nanger dama</i>	Dama gazelle	Critically endangered	A2cd; C2a(i)
Bovidae	Antilopinae	Saiga	<i>Saiga tatarica</i>	Saiga	Critically endangered	A2acd
Bovidae	Cephalophinae	Cephalophus	<i>Cephalophus jentinki</i>	Jentink's duiker	Endangered	C1
Bovidae	Cephalophinae	Cephalophus	<i>Cephalophus spadix</i>	Abbott's duiker	Endangered	C2a(i)
Bovidae	Antilopinae	Gazella	<i>Gazella cuvieri</i>	Cuvier's gazelle	Endangered	C2a(i)
Bovidae	Antilopinae	Gazella	<i>Gazella leptoceros</i>	Slender-horned gazelle	Endangered	C2a(i)
Bovidae	Antilopinae	Gazella	<i>Gazella spekei</i>	Speke's gazelle	Endangered	A2cd
Bovidae	Reduncinae	Kobus	<i>Kobus megaceros</i>	Nile lechwe	Endangered	A2a
Bovidae	Hippotraginae	Oryx	<i>Oryx leucoryx</i>	Arabian oryx	Endangered	D
Bovidae	Caprinae	Pantholops	<i>Pantholops hodgsonii</i>	Chiru/Tibetan antelope*	Endangered	A2d
Bovidae	Antilopinae	Procapra	<i>Procapra przewalskii</i>	Przewalski's gazelle	Endangered	C2a(i)
Bovidae	Bovinae	Tragelaphus	<i>Tragelaphus buxtoni</i>	Mountain nyala	Endangered	C1
Bovidae	Antilopinae	Ammodorcas	<i>Ammodorcas clarkei</i>	Dibatag	Vulnerable	A2cd
Bovidae	Cephalophinae	Cephalophus	<i>Cephalophus zebra</i>	Zebra duiker	Vulnerable	A2cd; C1
Bovidae	Antilopinae	Dorcatragus	<i>Dorcatragus megalotis</i>	Beira	Vulnerable	C1
Bovidae	Antilopinae	Eudorcas	<i>Eudorcas rufifrons</i>	Red-fronted gazelle	Vulnerable	A2cd
Bovidae	Antilopinae	Gazella	<i>Gazella dorcas</i>	Dorcas gazelle	Vulnerable	A2cd
Bovidae	Antilopinae	Gazella	<i>Gazella gazella</i>	Mountain gazelle	Vulnerable	A2ad
Bovidae	Antilopinae	Gazella	<i>Gazella subgutturosa</i>	Goitered gazelle	Vulnerable	A2ad
Bovidae	Antilopinae	Nanger	<i>Nanger soemmerringii</i>	Soemmerring's gazelle	Vulnerable	A2cd; C1
Bovidae	Bovinae	Tetracerus	<i>Tetracerus quadricornis</i>	Four-horned antelope	Vulnerable	C2a(i)
Bovidae	Antilopinae	Antilope	<i>Antilope cervicapra</i>	Blackbuck	Near threatened	
Bovidae	Antilopinae	Eudorcas	<i>Eudorcas thomsonii</i>	Thomson's gazelle	Near threatened	
Bovidae	Reduncinae	Kobus	<i>Kobus vardonii</i>	Puku	Near threatened	
Bovidae	Antilopinae	Litocranius	<i>Litocranius walleri</i>	Gerenuk	Near threatened	
Giraffidae	Palaeotraginae	Okapia	<i>Okapia johnstoni</i>	Okapi*	Near threatened	
Bovidae	Hippotraginae	Oryx	<i>Oryx beisa</i>	Beisa/fringe-eared oryx	Near threatened	
Bovidae	Antilopinae	Procapra	<i>Procapra picticaudata</i>	Tibetan gazelle	Near threatened	
Bovidae	Bovinae	Tragelaphus	<i>Tragelaphus eurycerus</i>	Bongo	Near threatened	
Bovidae	Bovinae	Tragelaphus	<i>Tragelaphus imberbis</i>	Lesser kudu	Near threatened	
Bovidae	Antilopinae	Eudorcas	<i>Eudorcas rufina</i>	Red gazelle	Data deficient	
Bovidae	Antilopinae	Gazella	<i>Gazella arabica</i>	Arabian gazelle	Data deficient	
Bovidae	Antilopinae	Madoqua	<i>Madoqua piacentinii</i>	Silver dik-dik	Data deficient	

Antelope Database – Species level: Species not threatened

Family	Subfamily	Genus	Species				
			Latin name	Common name	Status	Criteria	Population trend
Bovidae	Aepycerotinae	Aepyceros	<i>Aepyceros melampus</i>	Impala	Least concern		Stable
Bovidae	Alcelaphinae	Alcelaphus	<i>Alcelaphus buselaphus</i>	Hartebeest	Least concern		Decreasing
Bovidae	Antilopinae	Antidorcas	<i>Antidorcas marsupialis</i>	Springbok	Least concern		Increasing
Antilocapridae	Antilocaprinae	Antilocapra	<i>Antilocapra americana</i>	Pronghorn*	Least concern		Stable
Bovidae	Bovinae	Boselaphus	<i>Boselaphus tragocamelus</i>	Nilgai	Least concern		Stable
Bovidae	Cephalophinae	Cephalophus	<i>Cephalophus callipygus</i>	Peters' duiker	Least concern		Decreasing
Bovidae	Cephalophinae	Cephalophus	<i>Cephalophus dorsalis</i>	Bay duiker	Least concern		Decreasing
Bovidae	Cephalophinae	Cephalophus	<i>Cephalophus harveyi</i>	Harvey's duiker	Least concern		Decreasing
Bovidae	Cephalophinae	Cephalophus	<i>Cephalophus leucogaster</i>	White-bellied duiker	Least concern		Decreasing
Bovidae	Cephalophinae	Cephalophus	<i>Cephalophus natalensis</i>	Natal Red duiker	Least concern		Decreasing
Bovidae	Cephalophinae	Cephalophus	<i>Cephalophus niger</i>	Black duiker	Least concern		Decreasing
Bovidae	Cephalophinae	Cephalophus	<i>Cephalophus nigrifrons</i>	Black-fronted duiker	Least concern		Decreasing
Bovidae	Cephalophinae	Cephalophus	<i>Cephalophus ogilbyi</i>	Ogilby's duiker	Least concern		Decreasing
Bovidae	Cephalophinae	Cephalophus	<i>Cephalophus rufilatus</i>	Red-flanked duiker	Least concern		Decreasing
Bovidae	Cephalophinae	Cephalophus	<i>Cephalophus silvicultor</i>	Yellow-backed duiker	Least concern		Decreasing
Bovidae	Cephalophinae	Cephalophus	<i>Cephalophus weynsi</i>	Weyns' duiker	Least concern		Decreasing
Bovidae	Alcelaphinae	Connochaetes	<i>Connochaetes gnou</i>	Black wildebeest	Least concern		Decreasing
Bovidae	Alcelaphinae	Connochaetes	<i>Connochaetes taurinus</i>	Common wildebeest	Least concern		Stable
Bovidae	Alcelaphinae	Damaliscus	<i>Damaliscus lunatus</i>	Tsessebe	Least concern		Decreasing
Bovidae	Alcelaphinae	Damaliscus	<i>Damaliscus pygargus</i>	Blesbok/bontebok	Least concern		Stable
Bovidae	Antilopinae	Eudorcas	<i>Eudorcas albonotata</i>	Mongalla gazelle	Least concern		Unknown
Bovidae	Antilopinae	Gazella	<i>Gazella bennettii</i>	Chinkara	Least concern		Stable
Giraffidae	Giraffinae	Giraffa	<i>Giraffa camelopardalis</i>	Giraffe*	Least concern		Decreasing
Bovidae	Hippotraginae	Hippotragus	<i>Hippotragus equinus</i>	Roan antelope	Least concern		Decreasing
Bovidae	Hippotraginae	Hippotragus	<i>Hippotragus niger</i>	Sable antelope	Least concern		Stable
Tragulidae	Tragulinae	Hyemoschus	<i>Hyemoschus aquaticus</i>	Water chevrotain*	Least concern		Decreasing
Bovidae	Reduncinae	Kobus	<i>Kobus ellipsiprymnus</i>	Waterbuck	Least concern		Decreasing
Bovidae	Reduncinae	Kobus	<i>Kobus kob</i>	Kob	Least concern		Decreasing
Bovidae	Reduncinae	Kobus	<i>Kobus leche</i>	Lechwe	Least concern		Stable
Bovidae	Antilopinae	Madoqua	<i>Madoqua guentheri</i>	Guenther's dik-dik	Least concern		Stable
Bovidae	Antilopinae	Madoqua	<i>Madoqua kirkii</i>	Kirk's dik-dik	Least concern		Stable
Bovidae	Antilopinae	Madoqua	<i>Madoqua saltiana</i>	Salt's dik-dik	Least concern		Stable
Bovidae	Antilopinae	Nanger	<i>Nanger granti</i>	Grant's gazelle	Least concern		Decreasing
Bovidae	Antilopinae	Neotragus	<i>Neotragus batesi</i>	Bates' Pygmy antelope	Least concern		Stable
Bovidae	Antilopinae	Neotragus	<i>Neotragus pygmaeus</i>	Royal antelope	Least concern		Decreasing
Bovidae	Antilopinae	Nesotragus	<i>Nesotragus moschatus</i>	Suni	Least concern		Stable
Bovidae	Antilopinae	Oreotragus	<i>Oreotragus oreotragus</i>	Klipspringer	Least concern		Stable
Bovidae	Hippotraginae	Oryx	<i>Oryx gazella</i>	Gemsbok	Least concern		Stable
Bovidae	Antilopinae	Ourebia	<i>Ourebia ourebi</i>	Oribi	Least concern		Decreasing
Bovidae	Reduncinae	Pelea	<i>Pelea capreolus</i>	Grey rhebok	Least concern		Stable
Bovidae	Cephalophinae	Philantomba	<i>Philantomba maxwellii</i>	Maxwell's duiker	Least concern		Decreasing
Bovidae	Cephalophinae	Philantomba	<i>Philantomba monticola</i>	Blue duiker	Least concern		Stable
Bovidae	Antilopinae	Procapra	<i>Procapra gutturosa</i>	Mongolian gazelle	Least concern		Unknown
Bovidae	Antilopinae	Raphicerus	<i>Raphicerus campestris</i>	Steenbok	Least concern		Stable
Bovidae	Antilopinae	Raphicerus	<i>Raphicerus melanotis</i>	Cape grysbok	Least concern		Stable
Bovidae	Antilopinae	Raphicerus	<i>Raphicerus sharpei</i>	Sharpe's grysbok	Least concern		Stable
Bovidae	Reduncinae	Redunca	<i>Redunca arundinum</i>	Southern reedbuck	Least concern		Stable
Bovidae	Reduncinae	Redunca	<i>Redunca fulvorufula</i>	Mountain reedbuck	Least concern		Stable
Bovidae	Reduncinae	Redunca	<i>Redunca redunca</i>	Bohor reedbuck	Least concern		Decreasing
Bovidae	Cephalophinae	Sylvicapra	<i>Sylvicapra grimmia</i>	Common duiker	Least concern		Stable
Bovidae	Bovinae	Syncerus	<i>Syncerus caffer</i>	African buffalo*	Least concern		Decreasing
Bovidae	Bovinae	Tragelaphus	<i>Tragelaphus angasii</i>	Nyala	Least concern		Stable
Bovidae	Bovinae	Tragelaphus	<i>Tragelaphus derbianus</i>	Giant eland	Least concern		Decreasing
Bovidae	Bovinae	Tragelaphus	<i>Tragelaphus oryx</i>	Common eland	Least concern		Stable
Bovidae	Bovinae	Tragelaphus	<i>Tragelaphus scriptus</i>	Bushbuck	Least concern		Stable
Bovidae	Bovinae	Tragelaphus	<i>Tragelaphus spekei</i>	Sitatunga	Least concern		Decreasing
Bovidae	Bovinae	Tragelaphus	<i>Tragelaphus strepsiceros</i>	Greater kudu	Least concern		Stable

Antelope Database – Sub-species level

Family		Subfamily	Genus	Latin name	Common name	Species		Criteria	Population trend	Latin name	Common name	Sub-species		Status	Criteria	Population trend
Bovidae	Antilopinae	Saiga		<i>Saiga tatarica</i>	Saiga		Critically endangered	A2acd	Decreasing	<i>Saiga tatarica ssp. tatarica</i>	Saiga			Critically endangered	A2acd	Decreasing
Bovidae	Antilopinae	Eudorcas		<i>Eudorcas affricus</i>	Red-fronted gazelle		Vulnerable	A2acd	Decreasing	<i>Saiga tatarica ssp. monodactyla</i>	Mongolian saiga			Endangered	A2acd, C1+2a(ii)	Decreasing
Bovidae	Antilopinae	Gazella		<i>Gazella subgutturosa</i>	Gilded gazelle		Vulnerable	A2acd	Decreasing	<i>Eudorcas affricus ssp. libyca</i>	Hugulin's gazelle			Vulnerable	C1	Decreasing
Bovidae	Hippotraginae	Oryx		<i>Oryx beisa</i>	Beisa/ridge-eared oryx		Near threatened		Decreasing	<i>Gazella subgutturosa ssp. tatarica</i>	Arabian sand gazelle			Vulnerable	C2a(ii)	Decreasing
Bovidae	Bovinae	Tragelaphus		<i>Tragelaphus eurycerus</i>	Bongo		Near threatened		Decreasing	<i>Oryx beisa ssp. capensis</i>	Fringe-eared oryx			Near threatened	C1	Decreasing
Bovidae	Aepycerotinae	Aepyceros		<i>Aepyceros melampus</i>	Impala		Least concern		Stable	<i>Oryx beisa ssp. beisa</i>	Beisa oryx			Critically endangered	C2a(ii)	Decreasing
Bovidae	Alceiaphinae	Alceiaphus		<i>Alceiaphus busseolaphus</i>	Hartebeest		Least concern		Decreasing	<i>Tragelaphus eurycerus ssp. isabaei</i>	Mountain bongo			Near threatened	C2a(ii)	Decreasing
										<i>Tragelaphus eurycerus ssp. eurycerus</i>	Lowland bongo			Vulnerable	D1	Stable
										<i>Aepyceros melampus ssp. petersi</i>	Black-faced impala			Least concern		Stable
Bovidae	Alceiaphinae								Decreasing	<i>Aepyceros melampus ssp. melampus</i>	Common impala			Extinct		
										<i>Alceiaphus busseolaphus ssp. busseolaphus</i>	Bubal hartebeest			Critically endangered	C2a(ii)	Decreasing
										<i>Alceiaphus busseolaphus ssp. tora</i>	Tora hartebeest			Endangered	C2a(ii)	Decreasing
										<i>Alceiaphus busseolaphus ssp. leiyuei</i>	Leiyue hartebeest			Endangered	A2acd	Decreasing
										<i>Alceiaphus busseolaphus ssp. major</i>	Western hartebeest			Near threatened		Stable
										<i>Alceiaphus busseolaphus ssp. lichtensteini</i>	Lichtenstein's hartebeest			Least concern		
										<i>Alceiaphus busseolaphus ssp. Cokeri</i>	Coker's hartebeest			Least concern		Decreasing
										<i>Alceiaphus busseolaphus ssp. Cebraia</i>	Red hartebeest			Least concern		Increasing
										<i>Alceiaphus busseolaphus ssp. rubidus</i>	Ruwenzori black-fronted duiker			Endangered	B1a(iii), C2a(ii)	Decreasing
										<i>Cephalophus gombi ssp. brookei</i>	Brooke's duiker			Vulnerable	C1	Decreasing
Bovidae	Cephalophinae	Cephalophus		<i>Cephalophus gombi</i>	Ogilby's duiker		Least concern		Decreasing	<i>Cephalophus gombi ssp. ogilbyi</i>	Ogilby's duiker			Vulnerable	C1	Decreasing
Bovidae	Alceiaphinae								Decreasing	<i>Cephalophus gombi ssp. crassibulum</i>	White-legged duiker			Least concern		Stable
										<i>Damaiscus lunatus ssp. korringa</i>	Korringa			Vulnerable	C1+2a(ii)	Decreasing
										<i>Damaiscus lunatus ssp. toad</i>	Coastal topi			Near threatened		Decreasing
										<i>Damaiscus lunatus ssp. limele</i>	Topi			Least concern		Decreasing
										<i>Damaiscus lunatus ssp. lunatus</i>	Tsessebe			Least concern		Increasing
										<i>Damaiscus lunatus ssp. superstes</i>	Bengwelu tsessebe			Least concern		Increasing
										<i>Damaiscus lunatus ssp. liang</i>	Tiang			Least concern		Stable
										<i>Damaiscus pygmaeus ssp. pygmaeus</i>	Bontebok			Near threatened		Stable
										<i>Damaiscus pygmaeus ssp. gilgilis</i>	Bushbuck			Least concern		Stable
										<i>Giraffa camelopardalis ssp. giraffa</i>	West African giraffe			Endangered	D	Increasing
Bovidae	Giraffinae	Giraffa		<i>Giraffa camelopardalis</i>	Giraffe*		Least concern		Decreasing	<i>Giraffa camelopardalis ssp. peralta</i>	Giant sable antelope			Critically endangered	A2acd, C2a(ii)	Decreasing
Bovidae	Hippotraginae	Hippotragus		<i>Hippotragus niger</i>	Sable antelope		Least concern		Stable	<i>Kobus ellipsodermis ssp. debassai</i>	Debass waterbuck			Near threatened		Decreasing
Bovidae	Reduncinae	Kobus		<i>Kobus ellipsodermis</i>	Waterbuck		Least concern		Decreasing	<i>Kobus ellipsodermis ssp. ellipsodermis</i>	Common waterbuck			Least concern		Decreasing
Bovidae	Reduncinae	Kobus		<i>Kobus kob</i>	Kob		Least concern		Decreasing	<i>Kobus kob ssp. kob</i>	Buffon's kob			Vulnerable	A2acd	Decreasing
Bovidae	Reduncinae								Decreasing	<i>Kobus kob ssp. leucotis</i>	White-eared kob			Least concern		Unknown
										<i>Kobus kob ssp. thomasi</i>	Uganda kob			Least concern		Stable
										<i>Kobus lechwe ssp. robertsi</i>	Robert's lechwe			Extinct		
										<i>Kobus lechwe ssp. anselli</i>	Upemba lechwe			Critically endangered	A2acd	Decreasing
										<i>Kobus lechwe ssp. kalandensis</i>	Kalwe lechwe			Vulnerable	D2	Stable
										<i>Kobus lechwe ssp. smithemani</i>	Black lechwe			Vulnerable	D2	Stable
										<i>Kobus lechwe ssp. lechwe</i>	Red lechwe			Least concern		Stable
										<i>Oreotragus oreotragus ssp. portoussi</i>	Western klipspringer			Endangered	C2a(ii)	Decreasing
										<i>Ourebia ourebi ssp. kenya</i>	Kenya oribi			Extinct		
										<i>Ourebia ourebi ssp. hagardi</i>	Hagard's oribi			Vulnerable	C1	Decreasing
Bovidae	Antilopinae	Ourebia		<i>Ourebia ourebi</i>	Oribi		Least concern		Decreasing	<i>Redunca fluvicola ssp. adamaudae</i>	Western mountain reedbuck			Endangered	C2a(ii), D	Decreasing
Bovidae	Reduncinae	Redunca		<i>Redunca fluvicola</i>	Mountain reedbuck		Least concern		Stable	<i>Redunca fluvicola ssp. charlesi</i>	Charley's mountain reedbuck			Vulnerable	C1	Decreasing
Bovidae	Reduncinae	Redunca		<i>Redunca fluvicola</i>	Mountain reedbuck		Least concern		Decreasing	<i>Redunca fluvicola ssp. fluvicola</i>	Southern mountain reedbuck			Least concern		Stable
Bovidae	Bovinae	Tragelaphus		<i>Tragelaphus derbianus</i>	Giant eland		Least concern		Decreasing	<i>Tragelaphus derbianus ssp. derbianus</i>	Western giant eland			Critically endangered	C2a(ii)	Decreasing
				<i>Tragelaphus derbianus</i>	Giant eland		Least concern		Decreasing	<i>Tragelaphus derbianus ssp. agass</i>	Eastern giant eland			Least concern		Decreasing

* Non antelope species monitored by the ASG

Regional Rundown

West Africa

The role of Senegal in the recovery of the Sahelo-Saharan antelope species: the case of the reintroduction of Dorcas Gazelle, Teresa Abáigar ^{1*}, Babacar Youm ², Marius Niaga ², Conrad Ensenyat ³ and Mar Cano ¹

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Abstract. During the last 25 years Senegal made a significant effort to recover the three sahelian species which disappeared from its sahelian region: the scimitar-horned oryx (*Oryx dammah*), the mhorr gazelle (*Gazella dama mhorr*) and the dorcas gazelle (*G. dorcas*). With this purpose, the Senegalese government created two fauna reserves: the Guembeul Reserve and the Ferlo North Reserve. The mhorr gazelle was reintroduced in 1984 and the scimitar-horned oryx in 1999. The reintroduction of dorcas gazelles started in April 2007 with a project conceived to be carried out in three phases: phase 1) translocation of 20 gazelles (6.14) from the captive global population living in several zoological institutions in Europe to the Guembeul Reserve, phase 2) acclimation to the new environmental and management conditions and growing of population under genetic control, and phase 3) translocation of part of the gazelles from the Guembeul Special Fauna Reserve to the North Ferlo Fauna Reserve and genetic reinforcement of the reintroduced population. After 14 months of the reintroduction, the gazelles are well adapted to the new conditions and now number 31 gazelles (9.22). To assure the success of the reintroduction project, other actions related with training and education of local people were carried out.

Keywords. Conservation, Dorcas Gazelle, *Gazella dorcas*, Reintroduction, Sahelo-Saharan antelopes, Senegal

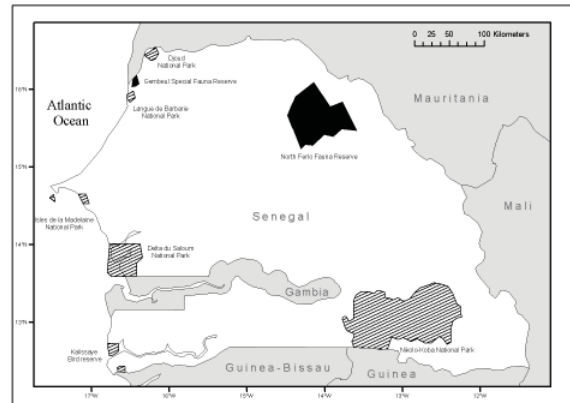
The Sahelo-Saharan antelopes in Senegal. An introduction

The six mammal species commonly known as Sahelo-Saharan antelopes (SSA) are acutely suffering the consequences of human habitat degradation and overexploitation; as a result, one of the species, the scimitar-horned oryx *Oryx dammah* is extinct in the wild, two of them are at the limit of extinction (addax *Addax nasomaculatus* and dama gazelle *Gazella dama*), other two are categorized as “Endangered” (slender-horned gazelle *Gazella leptoceros* and Cuvier’s gazelle *Gazella cuvieri*) and the last one, dorcas gazelle *Gazella dorcas*, is listed as Vulnerable (IUCN Red List 2007).

The Sahel has played an important role for the maintenance and survival of three of these species, oryx and mhorr and dorcas gazelles. This is because, although their distribution is not limited to the Sahelian habitat, this area is occupied during their migration periods, when herds look for food and shelter. Therefore, not so

long ago, the presence of these antelope used to be quite common in Senegal, Mauritania, Mali, Niger, Burkina-Faso, Chad and Sudan (see details of the distribution of these species in UNEP/CMS 2005).

The Republic of Senegal (see Figure 1) occupies an area of 196,192 km² distributed in 14 administrative regions. It is a very flat country whose highest altitude is 498 m in the south east (Fouta-Djallon). It comprises three biogeographic regions well differentiated in climate, vegetation and predominant fauna.



Roughly described, these are: 1) the Sahelian region, occupying the northern third of the country, with forests of different species of acacia (*Acacia raddiana*, *A. senegal*, *A. albida*, *A. seyal*), baobabs (*Adansonia digitata*), *Balanites aegyptiaca* and *Ziziphus mauritiana*, 2) the Sudanese savannah that extends over the central plains and the southeast, which is dominated by *Khaya senegalensis*, *Pterocarpus erinaceus*, *Parkia biglobosa*, *Borassus aethiopum*, and *Oxytenenthera abyssinica* and 3) the sub Guinean savannah in the southwest represented by *Parinari excelsa*, *Chlorophora regia* and *Elaeis guineensis*. There are also smaller ecosystems mediated by the topography and water regime; in particular, the forest of *Acacia nilotica* in the valley of the Senegal River and mangroves (*Rhizophora racemosa*) in the Saloum and Casamance estuaries (Ndiaye 2000; Jebali 2008).

During the last 25 years Senegal has made a significant effort to recover the three SSA species which disappeared from its Sahelian region at different times. The scimitar-horned oryx disappeared before 1914 (Sournia and Dupuy 1990). The mhorr and dorcas gazelles were occasional visitors to the Sahel zone; DMG until 1972-1973 (Poulet 1972), but there is not a precise date of extinction for dorcas gazelle (Sournia and Dupuy, 1990). The first conservation actions taken were the establishment of two fauna reserves in the Sahelian region: the Guembeul Special Fauna Reserve and the North Ferlo Fauna Reserve (Figure 1).

The Guembeul Special Fauna Reserve (GR) was created on May 30 1983 with a clear vocation to serve as a place for animal acclimation during the first phases of reintroduction projects and to carry out environmental awareness tasks. With a surface area of 720 ha, the GR is located 10 kms southeast of the city of Saint Louis. Due to its proximity to Djoudj National Park, it is also an important site for many species of migratory aquatic birds at it is included in the list of Ramsar sites since 1986; since 2005, the site belongs to the transboundary biosphere reserve of Delta of the Senegal River

(UNESCO-MAB www.unesco.org/mabdb/br/brdir/directory).

The North Ferlo Fauna Reserve (FR) was created by a presidential decree on March 21 1972 to protect the Sahelian fauna in northern Senegal and to serve as a final destination for SSA reintroduced in Senegal. It is located in northeast Senegal and extends over 487000 ha. The climate is Sahelian modulated by the continental character of the zone. Among other conservation actions undertaken through the Natural Park Management Direction (DPN), the Senegalese Ministry of the Environment and Protection of Nature has, created a sanctuary in Katané. In 2001 a 440 ha enclosure was put up in Katané for the reintroduction of SSA no longer in Senegal.

Senegal was a pioneer in the reintroduction of SSA in Western Africa. In 1984, the GR received the first reintroduction of mhorr gazelle (*Gazella dama mhorr*) with 7 gazelles (2.5) born in captivity at the Parque de Rescate de la Fauna Sahariana (PRFS) (EEZA, CSIC, Almería, Spain) and donated by the Spanish National Research Council (CSIC) (Cano et al. 1993). In 1999, a group of 8 (3.5) oryx was donated by the Israeli Wildlife Authority, and 2 (0.2) more by the Zoo of Vincennes (France) in 2002 (Ba and Clark 2002; Clark 2002; Jebali 2008). At present 15 mhorr gazelles and 40 oryx are living in the GR. In view of the success and growth of both mhorr gazelle and oryx populations in the GR, in January 2003, 9 mhorr gazelles and 8 oryx were transported from the GR to the FR where they seem to have adapted well. At present 11 mhorr gazelles and 42 oryx are living in the Katané enclosure.

The reintroduction of dorcas gazelle.

The last SSA reintroduced in Senegal was the Saharawi dorcas gazelle, *Gazella dorcas neglecta*.



On April 10 2007, 20 dorcas gazelles (6.14) were transferred from the PRFS to the GR, thus initiating the project for the reintroduction of this species in Senegal, where it had disappeared during the seventies (Sournia and Dupuy

1990). The group of 20 dorcas gazelles was selected from the global population managed *ex situ* within the European Captive Breeding Programme (EEP/EAZA). The animals reintroduced were selected following genetic, demographic and behavioural criteria and came from the following institutions: Madrid Zoo, Barcelona Zoo, Núcleo Zoológico "Coronel Duyos" (Nueva de Llanes, Asturias), OASYS-Tabernas Desert Thematic Park (Almería), Marwell Zoological Park (UK) and the PRFS.

The dorcas gazelle reintroduction project was conceived to be carried out in three stages: 1) selection, preparation and transfer of animals to the GR; 2) acclimation to the new environmental conditions and controlled reproduction in the GR; and 3) translocation of dorcas gazelles from the GR to the FR. The reintroduction was made following the recommendations of the ASG/SSC/IUCN.

One month before their transfer to Senegal, the gazelles from other centres were concentrated at the PRFS. After forming two herds from the groups of selected reproductive females, each animal was marked with a unique identification code and the health tests required and export permits (CITES) were completed. This initial grouping of individuals allows the establishment of relationships and ties that form the group's social structure.

As for the transportation, each animal was captured with a net and placed into an individual crate. During this operation they were given a special treatment to protect them from stress (trilafon©) and possible complications derived from immobilisation while travelling. The gazelles were transported by plane (Hercules-130) in a direct flight of 6 hours from Almería (Spain) to St. Louis (Senegal). Upon arrival at the GR, the 20 gazelles were released in three groups in the three acclimation enclosures of 2500 m² each as follows: two reproductive groups (1.6 and 1.8) and a group of 4 adult males. After 14 months in the GR, the gazelles seem to be well adapted to the new climatological and management conditions.

In the PRFS dorcas gazelles were fed with barley, commercial pellets for livestock and alfalfa; moreover, mineral are supplied in salt blocks; water was provided *ad libitum*. When the gazelles were taken to the GR their diet was changed, progressively reducing the amount of barley until its disappearance and substituting alfalfa with peanut straw; water and minerals were also provided *ad libitum*. Female social behaviour in the reproductive groups did not vary substantially with respect to their social organisation in the PRFS. Each female kept its rank in the hierarchy except the oldest one (10 years old), who decreased its rank and isolated from the rest of the group. As the enclosures in the GR were larger than those in the PRFS, gazelle flight distance to human approach increased with time. In order to maintain genetic variability, the reproductive males were changed in each reproductive period. Every time a calf was born it is identified. During the period April 2007-June 2008 there were 16 births, female biased (5.11), and 5 deaths (1 adult male death by an infectious process, 2 adult females by trauma and 2 offspring). By August 2008, the number of DG in the GR is 31 (9.22) (Figure 2), distributed as follows: a reproductive group of 12 gazelles (1 adult male, 4 adult females, 7 youngsters); a second reproductive group with 12 gazelles (8 adult females and 4 youngsters), a bachelor group of 3 males, and 4 isolated adult males.

As the first phases of the reintroduction of dorcas gazelle in Senegal were successful, a third phase has started, in which most of the gazelles will be transported to Katané enclosure in the FR; while the rest of gazelles will be kept as a breeding stock in the GR; the surplus of this group will be regularly transferred to the FR.

Also related to the dorcas gazelle reintroduction project, other actions have been carried out: a training course on management and conservation of endangered species addressed to the curators of the GR and the FR; an "ecomuseum" or visitors' centre has been built and equipped in the GR, which hosts a permanent exposition of the local ecosystem and conservation projects carried out in the institution.

With this successful reintroduction of dorcas gazelle, Senegal has recovered its three autochthonous SSA, which became extinct not so long ago. Now efforts should be addressed to provide wider protected areas where these antelopes can freely settle and reproduce, allowing them to reach population sizes large enough to assure their genetic and ecological viability.

Acknowledgements

We thank the technical staff of the Parque de Rescate de la Fauna Sahariana (Almería, Spain) and rangers of the Guembeul Special Fauna Reserve and from the Direction of National Parks of Senegal for their assistance during the capture, transport and release of gazelles. Special thanks to all EEP *Gazella dorcas neglecta* participants, who provide gazelles for the reintroduction. The dorcas gazelle reintroduction project in Senegal was funded by the Spanish Ministerio de Educación y Ciencia (REN2002-12684 E), the CSIC, the Spanish Ministerio de Defensa, the Barcelona Zoo, the Zoo-Aquarium of Madrid, the OASYS Park (Almería, Spain), the Senegalese Ministère de l'Environnement et de la Protection de la Nature, and the Direction des Parcs Nationaux of Senegal.

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Southern Africa

Giant sable antelope rescue and translocation,

by Pedro Vaz Pinto.

Background

When the rediscovery of the giant sable antelope in Cangandala NP, supported by trap camera photographs, was announced in 2005, few people could predict the frustration and uncertainty that soon followed. As the photographic record expanded and began to be critically analyzed, a shocking and unexpected reality became evident: the last surviving sable herd in Cangandala lacked a breeding bull and cows were producing hybrid calves with a roan antelope bull.

Over the last three years we witnessed the helpless decline of this breeding group, as three young sable males were pushed away by the roan bull, and the ageing females continued to produce hybrid calves. Since 2005, no pure sable offspring was recorded, and we found the remains of one sable female – presumably due to old age. In the meantime, a hybrid calf had been born approximately every six months, and ironically roan numbers had increased and threatened to replace the last sable group in Cangandala. The hybrids seem to be infertile as no female hybrids have been recorded with calves.

In 2008, we failed to complete a planned capture operation because of the last minute cancellation by the contracted Namibian capture operator. By early 2009 the situation was totally desperate, and this population without intervention, was doomed to extinction. We had no sable bull in the park, and we were down to less than ten old cows, and similar number of hybrids, including two hybrid bulls. The territorial roan bull was still present in the area occupied by the cows.

The Luando Strict Reserve is the only other protected area where the giant sable is known to occur. Being more than 10 times larger (828,000 ha versus 63,000 of Cangandala) and with prime miombo mosaic habitat, it has long been the stronghold for this subspecies and assumed to be the reservoir from which animals could be found to repopulate Cangandala if necessary. However, the results from camera traps installed in the reserve over the last two years, gave disappointing results. The trap cameras often recorded roan, but no sable, while poaching in the area seemed to be out of control. By mid-2009 we had identified a few promising areas for sable, but we had still failed to localize a sable herd, less alone bulls.



photo provided by Pedro Vas Pinto

Tackling the crisis

An emergency plan for 2009 was devised in consultation with Dr. Richard Estes, Dr Jeremy Anderson and Dr. Peter Morkel. Implementing this plan was considered to be the last chance to save the giant sable in Cangandala NP, and it was presented to and endorsed by the Angolan Government. We started off by building a 400 ha fenced sanctuary in the park, covering a relatively good diversity of habitats and including a drainage line. A capture operation was to follow and the objective was ambitious: first to capture and relocate as many of the pure cows as possible into the sanctuary, thus separating them from the hybrids and roan bull; secondly to capture and introduce a sable bull from Luando. The concerns were that no giant sable had ever been darted before, and an adult bull hadn't been recorded in decades!

Just a week before we started the capture operation we obtained lab results on mtDNA from Oporto University in Portugal, establishing that one particular dung sample we had collected in June in Luando reserve was, as we suspected, *Hippotragus niger variani*.

The capture operation took place between July 24th and August 17th, and crucial to the operation was the participation of Barney O'Hara from Botswana with his well-equipped Hughes 500 helicopter and the highly experienced veterinarian, Dr Peter Morkel. This proved to be a winning team from the start.

The animals were to be darted from the air and, when necessary, also air-lifted suspended by their legs 33m below the helicopter. A temporary holding pen using opaque game capture plastic was built inside the sanctuary.

We also acquired several VHF and a couple of GPS/GSM sable collars from AWT.

All the activities were supervised by the Ministry of Environment, as leading Governmental agency in charge of Angolan protected areas, and the official representative on the ground was Cardoso Bebeca as Park Administrator of Cangandala NP.

The capture

On the first flight in Cangandala, we located the solitary roan bull and the sable/hybrid group totaling 17 animals, and a hybrid female was darted and collared. Subsequently she would be used to lead us to the herd and pure cows. She proved to be a very cooperative and trustworthy "Judas", and over the following weeks we managed to catch all the nine pure cows in Cangandala, and transport them

successfully to the holding pen.

The females were in excellent physical condition and were all at least relatively old, yet not showing excessive wear of their incisors. Their ages were estimated to range between 8 and 14 years. None of this was a surprise, since the first hybrids had been born in 2002. Finding all the females together and in good condition well into the dry season, was also consistent with reduced breeding opportunities, and only one of the females showed signs of lactation and having produced a calf (a hybrid) earlier in the season.



Bull and two cows in boma (photo provided by Pedro Vas Pinto)

Once all the pure females had been relocated, we darted and collared a second hybrid female, but failed to find the remaining hybrids or the roan bull. By then, too much disturbance had been done, as the herd without the older females had lost cohesion, and the other hybrids had scattered.

While this was happening in Cangandala, we were also flying on approximately alternate days to Luando reserve, where the results also exceeded our expectations. The prime area was deep into the reserve but on our first flight we spotted and darted a giant sable bull, and the tone was set for the days that followed. In twelve days of flight over the reserve we darted 8 bulls and one cow. One of the bulls was collared and subsequently relocated to Cangandala. Because it was more than 100km away, the bull was transported to Cangandala inside a military Russian chopper MI-8 from the Angolan Air Force.

In total we saw 15 bulls in Luando, but only three females, with two yearlings and two small calves. The reason for this disparity may be due to the season, as the females were calving and more restricted in their movements, while males tended to be isolated and often their black figure were conspicuous under the leafless miombo. Sure enough, the one female had just calved recently when we caught her, and when seen a couple of weeks later, she had joined with a couple other females, two calves and a couple yearlings, plus one bull.

Conclusions

The success of this operation means that we can finally get a grip on this magnificent creature's fate. If we are able to secure the area and manage the sanctuary properly, and if the animals adjust as



photo by R. D. Estes

expected, we may well have rescued the Cangandala giant sable population from the ashes. We have now one pure bull with nine old females, some who haven't bred at least in years, and some who may have done it once and a while with the wrong species. How this bizarre historical breeding pattern would affect them in the future is uncertain, but first indications are very hopeful. From the first moment, the females accepted and submitted to the giant sable bull, and they have been following him everywhere since. The timing may also work well in our favor, as the bull is expected to induce estrus in the females during September. If everything goes as expected in Cangandala, we should welcome the first pure giant sable offspring in May 2010.

In the meantime, the sanctuary must be strengthened and greatly expanded, as management requirements are expected to increase substantially. In a couple of years time, the introduction of new blood from Luando will also be necessary.

In Luando reserve we were fortunate to have located an apparently healthy breeding nucleus that may comprise up to two giant sable herds, but we flew over large areas with little game and where sable seem to have disappeared. Human encroachment inside the reserve is obvious and poaching is a huge problem, as we saw several active bushmeat camps. An extensive census must be a priority, to define the best strategy and allow us to focus immediately on the most important areas. The hunting of bushmeat in the areas occupied by giant sable must be stopped as soon as possible.

The Angolan authorities are now called upon to conserve the national symbol, and the military are already active in Luando to provide security. While the future of this remarkable antelope is still uncertain, we may have now established a sound base for its recovery.

The Giant Sable Conservation Project is an initiative led by the Angolan Ministry of Environment in partnership with The Research Centre of The Catholic University of Angola and the Provincial Government of Malanje.



Interest Groups

Uncovering the mysteries of the imperiled giraffe, an interview with Julian Fennessy

Every school child knows the giraffe: with its record height, small horns, and tell-tale spots, it is hard to miss. Although well-known among school children and the public there has been a vacuum in giraffe research until recently.

Dr. Julian Fennessy probably knows the giraffe better than anyone. Trekking across savannah, forest, and the deserts of Africa, Fennessy is collecting genetic samples of distinct giraffe populations and overturning common wisdom regarding their taxonomies. It had

long been accepted knowledge that the giraffe was made up of one species and several subspecies, however with Fennessy's work it now appears that several of the subspecies may in fact be distinct species.

Such discoveries could have large conservation impacts, since conservation funds and efforts are largely devoted to species. The giraffe has suffered significant declines in the past decade with the total population dropping some 30 percent across Africa.

"Sadly all the standard players are involved," Fennessy told

Monagabay.com. "A mix of habitat loss, habitat fragmentation, impacts of war and civil unrest, and poaching."



When told that giraffes are threatened, Fennessy said, people are "surprised – often in complete shock, although on the other spectrum some quite vehemently deny such a statement! Giraffe are

everywhere, that is what I keep hearing from those who safari across the continent, but sadly they are not in the large numbers we hoped."

Founding member of both the Giraffe Conservation Foundation (GCF) and the International Giraffe Working Group (IGWG), Fennessy is working tirelessly to conserve giraffe species, subspecies, and distinct populations. As he puts it, "I wish I had more hours in the day..."

Fennessy discussed researching giraffes, unraveling their taxonomic mysteries, and building conservation efforts with Mongabay.com in March 2009.

Mongabay: *What is the focus of your research? What is your background?*

Julian Fennessy: The focus of my personal research is broad, but really can be best summed up as trying to find out what the current status of giraffe populations and (sub)species are in the wild. On a finer scale, with many others, I am looking at individual populations more closely to help build up a greater profile of giraffe life history – something significantly lacking.

I have a Bachelors of Applied Science in Natural Resource Management and subsequently undertook many years of field work/research which allowed me to write up a PhD on the ecology of giraffe in Namibia's northwest.

However, field work and an enthusiasm to increase the profile of giraffe and their long-term conservation and management, has been the driver to moving me forward.

Mongabay: *What led you to focus on giraffes?*

Julian Fennessy: Since my first trip to Africa when I was 16—as a Rotary Exchange Student—I decided life was not about spending time behind a desk and the 9-5 grind, but it was definitely not the giraffe that grabbed my attention. Rhinos were top on the list but after returning to Southern Africa (after my undergraduate degree) and subsequently working on a project researching elephants and giraffe in the north-western desert of Namibia (amongst other things), I decided there was too much politics and egos in elephants and amazingly stumbled across the paucity of knowledge about giraffe. So...giraffe it was; I found a niche and ran with it!

Mongabay: *Do you have any advice for students hoping to become conservation scientists?*

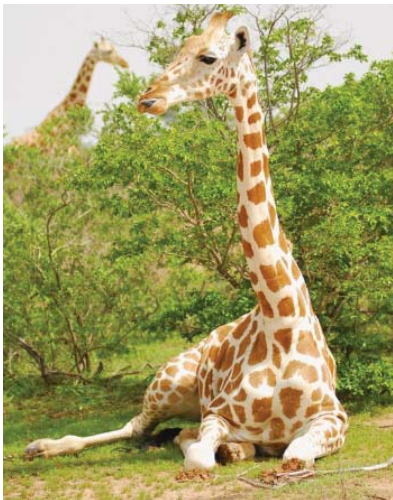
Julian Fennessy: Believe in yourself! If you really want to do something or be somewhere, you can. We live at a time of amazing opportunities, the world is so small and the desire to learn is as great as ever.

I was not an 'A' grade student by any stretch of the imagination but realized that many people who have PhDs and become 'famous' are not always what the television or books show. This may be outlandish but many of them struggle socially and their connection to how their research can truly apply to conservation and management on the ground, and in turn support community initiatives and social and economic awareness for those living with wildlife, is limited. Therefore, put everything in context, take all with a grain of salt and look at the bigger picture – but of course get the basics down pat and if lucky learn from a mentor or someone who wants to share experiences and listen to you. Oh...and enjoy!

Mongabay: *What is your favorite place to work in Africa?*

Julian Fennessy: That is a tough one – each place is magical and has its pros (and some cons). The rawness of Zambia, the beauty of the Reticulated giraffe roaming across northern Kenya, the deserts of Namibia and Niger, and of course, the 'package' that is the Okavango Delta in Botswana. So...in a nutshell, I do not have one special place but what makes somewhere special is the people you are with and the experiences you have.

GIRAFFE: UNLOCKING NEW SPECIES **Mongabay:** *What is the role of the giraffe in their ecosystems?*



Julian Fennessy: Giraffe are landscape changers, maybe not to the same degree as elephant and in some environments rhino, but they definitely open up areas and promote growth of new forage for them and other smaller browsers to make the most of.

Some interesting research in Kenya highlighted that when Described as in 'dire straits' the West African giraffe in Niger numbers less than 1,000. Photo by: JP Suraud.

areas protected from herbivores, some Acacias declined and the knock on effect to other species e.g. ants, was considerable: http://news.mongabay.com/2008/0110-ants_trees.html

Such research is fascinating and highlights that we know very little about ecosystems, the species that have evolved in them, and the role they play – happy learning!

Mongabay: *So far you have shown that six subspecies of giraffe may in fact be separate species. What is the process of moving an animal from subspecies status to species?*

Julian Fennessy: Using genetic based research at least six potential species have been highlighted, however, a few more populations are still to be sampled – part of the ongoing work I am involved with. The process of moving an animal from subspecies status to species should be easier said than done (although timely and depends on who you know I am sure!) but the lack of primary data collection (scientists going to the field to collect samples from the ground and truth appropriately) is the fundamental flaw in this debate.

Much of the debate around giraffe taxonomy is that 'desktop' science with limited knowledge of giraffe pelage (coat) patterns, historical and current range, ecological and geographic separation and now genetic variation, has resulted in a mess of taxonomy which has in all practicality gone beyond repair. We need to start again, we need to use the historic assumptions and classifications coupled with appropriate field data, research, and technology to build their status from the ground up. Whether it is one, two or more species, and in turn as many or more subspecies, it is important to the long-term conservation and protection of threatened populations.

Mongabay: *What are the primary differences between species and subspecies?*

Julian Fennessy: Traditionally, and in the most simplistic taxonomic terms, if two individuals could mate and produce viable and fertile offspring, then they were considered from the same species. However, if they were not fertile or could not reproduce, then they were assumed to be distinct species.

However, taxonomy is part science, part art, with more than 20 published species concepts to help define species level differentiation.

There is so much uncertainty in the current taxonomy of the giraffe that no one for sure can put their hand on their heart and say there is this many species or that many subspecies. Only time and dedicated data driven research will help us unravel this cryptic question – something the Giraffe Conservation Foundation, International Giraffe Working Group and Henry Doorly Omaha Zoo Centre for Conservation and Research are collaborating on.

Mongabay: *How many giraffe species are recognized now? Which are the most endangered?*

Julian Fennessy: Currently, and again this is based on the uncertainty in giraffe taxonomy, only one (1) species is recognized – *Giraffa camelopardalis*.

Within this species, nine (9) different subspecies are recognized:

G.c. angolensis, Angolan or Smoky giraffe (below)

G.c. antiquorum, Kordofan giraffe

G.c. camelopardalis, Nubian giraffe

G.c. giraffa, South African giraffe

G.c. peralta, Niger or West African giraffe

G.c. reticulata, Reticulated or Somali giraffe

G.c. rothschildi, Rothschild or Baringo giraffe

G.c. thornicrofti, Thornicroft's giraffe

G.c. tippelskirchi, Masai giraffe



However, recent genetic research we have been involved with has highlighted that these (sub)species are distinct, species level separation (see: <http://news.mongabay.com/2007/1220-giraffes.html>). Based on this work and more we are undertaking, research indicates that the following, at least, are up for potential species status (note that all populations have yet to be sampled): West African, Reticulated, Rothschild, Masai, South African and Angolan giraffe.

Of all giraffe populations, it appears that some are in dire straits and others number less than 1,000. Specifically, the West African, Rothschild and Thornicroft's giraffe have very low numbers, the latter has possibly always had a small population. However, little is known of the population numbers of Kordofan and Nubian giraffe as they inhabit areas of extreme civil unrest. Numbers of Reticulated giraffe are assumed to have plummeted over the last decade from nearly 30,000 to around 5,000 whilst encouragingly, numbers of giraffe in Southern African seem to be stable and/or increasing.



Mongabay: *You are currently working to see if Thornicroft's giraffe (left) is a separate species as well. Any results you would like to share?*

Julian Fennessy: Stay tuned... the preliminary results are due out within the month and hopefully we can again highlight the important differences in this giraffe (sub) species to those across the continent which one would expect considering

their geographic isolation, and of course pelage (coat) patterning.

Mongabay: *How is discovering the actual taxonomic differences among giraffes important for conservation?*

Julian Fennessy: This is not just a matter of keeping geneticists or taxonomists in business or the age old argument of 'splitters' vs. 'clumpers'. For me it is simple – with better understanding of the taxonomic difference of giraffe populations, as well as a greater understanding of their current (and historical) population numbers and distribution, one can then build up a scenario of what is happening to them as distinct biological units which may or may not require targeted conservation and management – independent of whether the broader taxonomic question of species vs. (sub)species. The fundamental questions we face regarding giraffe's actual taxonomic differences are critical since protective legislation is generally afforded based on the term "species."

THREATS TO GIRAFFES Mongabay: *Are people often surprised to hear that giraffes are endangered?*

Julian Fennessy: Surprised – often in complete shock, although on the other spectrum some quite vehemently deny such a statement! Giraffe are everywhere, that is what I keep hearing from those who safari across the continent, but sadly they are not in the large numbers we hoped. Some populations and (sub)species are fairing better than others, which is the same for much wildlife across the world.

Mongabay: *It is currently thought that giraffe populations have dropped 30 percent in a decade. What are the reasons for such a drastic decline?*

Julian Fennessy: Sadly all the standard players are involved – a mix of habitat loss, habitat fragmentation, impacts of war and civil unrest, and poaching. Wildlife the world over is in decline with very few species on the rise. As giraffe require larger areas to survive than many other species, a loss in habitat quality and availability has been devastating, let alone an easy prey in areas of conflict.

Mongabay: *You were very involved in having the West African giraffe listed as an endangered species by the IUCN in 2008, how difficult is such a process?*

Julian Fennessy: Data, data, data – that is the key! The process can be as easy or difficult as the population allows. We have some good researchers and local NGOs in Niger collaborating with government and international partners who have monitored and censused the population for many years now. We have a good understanding of their numbers, distribution, and threats, as well as historical knowledge of where they once roamed and in what numbers. Using the IUCN Red List Criteria, the process requires one to be methodical and apply as appropriate to the population/(sub)species – which in this case is one and the same.

Next on the list to assess is the Thornicroft's giraffe based on the recent research we have been doing there and possibly followed by

the Rothschild giraffe – I wish I had more hours in the day...

Mongabay: *Any evidence of giraffes living in the Southern Sudan, which has only recently opened up to scientists again?*

Julian Fennessy: Wildlife Conservation Society's work in the past few years has re-highlighted the large numbers of antelope in particular that survived the devastating war in this region. Fortunately, other beasts like elephant and giraffe did better than buffalo and zebra. Chatting to the head of the country programme recently, giraffe are still surviving in a host of different areas and although maybe not in the thousands, the populations are apparently stable. Hopefully when things settle a little more and the road infrastructure/accessibility improves, I can get in their with a team to see what is happening with them and which (sub)species are surviving where!



Mongabay: *You are a founding member of both the Giraffe Conservation Foundation (GCF) and the International Giraffe Working Group (IGWG), what can you tell us about these organizations?*

Julian Fennessy: The Giraffe Conservation Foundation (GCF) is a new charity based in the UK which is endeavouring to support and profile giraffe conservation and management work across the African continent. As a new organization on the block, we are looking at supporting targeted projects in Kenya and Niger to start with, as well the continent-wide taxonomic research. But, there are so many projects and ideas which we could support – sadly just not the dollars. If anyone is keen to help out, feel free to drop me a line – happy to chat! Have a look online at the GCF website: <http://www.giraffeconservation.org/> – coming to a webpage near you soon! The International Giraffe Working Group (IGWG) sits under the banner of the IUCN Species Survival Commission, and in particular the Antelope Specialist Group. Established in 2003, the Group came together to look at ways of undertaking and providing support to giraffe conservation and research in both in-situ and ex-situ populations. We have been undertaking some collaborative research and conservation management support projects both in Africa and in the zoo world. As well, we produce a newsletter to try and bring the community together – this seems to be an effective tool

which hopefully will grow as a resource (contact me for a copy or download online at: http://www.iucn.org/about/work/programmes/species/about_ssc/specialist_groups/directory_specialist_groups/directory_sg_mammals/asghome/)

Mongabay: *What are your future plans?*

Julian Fennessy: Personally, when I grow up...I would love to be a full-time giraffe 'fundi' (expert) with the capacity and support to look at what is happening to these critters across the continent and work with partners from all areas to increase our knowledge of giraffe and their profile, and subsequently improve their conservation and management. However, funding is and may always be limited so maintaining a strong foot in the giraffe world is important to me as an outlet – let alone a responsibility.



Giraffa newsletter published

The Giraffe Specialist Group recently published Volume 3 of their newsletter *Giraffa*. Please contact Julian Fennessy, Julian.Fennessy@gmail.com for a copy. Included in this edition:

- PHVA workshop for West African Giraffe
- Illegal hunting of giraffes: news from Tanzania
- Giraffes of the Garamba National Park, DRC
- Community based giraffe conservation in Kenya
- The Advantages of Proactive Reinforcement Training With Captive Giraffe
- The behavior of reticulated giraffe in the Laikipia



Antelope in the News

*The articles contained in this section have been published in public forums and have not been endorsed by **Gnusletter** for accuracy or content. We invite you to review the information in the context of public reports concerning antelope.*

Ed.

Private Sector Investment in Nature Conservation Scheme by Musa Ndow, AllAfrica.Com, The Daily Observer

Momodou Kotu Cham, minister of Forestry and the Environment (Gambia), has revealed that upon approval by Cabinet, his department has now introduced a scheme for the private sector to invest in nature conservation, particularly within their gazetted national parks, nature reserves and forest parks.

According to him, inviting the private sector into nature conservation, especially within the protected areas, is a major policy shift. Currently, he noted, government's policy orientation is mainly to create favourable conditions for the involvement and empowerment of local communities, particularly peripheral communities to the parks, in biodiversity and wild life schemes so

that tangible benefit is accrued to these communities.

Hon. Cham made these revelations last Friday, at a press briefing convened at his office, at the Quadrangle in Banjul. The concept, he noted, could become an economically and commercially viable activity for some species in different ecological contexts and at different socio-economic levels. This, he added, would also help to assure the survival of wildlife and at the same time help to assure the survival and prosperity of the rural communities while creating new business opportunities.

According to the Forestry and Environment minister, the need for the involvement of the private sector now is due to the current state of the country's national parks and reserves. "They have been progressively declining both in number of animal species and forest cover," he stated, singling out poor management of parks, insufficient inflow of resources and lack of technical skills as major obstacles to the preservation of nature reserves in the country.

Bush fire, he said, has also been another threat to the forest and it has ravaged many parks. "As indicated in the Banjul Declaration of 1977, there has been a steady decline in animal species and numbers in The Gambia, and records also indicate that 66 species of the animals have so far gone into extinction in The Gambia, including the Sitanungu, leopard, and the elephant," Minister Cham said, adding that it was reported that the West African giant Derby Eland, the largest species of antelope, was last seen in The Gambia in the 1960s.

Minister Cham believes that a scheme in which the Gambian private sector or even the foreign capital venture get into natural resources conservation could augur well for the development and management of parks, providing the needed financial resources, and that this could also contribute towards the development of the local skills and expertise in park and natural resources management.

Additional tourism product

This aspect, the minister noted, is crucial for the country's tourist industry especially when the focus of the current tourism policy is to extend in to upscale tourist market, which natural resources have the potential to facilitate. He said this would enhance and increase in the value of wild life species and associated activities (games viewing, sport hunting or safari).

Breeding and re-stocking programme

This can help, among other things, to address the disappearance of natural habitats and wildlife resources which are due to human population pressure for agriculture and habitation. And according to him, this could increase the number of threatened species and bring back those species that have disappeared from the country's forest and parks. The scheme, he added, would also create an additional employment opportunities for the peripheral communities to the parks and the sector's contribution to the general economy of the country will be enhanced.

Propose approach to this scheme. To implement these schemes, Minister Cham went on, specific activities have been planned, and these include studies to develop the relevant policy and

legal framework to guide the process. He said that to effectively manage the scheme, staff of the department of parks and wildlife



management (DPWM) as well as those at the forestry department would be trained, and this would include practical attachment at certain game reserves within the region, adding that the scheme also provide room to encourage the creation of local organisations of business entrepreneurs interested in investing in nature.

To that effect, he announced, a chapter of an international organisation has been registered recently, and it is called Leadership in Conservation for Africa (LCA). Its Gambia chapter comprise members from the ground to operators, The Gambia hotel association, The Gambia Chamber of Commerce and Industry, and private forest owners. "Investment in park infrastructure, technically skilled personnel, animals for stocking and marketing would be expected to be the responsibility of the private sector, and the government would provide the conducive policy and legal environment backstopping to further ensure that the parks and animals are managed in accordance with required standards and norms," he said.

The details of the agreements and modus operandi within the parks and reserves, Minister Cham stated, would be developed in a consultative manner to take into account the well being of the forests as the general economic well being of the country.



24 added to China's only Saiga antelope population, from CHINA.ORG.CN, Xinhua

The Gansu Endangered Animals Research Center, located in Wuwei City (China) on the southern edge of the Tengger Desert, was founded in 1987. Breeding various endangered animals such as wild camels and Przewalski's horses, it is China's only habitat for Saiga antelope populations.

"These young antelopes are growing well, with a 100 percent survival rate, in an open field specially constructed for them where they can run freely," said Zhao.

The Saiga antelope, also known as the high-nose antelope in Chinese, is largely found east of the Caspian Sea, in Kazakhstan, Russia, Mongolia, Uzbekistan and Turkmenistan. Because of its decreasing number, it has been listed among the endangered species in the Convention on International Trade in Endangered Species of Wild Fauna and Flora.

As a Class I state-protected species in China, the Saiga antelope was once found in the Junggar Basin and Beita Mountain in Xinjiang, the Mazongshan area in Gansu Province and the China-Mongolia border area in the 1950s. But it has not been seen in the wild in a long time.

The Gansu Endangered Animals Research Center has acquired more than 10 Saiga antelope from abroad since 1988. It now has 65 Saiga antelope after more than 20 years of breeding.

“The introduction and artificial domestication aim to restore this species in China,” said Wang Li, deputy director of the research center. “However, more individuals have to be introduced because its population is rather small now.”



Tents set up to aid Tibetan antelopes in birth season, from CHINA.ORG.CN (*Xinhua News Agency June 17, 2009*)

Preservationists in China's Hoh Xil National Nature Reserve said on Wednesday that they have set up several big tents on the Qinghai-Tibet plateau region, to help pregnant Tibetan antelopes give birth in harsh weather. Wang Zhoutai, chief of the Protection and Management Office at the reserve, said they have monitored 1,000 pregnant antelopes at the bank of Zonag Lake, where the tents were set up 4,700 meters above sea level to shelter the animals.

“Snow storms were frequent in the area recently. These antelopes have traveled a long way on migration to reach the place to give birth,” he said. About 30,000 Tibetan antelopes gave birth in the reserve in northwest Qinghai Province last year, which is dubbed a “big maternity ward” for the endangered animal, native to the plateau region.



The reserve closed tourist activities in the core area of the reserve in May, in bid to guarantee the pregnant antelopes remain undisturbed

by tourists. Wang said the birth season will end in August. The reserve has reinforced patrols and prepared to tackle armed poachers. The antelopes have become a target of poachers since the 1980s. International traffickers make luxury shawls, each piece of which requires the pelts of three to five antelopes. Armed poaching had led to a drastic decline in the antelope population in the 1990s. There were only 20,000 left in Hoh Xil when rangers started to fight the illegal practice in February 1998.

The population in the reserve had increased to 60,000 by 2008, said the reserve.



Wiping out the World's Mass Migrations: First Analysis of the Effect of Habitat Changes on Migrating Grazers, *American Museum of Natural History* www.amnh.org/science/papers/grant_migration_2009

Densely packed wildebeests flowing over the Serengeti, bison teeming across the Northern Plains—these iconic images extend from Hollywood epics to the popular imagination. But the fact is, all of the world's large-scale terrestrial migrations have been severely reduced and a quarter of the migrating species are suspected to no longer migrate at all because of human changes to the landscape. A recently published research paper highlights this global change and presents the first analysis of the dwindling mass migrations.

“Conservation science has done a poor job in understanding how migrations work, and as a result many migrations have gone extinct,” says Grant Harris of the Center for Biodiversity and Conservation at the American Museum of Natural History, first author of the paper in *Endangered Species Research*. “Fencing, for example, blocks migratory routes and reduces migrant's access to forage and water. Migrations can then stop, or be shortened, and animal numbers plummet.”

Migrations of large-bodied herbivores (also called ungulates) occur when animals search for higher quality or more abundant food. Ecologically, there are two primary drivers of food availability. In temperate regions of the world, higher-quality food shifts predictably as the seasons change, and animals respond by moving along well-established routes. For savannah ecosystems, rain and fire allow higher-quality food to grow. This is a less predictable change that animals must track across expansive landscapes.

Human activity now prevents large groups of ungulates from following their food. Fencing, farming, and water restrictions have changed the landscape and over-harvesting of the animals themselves has played a role in reducing the number of migrants. To assess the impact of human activity on migrations throughout the world, Harris and his co-authors gathered information on all 24 species of large (over 20 kilograms) ungulates known for their mass migrations. Animals included in the study, for example, range over Arctic tundra (Caribou), Eurasian steppes and plateaus (Chiru and Saiga), North American plains (bison and elk), and African savannahs (zebra and wildebeests). The fewest number of mass-migrating species live in

the Americas, and this is the location where the most data exists. Evaluating the human impact on migratory species in Africa and Eurasia is hampered by a lack of scientific data: in Africa where most of the large-scale migrations remain three species have no scientific publications on their status, and in Eurasia half of the six remaining migratory species are very poorly documented. All 24 species in the current study lost migration routes and were reduced in number of individuals. In North America, bison are still considered migratory, but their range is now restricted from the Great Plains to two small sites in Yellowstone and Alberta. Similar changes are found on other continents when human activity limits the ability of species to move to new patches of food. The analysis found even more drastic curbing for six species in particular. The springbok (*Antidorcas marsupialis*), black wildebeest (*Connochaetes gnou*), the blesbok (*Damaliscus dorcas*), and quagga (*Equus quagga*) of southern Africa; the kulan (*Equus hemionus*) of central Asia; and scimitar horned oryx (*Oryx dammah*) of northern Africa either no longer migrate or are impossible to evaluate as migratory animals.



“If we are going to conserve migrations and species, we need to identify what needs to be done: where migrations remain, how far animals move, their habitat needs and location, threats, and the knowledge gaps needed to be filled,” says co-author Joel Berger of the Wildlife Conservation Society and the University of Montana. “For some of these species, such as the wildebeest and eland in Botswana, threats were identified decades ago. We as a society have made little progress at figuring out how to save migrations.”

“A large part of this is an awareness issue. People don’t realize what we have and are losing,” says Harris. “We lose migrations and become biologically depauperate with farms and fences, even though there is no reason why humanity cannot technically and socially advance while maintaining natural phenomena. A balance can be struck we just need to strike it.”

In addition to Harris and Berger, authors on this research paper include Simon Thirgood and J. Grant Hopcraft of the Frankfurt Zoological Society in Tanzania, and Joris Cromsigt of the Mammal Research Institute at the Polish Academy of Sciences. The research

was supported by the John D. and Catherine T. MacArthur Foundation, the Frankfurt Zoological Society, the Wildlife Conservation Society, and the Marie Curie Transfer of Knowledge project BIORESC.



Oribi Working Group Activities, *Endangered Wildlife Trust*
http://www.ewt.org.za/workgroups_overview.aspx?group=oribi&page=overview

The EWT-OWG in partnership with the relevant provincial conservation authorities (e.g. Ezemvelo KwaZulu-Natal Wildlife), also captures and translocates “doomed” Oribi populations to areas where it will be easier to conserve them. A doomed Oribi population is one that has declined over the past 5 years, based on the results of the biannual counts, due to threats that cannot be stopped and it is clear from the downward trend that the remaining animals will disappear if they are not translocated to a safe site where they face no significant threats. Safe sites are identified by members of the EWT-OWG. This includes assessing the habitat suitability for Oribi of a site and no hunting of Oribi with dogs.

It must be noted that these translocations are not seen as a way of removing Oribi in order to develop the area, and only take place after much research and field investigations to assess the population threat.

The capture and translocation season for wildlife is from the 1 March to 30 September annually. The capture of Oribi usually takes place after the first spring burns as the Oribi are easier to see. Capture and translocations are not done in Summer as females may be pregnant or have a lamb hidden away. The EWT-OWG has completed a number of translocations. Five Oribi were captured on Noukloof Farm and released on Cathkin Estate. Cathkin Estate currently has 4 Oribi with no breeding occurring as yet. Three Oribi were captured on Fountain Hill and released at Michaelhouse. The 3 animals are doing well producing 1 lamb in December 2006. Four Oribi were captured at Roselands Farm, radio collared and released on Crane Farm and are doing well.



Incident: Brussels Airlines A333 at Bujumbura on June 19th, 2009 antelope strike, *The Aviation Herald*
<http://avherald.com/h?article=41bbf948&opt=0>

A Brussels Airlines Airbus A330-300 performing flight SN-453 from Brussels, Belgium to Bujumbura (Burundi) was landing at Bujumbura's International Airport, when the airplane struck the antelope during roll out. The airplane stopped safely, the passengers disembarked normally.

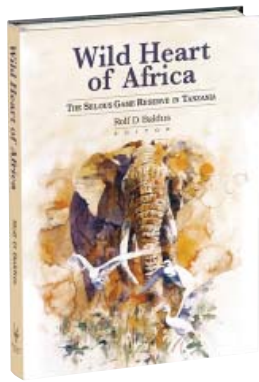
The onward flights to Nairobi, Kenya and back to Brussels had to be cancelled due to damage to the landing gear. The airplane was ferried back to Brussels on June 21.

The fate of the antelope has not been reported.



Gnusletter book review:

Rolf D. Baldus (Ed.) **WILD HEART OF AFRICA –THE SELOUS GAME RESERVE IN TANZANIA**, Rowland Ward Johannesburg 2009, 268 pages. Standard edition 65 US\$;
<http://www.rowlandward.com/>



Due to its sheer size of 50,000 sqkm and its wilderness character the Selous Game Reserve in Tanzania is one of Africa's most important refuges for antelopes. Finally a team of 20 expert contributors who know the place intimately has written the first comprehensive book on the reserve. Together they served the Selous as wardens, researchers and managers for a combined total of over 100 years. The book covers conservation, the history, ecology, wildlife and many other aspects. Prof. Pitra has summed up

the research on the "Roosevelt sable" in a most interesting article. The man who has put this all together as editor during one decade and who has provided many chapters himself is Dr. Rolf D. Baldus (ASG). He worked in the Reserve and with the Tanzanian Wildlife Division for 13 years. The text is complemented by 400 colour photographs, 50 paintings of Selous scenes by Bodo Meier and Wilhelm Kuhnert and by useful maps.



Recent Publications or Reports

Bushbuck, harnessed antelope or both?, by Torsten Wronski, *Zoological Society of London (ZSL), Conservation Programs, Regents Park, London NW1 4RY, United Kingdom*, Yoshan Moodley, *Max-Planck Institut für Infektionsbiologie*,

Charitéplatz 1, 10117, Berlin, Germany

The bushbuck, known as *Tragelaphus scriptus*, is one of Africa's most common and widely distributed antelope species (East, 1998). Over the last decades, the bushbuck has received little attention by conservationists since it is found in almost all habitats of sub-Saharan Africa and occurring in approximately 73% of the total land area. It persists in a wide range of natural habitats across the continent and it seems to be easier to describe where it does not occur than to specify where it occurs. Only in the primary lowland forest of the Congo basin, in the Somali-arid area (Horn of Africa) and in the south and southwest African arid and semi-arid habitats it is absent. The bushbuck is known to be an extremely flexible species surviving in numerous anthropogenically influenced habitats (Odendaal and Bigalke, 1979; Schmidt, 1983; Wilson, 2001), and plasticity in habitat use may be a key to its survival, even in densely settled areas and urban surroundings with severe hunting pressure (Wilson, 2001; Awerbeck *et al.*, 2008). Moreover, bushbuck show extreme low rates of gastro-intestinal tract parasitic infections, which may be attributed to being a highly selective feeder (91% browse) and nimble parasite avoidance (Apio and Wronski 2004, Wronski and Apio 2005, Apio *et al.* 2006a, b). Due to its common appearance throughout Africa and its secretive and crepuscular life style the bushbuck represents possibly the most ignored and misconceived ungulate species in Africa. Until recently the bushbuck was thought to be non-territorial, with a dominance hierarchy acting between males and little or no knowledge about the female social organisation. Recent studies revealed a complex social organisation with matrilineal structures amongst females and alternative mating strategies amongst males (Wronski 2005; Wronski and Apio 2006; Wronski and Plath 2006; Wronski *et al.* 2006a, b, c, d, e, 2007; Apio *et al.* 2007). Regarding its ecological plasticity, its behaviour and its life history traits, the bushbuck resembles the European roe deer, which as an anthropophilous species benefits (or at least does not suffer) from human activities.

Based on phenotypic differences in fur-colouration and patterning, early taxonomists hypothesised that two bushbuck species, *T. scriptus* (harnessed antelope) and *T. sylvaticus* (bushbuck) exist (Lydekker 1893; Sclatter and Thomas 1900; Matschie 1912).

The strongest contrast in colouration on the extremities and a harnessed colour pattern was found in *T. scriptus* males, while a weaker contrast and non or faded harnessed pattern was described for *T. sylvaticus* males. Thomas (1891, 1902) however, suggested a subspecies status for *T. sylvaticus*, rendering this taxon one amongst many other subspecies described for *T. scriptus*. In total 42 subspecies were described by various authors across the African continent (Rode, 1943; Halthenorth & Trense, 1956; Grubb, 1985). A recent analysis of genetic diversity using mt-DNA sequences (cytochrome b and control region) revealed an unprecedented example of 23



phylogenetically distinct groups ('ecotypes'), the distribution of which was found to correlate strongly with pan-African eco-regions as described by Olsen *et al.* (2001), suggesting that ecological heterogeneity on the African mainland acted as a driving force for local adaptation within both the '*scriptus*' and the '*sylvaticus*' lineage (Moodley & Bruford, 2007). Moreover, 19 'ecotypes' corresponded with previously suggested subspecies, while six others haplotypes were newly recognized forms in the upper and lower Volta region, in Niger, Angola and the Luangwa and Zambesi Valleys (Figure 1).

The high genetic diversity within both lineages (west-central '*scriptus*' and south-eastern '*sylvaticus*') found by Moodley and Bruford (2007) as compared to other tragelaphines suggests that bushbuck may actually comprise two distinct species. An analyses of Moodley *et al.* (2008) recovered well-supported clades for both the *scriptus*- and the *sylvaticus*-lineage confirming the non-monophyly of *Tragelaphus scriptus*. More importantly, however, the two bushbuck lineages did not form a monophyletic group, but were rather placed at different positions on the cytochrome *b*-tree. The *sylvaticus*-lineage always formed a clade with *T. spekei* and *T. euryceros*. Due to the lack of resolution at the base of the tree, the position of the *scriptus*-lineage within a tragelaphine context differed in the different analyses. *Scriptus* was either the sister group of *T. angasi* in the maximum likelihood analyses, unresolved in the Bayesian analyses, and sister to all other tragelaphines in the most parsimonious analysis. If these results are corroborated by an analysis of nuclear markers, then one should resurrect the species status of both bushbuck species using the names *Tragelaphus scriptus* and *T. sylvaticus*. However, although such species delineation is not recommendable based on mt-DNA data only, the results indicate that propositions of early taxonomists were right, in that actually two 'bushbuck' species may have evolved, the bushbuck or Imbabala and the harnessed antelope or kéwel.

In the light of these findings, the impact on conservation science is considerable since at least two evolutionary significant units are existent in Africa and by understanding the genetic similarity of bushbuck populations inhabiting different habitats conservation managers can potentially trace which ecoregions are most similar and establish which are the most unique in evolutionary history. The conservation of habitat or ecoregion biodiversity is one of the greatest challenges in Africa. Using the bushbuck will allow conservationists in Africa to focus their efforts on the most biodiverse and more unique habitats which harbour the most genetically distinct populations. The bushbuck therefore provides a model framework for the incorporation of genetic and biogeographic information into a more a widely applicable model for pan-African conservation and, potentially, for the conservation of other global regions.

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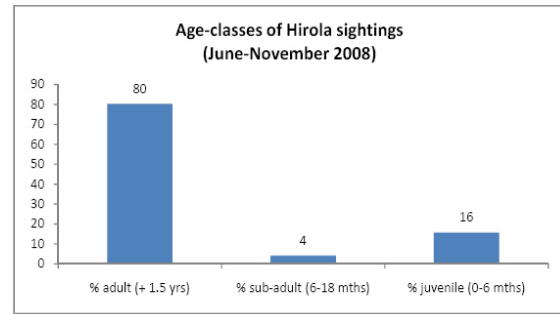
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Preliminary results on the population demography of Hirola in Ishaqbini Conservancy: June-November 2008, J. King, Northern Rangelands Trust

The following information is based on data collected by conservancy scouts during routine patrols in Ishaqbini Conservancy, including age and sex of Hirola sighted. Scouts were trained to age and sex Hirola based on physical features including horn shape and size, body shape and other characteristics. This is preliminary data based on the first 6 months of data collection by scouts and therefore their experience in ageing and sexing individuals is likely to improve over time. This is reflected in the high number (and proportion) of animals whose sex was not determined. The average group size observed was 11 individuals (+/- 7.9 Std. Dev), this is slightly higher than the average group size reported by Muchai *et al.* (2007)¹. Following a review of the Hirola monitoring by scouts in December 2008 it was found that daily monitoring of age and sex structure of Hirola during routine patrols is too time consuming for the scouts. It was therefore agreed that two scouts will be dedicated to Hirola monitoring 2-3 days per week. These 'Hirola scouts' will ensure consistency between data collected and enable them to identify and gather long-term data on distinctive individuals in the population. Data collected by the Hirola scouts will be analysed separately after a 6-month period (December 2008 – May 2009).

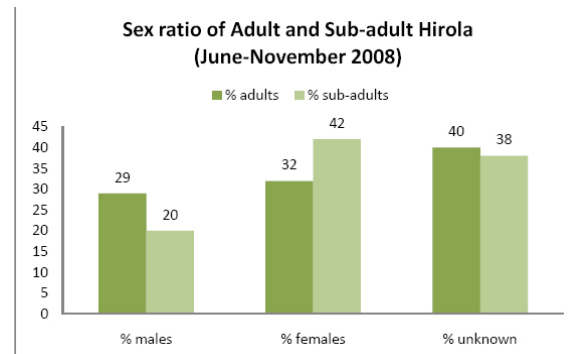
Age Structure

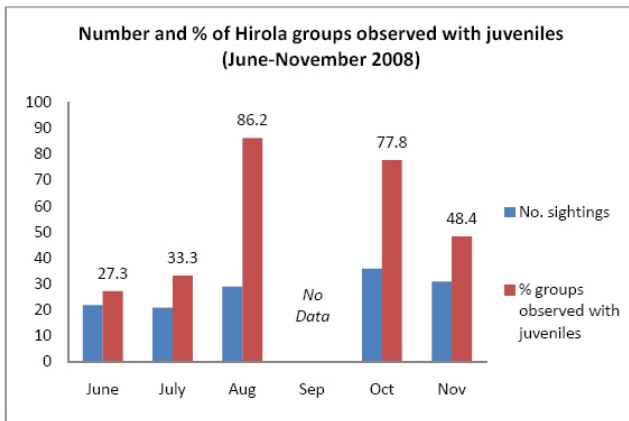


Majority of all Hirola observed were adults (80%), with only 4% of Hirola observed being sub-adults (approximately 6 months to 18 months or 2 years), and 16% of all Hirola observed were juveniles (approximately 0-6 months). However, these results should be treated with caution as scouts had limited experience in ageing Hirola. The much higher proportion of juveniles to sub-adults suggests that there may be a decline in recruitment of juveniles into the population. With further monitoring this should be investigated to examine what factors are affecting juvenile recruitment. Approximately 40% of all adults or sub-adults observed did not have their sex identified. This is due to a combination of time constraints and limited knowledge of some scouts in ageing and sexing individuals. However, of the remaining 60% of adults & sub-adults that were sexed, the ratio was 1:1.1 adult males to females, whereas the ratio of sub-adults that were sexed was 1:2.2 males:females. Again this data should be treated with caution due to the high proportion of both sub-adults and adults that were not sexed, but the skewed sex ratio of sub-adults should be monitored.

Breeding Season

Preliminary data suggests a peak in breeding during August-October (unfortunately no data is available for September). Both the number and the proportion of groups observed with juveniles (approximately 0-6 month age-class) was much higher in August and October (more than 75% of all groups observed had juveniles) than the preceding two months. This dropped to just under 50% of groups observed with juveniles in November. The increase in sightings of juveniles from August is similar to the breeding peak reported by Andanje in Tsavo hirola (Andanje 1998²). The decline in observations of juveniles in November could be explained in part by the experience of scouts in ageing Hirola (e.g., calves over 3 months old have small horns and may have been incorrectly classified as sub-adults by scouts), or may suggest that there is high mortality among young calves (again this is similar to Andanje's observations of Hirola in Tsavo).





Next Steps

Following the selection of conservancy scouts who will be dedicated to *Hirola* monitoring, further training on ageing and sexing of *Hirola* will be carried out with these scouts. This will ensure better accuracy in data collected for long-term monitoring of population demography. More training and emphasis on identifying different individual *Hirola* will also be carried out to enable us to collect data on known individuals, their associated herd structure and juvenile survival rates. Patrols for the *Hirola* scouts will be designed to cover areas predominated by *Hirola* within the conservancy on two consecutive days each week. This sampling procedure will be similar to a recetranssect method that will provide more systematic data collection on *Hirola* groups within the conservancy.

Preliminary analysis of the data collected by conservancy scouts has potentially identified specific aspects of population that warrant further monitoring and investigation:

- Low recruitment of juveniles to sub-adults
- High mortality of young juveniles
- Skewed sex ratio of sub-adults

Further training with conservancy scouts will enable us to determine whether reliable data on associations and habitat preference by *Hirola* can be gathered by the *Hirola* scouts. There was insufficient data collected during this 6-month period on these aspects. NRT will carry out further training on ageing, sexing and individual identification of *Hirola* with the *Hirola* scouts in March 2009.

¹ Muchai, M., Yego, R., Kamau, F., Njeri, T., Njoroge, P., Githiru, M. & Giani, A. (2007) *The Distribution, Abundance and Habitat Use of the Hunter's Antelope (Hirola) Beatrix hunteri*; Sclater, 1889, in Ishaqbini Community Wildlife Conservancy and Arawale National Reserve, Kenya. Unpublished Report. National Museums of Kenya & Terra Nuova.

² Andanje, S.A. 1998a (July). Factors Limiting the Abundance and Distribution of the *Hirola* (*Beatrix hunteri*) In situ and Ex-situ Populations in Kenya. Unpublished report. Kenya Wildlife Service Biodiversity Conservation Unit and Zoological Society of London.



Grazers on the plains: challenges and prospects for large herbivores in Central Asia, by David P. Mallon¹ and Zhigang Jiang², *Journal of Applied Ecology*, 2006, Vol. 46

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Summary

1. Twelve species of large herbivores dwell on the steppes of Central Asia and the Qinghai-Tibet Plateau. Three of these species once occurred in vast herds in the three major rangeland ecosystems of the region. Populations of all species are now diminished, some reduced to a point close to extinction, mainly due to overharvesting and habitat loss.

2. The rate and effectiveness of hunting increased steadily throughout the second half of the twentieth century. Major social and economic changes that occurred across the region during the last 20 years have further accelerated the declining trend.

3. Synthesis and applications. Conservation of these species over the long-term presents a challenge, especially across the spatial scale required for the migratory and nomadic species. Immediate efforts are urgently needed while substantial numbers remain and extensive tracts of habitat are still intact.

The vast rangelands that cover the steppes, deserts and plateaux of Central Asia and Tibet harbour 12 species of large herbivores (Table 1), not including five caprins that occur in the high mountains that fringe and intersect the area. They include the ancestors of several domestic animals and three migratory or nomadic species, each one integral to, and emblematic of, the three major rangeland ecosystems in this region. These are: Mongolian gazelle on the Daurian steppes of eastern Mongolia, China (Inner Mongolia) and Russia; chiru on the Qinghai-Tibet Plateau, and saiga antelope in Central Asia, extending west to the pre-Caspian steppes on the southeastern edge of Europe.

Numbers and ranges of all species have declined, some severely. Nonetheless, eastern Mongolia remains one of the very few places outside east and southern Africa where herds containing many thousands of antelopes can still be seen (Olson *et al.* 2009). At the other

end of the scale, wild camel (Hare 2008) and Przewalski's gazelle (Jiang *et al.* 2000; IUCN SSC Antelope Specialist Group 2008) survive as tiny remnant populations in small fractions of their former ranges. Przewalski's horse became extinct in the wild around 1969 and free-ranging animals are currently restricted to three reintroduced populations in Mongolia (Boyd *et al.* 2008).

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Age-Specific Changes in Reproductive Effort and Terminal Investment in Female Nile Lechwe,

by Fred B. Bercovitch¹, Caroline Pitt Loomis^{1,3}, and Randy G. Rieches², *Journal of Mammalogy*, Volume #90, Issue #1

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Abstract

Reproductive effort should negatively correlate with reproductive value, yielding a pattern of increased effort with age. According to

the terminal investment hypothesis, females near the end of their reproductive life span should devote more resources to reproduction than those near the start of their reproductive careers. We tested predictions of the terminal investment hypothesis by evaluating 38 years of reproductive life-history data collected from Nile lechwe (*Kobus megaceros*), an ungulate species living at San Diego Zoo's Wild Animal Park. The maximum reproductive success of Nile lechwe matched predictions of models of lifetime reproductive effort, with the relative mass of newborn calves providing an accurate indicator of the costs of reproduction. Newborn mass was significantly correlated with maternal age, and neonatal males tended to be heavier than neonatal females. Older dams were more likely to produce sons than daughters, dams that produced sons were more likely to die than were dams that produced daughters, and male calves were less likely to survive than were female calves. We conclude that young females endure a fertility cost while breeding, whereas older females encounter a survivorship cost, associated with progeny production. Our findings support the terminal investment hypothesis, and we suggest that secondary sex ratio bias among older female Nile lechwe reflects the evolution of a flexible life-history strategy promoting production of costly male calves when reproductive value is declining.

Keywords: *Kobus*, reproductive success, residual reproductive value, sex ratio adjustment, sexual selection, ungulates





Pedro Vaz Pinto with captured giant sable (photo by R.D. Estes)

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