Giraffa

Newsletter

Note from the Editor

Sadly this will be the last ever issue of *Giraffa* as we know it. *Giraffa* is the newsletter of the IUCN SSC ASG International Giraffe Working Group (IGWG) and after 7 years and 10 issues its time is up. It is not because of a lack of interest or readership that we'll stop with *Giraffa*, but for the simple fact that the IGWG has ceased to exist.

So after this announcement, I am delighted to let you all know that the IUCN Giraffe and Okapi Specialist Group (GOSG) was officially established in March 2013 (making IGWG obsolete)! This is very is exciting news for the conservation and management of these two iconic species. GOSG will provide an international platform on which to increase awareness, research and conservation objectives, and enables the IGWG and its okapi 'cousins' to come together under one umbrella.

While we are planning to continue a newsletter for GOSG, it is only befitting that the name of the publications is changed for future issues – to **Giraffid**. This new title is inclusive and encompasses all critters equally as both species collectively fall under collective family name Giraffidae.

However, before we depart completely, we again have another bumper issue for all: to be read around a warm winter's fire in the South, or during summer break in the North. From learning more about the conservation status of giraffe in Ethiopia and Rwanda, to the intelligence of a giraffe and an array of captive giraffe stories, there is something in it for everyone. Tall Tales continues to grow as exciting little stories and snippets come in from around the globe, while a few new and interesting papers have recently been published.

For all of those attending, or wishing they could, the Giraffe Indaba II (or is that Giraffid Indaba I ?!? ☺) will be held in Nairobi from 25-30 August – soon! Space is still available for those wanting to join so go online, book away and see you for a packed week of all things giraffid.

Enjoy this final issue, and we look forward to bringing you new and exciting news from the giraffe and okapi world under the future banner of **Giraffid**!

Julian Fennessy
Co-Chair GOSG & GCF Trustee

Volume 7(1), June 2013

Inside this issue:

Newsletter of the IUCN SSC ASG International Giraffe Working Group (IGWG) & the Giraffe Conservation Foundation (GCF)

Objectives

IGWG: to define the taxonomy of giraffe with respect to the historic classifications as seen today across the African continent blending traditional taxonomic morphometrics with molecular genetic techniques and to establish the effect of habitat fragmentation and reduction on conservation management decisions for the future success of the species.

GCF is dedicated to securing a future for all giraffe populations and (sub)species in the wild.

This newsletter was compiled and designed by Steph Fennessy. Please send any questions, comments or articles for the next issue of *Giraffa* to steph@giraffeconservation.org.

A new future: the IUCN SSC Giraffe and Okapi Specialist Group (GOSG)

Julian Fennessy, GCF & GOSG

Some very exciting news has come from the IUCN recently: the newest, and surely the tallest, IUCN Species Survival Commission (SSC) Specialist Group has been approved – the Giraffe and Okapi Specialist Group (GOSG). This is wonderful news after a lot of hard work by the Giraffe Conservation Foundation (GCF), the Zoological Society of London (ZSL) and other partners!

In collaboration with okapi specialists at ZSL, GCF established the IUCN Species Survival Commission (SSC) Giraffe and Okapi Specialist Group (GOSG) in March 2013. With the declining numbers of giraffe and okapi, GOSG will help to attract and strengthen international support for the two species and provide an official forum to support implementation of much needed conservation strategies for the species across the African continent. The two co-chairs for the group are Dr Julian Fennessy (giraffe) and Dr. Noelle Kumpel (okapi), while the Giraffe Conservation Foundation and Zoological Society of London will provide host institution support to the two branches respectively.

There remains much to do to safeguard a wild future for both these species. Although widespread and common in places, both giraffe and okapi are increasingly threatened by loss and fragmentation of their habitat, and increasing human population growth. With respect to okapi, the extension of towns and militia groups, large areas of the Congo Basin forests have been degraded by extraction of timber or fuel wood or converted to agriculture, resulting in a discontinuous and patchy distribution for the species.

The vulnerability of the okapi was emphasised recently when in June 2012 the reserve headquarter of the Okapi Faunal Reserve (RFO) was attacked by armed poachers, killing six people (including two rangers) and slaughtering or fatally wounding all the captive okapi kept there by the Okapi Conservation Project.

Given the paucity of data and field activities focused on giraffe and okapi, there is a great and urgent need for (a) improved and up to date information on each species' distribution, abundance, population connectivity and threats across their range, (b) a more cohesive strategy for conservation of each species, and (c) enhanced awareness of and support for conservation of both species and their respective habitat.

All invited members of GOSG have been contacted and the establishment of a formal membership is well underway. With the formation of this new specialist group, the IUCN SSC ASG International Giraffe Working Group (IGWG) has ceased to exist.

To find out more about GOSG and other IUCN SSC Specialist Groups go to www.iucn.org or contact Noelle Kumpel or Julian Fennessy directly at the details below.

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IUCN SSC Species Survival Commission GOSG GIRAFFE & OKAPI SPECIALIST GROUP

Status of giraffe in Ethiopia – the case of Mago National Park and Tama Wildlife Reserve

Tilaye Wube, Addis Ababa University

Background

The status of giraffe in Ethiopia both past and present has been summarised by Marais *et al*. (2012)[1]. According to this summary, two subspecies of giraffe occur in Ethiopia. The Nubian giraffe (*Giraffa camelopardalis camelopardalis*) inhabits the western and southwestern parts and the reticulated giraffe (*G. c. reticulata*) occurs in the southern lowlands east of the Omo River including the Mago National Park, Borana and Ogaden areas. It was also indicated that the giraffe population in Omo National Park could be Rothschild's giraffe (*G. c. rothschildi*) based on morphological distinctions. However, this remains to be verified until after proper taxonomic evaluations are conducted.

The summary indicates a sharp decline in population size of the known giraffe populations within a span of three decades. In 1971, the nation-wide giraffe population was estimated between 1,000 and 2,000 individuals. Also the combined population for adjacent wildlife areas, Omo and Mago National Parks and Tama Reserve, was estimated between 800 and 1,600 individuals in 1978. This number was drastically reduced to 200 individuals or 20-30% of the original population within a matter of 16 years. In 1999, the population in Mago was reported to have disappeared, while 160 individuals remained in Omo and Tama.

Due to lack of comprehensive and well organised studies, the current status of Ethiopian giraffe is not clearly known. However, it was indicated in the summary report that giraffe may still occur in Mago based on unpublished information as opposed to the 1999 report, which stated their complete disappearance. An aerial survey in 2006 suggested the presence of at least 20 individuals in Omo.

The summary concludes on the presence of less than 150 Nubian, 20 Rothschild's (this pending verification of the Omo and Tama populations as Rothschild's) and 100 reticulated giraffe distributed in the Gambella National Park (Nubian), Omo National Park and Tama Reserve (Rothschild's), Mago National Park, Borana and Ogaden Regions (reticulated).

Trip to Mago National Park and Tama Reserve

The writer conducted a trip to the Mago National Park and Tama Reserve in order to survey the status of giraffe between December 31 2012 and January 5 2013. The Mago National Park is located 32km from the nearby town of Jinka accessed through a gravel road. The major part of the 2162km^2 park area lies on a plain topography (520m a.s.l. at the park headquarters). The intact natural vegetation is a mix of open grassland and bush land. Along its western border, the park is bisected by the Neri River, which also joins the Mago River southwards before they join the Omo River that eventually flows to Lake Turkana.

Group picture with park staff (standing second from left is Motuma, then Tilaye and Cokaya).

At the park headquarters, I have interviewed the warden, Motuma Sharo, about the situation of giraffe. He told me that in his three years stay at the park, he has never seen any giraffe or their signs and he believes that they do not exist in the park. Cokaya is also a member of the management staff of the park who has been serving since the establishment of the park in 1978. According to him, there were plenty of giraffe in the early days with large herd sizes. Their number decreased steadily and he also agrees that giraffe are not sighted in the park anymore. Both Motuma and Cokaya told me that the main cause of destruction of the giraffe is the relentless hunting by particularly members of the Hammer tribe who inhabit the adjacent areas along the eastern boundary of the park. The men of this tribe have access to automatic rifles. The main driving force for the killing of giraffe is their tail, which is used to make strings used in production of highly prized traditional necklaces. The men will have better chance of getting wives if they wear such necklaces and present them as gift to would-be wives. Giraffe are also killed for their meat. Other large herbivores like elephant and buffalo occur in the park. Elephant dung, which was few days old was sighted on the main drive way that leads

[1] Marais A, Fennessy S and Fennessy J. 2012. *Country profile: a rapid assessment of the giraffe conservation status in Ethiopia*. Giraffe Conservation Foundation, Windhoek, Namibia.

to the park headquarters. According to the two park staff, elephant and buffalo are also persistently hunted for meat and ivory. The killing is not limited to large herbivores only. A wide range of species are also hunted including some of the large carnivores. At the headquarters, I was able to see a display of animal body parts including skins, horns, as well as elephant ivory and a skull confiscated from local poachers.

Remains of wildlife killed by local poachers.

The protection scheme of the park is very weak if not non-existent. Currently, the park is under the administrative responsibility of the South Nations Nationalities and Peoples Regional Government. According to the management staff, the park is given minimum attention with minimal provision of the required manpower, equipment and financial resources. Apparently, it is only a matter of time before the other large mammals are also decimated unless the current condition is improved with immediate effect.

I asked about the situation in the Tama Reserve and received an encouraging reply. Giraffe still exist in the reserve. The Tama Reserve, located some 35km south of the park headquarters, is also an expansive wilderness characterised by a mix of typical savannah woodland and grassland. It is bisected by the Elma River, which supports a riparian vegetation along its banks. The reserve is located adjacent to scattered villages of another pastoralist tribal community, the Mursi. Like the Hammer, the Mursi also have access to automatic rifles and kill giraffe for similar reasons. However, the Mursi are described as less aggressive hunters than the Hammer so that hunting pressure is relatively relaxed in the reserve, according to the park managers.

Accompanied by two park scouts, I headed to the Tama Reserve with some hope to spot giraffe. Visual survey from a pickup truck was conducted for two consecutive days along a 10km drive. However, we were able to see only a herd of three to four individuals of zebra at a distance of some 100m away from the track. We also conducted a ground survey on foot on a perpendicular line covering about 3km to the bank of the Elma River. A young crocodile in the shallow waters of the partly drying Elma River was the only wildlife observed. Even though we were not able to locate the giraffe in the reserve, their presence is not doubted. Several members of the neighbouring Mursi tribe we have interviewed told us that giraffe certainly occur in the reserve and they come across them frequently.

Conclusion

- It is safe to conclude that giraffe no longer exist in the Mago National Park.
- It is highly probable that some individuals still occur in the Tama Reserve, however, their status is unclear.
- The conservation and protection scheme in both Mago Park and Tama Reserve is weak if not non-existent. It appears only a matter of time before the remaining giraffe in Tama Reserve will be completely decimated. Even though the Mursi are described as less aggressive hunters, this could be doubtful. One of the scouts is a member of this tribe and he confided about killing two giraffe before his recruitment at his current job.

Future Research and Conservation Action

- First-hand concrete data needs to be obtained on the exact status of the remaining giraffe in Tama Reserve and elsewhere (Omo, Gambella, Borana and Ogaden). Visual surveys from a vehicle or on foot may not be the best method to locate giraffe since they are distributed on wide expanses of wilderness. Instead, aerial survey and / or camera trapping might be more successful.
- Once the existing populations are located, their ecology (feeding, movement, distribution pattern, reproductive behaviour) should be studied.
- Genetic analysis needs to be conducted to determine the taxonomic identity of all populations in order to confirm whether they are Rothschild's, reticulated or Nubian giraffe.
- Awareness raising and advocacy campaigns involving government bodies and local people should to be organised and implemented to stop killing of giraffe.
- Plans need to be worked out for relocation of critically endangered populations, for example those in Tama Reserve, to other well protected wildlife areas with similar climatic and vegetation zones like the Awash National Park.

I would like to thank GCF for the small grant provided to facilitate this project.

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Giraffe Conservation Status Report – Country Profile: Rwanda

Andri Marais, Stephanie Fennessy & Julian Fennessy, Giraffe Conservation Foundation

Sub-region: East Africa

General statistics
Size of country: 26,338 km²

Size of protected areas / percentage protected area coverage: 9%

(Sub)species
Masai giraffe (*Giraffa camelopardalis tippelskirchi*)

Conservation Status
IUCN Red List (IUCN 2012):
Giraffa camelopardalis (as a species) – least concern
G. c. tippelskirchi – not assessed separately

In Rwanda:
Giraffe is listed by the Rwanda Environment Management Authority as a protected species that may consequently not be hunted. Rwanda's draft Wildlife Act is currently under revision at parliament level.

Issues/threats
Rwanda is one of the smallest but most densely populated countries in Africa (over 10 million inhabitants account for a population density of 230/km2) and one of the poorest countries in the world (Nsabimama 2010, Blanc *et al.* 2007). Growing population pressure, limited land resources, and a decade of war, has resulted in movement and resettlement of human populations in and adjacent to protected areas (Blanc *et al.* 2007; Kanyamibwa 1998). In 1994, following the Rwandan Civil War, returning refugees from Uganda and Tanzania saw an opportunity to resettle in Rwanda. Together with their livestock they occupied much of the Akagera National Park and surrounding land in the north east of the country (Van De Weghe 1990). With grazing and water readily available adjacent to and inside the park, human-wildlife conflict increased e.g. human injuries from wildlife, crop-raiding, illegal killing and illegal grazing (Van De Weghe 1990).

Akagera Management Company, a partnership between African Parks and the Rwanda Development Board, has been responsible for the management of Akagera National Park since early 2010 and since then there have not been any recorded incidents of illegally killed giraffe, or carcasses found (S. Hall pers. comm.).

However, giraffe have been sighted with snares and other injuries, and as such illegal hunting is still considered a potential serious threat (S. Hall pers. comm.).

An aerial survey undertaken in 2002 indicated a 50-80% decline in wildlife in the area of the former Akagera National Park (Lamprey 2002). The decline was most marked in the degazetted area and has mainly been attributed to human activities (Lamprey 2002). As giraffe frequently roam outside the park into the degazetted area, this could suggest a possible negative impact on current and future giraffe populations. At the time of writing, a boundary fence is under construction, which would limit the movement of animals out of the park boundaries in future.

Estimate population abundance and trends
Historic
Giraffe do not naturally occur in Rwanda (East 1999). Historic records indicate significant populations of wildlife, although never giraffe (Van De Weghe 1990).

Recent
The first extra-limital introduction of giraffe into Rwanda occurred in 1986 (East 1999; Van De Weghe 1990). The Government of Kenya donated two male and four female Masai giraffe, which were subsequently introduced into the southern part of Akagera National Park in 1986 (East 1999; Van De Weghe 1990). Until then, the species had never been recorded in Rwanda, despite the eastern savannas of Rwanda bordering with Tanzania in an area where giraffe were once abundant (Van De Weghe 1990). Regardless of their alien status, the giraffe flourished and the first offspring was born in 1988, after which the population grew exponentially (Van De Weghe 1990) to approximately 20 by 1994 (East 1999).

An aerial survey of the Akagera National Park was conducted in 2002 and estimated the total giraffe population at 101 individuals (Lamprey 2002). However, 80% of the giraffe were surveyed outside the current park boundaries, in the degazetted area, possibly suggesting that this is their preferred habitat.

Current
The most recent aerial survey of the park was undertaken in 2010 in which no giraffe were recorded in the sample transects, making population estimates difficult. Only one group of 15 giraffe was observed outside the survey transect and hence could not be included (S. Hall pers. comm.).

During informal ground counts along the two main roads in Akagera National Park (south to north) park officials have recorded 23, 31 and 38 individuals respectively in 2012. However, based on incidental observations, the Akagera National Park giraffe population is currently estimated at just over 100 individuals (S. Hall pers. comm.; www.african-parks.org).

N.B. An aerial survey is planned for the end of 2012 and it is hoped that this will give a more precise estimate of current giraffe numbers.

Future Conservation Management

The following are proposed conservation management options for giraffe in Rwanda:

- As giraffe are an extralimital introduction to Rwanda, it is important that any future introductions (although this in itself should be reviewed in light of its biodiversity conservation for giraffe) should only be the same (sub)species as previously introduced – *G. c. tippelskirchi*;
- Development of National Giraffe Strategy for Rwanda; and
- Support to dedicated giraffe conservation, habitat protection, education and awareness initiatives (government, NGO and academic).

Acknowledgements

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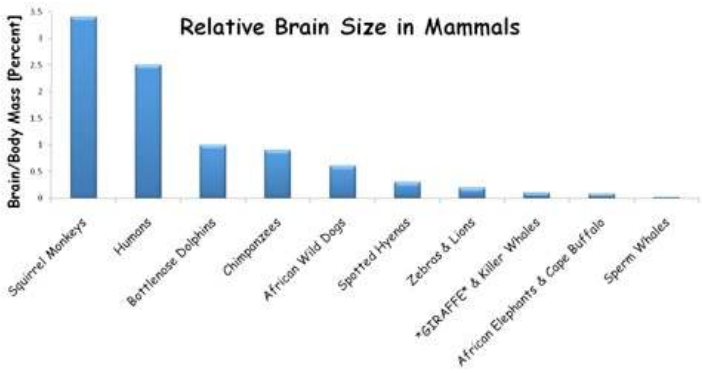
How smart are giraffes?

Fred Bercovitch, Primate Research Institute and Wildlife Research Center, Kyoto University

Nobody has a clue. But giraffes might be smarter than people think. Consider the case of African elephants. Their intricate fission-fusion social system and strong affiliative bonds, especially between cows and calves, has often been attributed to their advanced cognitive abilities to recognise and remember individuals over time, which is partly dependent upon their relatively large brain size. Now, consider the case of giraffes. Their relatively loose social associations and apparent weak affiliative relationships among individuals is often linked to a low intelligence and small relative brain size. But recent evidence has revealed that giraffe society is more similar to African elephants than previously thought, and their relative brain sizes are comparable (see figure below).



Whether relative brain size accurately reflects intelligence is debatable, but it has been used as a proxy for cognitive ability, despite the warning message of nearly 150 years ago. Charles Darwin, in The Descent of Man and Selection in Relation to Sex, wrote (1871, p. 436) "…no one supposes that the intellect of any two animals or of any two men can be accurately gauged by the cubic contents of their skulls. It is certain that there may be extraordinary mental activity with an extremely small absolute mass of neuron matter… Under this point of view the brain of an ant is one of the most marvellous atoms of matter in the world, perhaps more than the brain of a man." Mammalian brains are metabolic engines that require a substantial amount of resources to run. Their mass has to somehow be related to body size and diet, but the evolution of an enlarged brain might reflect additional factors. Building upon the basic brain blueprint, two key ideas have been proposed to account for the emergence of advanced cognitive processes coupled to large brains.

The foraging brain hypothesis suggests that animals with a varied diet have evolved acute navigational systems and mental mapping networks that enable them to find and feast on limited resources scattered about their home ranges. Natural selection has favoured individuals with the ability to find high quality resources that are distributed in a non-random fashion by using their stored memories and keen brainpower. The social brain hypothesis suggests that animals with varied social relationships have evolved acute social network mapping abilities that enable them to navigate complex relationships within a group. Natural selection has favoured individuals with the ability to adjudicate associations involving affiliation and agonism as a means of augmenting reproductive success. Whether variance in relative brain size across species is best explained by the foraging or social hypothesis is subject to debate, but we can place recent research on giraffe into both perspectives.

In terms of the foraging brain hypothesis, giraffe are not really spending all of their time nibbling on acacia leaves in the African savannah. Their diet differs across ecological areas, but they forage on over 100 items. Male giraffe in both Luangwa Valley, Zambia, and Nairobi National Park, Kenya, have home ranges covering about 80 km^2, and one bull in the Namib desert, Namibia, wandered over nearly 2,000 km^2 over a two-year period. Giraffe could be simply wandering randomly over large areas, but they could also be moving specifically towards certain resources. My hunch is that they develop a mental map of resource distribution over time, and given a diverse diet, then their brainpower must be substantial enough to register and act on the information. In terms of the social brain hypothesis, the flexibility and fluidity of giraffe herds has recently been revealed to reflect kinship, with cows and calves maintaining ties into the adulthood of the daughters. Giraffe could be simply wandering randomly over areas overlapping or adjacent to others that they sometimes join up with, but they could also be establishing herds based upon the characteristics of their neighbours. My hunch is that they develop a social map of individuals living nearby, and given a diverse society, then their brainpower must be substantial enough to register and act on the information.

All of the species shown in the figure above live in complex social systems, but vary in the type and level of complexity. Squirrel monkeys reside in multi-male/ multi-female social systems often characterised by sexual segregation, African wild dogs live in kin-based cooperative breeding units, and African elephants have a modular, matrilineal society. The species also vary in type and level of complexity of diet. Chimpanzees use loud food calls to attract their neighbours to pockets of ripe fruit trees and somehow sperm whales manage to converge on squid in the middle of the vast ocean. From

sperm whales to squirrel monkeys, relative brain size demonstrates substantial variation.

So how smart are giraffes? We don't have a clue. We simply do not know. What we do know is that the more we study giraffe, the more we learn that their foraging and social strategies are complex. If African elephants, chimpanzees, and sperm whales are reasoned to have advanced intellectual capabilities enabling them to modify social structure based on individual social relationships, and to navigate a habitat that covers a wide range while subsisting on difficult to find food, then I would simply suggest that giraffe are no different. They are probably smarter than we think. I doubt that any giraffe would be able to show that they can count using a touch-screen computer panel, as does Ai, my chimpanzee colleague, but studies of giraffe cognitive ability would certainly be useful.

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PhD summary: REM-sleep as indicator for stress in Giraffe (*Giraffa camelopardalis*)

Florian Sicks, Tierpark Berlin

Measuring the well-being of an animal in a scientific way is still an unsolved challenge. In order to objectively assess the well-being of animals, 'stress' is often used as a key indicator.

In general, the stress response of an organism comprises four systems: behavioural, neuroendocrine, vegetative nervous and immune system responses. The parameter best established to measure stress in zoo animals is the analysis of cortisol metabolite concentration in animal faeces. Since the "stress hormone" cortisol is not secreted after every stress event, other parameters of stress response, e.g. behaviour, should also be considered for an exact assessment of stress. Chronoethology follows this approach, detecting changes in the time pattern in the behaviour of an animal as a response to changes in the environment or an endogenous factor. In this regard, sleep behaviour could take on a prominent position in the future, as it is affected by all four abovementioned stress response systems. Furthermore, medical sleeping research has found that the length of REM sleep (rapid eye movement) is particularly prone to be affected by stress. Nevertheless, sleeping behaviour has not yet been widely used as an indicator for stress for zoo and wild animals. The aim of this project was to investigate the applicability of REM sleep for measuring stress in zoo animals in order to objectively assess their well-being. Giraffe (*Giraffa camelopardalis*) was chosen as a model species for this non-invasive research approach due to their unique sleeping position during REM sleep and their sensitivity to environmental changes.

The sleeping behaviour of 17 giraffe of different ages and sex was analysed during 9,675 night observation hours (645 nights). To detect stress-induced changes in the REM sleep pattern, the giraffe were first observed under "standard conditions" to obtain reference values. As a next step different stress situations, e.g. malnutrition, transport, changes in herd structure, birth on cows and different unique stress events, were examined as to their effect on the giraffe's REM sleep pattern and compared to the reference values. To validate the method using sleep observation as an indicator of stress, a well-established stress parameter for ruminants was adapted and used: the measurement of cortisol metabolite concentration in faeces with enzymimmunoassay. This method had never before been used with giraffe.

Under standard conditions, giraffe spent an average of 27 minutes per night in REM sleep. The time spent in REM sleep per night depends highly on the age of the animal. While juvenile giraffe showed an average of 63 minutes of REM sleep per night, older giraffe spent only 4.5 minutes per night in the REM sleep position. After a stress event, the REM sleep pattern of the animals changed: all four transported giraffe showed no REM sleep or strongly shortened REM sleep periods during the first nights after relocation. This correlated with an increase in the cortisol metabolite concentration in the faeces of all giraffe. Changes in herd structure also triggered significant changes in the REM sleep pattern in most cases. The death of a bull caused the strongest change in sleeping behaviour observed within this study: his female companion did not take on the REM sleep position for a period of 21 days, however, the cortisol metabolite concentration in her faeces did not increase after the death of the bull. The observed giraffe cows spent less time in REM sleep after the birth of their respective calves. However, new-born giraffe, which had suffered from lack of food and died within a few days, spent significantly more time in the REM sleep position than healthy calves at the same age.

An increased REM sleep duration, as observed with a new-born giraffe that died within a few days, might help so conserve energy in times of food shortage. Less time spent in REM sleep, as observed in response to most other stress events, might indicate raised awareness to avoid predation.

In summary, all observed stress events influenced the duration of REM, but not necessarily the cortisol metabolite concentration. REM sleep periods changed gradually and varied depending on the respective stressor allowing conclusions with regards to the intensity of the stressors. A high sensitivity of REM sleep as a parameter for stress is favoured by its bi-directional changeability.

In conclusion, REM sleep is well suited as a parameter to measure stress in giraffe. The analysis of REM sleep patterns might help to objectively assess the effect of stressors that were subjectively classified as intense or low stress on the well being of an animal. In addition, the continuous monitoring of REM sleep patterns can be used as an early indicator for disturbances in the well-being of animals, such as malnutrition, injury or illness, and thus allows for prompt intervention.

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Giraffe nutrition and body condition workshop at Marwell Wildlife, Hampshire, UK

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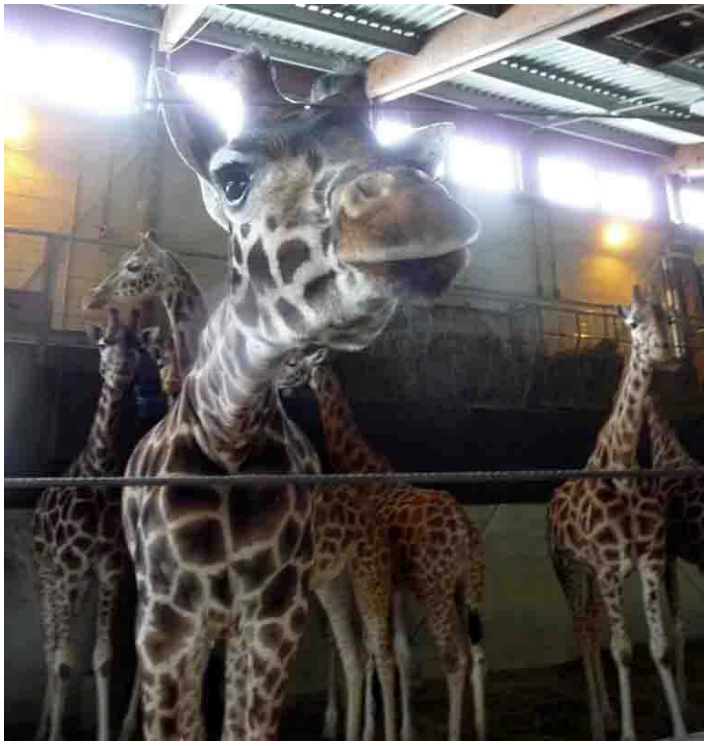
In spite of being kept consistently in captivity in the UK for well over 170 years, giraffe can still pose numerous problems to those managing them in a zoo. Correct dietary formulation, adequate consumption of offered food, and attainment of comparable longevity to free-living wild individuals can all pose headaches. Collaboration, conversation, education and research involving all those stakeholders in the giraffe world are needed if these problems are to one day be a think of the past. In light of this, in January 2013 a workshop, discussion tour and series of presentations for zoo keepers, zoo managers, researchers and students was held at Marwell Wildlife, Hampshire, UK on the subject of ungulate nutrition, with a specific focus on giraffe as a "problematic" species to keep and feed. Here, this paper presents an overview of the giraffe-centred information that was included in this event to bring together what is currently known about the problems associated with feeding giraffe in the zoo and how to spot the signs of potential poor health. This is by no means an exhaustive account, but simply a summary of important interlinking points between diet, climate, body condition and health.

Giraffe are highly evolved browsers adapted for low-starch, low-sugar, complex fibre diets that stimulate rumination and maintain a healthy gut environment for fibre assimilation. Numerous maladies can become apparent when the health of the giraffe's gut is compromised by captive feeding regimes. The evolutionary biology of the giraffe also means it is poorly-equipped to cope with the climate in temperate areas of the world. A giraffe's morphology is designed to lose heat and cool it under the equatorial sun; with limited body fat, giraffe do not have large stores of energy that can be relied upon to maintain demand if their diet is poor. Hence apparently healthy animals can lose condition and appear "off colour" in a very short time frame should environmental and husbandry variables continually affect their ability to maintain homeostatic equilibrium. A peculiarity of internal complications arising, in part from poor diet present as giraffe continuing to consume offered food yet losing weight and condition. Consequently it is important that those managing captive giraffe have a good "eye" for what giraffe body condition should be (relative to the specific individual animals in their herd) and note when changes to overall condition are seen.

Giraffe keepers should pay particular attention to a giraffe's neck, flanks and pelvic area, and photograph or document any apparent changes in coverage of these areas or fat deposition to enable comparison between times and dates. Colour, texture and general appearance of a giraffe's pelage is also a reliable indicator of internal health and how well the animal is "using" the food it is being offered. Patchy, thinning and discoloured coat pattern can be a sign of an underlying nutritional problem that may need further attention. It is important to note that elevated protein levels for browsing ungulates (giraffe included) are erroneous, and that too much protein in the diet is not a way of warding-off so called "peracute mortality syndrome" (sudden death conditions) that can afflict giraffe swiftly and with disastrous consequences. Excellent reviews of why high protein content is unnecessary can be found in the 2008 and 2011 editions of the comprehensive text "Zoo and Wild Animal Medicine".



Finally, hoof health (correct growth and wear) will also give an indication of gut health and quality of the diet offered (as digested by the giraffe). Giraffe are obviously tall, bony animals and it in their nature to appear slim; however, we can familiarise ourselves with specific areas of the body that should appear well-padded in wild animals and use this as a baseline for assessing condition of those individuals held in captivity.

Several scientific papers state that the fleshy appearances of the necks of wild giraffe are not always noted in captivity, and it is this loss of fat storage that can be especially apparent to those caring for giraffe in the zoo. A

wider, fleshy base to the neck is an important sign of a healthy individual. Delegates attending the event were shown the herd of giraffe held at Marwell Wildlife and had the opportunity to try their hand at scoring the body condition of the adult giraffe using Kearney & Ball's scale (available in the 2006 EAZA husbandry guidelines) that provides description of an animal's condition from one (emaciated) to eight (obese). Assessing "whole" body condition as well as focussing on neck shape and degree of "fleshiness", pelvic protrusion and hoof shape can give an overall picture of the condition of that giraffe at that time. It is important to note that physiological changes can alter the condition of giraffe at different times of the year, and that as a subjective measure, it is always best to have several people able to score condition so a consensus can be reached for each animal in the zoo. Marwell's giraffe were not the best for illustrating the range of scores possible, as they all were all in excellent health!

Keepers should note that concentrate rations can alter the internal structure of the giraffe's gastrointestinal tract and limit the absorptive surface area of the rumen, hence provision of weighed amounts of concentrate (ideally fed per animal) alongside of ad libitum structural fibre helps to maintain integrity of gut villi. There is the potential for giraffe fed ad libitum access to concentrates to gorge on pelleted rations in place of consuming forage. This rapid fermentation may lead to acidosis within the rumen and laminitic changes to hoof structure, both with potentially debilitating future consequences.

The rumen of a giraffe is relatively small and weak considering the animal's body size and is designed to allow the passage of leaf matter that does not stratify (form a mat) within. Feeding browse is the most biologically-relevant feeding strategy for captive giraffe yet the least practical and logistically possible; see Hatt *et al*. (2005) for an explanation of amounts needed to feed an entire herd browse-only. The feeding of grass hay can hence block the rumen and restrict the passage of ingesta to lower parts of the gastrointestinal tract. This reduces the giraffe's ability to maintain metabolic and energetic demand leading to a loss of fat stores and potential loss of life. Similarly, when captive giraffe are consuming grass hay with high silica content abnormal tooth wear can affect how the animal chews its forage, hence adding to its problems of adequately digesting such "compromise" forage rations fed in the zoo. It is important that legume-based (e.g. lucerne, clover, alfalfa) forages are fed to specialised browsers as, whilst still a compromise between behavioural ecology and zoo practically, they are kinder on teeth and do not stratify within the gut.

It is also useful to observe the behaviour of the individuals within a herd to note the development of any oral stereotypic disturbances that may provide a clue to both the quality of physical as well as psychological health. Acidic changes to a giraffe's rumen may cause excess licking, salivation and oral movements as the individual attempts to cope with the changed environment of its gastrointestinal tract. Likewise, giraffe without enough lucerne or browse to consume on may also demonstrate oral disturbances in an attempt to fill their time budgets, which are not being occupied by foraging and feeding behaviour. Browse as "enrichment" extends foraging time, increases salivary flow and can help buffer the environment within the rumen, to the giraffe's benefit. Increased performance of routine, stereotypic activity may further reduce body condition and hence can be especially detrimental to individual giraffe already suffering due to dietary inadequacies.

To summarise, alterations to diets including i) the weighing of concentrate rations given individually as a proportion of body weight, ii) the use of high-quality legume forage opposed to grass hay, iii) provision of as much quality browse as is logistically possible throughout the year, and heat/protection from cold weather in inclement periods of the year can help reverse a loss of condition and prevent further complications. Both current EAZA and AZA husbandry guidelines provide excellent descriptions of suitable forage sources to maintain good health as well as heating requirements and housing styles for giraffe kept in temperate areas of the world (both documents are free to download). Warmth, good quality legume forage (with ad libitum access), plenty of browse (as many months of the year as is possible to collect) and provision of individual-specific amounts of low-starch concentrate pellets are the golden rules for keeping giraffe in good body condition throughout their lives.

For more information on giraffe nutrition, physiology and pathology please see AZA (2004), Clauss *et al.* (2006), EAZA (2006), Hummel *et al*. (2006), Rose *et al*. (2006), Hatt *et al.* (2005), Potter and Clauss (2005), and Hofmann and Matern (1988). Likewise, excellent chapters exist in the three most current editions of the "Zoo and Wild Animal Medicine" series on giraffe management, ungulate nutrition and developments to the way in which captive giraffe should be fed (Fowler and Miller, 2008, Fowler and Miller, 2003, Miller and Fowler, 2011).

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Standing tall for Rothschild's giraffe (*Giraffa camelopardalis rothschildi*) – Conservation breeding of Rothschild's giraffe over the last nine years at Woburn Safari Park (2003-2012)

Lindsay Banks, Woburn Safari Park

Introduction

The Rothschild's giraffe (*Giraffa camelopardalis rothschildi*) has been classified by the IUCN as endangered and it is estimated that there are fewer than 650 individuals (IUCN 2012) left in East Africa. The current trend for this subspecies is in decline and presently only a few isolated populations exist, confined to managed conservation areas in Uganda and Kenya. It is believed that there is no natural gene flow between the Kenyan and Ugandan populations and as a result, it is understood to be one of the rarest giraffe in East Africa. Recent research suggests that the Rothschild's giraffe is genetically distinct from other giraffe and thus potentially could be a separate species. This genetic distinction, coupled with isolated populations in decline, makes this giraffe a significant priority for conservation.

Breeding in the wild

Female giraffe become sexually mature from the age of three to four years and in captivity have calved at the age of four. Males are sexually mature at the age of three and a half but are not usually mature enough to compete with adult bulls until the age of seven. Females can breed up to the age of twenty years (EAZA Giraffe Husbandry Guidelines 2006). The giraffe has a gestation period of 14-14 ½ months and females come into oestrus for one day every two weeks. It is not uncommon for females to become pregnant two, three and seven months after parturition (Dagg and Foster 1982, EAZA Giraffe Husbandry Guidelines 2006). Females have a potential to produce offspring every seventeen months and giraffe do not exhibit a set breeding season and thus breed perennially.

Wild giraffe are described as socially gregarious and tolerant animals, which often form loose herds consisting of males and females, as well as calves and juveniles. It has been documented that in the wild, females will calve alone, or in the presence of other herd members. In

Kruger National Park, a female was observed calving in the presence of nine other females, who not only observed the calving process but also nuzzled and showed a keen interest once the calf was born. Therefore, it was felt critical that any management strategy implemented should reflect conditions in the wild to maximise reproductive potential and to create stable herd structures.

Breeding at Woburn – A new era focused on social groupings and choice

A new breeding management strategy is born

In captivity this species is closely managed as part of an EEP breeding programme with approximately 410 giraffe held in 83 participating institutions (data current as of July 2012: ISIS 2012). In 2003, Woburn managed a small herd of 1.2 plus a hybrid female. Historically, Woburn had a poor record for calf survival, with females often separated and shut away from the herd pre and post parturition. The result was poor calf survival with many females becoming stressed and anxious during separation. Often calves were abandoned or injured.

In 2003, it was decided that a new management strategy for this species was necessary, with the following aims:

- To make a significant and marked contribution to the conservation of the endangered Rothschild's giraffe.
- To identify and address the poor historic record of calving at Woburn.
- To identify whether a lack of support and presence of experienced conspecifics during parturition could be attributable to calving problems.
- To adopt significant changes in husbandry and management to improve breeding rates of Rothschild's giraffe.
- To develop a management strategy that is conducive to animal welfare and captive breeding.

It was felt that any new management strategy should optimise, as much as possible, the natural social and environmental conditions for the giraffe. The focus therefore, was on two key areas: individual choice and natural social groupings. It was felt that by providing an individual with choice, just as it would have in the wild, potential stress and anxiety could be reduced. At all times the herd is managed as a single social unit with adults, juveniles and calves living together. Pregnant females remain within the herd at all times. The only separation that occurs is with the adult male, which is separated overnight in the winter months. All of the giraffe are allowed to make their own individual choice about where and how they want to calve.

The giraffe enclosure incorporates three key areas: the house, the yard and the paddock. The giraffe are left to make their own decisions as to whether they would prefer to calve in the house, the paddock, or all three. At all times, individuals have access to the rest of the herd and are free to choose whether they calve in the presence of conspecifics or alone. By providing choice stress is reduced, the individual is free to make its own decision and is not restricted.

Calving is a social event for all herd members

Females often choose to remain with the herd and are relaxed and calm throughout parturition. On all occasions, females choose to be around other females, particularly close siblings or mothers. Similar to some observations in the wild, other females often surround and take an active interest during parturition. Minutes after birth the females nuzzle the calf and the male has been observed encouraging the calf to stand with its feet, as well as

protectively standing over the calf. The females do not seem fazed by the male's behaviour and often choose to spend time with the male pre and post parturition. The process of parturition appears to be a major social event within the herd with all herd members, even calves and juveniles, taking an active interest. No aggressive behaviour has been observed by any individuals during parturition.

The resulting offspring have almost become habituated to the process of parturition and the presence of calves. Parturition has become a normal and familiar event to all herd members. Calves produced at Woburn exhibit maternal instincts and behaviour comparable to wild females, protecting calves with vigour and determination. Equally, these individuals are relaxed and unfazed by parturition, which could be attributable to experiencing and observing many other births from an early age. It is evident that the presence and support of experienced conspecifics is critical.

New management strategy is a success – a baby boom at Woburn

As a result of this new giraffe management strategy, Woburn has had a marked and significant improvement in its breeding success. The herd has increased from four in 2003 to over fifteen individuals in 2012, with three more calves expected at the end of 2013. In nine years the herd size has nearly quadrupled. Over twenty-one calves have been produced of which seventeen have survived. Of the four calves that died, all were due to circumstances beyond the control of staff and included heart and stomach defects. Five individuals bred at Woburn have been moved to other zoos for breeding. Further moves are planned for 2013. The breeding male has been exchanged to ensure genetic diversity. The two original breeding females have produced ten calves between them. Their offspring have gone on to produce eight calves. One of these calves was born at another institution when the female left Woburn in calf.

It is evident that by providing giraffe with choice, space and an ability to be with the herd pre and post parturition, significant breeding success has been achieved. As a result of changes in husbandry and management, calving has become a social event, with all herd members taking an active interest and role. Parturition is a calm and relaxed experience for the females and all herd members are given the opportunity to learn from conspecifics as well as seek support from conspecifics during parturition. The result has been the production of calves, which exhibit characteristics and behaviours comparable to wild giraffe. Females appear more comfortable with parturition and raising calves. The second-generation offspring are excellent mothers, exhibiting characteristics of wild giraffe in their vigour and determination when protecting the calf. The females appear to have extremely strong maternal instincts and are extremely attentive and protective mothers.

It is apparent that the support of experienced conspecifics has been vital, with females often choosing to calve alongside their mothers or close siblings. It is possible that, in the past a lack of, or opportunity to be around, conspecifics, could have been a contributing factor to historical calving problems.

It is important to note that this is a specific account of a management success at Woburn. It does not dictate how giraffe should be managed, but does offer an insight into how different husbandry techniques have been successfully employed.

Acknowledgments:
I would like to acknowledge Jake Veasey for initiating this new strategy, all the staff who continue to follow it and to Keith Harris for his continued support.

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All photos from Lindsay Banks and Jason Lee Charles Hurst

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Happy tongues

Friederike von Houwald, Zoo Basel

The Husbandry and Management Guidelines for Giraffes (EAZA Giraffe EEPs 2006; EAZA Husbandry and Management Guidelines for *Giraffa camelopardalis*; Burgers' Zoo, Arnhem), describe that giraffe (and the same is applicable for okapi) develop quite often behavioural disturbances in zoos. In general, it is stated in the Guidelines that two forms can be distinguished: the true stereotypic behaviour such as pacing, head shaking, etc. and the oral disturbances, such as tongue playing, vacuum chewing and object licking.

This short paper describes how giraffe and okapi at Zoo Basel, Switzerland are animated to keep their tongues busy in order to avoid the development of oral stereotypic behaviour.

As outlined in the Husbandry Guidelines, oral stereotypic behaviour mainly occurs in species that seem to have a need for a certain amount of tongue movement. This is obvious when observing the feeding behaviour of giraffe in the wild. A very long tongue is the 'result' of an evolutionary development, meant to reach out for leaves and branches, which are otherwise difficult to obtain.

Looking at how food is presented in zoos, one can often observe that animals are not using their tongue, but take the food with the mouth. Apart from the fact that food is plenty and that zoo animals do not really have to search for food, this way of feeding leads to a 'full-feeling' very fast. The animal therefore stops feeding, starts digesting and often becomes restless, especially its tongue, which had 'nothing to do' while eating and oral stereotypic behaviour can result from this.

At Basel Zoo an attempt was made to reduce oral stereotypic behaviour in giraffe and okapi. For this purpose several wooden feeding devices in various sizes and holes were created. Food such as Lucerne, leaves, legumes were given and the time was measured how long animals spent feeding and how often long oral stereotypic behaviour such as licking was observed. The outcome of the study showed that the amount of oral stereotypic behaviour was clearly reduced by offering these feeding devices, but was still prevalent. A new device was created, which made it more difficult for the animals to reach the food: a clear plastic ball, with different holes (4-5cm). This ball was hung up in different locations and heights. In addition to this, the wooden devices were multiplied and added to the inside as well as outside furniture.

Furthermore, branches were hung up high and all hay racks were modified so that the animals had to use their tongue to reach for the food.

Every attempt was made to give the animals as many choices as possible to search for food and to make them walk from one device to the next as this also reflects their normal behaviour.

The only items that were still fed from a normal trough were pellets and beet pulp. It showed that a lot of pellets were lying on the floor when offered in the devices and it was difficult to assess whether or not each individual

received the right amount and a lot of food was wasted. All other food was given throughout the whole day in various devices.

Our experience has shown that a large variety of feeding devices as well as offering food at many different spots inside and outside does activate the animal not only to move but also to use its tongue much more so that there is no 'motivation' for the tongue to be active apart from feeding and grooming. The devices are easy to make, reusable and long-lasting.

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Giraffe Training Program in Bellewaerde Park, Belgium

Maslov Nadimir, Bellewaerde Park

In most zoos today, behavioural husbandry has become a crucial concern when achieving quality animal care in captive wildlife populations. In this sense, behavioural husbandry is now an essential component next to the daily routine operations related to nutrition, sanitation and veterinary care (Roberts 2009; *Giraffa* Vol. 3, Issue 2). By means of conditioning and training, animals can cooperate in the improvement of their health and in their health care by allowing manipulation (injection, examination, etc.).

The animal care management team in Bellewaerde Park has developed a behavioural husbandry programme for its collection. During the last five months a pregnant Rothschild's giraffe (*Giraffa camelopardalis rothschildi*) was trained into a crush. The purpose was to train the animal in case difficulties would arise while giving birth. The crush was also used to take an echography, measure temperature and to control (manipulate) of the animal. In order to achieve this, a new infrastructure needed to be built in the stable.

The approach in the training programme can be described as 'learning' (Dewsbury 1978). Learning can be broadly defined as a change in behaviour resulting from practice or experience. Mellen and Ellis (1996) defined that when a practice or experience is dictated by humans, the process is called training. The training practices are based on an 'operant conditioning process' with positive reinforcement techniques. 'Operant conditioning' conditions voluntary response. This means that the animal voluntarily chooses to cooperate for a small food reward. In this sense, it is a tool to enhance animal health care and welfare, to improve husbandry and veterinary care.

Goals range from the manipulation to facilitate the collection of blood, urine and other samples as well as dental examination, echography, ultrasound, and other veterinary procedures.

1. Can giraffes be trained inside the area of a crush?
2. Is training more versatile and multi-functional than may have been perceived initially (a useful tool for improving animal health care and husbandry needs)?
3. Can training (and research) enrich the every day life of captive giraffes?

Procedure:
Positive reinforcement was used to train one female giraffe into a crush, in order to achieve voluntarily response and cooperation. The experimental/training area is a corridor/crush with two gliding doors for the animals that connect the areas in the stables with the outdoor enclosures. Also, the corridor/crush has three service doors for the animal keepers to manipulate the

infrastructure, the animals, and organise the training and examination sessions.

After five months of intensive (daily) training, the giraffe voluntarily accepted to enter directly in the management area (crush) and doors could be closed off manually in a secure way both for the animal as for its keepers and trainers. The duration of stay in the crush was gradually increased. During these periods the giraffe was nearly immobilised, and physical contact was made with the animal (skin, ventro-lateral areas, genital and anal area) in order to facilitate specific manipulation in case of a difficult birth or in order to regularly control body temperature. To achieve this, standard procedures were established for the animal keepers.

Mainly pellets were used in the training, eventually also complemented with fresh food items (apples and carrots). The animal was approached with patience and always backing up (trainer) until the giraffe would be comfortable enough to proceed to the next step or phase in the training programme.

Results:

During two periods of evaluation (May 1 to June 15 2012 and December 5 2012 to January 14 2013) faecal material was collected and progesterone concentrations were assessed. Progesterone levels in faecal material were sent for analysis to the Chester Zoo Laboratory to ensure standardised and comparable results.

Results indicated that the giraffe's progesterone levels also increased following the first set of results, however from mid December concentrations decreased significantly to almost those observed in non-pregnant individuals.

During training it was possible to confirm pregnancy and foetal movements could be perceived by means of a simple physical examination in the abdominal area, until today (June 2013). The (alarming) decrease of progesterone levels in December may have been due to stress at the beginning of the winter period when the animals are kept inside their facilities during larger part of the day, and possibly additional stress associated with the beginning of the training.

1. Three echographies were carried out, without the use of tranquilizers and in the absence of anaesthesia that can jeopardize the animal's health or life.
2. On a daily basis, simple procedures were made possible such as taking body temperature, physical examination of the mammary glands, aspects of general health condition, and eventually plan an intervention in case of a difficult birth or allowing X-rays.
3. It is believed that through positive reinforcement the individual will retain the effects and learning from training for a longer period throughout its life, therefore facilitating new procedures in the future.
4. It provides animal with mental stimulation and husbandry. It helps animals to cooperate in giving medical care.

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Tall Tales

A grieving mother

Dr Paula Kahumbu, Executive Director of WildlifeDirect, sent us the following observation from Nairobi National Park, Kenya:

"I witnessed a giraffe mother apparently grieve over her newborn calf, which was killed by a lion. Someone alerted me to the injured calf with its mother very near my house. I rushed out to see but the calf had died from the wounds and lay dead on the middle of the road. I couldn't get near as the mother was standing guard over her calf. It took her hours to leave the baby. It is the second time that I've seen giraffe showing such intense emotion – the other time was when we moved some giraffe from Haller Park – the male not only tried to protect the females, he stood with them and rubbed necks gently with the hooded female. He then proceeded to chase the trailer for several kilometres as she was taken away."

Close encounter at the Giraffe Centre in Nairobi

Giraffe enthusiast Carol Field recalls her very special encounter with a giraffe: "Just over 80 years ago, the Nairobi Giraffe Centre was built and in 1979 the Manor's owners founded AFEW (African Fund for Endangered Wildlife). Through AFAW, some endangered Rothschild's giraffe were brought to live in the Manor grounds, and the Giraffe Centre has been their sanctuary and home ever since. The Centre is a fabulous place for those like myself who adore giraffe, especially as you are allowed to climb a raised platform take stunning close-up photographs and feed giraffe by hand.

My husband and I scaled the feeding tower and bought a small bucket of pellets for the giraffe. From the tall tower we were of equal height (the giraffe & us, not my husband and I). It was magnificent. Whilst I fed a young giraffe it's massive black tongue knocked some of the pellets out of my hand onto the feeding platform floor. I didn't want to waste any, so I bent my head down to retrieve the food and the giraffe had the same idea. Our heads knocked together and there was an almighty crack – I was momentarily knocked out. When I came around, the giraffe was bent over towards me, as if to check I was OK [or more probably to see if there was more food in the bucket]. It allowed me to stroke its face and neck. A truly amazing experience with a truly amazing creature. I didn't believe it was possible, but I am more addicted to giraffe now than ever. Keep up the good work."

Tanzania giraffe become new target for wild meat hunters

The giraffe is increasingly becoming a new target for wild meat hunters in the northern part of Tanzania and local authorities warn that if the trend left unchecked, the innocent animals will soon be wiped out.

Longido district is one of the highly affected areas in the northern safari capital of Arusha with the increasing wave of giraffe poaching. "Giraffe poaching is very new in this area, which is very close to Lake Natron Game Controlled Area. We used to see poachers targeting large mammals like rhinos and elephants, but now it is not the case," said James Ole Millya, District Commissioner for Longido, which also borders Kenya.

He further stated that of late, there has been a growing trend of poaching giraffe, the Tanzania's national symbol. "Despite the fact that it is illegal to for anyone to kill a giraffe since it is sanctified as a national symbol, but the

situation is getting out of hand," the DC told Xinhua on Thursday. "It is so astonishing to see an increasing wave of people who are engaging in killing these innocent animals. I don't know what these people want from giraffe," he said, adding that Longido district is facing serious poaching and most poachers are targeting giraffe and other wildlife. "As government, we'll not keep silent; we will continue to fight against this new war. This is a serious war ... giraffe is an important natural resource that we'll not allow to go away with greedy people," he said.

He added that Tanzania's government wound fight against the perpetuators as giraffe need to stay for the future generation. "The district council through Natural Resources unit and anti- poaching unit, is working on the matter and so far several people linked to poaching are in custody and very soon will be taken to court," he said.

Some people in the area say giraffe is becoming a target to poachers because it has a lot of meat on their bones compared to other herbivores in the wilderness. "It is easy to hunt giraffe than other animals ... and this has been contributed by its politeness," one of the Gelailumbwa villagers said.

In recent years, roasted wild meat is becoming a popular business to some people in Arusha and neighbouring regions, making anti-poaching campaign a quagmire. Though the wild meat business is carried-out secretly, there are areas, which are popular for the illegal business including Majengo, Ngaramtoni and Kisongo suburbs of the northern safari capital of Arusha.

According to the census conducted by the Tanzania Wildlife Research Institute (Tawiri), in 2002 in Selous Game Reserve 2, there were 6,712 giraffes, but the number decreased sharply, with the 2006 census indicating that there were only 3,163 giraffes left. Of relief, however, is the fact that a 2006 census in Serengeti established that there were 5,246 giraffes while the number went up to 12,078 in 2010. It also estimated in 2007, a total of 210 giraffes were killed in West Kilimanjaro, and local game rangers say that on average, 20 giraffes are killed every month. It means a lot has to be done if the country is to save this unique animal.

This article was reprinted from http://www.coastweek.com/3613-news-tanzania-giraffe-poaching-target.htm

I wrote the bible on giraffes – now I realise facts were wrong

Science is based largely on observable concrete facts. When I work with students at the University of Waterloo, I explain enthusiastically that credit must always be given in their essays to those men and women who have discovered some earlier truth about the subject they are writing about. Science progresses from one generation to the next by research carried out "on the shoulders of giants," I pronounce. Students may wonder what shoulders have to do with anything, but they remain silent. Yet recently, while writing a second scientific book on the giraffe (itself a giant), I noticed that this adage is not necessarily true at all.

The first such book was written in 1976 – by me and Bristol Foster, a classmate in biology from the University of Toronto. It was the bible of giraffe information for a while, and it sold so well that I was asked to update it in 1982. These books were stuffed with facts, but now, to my horror, I realize that some of them were wrong!

For our first book, much of the content was supplied by our own research. I had been the first to study giraffes in Africa, from 1956 to 1957, while Bristol had been the second, in the 1960s. With no budget, I had documented obvious features such as the time of day for various activities (feeding, ruminating, sparring, resting, mating) and filmed the gaits of giraffes, which would become part of my PhD thesis.

Bristol, who worked from the University of Nairobi, had financial backing. In one 20-month study, he drove through Nairobi National Park each week, noting all the giraffes he encountered. He photographed each animal from the left side so that he could recognize individually the 241 giraffes that visited the park during that time. His analysis of which animals were present on any given day, which was taken as reflecting possible friendships, found that females were almost always in groups, unlike the loner males, but that the members of these groups changed each week. Apparently, available food trumped friendships: Females congregated near tasty forage trees, but that did not make them good buddies. In our book, we noted that giraffes had little social interest in each other. Subsequent scientists could not build upon this information because it was wrong. It did reflect what we saw in Nairobi National Park in the 1960s, but not how giraffes in general see each other.

In recent years, more long-term studies by other researchers have shown that female giraffes do have buddies with whom they may hang out for six years or more. We now know that giraffes, like elephants and rhinoceroses, may communicate with each other by sounds too low for us to hear. They may seem to be scattered indifferently over a large area, but they are probably communicating by infrasounds. Giraffes inhabiting a large area are familiar with each other, but spend their days in smaller groups that often change their composition. Like people. Some anatomy was also wrong in our 1976 book. Oh, no!

Giraffes have excited biologists because of their unusual shape. The brain is far above the heart, so how do they manage blood-pressure issues, the scientists wondered. Knowing that the heart must be very strong, researchers weighed the heart of a young giraffe, then managed to make a mistake in calculation, reporting that the weight was 2.5 per cent of total body weight. This number was far too high. The truth is, giraffe hearts are similar in size to those of other mammals (about 0.52 per cent of body mass), but their thick walls make them extraordinarily powerful.

Other research giants provided incorrect information about giraffe youngsters. Calves are seldom seen being born in the wild, but giraffe births in zoos are major events. It is well documented that these mothers can behave badly. Some refuse to suckle their young, others step on and injure them. Others kick them. Even in the field, newborn giraffes have been seen all alone, no mother in sight, and the inference has been made that she abandoned them. Giraffe mothers had a bad rap. This was most unfair. We now know that a few months after giving birth, a female may again be pregnant. Her body provides milk for her youngster even as it is organizing the gestation of her next infant. And if her newborn calf dies, she may be distraught, circling the small corpse, sniffing it, standing guard for days, long after her female colleagues have wandered off. Giraffes are actually exceptional mothers – few women would want to emulate their productivity.

Maybe I shouldn't push the "shoulders of giants" scenario so enthusiastically at my students.All scientists must be aware of what has been accomplished earlier in their field, and usually they can build on these findings. But sometimes they have to correct them instead.

Anne Dagg, University of Waterloo. This article was reprinted from http://www.theglobeandmail.com/life/facts-and-arguments/sometimes-research-giants-make-big-mistakes/article12474057/

Births are neck and neck

Talk about a rare pair – twin reticulated giraffes born at Natural Bridge Wildlife Ranch earlier this month are only the second reported set of living twins ever born in the United States, according to Laurie Bingaman Lackey, giraffe studbook keeper for the Association of Zoos and Aquariums. Weighing 95 pounds and standing 41/2 feet tall, Wasswa, a female, was born first on May 10. Her brother, Nakato, weighing 125 pounds and standing 51/2 feet tall, followed soon after. At only a few weeks old, both are miniature versions of their stately mother, but with gangly legs and knobby knees they'll eventually grow into.

The giraffes, the 19th and 20th born at the 400-acre ranch in New Braunfels, reportedly are doing well. Because of concerns that the mother would not be able to produce enough milk for both, Nakato is being hand-reared to ensure he receives adequate nutrition. Their mother, Carol, was born at the ranch in 2005. This is the third time she has given birth.

According to spokeswoman and animal specialist Tiffany Soechting, the twin births were "quite shocking" for everyone at the ranch — including several very lucky visitors who were on hand to watch the births. Gamekeepers knew Carol was pregnant, but they didn't do a sonogram, as might happen at some zoos, which would have revealed she was having twins. "We prefer to let things progress more naturally, and a sonogram can be stressful, especially now that we know she was carrying twins," Soechting said.

When Wasswa was born, dropping to the ground from her mother who was standing upright (as giraffes do), they rushed to make sure she was OK. "She was smaller than an average baby giraffe, so we were a little concerned," Soechting said. "Then we looked up, and were surprised to see two more feet coming out of Carol."

After some discussion, and although Carol initially was attentive to both calves, they decided to move Nakato to a separate enclosure so she could give most of her attention to the smaller Wasswa. Several days later they tried returning him to his mother, but she became aggressive. "She kicked at him and tried to push him away," Soechting said. "It's a natural reaction because she's protecting Wasswa. So we put him back in the separate enclosure."

Mother and son still share a fence, and when Nakato comes close, she'll bend down and give him a quick lick or two — which is how mother giraffes groom, bond and stimulate their offspring. Soechting uses a cartoonishly large baby bottle to feed Nakato a special infant wildlife formula. The young calf drinks three 64-ounce bottles a day.

The names are African in origin, with Wasswa meaning first born male twin, Nakato meaning second born female twin. Yes, the genders are switched, but Soechting said she wanted the names to comply with Spanish-language grammar rules — where “female” words end in -a, and “male” words end in -o.

Natural Bridge Wildlife Ranch is currently home to eight giraffes, including the twins' 10-year-old father, Marshall. “Some animals twin happily, such as sheep and goats,” said Lackey from AZA. “But giraffe twins are extremely rare. There's just (only) so much room in the mother's uterus for a pair of placentas to attach.”

This article was reprinted from http://www.mysanantonio.com/news/article/Rare-twin-giraffes-born-4554515.php#photo-4696994

Easier to import giraffes under new EU rules

New EU rules agreed Tuesday make it easier to import elephants, giraffes, rhinos and all other such non-domestic hoofed animals. The rules approved by the Standing Committee for the Food Chain and Animal Health (SCOFCAH) will simplify "the safe import of these animals and reduce the risk of illegal imports", a European Union statement said. "The animals covered by the new rules are not intended to enter the food chain but only for public display, education, conservation of the species and other scientific purposes," it added. Up until now the importation conditions for non-domestic ungulates -- animals with hoofs -- were extremely stringent, hindering the import of animals which are often of endangered species and sought for conservation programmes.

This article was reprinted from http://www.france24.com/en/20130507-easier-import-giraffes-under-new-eu-rules

Stressed giraffes don't get enough sleep

A giraffe's sleeping patterns will tell you whether or not she feels content. If she's just been transported from one zoo to another, for instance, or has just lost a mate, she'll skip over an essential phase of sleep.

No giraffe that roams the African savannahs sleeps for eight hours a day, and certainly not at a stretch. Where lions lurk, giraffes snooze a maximum of four-and-a-half hours spread over the course of a day. "They sleep during their breaks from feeding," says Florian Sicks, a biologist and curator for mammals at Tierpark Berlin zoo. Half an hour of that is rapid eye movement (REM) sleep, a phase in which humans - and presumably animals - have vivid dreams. The brain is as active as it is in a waking state, the eyes move back and forth under closed lids, but muscles are relaxed, with the exception of occasional twitches.

Parameters of stress

However, a giraffe sleeps as long as is usual for the species only when it feels at ease, Sicks discovered during research for his doctorate. "If a giraffe feels stressed, REM sleep is reduced to an absolute minimum." A transport from one zoo to another is extremely stressful for the animals. "Some giraffes almost completely dropped REM sleep for six days," the biologist says. It takes two to three weeks to restore their sleeping patterns.

Researchers normally look at the level of the stress hormone cortisone in an animal's blood to see just how stressed an animal may be. But Florian Sicks demonstrated that cortisone in the blood does not always adequately reflect stress levels: with some of the giraffes he examined, the cortisone concentration actually dropped, even though it was evident the animals were stressed and did not feel comfortable. "The length of REM sleep is a much more reliable measure of stress," Sicks says.

Curled up

For his doctorate, Sicks conducted research on 17 giraffes in zoos across Germany. Since giraffes are quite shy, he installed infra-red cameras in their compounds to observe them from a distance. "They probably would not have lain down to sleep had I been in their stalls," Sicks says. Although giraffes do snooze while standing up, to relax entirely and enter a REM phase they not only have to lie down, they must also curl up: they pull their legs in, stretch their long necks back and lay their heads down on one of their hind legs. "That position keeps their heads from slipping to the ground when their muscles are completely relaxed during REM sleep," Sicks explained. That position also made it easy for Sicks to determine when the animals were in a REM phase while watching them through the cameras.

Death of a life mate is the worst

Being transported from one zoo to another is not the only thing that upsets giraffes. They suffer most when their herds change, and especially when their life mate dies. Two of the giraffes Sicks researched - George und Jacqueline - had lived together for 15 years at the Opel Zoo near Frankfurt. "One day George died - he was more than 20 years old, which is an advanced age for a giraffe," Sicks recalls. "Jaqueline didn't even have a second of REM sleep for three weeks after that. That's a very long time. In experiments, rats, for example, died after three to six weeks of REM sleep deprivation."

Saving giraffe babies

REM phases get longer among newborn giraffes the hungrier they get. Zookeepers at the Frankfurt Zoo discovered that the hard way. A six-day-old baby giraffe died because its mother refused to give it any milk. In the days before her death, it had noticeably long phases when it was curled up in the position for REM sleep. The zookeeps learned from that experience. When the same giraffe mother had another baby and the newborn once again slept curled up for noticeably long periods, zookeepers separated them and fed the newborn with a bottle. The mother hadn't produced any milk this time either, but as a result of the timely intervention, the second baby survived. "When a newborn giraffe sleeps a lot more in the REM phase than is usual for a newborn, it's an early warning signal for the zookeepers," Sicks explains. That kind of signal is essential because, apart from taking a lot of naps, both baby giraffes were behaving completely normally. "It was only because we were monitoring her REM sleep that we were able to save the second," says Sicks.

This article was reprinted from http://www.dw.de/stressed-giraffes-dont-get-enough-sleep/a-16719043

Terrified tourists chased by crazed giraffe on safari

The long-necked giant chased and barged the vehicle through two miles of South African savannah – just like the T-Rex in hit movie Jurassic Park.

The dramatic footage was captured by cameraman Rainer Schimpf. He said: “There was laughter, then tension, then fear. The giraffe saw the game vehicle miles away and started walking to it, intimidating the passengers. Once the guests started feeling uncomfortable, the driver took off. The giraffe followed curiously at first rather than aggressively trying to look people in the eyes. Once he caught up with the car in a gallop the giraffe kicked at the driver and knocked off the right wing-mirror of the Toyota Land Cruiser. The driver, who was unhurt, stopped and backed up. The laughter and fun was gone then and we tried to escape - but the giraffe followed in a full gallop uphill until we reached the fence.”

The 13ft, two-and-a-half tonne giraffe is believed to have had an hormonal imbalance which triggered the raging attack. It is well-known in the park for its odd behaviour but had never attacked humans before. The relieved passengers – which included German tourist Silke Ptaszynski, South Africans Sarene Carter and Mavis Carter, and driver Trevor – were able to laugh about their experience back at camp.

This article was reprinted from http://www.thesun.co.uk/sol/homepage/news/4854942/terrified-tourists-chased-by-crazed-giraffe-on-safari.html

Auckland Zoo's giraffe move a tall order

A 480kg female giraffe has started a five day journey across the Tasman, as part of the Australasian breeding programme. Fifteen-month-old Nakuru is to be paired with a potential mate at her new home in Melbourne Zoo. After an unsuccessful initial attempt, she is now safely enclosed in an open-top crate, which will be delivered to the Ports of Auckland through rush hour traffic between 5:30pm and 6:30pm. Lucky motorists may catch a glimpse of Nakuru’s face peering out from the top of the crate, most likely when it is stopped at traffic lights.

Auckland Zoo's Pridelands team leader Nat Sullivan, who is part of the team who will accompany Nakuru on the sea voyage, has prepared her for the trip by vaccinating, micro-chipping and ‘crate-training’ her. Fortunately, Nakuru is a confident and interactive calf who is expected to respond well to the journey. “The only variable we can’t control is the weather…. we’re really hoping for smooth sailing to avoid a longer journey and possible sea sickness,” says Auckland Zoo spokeswoman Gina Dellabarca. She says it’s important for international zoos to work together to avoid excessive inter-breeding of animals.

Maersk Line's David Gulik says the transportation of live animals is rare and the 4.2m high cargo has presented some "unusual challenges". To make the transfer as smooth as possible, they will load the crate last and make it easy for zookeepers to regularly feed and check on her.

Nakuru will spend her first in month in quarantine before beginning her new life at Melbourne Zoo. Auckland Zoo says its giraffe head count now sits at three, however this will soon increase with Nakuru's mother pregnant again and due in July.

This article was reprinted from http://www.3news.co.nz/Auckland-Zoos-giraffe-move-a-tall-order/tabid/1160/articleID/294300/Default.aspx

Nakuru the giraffe arrives at new home

Nakuru the giraffe has finally arrived at her new home in Melbourne, after leaving Auckland more than a month ago. The 16-month-old suffered several delays on her trip to be paired with a potential mate, including a diversion for the cargo ship she was travelling on to look for a missing Russian sailor. While there were reports Nakuru suffered sea sickness, pictures from Melbourne Zoo show she's now happily walking around her new home, as well as interacting with her keeper and other giraffes.

This article was reprinted from http://www.3news.co.nz/Nakuru-the-giraffe-arrives-at-new-home/tabid/1160/articleID/298601/Default.aspx

To each Rothschild's its own name

In 2009, when Zoe Muller launched the Rothschild's Giraffe Project, she didn't quite envisage that it would become Kenya's longest running giraffe project. Now in its fourth year, Muller can count some successes with what is today the most endangered of the nine giraffe subspecies.

The Rothschild's giraffe is a subspecies with five "horns" (actually bone protrusions from the skull) instead of two. Also known as the Baringo giraffe, the Rothschild's last bastion in Kenya was in the west around Soy and neighbouring Uganda. However, after the subdivision of land in the late 1960s, it seemed that there was little hope for the survival of the Rothschild's.

This subspecies survived a dark period largely thanks to Betty Leslie-Melville; she brought a breeding herd from Soy to her backyard in Karen that is today the famous Giraffe Centre. With the success of the new herd in Nairobi, it was inevitable that at some point space would run out for the increasing numbers and it did. A few were taken to Lake Nakuru National Park while some wandered off into Nairobi National Park, where they bred with the Maasai giraffes – a matter of concern for hybridisation of a species so limited can lead to dwindling numbers of the species.

In 2007, the Soysambu Conservancy was formed around Lake Elementaita. Declared a Ramsar site in 2005, meaning a wetland of international importance, the former cattle ranch harbours a healthy population of wildlife and different habitats. With space available for more wildlife species to be brought in, it was the perfect choice for the Rothschild's giraffe. The giraffe browses on acacia. With little threat of carnivorous predators and increased security, Soysambu became the ideal choice.

Today, with 65 Rothschild's giraffes, Soysambu Conservancy harbours 10 per cent of the world's remaining population. "Kenya is the last remaining stronghold for these giraffe in the wild," states Muller. "It's classified as endangered on the IUCN Red List and there are thought to be fewer than 670 individuals left in the wild with 450 in Kenya." The Rothschild's Giraffe Project aims to research and conserve the species in the wild.

The researcher and her team, who spend long hours in the field studying their subjects and equally long hours at the computer entering data and analysing it, know their subjects by name much like the Amboseli Elephant Research Project, which is the longest study of wild elephants in the world, started in 1972 by Dr Cynthia Moss.

This article was reprinted from http://www.theeastafrican.co.ke/magazine/-/434746/1681644/-/xpyteoz/-/index.html

Namibia: Poachers On the Hunt in Etosha

Tourists to the Etosha National Park, Namibia, are now increasingly photographing limping wildlife that escaped the poacher's snares, right under the noses of game rangers and park officials. According to tourists poaching may be becoming a serious threat within the wildlife sanctuary. Earlier in January tourists photographed a severely injured zebra walking around with a wire snare around its neck and entangled in its legs. The zebra was spotted in the Namutoni area, which borders the Oshikoto Region. The incident seems to have escaped the notice of the game rangers, as well as the management of the park even though the tourists claim to have reported the incident to park officials. "There was no report of an incident this year and we do regular fence patrols," said the Director of Parks and Wildlife Management, Colgar Sikopo. He said there is "now and then such incidents, normally common along the fence on the Namutoni side". Suspicion is that people from outside the park or communities living close to the borders of the park, especially in the Namutoni area are responsible for the incidents of illegal poaching.

They cut holes in the fence of the park and place snares in the openings, which are usually well concealed and create the impression that there is a pathway for unsuspecting game. Once the animal steps through the opening, it is ensnared. "In many incidents these animals manage to disentangle themselves and move around with the wire until they are spotted," Sikopo explained. An electric fence is supposed to be erected or is in the process of being erected, to prevent the animals, especially elephants, from straying outside the park.

Yesterday, the environment ministry held a meeting with park authorities, the park's neighbours and communities living in and around the park to address the issue of illegal activities in the park. Last year a zebra and a giraffe were also found with snares dangling around their necks. According to Sikopo, when they were informed about the zebra and the giraffe, they immediately reacted by sending out veterinarians. "Normally we dart the animals when we find them before removing the snares. We treat them and many a time, these animals survive," he said. Amazingly Sikopo believes that both the zebra and the giraffe found last year with snares around their necks, survive until this day. However, he says that only because they have not found any carcasses belonging to the two animals. But who is to say poachers have not reached them before the game rangers? Sikopo says there may be thousands of animals moving about scarred with such deadly contrivances on their bodies and it is not possible to notice them unless you come very close to the animals.

This article was reprinted from http://allafrica.com/stories/201302010988.html

South Africans have accidentally been eating giraffe and kangaroo meat

Just to ensure that human beings have unknowingly consumed EVERY kind of animal who sings "Circle of Life" at the beginning of The Lion King, it looks like South Africans have inadvertently been munching on the horse's swaggier cousin, the zebra, as well as kangaroo and giraffe. Sigh. Just when we were getting över Ikea's Swedish horse meatballs and learning to trust again.

146 samples of biltong, dried meat strips that serve as a popular low-fat snack in South Africa, supposedly made of antelope meat, were tested by researchers at the University of Western Cape. Surprise! Not all made of antelope meat. All packets labelled 'beef' were found to be correct but 90 percent of biltong sticks supposedly made of kudu - a large, curly-horned antelope - were actually horse, pork, beef, giraffe or even kangaroo.

Additionally, one of the species in zebra biltong was found to be that of the endangered mountain zebra. But let's not take that "beef" label for granted! Earlier this week it was also discovered that South African hamburger and sausage products contained species of donkey and water buffalo. 'Waiter! There's a giraffe in my kudu'.

This article was reprinted from http://jezebel.com/5988002/south-africans-have-accidentally-been-eating-giraffe-and-kangaroo-meat

Kenya: Narok Police Seize 6,000 Kg of Giraffe Meat

Traffic police in Narok, Kenya, on Wednesday arrested a suspected poacher ferrying bush meat in a matatu in Narok town. Corporal David Chumo and Constable Nicholas Musango arrested the man, who had refused to stop when flagged down at the Siyaibei on the Narok-Nairobi highway. The officers found him with 6,000kg of giraffe meat believed to be from the world-famous Maasai Mara Game Reserve. Narok police boss Peterson Maelo said he believes the meat was headed for sale in Nairobi. The meat was packed in gunny bags. Maelo said bush meat dealers sell the meat cheaply to butcheries in Nairobi. He asked Narok people to buy meat from licensed butcheries.

This article was reprinted from http://allafrica.com/stories/201301251809.html

Giraffe fights and friendships revealed

As the tallest animals in the world, with gangly legs, twisting black tongues and patchwork markings, giraffes are instantly recognisable. But we still know relatively little about the behaviour of these supposedly "gentle giants". Footage recorded for a new landmark natural history series, Africa, coproduced by the BBC and Discovery, reveals a little seen brutal aspect to giraffes' lives. Male giraffes were filmed engaging in a bruising fight, literally going head to head until a single giraffe is left standing.

New research just published also shows that female giraffes form previously unrecognised close bonds with a select group of female companions. Not only do they make "friends" in this way, they avoid other females they get on with less well. Scientific studies of giraffes often focus on their iconic aspects: how fast they can travel or how high they can reach using their long legs, the strength of their necks and the colour of their coats. But in recent years, biologists have turned their attention to the relationships between animals.

Although their tall height may make them conspicuous, it takes an expert to find giraffes in the desert. The animals' home ranges extend up to 100 square miles as they seek out acacia trees in sparsely vegetated landscape.

"It took four weeks of waiting to capture about 60 seconds of fight," said Africa cameraman Martyn Colbeck, who described the sequence he filmed as "staggering".

The crew set up camp on the Hoanib River in the far north-west of Namibia with the aim of filming natural behaviour. “[Guide and driver] Paul and I knew where we should be to stand the best chance of getting the most giraffes in the best location," Mr Colbeck told BBC Nature. "We also knew that we would have to follow them all day, every day to stand a chance of getting a fight."

The filmmakers' "lucky break" came in the form of a female giraffe in oestrous: signalling her readiness to mate with any males in the vicinity. Two males arrived competing for her attention. Their rivalry soon escalated into a physical fight. "Paul and I have seen a lot of interesting animal behaviour in the remote deserts of Namibia, but neither of us had seen anything like this fight. And we are unlikely to see it ever again I suspect. Even though we were following the oestrous female and the consorting male, the fight came out of nowhere," he told BBC Nature.

The two challengers in the conflict were an older bull and a young male hoping to claim mating rights. "Suddenly the challenger came around the corner of a bend in the river and immediately challenged the dominant male in the most brutal way," said Mr Colbeck.

In a giraffe fight, males stand side-by-side, pushing and shoving to judge which is strongest. In evenly matched meetings, blows are sometimes exchanged - dealt by the giraffes' powerful, muscular necks. The horn-like structures on the stop of the giraffes heads, called ossicones, can inflict injuries but, according to experts, fights rarely get this serious.

"Normally giraffes size each other up and after a bit of stand off and a few swings the fun is over," said Dr Julian Fennessy from the Giraffe Conservation Foundation, based in the UK and Namibia. "When the battles are serious then it often ends in the subservient male skulking away. However, it can end in the death of one of them," he added. In this exchange the loser only suffered a sore head after receiving a surprising knock-out blow. Dr Fennessy told BBC Nature that such footage can help researchers understand more about this rarely witnessed behaviour. "I am never surprised as we are only starting to learning more and more about giraffe behaviour as research on these iconic species is in its infancy," he said.

This instinct for competition makes male giraffe naturally anti-social. But female giraffes do maintain close relationships with one another, according to a study published recently in the journal Animal Behaviour.

Early studies of giraffe societies suggested that groups were unstructured. But recent research has found that the animals demonstrate a dynamic common to chimpanzees, spider monkeys and spotted hyenas. Scientists identified that individuals temporarily associate, resulting in fluctuating group sizes and membership. To understand more about these short alliances, researchers observed animals in Etosha National Park, Namibia. The team, from the University of Queensland, Australia, were able to identify individuals by their unique markings. They found that females chose which members of a group they associated with and purposefully avoided others. According to the biologists, this behaviour could be the result of overlapping feeding grounds and frequent meetings between animals. Or it might be that female giraffes recognise each other from when they were young, and lived in giraffe crèches, or nursery groups, which have been widely documented in the wild, the researchers report. However, males are much more solitary beasts, choosing to wander alone as soon as they reach adulthood. If there are few mating opportunities, some studies suggest male giraffes do form "friendships" with one another. But in the main, male giraffes prefer to be lone warriors.

This article was reprinted from http://www.bbc.co.uk/nature/20694264

Mongabay award for the Okapi Conservation Project

Working for 25 years to conserve rare Okapis – forest giraffes found only in the Congo – the Okapi Conservation Project (OCP) has won this year's prestigious Mongabay award. Part of the project's work has been to assist in the protection of a 13,700 hectare wildlife reserve in the Ituri forest region. The award has offered great encouragement to the project which suffered from a brutal and fatal attack on the project's headquarters by Mai Mai rebel militia earlier in the year. Six people, including two ICCN (Congo Institute for Conservation of Nature) rangers and one of their wives, were killed in the raid which also ended in the theft of computers, medical supplies and other essential equipment.

According to John Lukas, co-founder of the project, the Mongabay award will "go a long way in motivating our great staff and donors to remain committee to the conservation of the Okapi … the region remains in turmoil

but through it all the OCP staff and the ICCN rangers have remained focused and committed to protecting the wildlife and helping the people living in the Okapi Wildlife Reserve."

This article was reprinted from http://www.coolearth.org/306/news-32/rainforest-news-155/award-for-congo-giraffe-project-1851.html

Tall order: giraffe for sale

Walter's family came from Africa and probably lived in a zoo before hanging around in Adelaide but he is looking for a new home in Tasmania. Walter is the name given by Latrobe's Grange Antiques owner Kevin Dahya to a 2.7-metre tall preserved giraffe displayed at yesterday's Tasmanian Antiques Fair. He said the 1920s bull giraffe was well-known around Latrobe for his “soft face”. Mr Dahya said Walter was probably from a zoo, as he lacked the “battle scars” of a wild animal. He rated the work of the taxidermist as 9.5 out of 10, as Walter looked authentic and alive - and that was what people wanted. Mr Dahya said the fair had enjoyed strong crowds who were staying longer. “It's great in promoting antiques and selling them in their true state. We're all custodians, we have to find these things a new home.” Mr Dahya said he often sold smaller giraffes but at $15,000 Walter might be enjoying a car ride back to Latrobe. “He's for people serious about taxidermy or decorating,” Mr Dahya said.

This article was reprinted from http://www.examiner.com.au/story/1560619/tall-order-giraffe-for-sale/

Dr ‘JP’ Suraud – Book of Remembrance

Nearly 12 months have passed since that fatal accident in August 2012, which cruelly ended the life of an unfulfilled talent, and worse robbed a wife of her husband and a little girl of a her father. This was a tragedy on so many levels and for many the pain remains acute, none more so than for JP’s wife, Hélène, and their (now) 4 year old daughter. And it is for Roxane that we make this appeal to you.

Losing anyone, even as important and influential as your father, at such an early age can only ever result in memories fading, and all too quickly. So we have decided to create a ‘book of memories’ for Roxane by which she can remember her dad, and which she can always look back on to maybe learn something new about him, to see the faces of the people he knew and worked with, and to read how he had made such an impression on them. Basically we want to help her understand and comprehend who her dad was, and realise the impact he had in his too short life.

We want it to be from the giraffe/conservation/scientific community, a place where, despite his youth, he had already become extremely respected and successful, some may even say notorious, both scientifically and also socially! I know I am not the only one who will forever remember the ‘conga’ for his (non) birthday in Namibia in 2011!

So may I ask all of you to please put down a few words, memories, impressions (professional and/or personal), send in photographs, papers, hand written, scanned or emailed, long, short, in any language you prefer. Our view at this stage is that it can be absolutely anything that you see fit, but please be aware we will not be editing it or changing typos etc., we leave it to you to provide all the content and even the style and format of your ‘input’ if you’d like. And also if you’d be clear how you’d like your own name/credentials included etc., assuming you would. We will then collate these and ‘design’ them into a ‘photo- book’, which we will print and send to Hélène and Roxane – from all of us.

I should add we are looking at other legacy ideas too, but didn’t wish to rush into something we couldn’t sustain, and so this is a first step we believe is achievable and will have lasting, personal, impact for his family.

One final thought please, in order to allow us to have this with JP’s family by the end of the year may I ask that all contributions reach us by the end of the 2013 Giraffe Indaba, that is 30 August. Sincerest thanks in anticipation.

Please forward your contribution to Andy Tutchings (GCF Chair) at *andy@giraffeconservation.org*

Recently published research

Fennessy J, Bock F, Tutchings A, Brenneman R & Janke A. 2013. Mitochondrial DNA analyses show that Zambia's South Luangwa Valley giraffe (*Giraffa camelopardalis thornicrofti*) are genetically isolated. African Journal of Ecology. Article first published online.

Thornicroft's giraffe, *Giraffa camelopardalis thornicrofti*, is a geographically isolated subspecies of giraffe found only in north-east Zambia. The population only occurs in Zambia's South Luangwa Valley, an area which interestingly places it between the current distribution of Masai (*G. c. tippelskirchi*) giraffe to the north, and the Angolan (*G. c. angolensis*) and South African (*G. c. giraffa*) giraffe in the south-west and south, respectively. Specific studies have been under- taken on the ecology of this subspecies, but their population genetics remains unknown. We studied 34 individuals from the South Luangwa National Park and adjacent Lupande Game Management Area and seven individuals from northern Botswana. The complete cytochrome b and control region sequences of the mitochondrial genome were sequenced and analysed together with database data by maximum likelihood tree reconstruction and maximum parsimony network analyses. The giraffe from Zambia's South Luangwa Valley are most closely related to the subspecies *G. c. tippelskirchi* and part of their radiation. However, they form a unique population that would benefit from increased research and conservation management.

Dadone LI, Haussler KK, Brown G, Marsden M, Gaynor J, Johnston MS & Garelle D. 2013. Successful management of acute –onset torticollis in giraffe (Giraffa camelopardalis reticulate). Journal of Zoo and Wildlife Medicine. **44**(1): 181-185.

A 2-yr-old male reticulated giraffe (*Giraffa camelopardalis reticulata*) presented with severe midcervical segmental torticollis upon arrival as an incoming shipment. Despite initial medical management, the giraffe developed marked neck sensitivity, focal muscle spasms, and decreased cervical range of motion. Using operant conditioning to assist patient positioning and tolerance to cervical manipulation, a series of manually applied chiropractic treatments were applied to the affected cervical vertebrae in an effort to restore normal cervical mobility. Laser therapy and cervical range of motion exercises were also used to reduce cervical muscle hypertonicity. The combined application of these nontraditional therapies produced marked clinical improvement. This case highlights the potential benefits of combining traditional medical management with chiropractic treatment and physical therapy techniques for management of severe acute-onset torticollis in a giraffe.

Geraads D, Reed K & Bobe R. 2013. Pliocene Giraffidae (Mammalia) from the Hadar Formation of Hadar and Ledi-Geraru, Lower Awash, Ethiopia. Journal of Vertebrate Paleontology. **33**(2): 470-481.

The Hadar giraffids belong to the genera *Giraffa* and *Sivatherium*. We recognize two species in the former genus; distinguishing between them on dental elements is straightforward, but it is more difficult on other remains. *Giraffa jumae* is about the size of the modern *G. camelopardalis*, but has a less pneumatized skull with more conical ossicones, more slender and often longer limb bones, and also differs in some dental features, making it an unlikely ancestor of the modern giraffe. *Giraffa stillei* has teeth that are always smaller than those of the modern form, less molarized premolars, ossicones smaller but otherwise similar to those of the larger Hadar species, and slender limb bones that are probably relatively long, thus not much shorter than those of the modern form. It might be the ancestor of the later *G. gracilis* from the Turkana Basin, and of *G. camelopardalis*. We assign no specimen to *Giraffa pygmaea*. *Sivatherium maurusium*, a well-known form of the African Pliocene and Pleistocene, is a rare form at Hadar. In contrast to most bovids, giraffids are more common in the Sidi Hakoma than in the overlying Denen Dora Member, perhaps as a result of grassland expansion at Hadar at that time.

Mitchell G, Roberts D, van Sittert S & Skinner JD. 2013. Growth patterns and masses of the heads and necks of male and female giraffes. Journal of Zoology. **290**(1): 49-57.

We have analyzed the growth patterns of the head and neck of 65 male and 71 female giraffes from two different populations of giraffes, and also the dimensions of 19 different components of the head and neck in 8 female and 13 male giraffes, to establish if they showed sexual dimorphism and if sexual selection for a weapon was a possible origin of the long neck of giraffes. We found that in both genders, the rate of increase in head mass was hypoallometric with respect to body mass. The rate of increase in neck length was similar in both genders and faster than the rate of increase in body mass. Increases in neck mass tend to be isometric relative to increases in body mass in both genders before puberty (c. 650 kg body mass in male and 700 kg in female giraffes), but in giraffes of greater body mass increases in neck mass are iso- to hyperallometric in both genders, with final neck, body and head mass being greater in male giraffes. The only significant gender difference we found for the dimensions of the 19 different head and neck components was that ossicones and skulls were heavier in mature male than in

mature female giraffes, but increases in skull mass did not alter the growth pattern of head mass significantly. These data suggest that the morphology and growth patterns of the heads and necks of male and female giraffes are similar, that sexual dimorphism of the head and neck is minimal and can be attributed to secretion of sex steroids. We have concluded that there is no evidence that sexual selection was a factor in the evolution of giraffe morphology and that the long neck of giraffes did not evolve as a weapon in males. The more likely selective advantage of a long neck was improvement of access to high-level browse.

Warner SE, Pickering P, Panagiotopoulou O, Pfau T, Ren L, *et al*. 2013. Size-Related Changes in Foot Impact Mechanics in Hoofed Mammals. PLoS ONE **8**(1): e54784.
Foot-ground impact is mechanically challenging for all animals, but how do large animals mitigate increased mass during foot impact? We hypothesized that impact force amplitude scales according to isometry in animals of increasing size through allometric scaling of related impact parameters. To test this, we measured limb kinetics and kinematics in 11 species of hoofed mammals ranging from 18–3157 kg body mass. We found impact force amplitude to be maintained proportional to size in hoofed mammals, but that other features of foot impact exhibit differential scaling patterns depending on the limb; forelimb parameters typically exhibit higher intercepts with lower scaling exponents than hind limb parameters. Our explorations of the size-related consequences of foot impact advance understanding of how body size influences limb morphology and function, foot design and locomotor behaviour.

Carter KD, Seddon JM, Frere CH, Carter JK & Goldizen A. 2013. Fission-fusion dynamics in wild giraffes may be driven by kinship, spatial overlap and individual social preferences. Animal Behaviour. 85(2): 385-394.
Many species exhibit fission–fusion dynamics, yet the factors that influence the frequent changes in group size and membership in these species have not been widely studied. Social ties may be influenced by kinship but animals may also form preferred associations because of social attraction or may only associate because they have similar habitat preferences. We investigated the association patterns of 535 wild giraffes, *Giraffa camelopardalis*, in Etosha National Park, Namibia using behavioural and genetic data from individually identified giraffes. We collected 726 records of group composition over a 14-month period and calculated pairwise association indices, which were tested against a null model. We found that female–female pairs, but not male–male pairs, showed both preferred and avoided relationships. We tested whether females' relationships could be explained by the degree of relatedness between pairs and whether pairs overlapped spatially. Correlations between matrices of pairwise associations, spatial overlap and relatedness showed that female–female associations were strongly correlated with amounts of spatial overlap and pairs that exhibited preferred relationships were more closely related than would be expected by chance. However, only about one-quarter of the variation in observed associations could be explained by spatial overlap and relatedness and therefore much of this variation may have been related to individual social preferences.

Perez W, Michel V, Jerbi H & Vazquez N. 2012. Anatomy of the Mouth of the Giraffe (*Giraffa camelopardalis rothschildi*). Int. J. Morphol. 30(1): 322-329.
The giraffe (*Giraffa camelopardalis*) is both the largest extant ruminant and a strict browser. We dissect and describe the macroscopic anatomy of the mouth of the giraffe. The heads of two adult giraffes and one fetus were used in this study. The lips were well developed, the upper one was predominant and dorsally flattened near the nostrils. The tongue had a lift or lingual torus and rostrally to it a groove-shaped depression or fossa linguae. There was no adipose body of cheek (Corpus adiposum buccae). The hard palate in the giraffe had 18 Rugae palatinae. The final roughness reaches the caudal border of the premolar 3. Caudal ridges had no papillae. The parotid gland was small and consisted of two lobes, one rostral and one caudal to be separated dorsally to accommodate the parotid lymph node. The parotid duct followed the same way as in the cow, ended in front of the upper premolar tooth 2 in the parotid papilla, (not evident at mucosal surface). Mandibular gland was divided into two lobes, the rostral one placed in the intermandibular space and the caudal hidden by the parotid gland. Giraffes have the monostomatic and polistomatic sublingual glands. The monostomatic sublingual gland was located rostrally and joined to the monostomatic of the other side in the very narrow rostral intermandibular space. The polistomatic sublingual gland was caudally located and reached the level of the third molar and at a deeper level than the monostomatic. The studied giraffes had dorsal, ventral and intermediate bucal salivary glands. Leaving aside the differences caused by different dimensions, the mouth of the giraffe had in general a similar anatomical arrangement to the cow.

Furuuchi K, Koyabu D, Mori K & Endo H. 2013. Physiological Cross-Sectional Area of the Masticatory Muscles in the Giraffe (*Giraffa camelopardalis*). Mammal Study **38**(1): 67-71.
No abstract available.

Giraffe Conservation Foundation

&

IUCN SSC International Giraffe Working Group

First announcement

Giraffe Indaba II

Save Our Species!

Is there a future for giraffe in Africa?

When? *Sunday 25 August – Friday 30 August 2013*

Where? *Masai Lodge, Nairobi, Kenya (bordering Nairobi National Park)*

Preliminary programme:

- Scientific and conservation presentations and posters
- Workshop sessions on key giraffe conservation and management themes
- Visit to Giraffe Centre (African Fund for Endangered Wildlife)
- Visit to Nairobi National Park
- Optional: Visit to the David Sheldrick Wildlife Trust Elephant Orphanage

For further information visit the GCF website: www.giraffeconservation.org
or contact indaba@giraffeconservation.org

GCF is dedicated to securing a future for all giraffe populations and (sub)species in the wild.