

A Productive Field Season in the Bush

As the year draws to a close, we once again returned to the Uganda bush in Murchison Falls National Park to continue our long-term demographic studies and foraging ecology research. During this time of the year, the weather has continued to nourish landscape before rescinding precipitation during the dry months of January and February. For now, however, the landscape is green and alive and the density of the giraffe population typically shifts towards the savannas of the western delta, with giraffe forming large mixed herds that sometimes exceed 100 individuals. Our main efforts during this field season were to continue to examine shifts in population size and distribution over space and time and to better understand how the landscape structure influences movement of the giraffe. During this particular field season, we were also joined by a television film crew to document some of the challenges and successes of giraffe conservation in Murchison Falls National Park. It certainly is an exciting time to be a giraffe researcher.

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Long Term Demographic Studies to Understand a Critical Giraffe Population

Earlier this month, the [IUCN Giraffe and Okapi Specialist Group released a report](#) updating the conservation status of *Giraffa camelopardalis* from 'least concern' to 'vulnerable'. This shift in conservation status highlights the remarkable recent decline of giraffe populations across Africa. The global population of wild giraffe dropped by an estimated 40% from nearly 155,000 to ~97,500 over a 30-year span with notable local extinctions in seven different countries. Although this alarming decline applies to the species as a whole, giraffe in certain regions of Africa and certain populations of giraffe are currently exhibiting positive trends in population growth or stability. Murchison Falls National Park in Uganda represents one of these recent success stories for the imperiled Nubian giraffe. This Park shelters the largest known



population of this (sub)species and one of the few naturally occurring viable populations. However, with development plans for the Park on the horizon, understanding the population dynamics and mechanisms for population growth has never been more imperative. The Giraffe Conservation Foundation (GCF) in partnership with Uganda Wildlife Authority (UWA) and Dartmouth College has worked since 2014 in implementing studies on the Park's population, spatial and foraging ecology to ensure a sound scientific foundation for subsequent conservation strategies of this critical population.

December 2016 represents the ninth season of demographic surveys conducted in Murchison Falls NP. Since giraffe are relatively long-lived animals with a rather long gestation period of roughly 15 months, a rigorous effort to understand giraffe population dynamics over space and time requires a long-term population monitoring programme. A more comprehensive understanding of spatiotemporal variation of demographic parameters and seasonal variation in population dispersion can provide deeper insights into key resources that influence overall population dynamics. According to data from aerial surveys, over the past two and a half decades, the giraffe population of Murchison Falls NP – as well as many of the other species of wildlife there – has grown at a remarkable rate. Part of our research aims to understand precisely how changes in these rates vary over space and time in this seasonal tropical environment.

To begin to address these topics, we have implemented seasonal photographic surveys. Our research team drives systematic routes through the entire expanse of the northern portion of the Park – which, until the recent translocations of Operation Twiga, was the only area that supported giraffe – and we photograph all giraffes that we encounter. In accordance with robust population survey protocols, we survey the entire extent of the park twice during each seasonal transition. Since the spot patterns are unique to each individual giraffe, we can use them as identifying characteristics which enable us to monitor changes in and individual's location, group association or health condition.

Similarly, a sudden absence from our encounter history (without a subsequent reappearance) might suggest a giraffe death. We employ the use of [specially designed software](#) to assist in correctly matching spot patterns of newly photographed giraffe to a database of previously encountered individuals. In addition to collecting images, we also note the age class, sex class, the presence of skin disease lesions, any signs of illegal snare wounds and the geographic coordinates of each observation. The process is rather simple in concept, although admittedly (and delightfully) sometimes challenging in practice. Giraffe don't always congregate in accessible areas which necessitates extensive off-road tracking, warthog holes are sometimes hidden in the long grass which necessitates extensive digging/jacking of stuck vehicles, and there are quite a few giraffe which necessitates extensive time in front of the computer, cataloging and matching spot patterns.

This field season yielded one of the most productive surveys in terms of number of giraffe observed. During the December 2016 survey, preliminary analyses of data suggest that we encountered **933 unique individual giraffe**, including 46 newly identified calves. The age class distribution was consistent with previous surveys, suggesting a population age structure dominated by adults (Fig1).

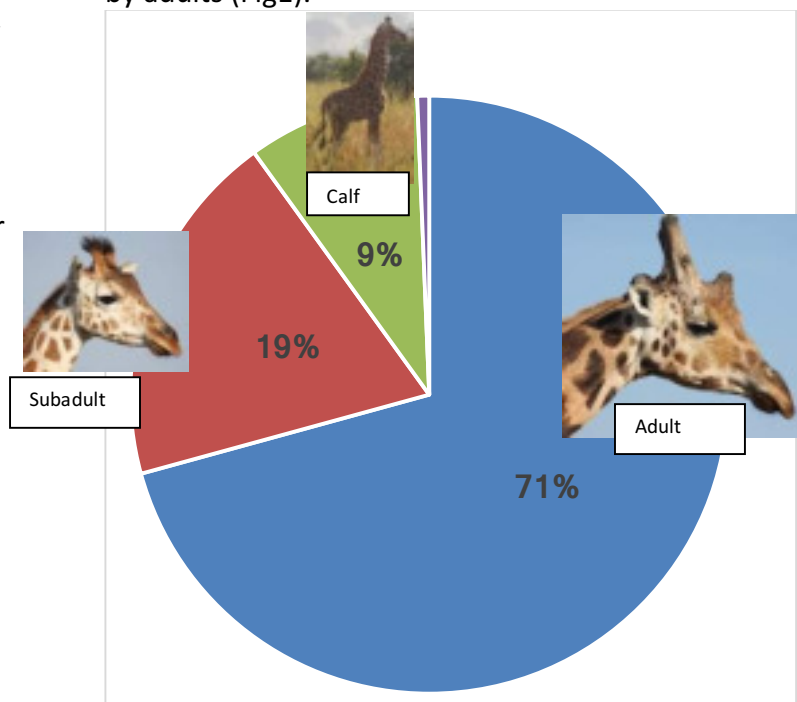


Fig 1. Age class composition of all unique giraffe observed during the December 2016 survey. N=933 giraffe

Sex distribution across all age classes was slightly male skewed during this survey, although in incorporating previous surveys, the population sex ratio is approximately 1 male : 1 female (Fig 2). The tall grass throughout much of the Park made sex determination of calves exceptionally challenging although in previous surveys, the sex ratio of observed calves is also nearly 1 male: 1 female.

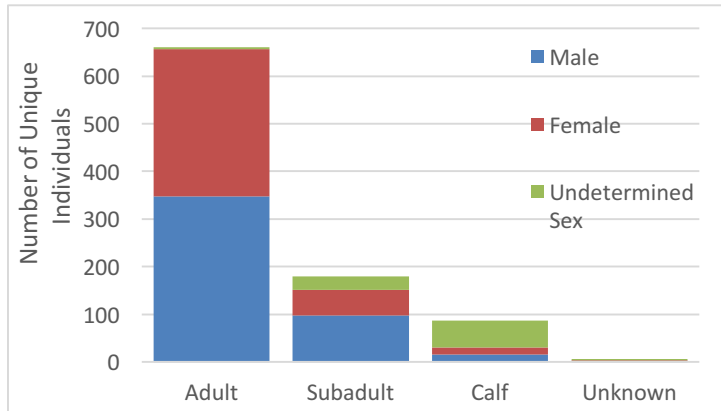


Fig 2: Sex composition across age classes. n= 933 giraffes

During the two rounds of this survey, we encountered **139 herds of giraffe**. Herds ranged in size from 2 - 102 individuals (Fig 3). Although herd sizes varied considerably, the mean herd size was 11.1 giraffe (standard deviation = 16.7).

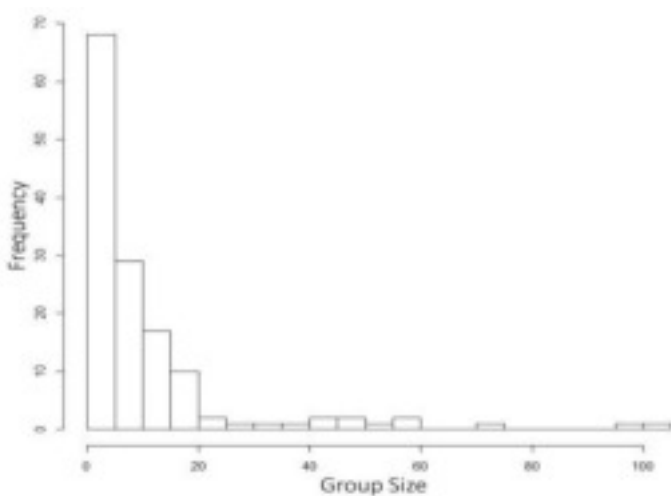


Fig 3. Histogram of observed giraffe herd size across both survey rounds

In addition to studying spatiotemporal variation of giraffe demographic parameters, we also utilised the opportunities afforded by our spatially explicit individual encounters to monitor the spatial distribution and demographic effects of other potential threats to the population, including giraffe skin disease and evidence of illegal snaring.

Giraffe skin disease (GSD) is a poorly understood affliction that occurs across various giraffe populations throughout Africa. In Murchison Falls NP, the disease is characterised by visible symptoms of crusty lesions mainly along the necks of giraffe (Fig 4). To gain a better understanding of the potential effects of GSD on giraffe survival and reproduction, our research programme monitors individuals with skin disease across space and time. During the December 2016 surveys, each giraffe was visually inspected for visible lesions characteristic of the GSD infection. There were observed signs of skin disease on **330 unique individuals** (representing approximately 35% of all unique observed individuals and approximately 49% of all unique adults). Consistent with previous survey results, over 98% of all giraffe with observed skin lesions were categorised as adults. It is not yet



Fig 4. A photograph of a skin disease lesion on the neck of a female giraffe

known what effect, if any, this affliction may have on survival, but as additional surveys are conducted over a longer time span, GCF will continue to evaluate any potential effects of skin disease on giraffe demographic parameters.

Additionally, we evaluated the spatial distribution of visible skin disease lesions across all observed giraffe during the survey period. Although giraffe were observed throughout the entire extent of the Park, visible lesions were conspicuously absent from the Ayago and Chobe areas of the central and eastern portion (Fig 5).

As with previous survey efforts, we also monitored the prevalence and spatial distribution of snare wounds on giraffe. Previously, officials with UWA have identified illegal snaring as a threat to giraffe and other wildlife in the Park.

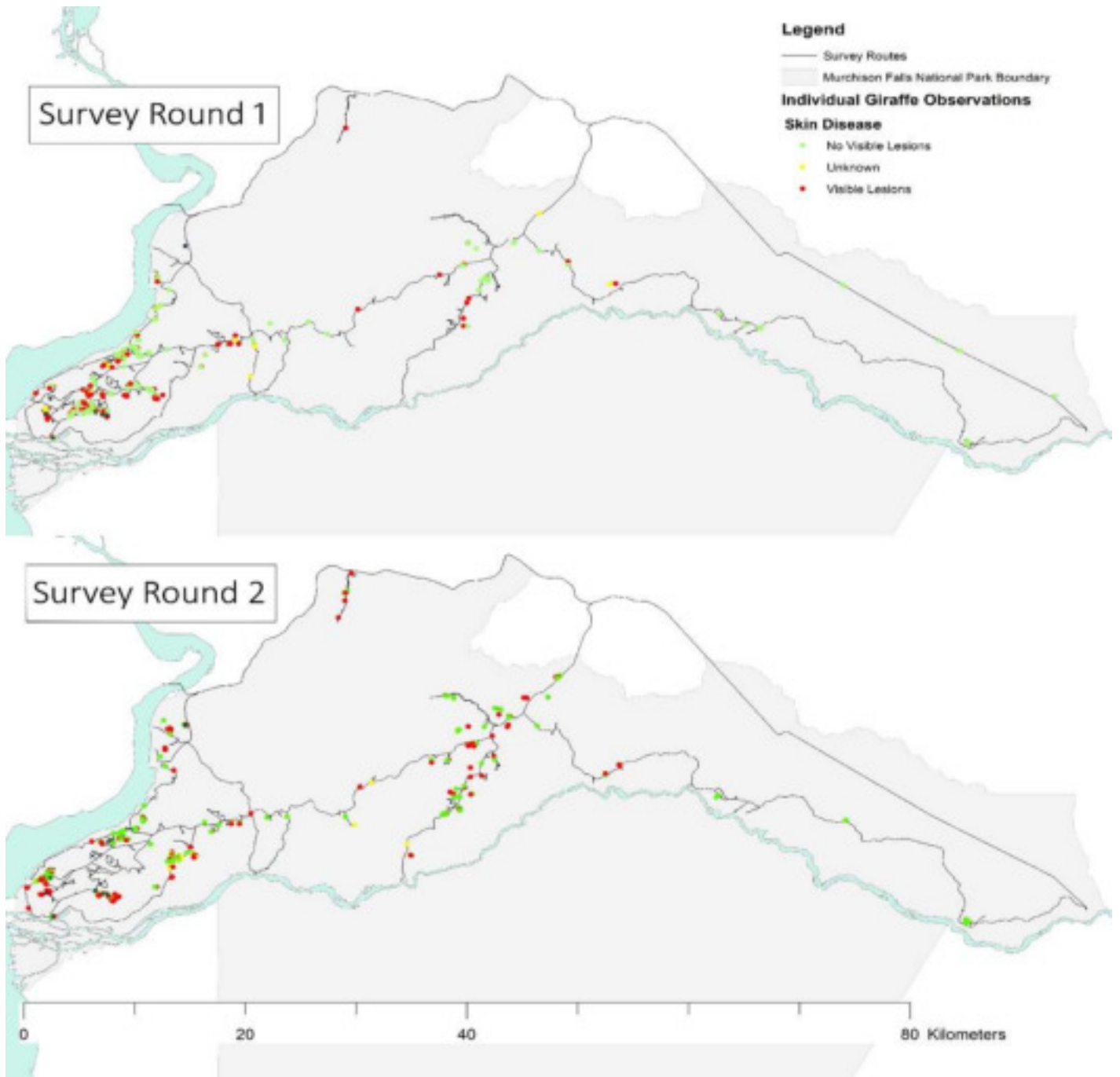


Fig 5. The spatial distribution of all observed giraffe during both rounds of surveys, highlighting the distribution of visible signs of skin disease.

To monitor the potential effect that the prolific snaring of Murchison Falls NP may have on the giraffe populations, all photographed giraffe were visually inspected for scars or other signs of snare-related injuries. Over repeated survey efforts, it is possible to track the individual survival of individuals with known encounters with snares. It should be noted, however, that these observed figures represent conservative estimates of minimum possible number of giraffe snare encounters.

There were observable snare injuries on **8 individuals** during this round of surveys. This figure is lower than in most previous surveys, potentially as a result of the long grass decreasing the detection of snare wounds on the lower legs of the observed giraffe. We also observed a single individual with a wire snare still attached to his leg. UWA veterinary staff were contacted and the snare was subsequently removed.

Having established nearly three years of baseline data, we are beginning to piece together the fascinating story of giraffe in Murchison Falls NP. We hope to apply the lessons learned in these long-term studies to inform effective conservation strategy for this critical population



Communicating Conservation Through Captivating Storytelling

The practice and challenge of conservation is largely related to effective translation of values across different audiences and promoting a deeper engagement of a wider communities in the realities of the field. To this end, even the most rigorous science can be complemented and augmented through a well-crafted narrative.

To communicate the threats that these giraffe face and the ongoing efforts to mitigate these threats, we sometimes work with journalists and filmmakers who craft engaging narratives that capture the beauty and challenges of this unique system through captivating and honest storytelling.

During the December field season, we were joined by television host Ivan Carter and a film crew from the television programme, Carter's W.A.R. (Wild

Animal Response) to document ongoing giraffe conservation efforts in the Park, particularly as they related to responding to the threats posed by illegal snaring. The indiscriminate nature of these wire snares and the effective simplicity of these traps makes for a lethal combination for the Park's wildlife populations. The snares likely aren't designed to specifically target giraffe; indeed, being much larger and stronger than the more numerous antelope species, giraffe are sometimes able to break these cables once they are ensnared, but they carry the scars of their encounters and occasionally even to drag the broken snare cable as it continues to cut into the flesh.

During this field season, there fortunately weren't many giraffe with snares still attached. We had, however, heard reports from some of the rangers



that there was an adult male with an old snare wound on which the wire was clearly still evident. Hearing these reports, we set off in search of this giraffe near his last confirmed sighting along the Pakuba area near the Albert Nile. With uncharacteristic good luck, we managed to track down the snared giraffe in the fading light of our first day. He was a large male and walked with a labored gait under the apparent discomfort of the snare wound. The wire cable was indeed seen protruding from the festering flesh on his lower leg. It was clear that veterinary intervention would be required, so we relayed the location of the injured giraffe to the UWA vet staff and planned to track it the next morning and remove the snare.

As the sun rose over the swiftly flowing Victoria Nile, the UWA veterinary response unit, accompanied by the Park senior warden crossed the river on the ferry and drove out to the bush to meet up with the scout team who had found the giraffe not far from its sighting on the prior evening. We quickly convened near the snared male and the veterinary response unit assembled their equipment and outlined the plan of the operation. These rangers and the vet team are well-practiced in these operations; an unfortunate reality of the prevalent threat of snaring along the waterways. With everyone having established their role in the operation, the vet team and film crew slowly approached the wounded giraffe to



The film crew carefully approaches a lone male giraffe

immobilise it, medically treat it and document the process. From the window of his Landcruiser, the UWA vet delivered a well-placed tranquiliser dart into the muscular tissue of the wounded giraffe. In a few minutes, the effects of the drug were evident, and the giraffe slowed to a tenuous walk. With a well-practiced efficiency, the rope team approached the giraffe and roped its legs to bring it to the ground in a controlled manner. Once the animal was safely secured on the ground, the team when in with large bolt cutters to remove the cable remnants from the infected wound and then clean and medically treat the old snare wound.



The team repositions the immobilized giraffe to allow easier access for medical treatment

Within minutes, the work on the giraffe was done and he rocked to his feet to run off across the savanna sans snare. Thanks to the effort of the film crew, this story of the unsung conservation heroes of Uganda will be shared with a much wider audience, communicating the risks, challenges and successes of giraffe conservation in Murchison Falls NP. Greater awareness, empathy and interest in wider audiences, coupled with community engagement and rigorous conservation science provides an excellent foundation upon which to develop more comprehensive conservation strategies to give this population the resources and protections they need to thrive.

Acknowledgements

