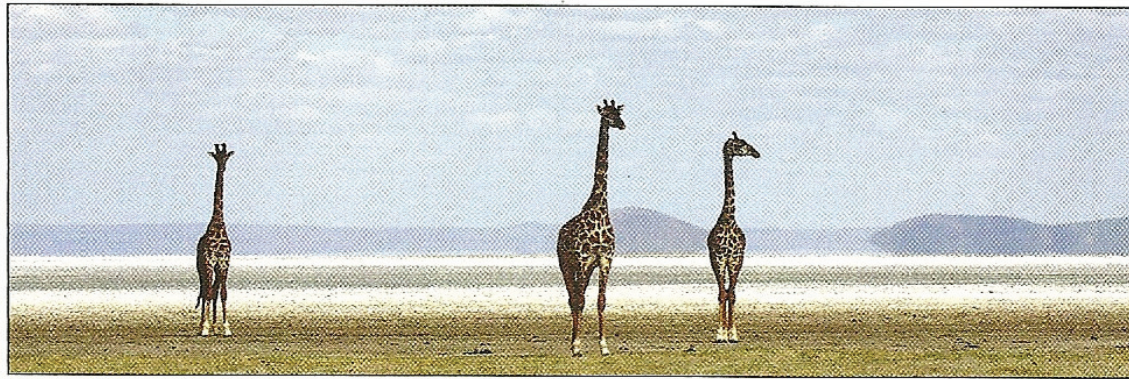


Spotlight on the
MASAI GIRAFFE



by DEREK E. LEE AND MONICA L. BOND

EXPLORERS CLUB
student grant recipient

...CALLED BY THE ÆTHIOPAINS THE NABUN...IT HAS A NECK LIKE THAT OF THE HORSE, FEET AND LEGS LIKE THOSE OF THE OX, A HEAD LIKE THAT OF THE CAMEL, AND IS COVERED WITH WHITE SPOTS UPON A RED GROUND; FROM WHICH PECULIARITIES IT HAS BEEN CALLED THE CAMELEOPARD. IT WAS FIRST SEEN AT ROME IN THE CIRCENSIAN GAMES HELD BY CÆSAR, THE DICTATOR. SINCE THAT TIME TOO, IT HAS BEEN OCCASIONALLY SEEN. IT IS MORE REMARKABLE FOR THE SINGULARITY OF ITS APPEARANCE THAN FOR ITS FIERCENESS...

—PLINY THE ELDER, *NATURAL HISTORY*, BOOK 8, CHAPTER 27

Thousands of years ago, the giraffe (*Giraffa camelopardalis*)—whose exotic appearance led the ancients to speculate that it was an unnatural cross between a camel and a leopard—was common throughout all of Africa, Southern Europe, and India, but later became restricted to Africa. As recently as 800 years ago, giraffe disappeared from North Africa as a result of creeping desertification and loss of woodlands. The



ranges of giraffe populations have contracted even further during the past half-century due to agricultural land conversion, poaching, deforestation, and drought, with the only substantial populations remaining in southern and eastern Africa.

Giraffe are highly visible indicators of the health of African savanna ecosystems. As obligate browsers—meaning they are specialized to feed upon the leaves of woody vegetation—they are dependent upon the savanna's shrubs and trees, particularly *Acacia* species. Unfortunately, little is known about the giraffe in the wild and how its survival and reproductive rates respond to predation, disease, changing land use, climate change, and poaching.

Although the Masai giraffe (*G. c. tippelskirchi*) is the national animal of Tanzania, populations have declined there since the 1980s. We have no strong inferences about the demographic or ecological causes of these declines and thus



surprisingly few data exist to guide conservation. We do know that giraffe are facing a barrage of threats in the semi-arid savanna woodlands of the Masai Steppe ecosystem, which lie in the eastern branch of the Great Rift Valley in northern Tanzania. In addition to giraffe, the Masai Steppe supports one of the most abundant and diverse communities of ungulates in the world, including migratory wildebeest and zebra. Unfortunately, this ecosystem is threatened and largely unprotected.

Since the 1940s, human population and agricultural expansion in the Masai Steppe have increased fivefold, causing substantial habitat loss and fragmentation. Estimates of the proportion of Tanzanian giraffe populations removed annually by illegal poaching range from 18 to 40 percent. Rainfall patterns are the primary drivers of savanna dynamics, but are likely to be altered by climate change, which may in turn reduce the availability and nutritive quality of woody vegetation needed by giraffe. In November 2000, a new threat emerged in the form of Giraffe Skin Disease

(GSD), which affects the skin on giraffe legs. First recorded in Ruaha National Park in the central part of the country, GSD has since spread to the Masai Steppe. Causative agents of GSD are yet to be established, but adverse effects, including increased risk of predation and secondary infections, are strongly suspected.

With support from The Explorer's Club, we are beginning to address the lack of data on demography and disease with the launch of a photographic mark-recapture and computer-assisted animal identification survey undertaken by researchers from the Wild Nature Institute. The technology is enabling us to study Masai giraffe populations and to model the epidemiology of GSD in the Masai Steppe ecosystem.

Computer-assisted photo-identification provides a powerful, inexpensive method for monitoring population movements and testing hypotheses about ecological mechanisms affecting demography. The use of photographic data enables us to track large numbers of individuals reliably without subjecting



them to stressful capture and marking procedures.

Traditional studies have required the capture and physical attachment of marks such as ear tags, collars, or leg bands to every individual included in the study. This can be incredibly expensive, particularly for large animals requiring sedation, and includes the very real possibility of injury to the study animal or human team members. This expense often results in few animals being marked, and thus the information gleaned from such small-sample studies tends to pale in comparison with the hundreds or thousands of animals that can be followed throughout their lives with photographic mark-recapture. With simply a car, a camera, and a computer we have been able to carry out a successful, low-cost, fine-scale demographic study of more than 1,000 individually known Masai giraffe.

We are collecting data on these animals three times per year at five spatially distinct sites in the Steppe in order to estimate population size and differences in reproductive success, juvenile survival, adult survival, and movement probabilities at each site. And—in collaboration with Bernard Kissui of the African Wildlife Foundation, and veterinarians from University of California, Davis; the Wildlife Conservation Society; and Tanzania's National Parks—we are monitoring differences in giraffe vital rates according to site, protected area status, lion density, nearby human population, vegetation characteristics, and prevalence of GSD. We also are studying how rainfall patterns vary over time and space within the Masai Steppe ecosystem, and how these patterns affect the growth and quality of woody vegetation upon which giraffe depend. The information we are gathering will be disseminated

to wildlife authorities, land managers, and conservation NGOs to guide policy decisions aimed at conserving viable giraffe populations in the Masai Steppe ecosystem and throughout their range.

The giraffe is a singularly unusual and fascinating creature that occupies a special place in the hearts of people around the globe. One truly feels at peace when near these gentle giants as they serenely munch leaves, their heads towering above the treetops, watching us watching them with a calm curiosity emanating from their deep brown eyes. It is distressing to imagine a world without this cherished icon, but with the development and implementation of effective conservation measures, we may not have to. ▲

B I O G R A P H Y

Derek E. Lee is a Principal Scientist for the Wild Nature Institute (www.wildnatureinstitute.org), a member of the IUCN Giraffe Working Group, a Ph.D. candidate at Dartmouth College, and a recipient of an Explorer's Club Student Grant. He has authored scholarly articles on population biology and demography for taxa as diverse as fish, rodents, seals, seabirds, owls, salamanders, and giraffe. Monica L. Bond is a Principal Scientist for the Wild Nature Institute. She published peer-reviewed articles on habitat use and behavior of grassland voles, owls, salamanders, and woodpeckers.

I N F O R M A T I O N

Wild Nature Institute organizes research safaris for citizen-explorers who wish to take part in our ongoing research in Tanzania. For information, visit our website www.wildnatureinstitute.org.