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Abstract: In 2002, The Zoological Society of London (ZSL) established the Tanzania Carnivore Programme (TCP). Tanzania is a vast country with limited infrastructure and communication, and despite a wide network of volunteer contributors supplying information on carnivore sightings, huge areas remain without even basic information about carnivore species distribution. For this reason, TCP initiated in December 2004 its own survey programme. Two professional advisors started to design surveys with camera traps and trained the TCP team. First surveys took place in Kilimanjaro and Tarangire National Park. Films came back showing lions, leopards, genets, caracals, spotted hyenas, aardwolves, zorillas, honey badgers, wild cats, mongooses and lots of servals. Photos will be put onto our database and all information gathered by the TCP will be used to establish a Carnivore Conservation Action Plan for Tanzania that will summarise information on each species and establish conservation priorities.

# CANDID CAMERA

## Surveying and conserving carnivores in Tanzania

Carnivores are perhaps the most charismatic of animals. They have been loved and hated by people through millennia, but they are rarely a source of indifference. Yet, these same qualities have led to their accelerating decline across the globe as they are killed for their skin, teeth and scent, or because carnivores themselves have used their killing skills on humans or their livestock. If we are to continue to live with these beautiful creatures, we need to find a means of increasing tolerance for their presence. This is true not least in Africa, a land populated by some of the world's most fascinating and appealing carnivores such as cheetahs, lions, wild dogs and leopards, but also with desperate human poverty and increasing demands on the landscape. Tanzania, one of the poorest countries in the world, is particularly important for carnivores. The country is a biodiversity hotspot and holds more than half of the continent's species, as well as globally important populations of most large carnivores found in Africa.

### The Tanzania Carnivore Programme

With this in mind, ZSL established the Tanzania Carnivore Programme (TCP) in 2002 using funding from UK government grant scheme the Darwin Initiative. This programme has a mission to ensure the long-term conservation of carnivores in Tanzania. It achieves this through working within Tanzanian institutions and providing training and support for Tanzanian nationals. It has a wide remit, including mapping the distribution of all carnivore species and informing the public about carnivores' needs and conservation. In its first two years the programme has established a team of trained and well-motivated Tanzanians that are dedicated to the cause of carnivore conservation. The programme has been particularly keen to encourage the private sector to contribute to conservation, such as through helping to monitor the distributions of Tanzania's 35 different carnivore species, and has successfully brought together private and governmental sectors.

However despite all this activity, Tanzania is a vast country with limited infrastructure and communication. There remain huge areas without even basic information about carnivore species distribution. In many of these areas there is the possibility of finding carnivores not yet known to occur in Tanzania, or even new species. The TCP has established a wide network of volunteer contributors that supply information on carnivore sightings, but they are unable to cover the whole country, and so, in December 2004, the TCP initiated its own survey programme.

Carnivores are notoriously difficult to survey. Many species are nocturnal, shy and/or secretive, and are extremely difficult to see. However hidden camera traps potentially allow us to have a window into their lives with minimal disturbance, and enable us to survey creatures which are rarely seen. In such surveys, camera traps are set up along small trails that show active use. The cameras are linked to a beam that knows when an animal moves along the trail by detecting any changes in heat in front of the camera. Once put in place, the cameras are left undisturbed for up to two months, except for battery checks and film changing.

Camera traps are not cheap, but funding from the Royal Society allowed ZSL to purchase 60 to initiate the surveys in December 2004. Two advisers, ZSL scientist Chris Carbone and jaguar biologist Marcella Kelly, joined the first survey to help

design the surveys and train our team. We were also joined by Charles Foley from the Tarangire Elephant Project, a long-term adviser for TCP. Our first surveys were planned for Kilimanjaro National Park and Tarangire National Park and although both areas are fairly well known, Kilimanjaro in particular has surprisingly sparse information about its resident carnivores. Tanzanian National Parks supported our work by granting permits, and its ecologists and rangers based in our survey areas joined us on much of each survey.

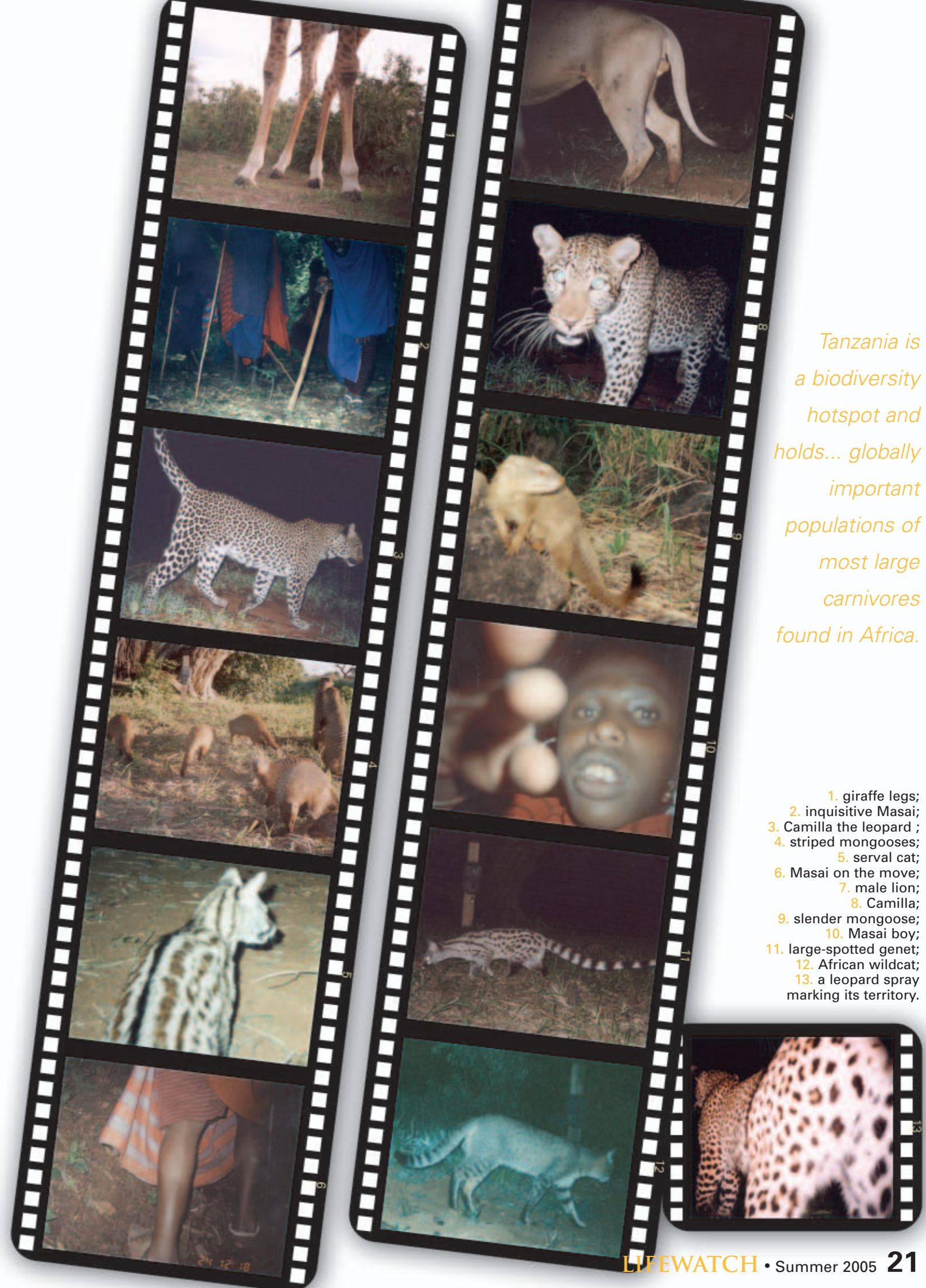
### Survey sites

Our advisers that had arrived from European and American winters got something of a shock at the first survey site, the Kilimanjaro plateau, 3,600m high and with a climate very similar to a British winter. Our days were spent struggling with the altitude and finding sites where we could place our cameras. The second survey site, Kilimanjaro Forest, was more appealing for our overseas visitors, and although fairly high, it was relatively dry.

Tarangire National Park was our third survey site and offered much more of what our visitors had expected – sweeping savannah vistas and a hot tropical sun. On this site we set up a more sophisticated survey, with two cameras placed opposite each other, allowing us to capture both sides of any animal passing through the beam. This system allows us to individually recognise many of the distinctive patterned carnivores, including genets, leopards, cheetahs, servals, spotted and striped hyenas and aardwolves, meaning we can accurately estimate densities. The Tarangire Elephant Project played host to us during the survey, and we camped among the baobabs and the elephants for a week while setting up the rigorous survey. By the end of the month the TCP team was proficient in survey methods and able to design and implement surveys on its own. The next two months were filled with excitement as each set of camera trap films came back showing lions, leopards, common genets, large spotted genets, caracals, spotted hyenas, aardwolves, zorillas, honey badgers, wildcats, white-tailed, slender and banded mongooses and lots of servals. We had no idea there were so many servals in these areas. There were some camera casualties along the way – Tarangire contains the highest density of elephants in the world, and it was inevitable there would be some grumpy responses to the cameras' flashes. However, although the stakes holding our cameras were often uprooted and carried hundreds of metres, for the most part our cameras survived. Some cameras were stolen, and one camera was obviously chomped on by one of our target carnivores. The cameras also suffered frequent indignities such as being sprayed by leopards that were intent on marking out their territories, and being nibbled by white-tailed mongooses.

The team is now sorting and putting photos onto our database, and planning the next survey, which will be further afield. All the information gathered by the TCP will be used to establish a Carnivore Conservation Action Plan for Tanzania that will summarise what information exists on each species and establish conservation priorities. This plan can be used as a guide for managers and policymakers to help ensure that Tanzania's unique carnivore biodiversity will survive in the long term.

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*Tanzania is a biodiversity hotspot and holds... globally important populations of most large carnivores found in Africa.*

1. giraffe legs;
2. inquisitive Masai;
3. Camilla the leopard ;
4. striped mongooses;
5. serval cat;
6. Masai on the move;
7. male lion;
8. Camilla;
9. slender mongoose;
10. Masai boy;
11. large-spotted genet;
12. African wildcat;
13. a leopard spray marking its territory.