

## 6 SUMMARY

- This study assessed the status and importance of the Selous Niassa Wildlife Corridor (SNWC) in southern Tanzania as a conservation area and biological corridor for wildlife, principally the African elephant (*Loxodonta africana*) and other key wildlife species. The distribution and movements of elephants and other wildlife species, their population structure and population size were investigated. With a view to identify key conservation and development issues, the relationship between people and wildlife were assessed, in particular potential sources of conflict, local knowledge about and attitudes towards wildlife. The data were derived from a novel combination of local knowledge of wildlife, own field observations, and advanced technology including satellite-based location and tracking of radio-collared individual elephants. The present study also evaluated the data collected by village game scouts (VGS) to assess their potential and effectiveness as a low cost monitoring system for the number, distribution and population structure of elephants. The study was conducted between July 2000 and December 2002.
- Biogeographically, the SNWC is part of the extensive miombo woodland system of eastern and southern Africa. Scientifically, it belongs to a habitat type of important conservation value about which relatively little is known. Census results and distribution records suggest that the SNWC should be viewed as an internationally important wildlife conservation area, and as a biologically important corridor, linking globally significant populations of Roosevelt's sable antelope (*Hippotragus niger roosevelti*), Liechtenstein's hartebeest (*Alcelaphus buselaphus lichtensteinii*), Nyassa wildebeest (*Connochaetes taurinus johnstoni*), eland (*Taurotragus oryx*) and greater kudu (*Tragelaphus strepsiceros*) and other wildlife and plantlife in the Selous Game Reserve and ecosystem in Tanzania with the Niassa Game Reserve and ecosystem in Mozambique.
- The SNWC is home to at least 2,400 African elephants and a globally significant population of at least 4,460 Roosevelt's sable antelope. The SNWC contains a number of well established, traditional movement routes for elephants that are still utilised by them, and numerous forest, bushed grassland, woodland and wetland areas that are important seasonal or year-round refuge habitats for elephants and

other wildlife species. Elephants were present throughout the Corridor. Roosevelt's sable antelope, eland and greater kudu were also widespread. African wild dogs (*Lycaon pictus*) occurred on a seasonal basis, yet when present were widespread throughout the southern section of the Corridor, emphasizing the value of the Corridor for seasonal key migratory species. However, there is also some evidence that wildlife populations have experienced declines. Liechtenstein's hartebeest had a fragmented distribution, and there is currently no positive evidence that Nyassa wildebeest are still present in the Corridor.

- To understand the long-term population development of elephants and other wildlife in the SNWC, continuous ecological monitoring is advisable. However, a large proportion of this area is outside the priority census zone and not regularly surveyed. Thus, the development of a simple, yet effective, low cost and sustainable monitoring system is essential for an assessment of the population structure and dynamics of elephants and other wild animals. Data collected by village game scouts (VGS) on the number, distribution and population structure of elephants based on elephant groups encountered in the field were considered as such a potential monitoring system. The VGS data fairly described the presence, distribution and population structure of elephants on different village lands. The data on their own were, however, not sufficient for an accurate estimate of elephant numbers. A protocol is recommended that combines direct field observations from encounters with elephant groups with regular dung counts along permanent transects by VGS during their routine anti-poaching patrol.
- Data on factors reducing the yield of agricultural crops were obtained from governmental records and interviews with local people and assessed for Songea Rural (Namtumbo) District, an area that includes the western part of the SNWC. Crop damage attributed to wildlife was claimed to be a common cause of significant reduction of crop yield. Crop damage caused by wild animals was claimed to occur throughout the year. Several wildlife species were considered to be involved. Interviewed people and governmental records reported damage by elephants, hippo (*Hippopotamus amphibius*), buffalo (*Syncerus caffer*) and sable antelope. In contrast to these claims, analysis of reports on the extent of crop damage attributed to each species and data from satellite-based tracking of radio-

- collared elephants indicated that only a small proportion of crop damage could be attributed to elephants.
- Crop production would be increased if more efforts towards preventing crop damage were focused on the control of weeds, crop diseases and “small pest species” such as rodents or birds. Where possible, alternative methods of dealing with crop-raiding elephants and other large wildlife species should be put into practise to ensure the protection of elephants in this part of Tanzania. With a reduction in poaching owing to the improvement of anti-poaching surveillance in the Selous Game Reserve and the surrounding buffer zones at the northern end of the Corridor and the increase in the population of people in this area, conflicts between people and elephants and other animals are likely to increase. In order to minimize conflicts between people, elephants and other wildlife in future, comprehensive conservation strategies that take into account both conservation and people-focused perspectives, in line with current Tanzanian wildlife policy, need to be implemented.
  - To investigate the movement patterns, home ranges and habitat use and selection of elephants, twelve immobilization and radio-collaring were performed in two phases which was followed by reimmobilization and removing of the tracking device after about two years of radio-tracking. During capturing, it was observed that elephant tended to retreat into remote and extremely dense vegetation during the day and were very wary of people. The dense miombo woodland and riverine vegetation made tracking of elephants by foot in areas without road and with steep terrain difficult and time consuming. Due to these obstacles, a helicopter was used for the second and third capture phases.
  - Biochemical analysis of blood serum in seven bulls immobilized by M99 showed a slight increases for alkaline phosphatase (AP), lipase, urea, potassium, and calcium while slight decrease were noted for  $\alpha$ -amylase, bilirubin and Aspartate Amino Transferases (AST). The slight variations in the elephant blood parameters was associated with age and seasons. The blood chemistry values for cholesterol, triglycerides, creatine, sodium, iron, and total protein were within the clinically normal ranges. The cause of leucocytosis and substantial decline in the PCV and Hb for the elephant which died was not established.

- The distribution and movements of elephants were assessed by ground-based census and satellite-based telemetry of radio-collared elephants. Three major movement routes from the Ruvuma river, the border between Tanzania and Mozambique at the southern end of the SNWC, to the centre of the Corridor, and four other routes from the centre of the Corridor towards the north were identified. Satellite-based tracking and field observations confirmed that elephants used these routes for their movements, ultimately connecting the Ruvuma River with the Selous Game Reserve at the northern end of the Corridor. The major elephant movement routes that were revealed by satellite-based tracking were known to local people.
- Data from satellite-based tracking were used to determine habitat preferences and home ranges and to trace movements across international borders. Ten radio-collared elephants (2 cows and 8 bulls) were tracked for periods from 8 to 24 months. During both dry and wet season, elephants significantly preferred forests, bushed grasslands and riverine areas and avoided cultivated areas. During the dry season, elephants also preferred woodland; during the wet season they also avoided swamps. Home range sizes varied between 328 and 6,905 km<sup>2</sup>. Observed home range sizes fell into three groups: small home ranges (328 to 576 km<sup>2</sup>), medium home ranges (1494 to 3,135 km<sup>2</sup>) and large home ranges (from 4,421 to 6,905 km<sup>2</sup>). Elephants with small home ranges spent their time mostly in areas between the Selous Game Reserve and the adjoining buffer zone at the northern end of the Corridor. Elephants with medium sized home ranges stayed in the central areas of the SNWC and occasionally visited Sasawala Forestry Reserve. Elephants with large home ranges moved across the central and southern sections of the SNWC, with extensive movements between Tanzania and Mozambique, and within Mozambique. Extensive movements of elephants were reported by local interviewees to occur in the months of March and April and June and December. Satellite tracking however showed extensive movements to occur during November and December and limited mobility between March and May. Food, access to water and possibly repeated contact with people in some localities are considered to be factors likely to influence elephant movements.
- Data from ground-based observations and satellite-based telemetry confirmed that elephants frequently moved across the international border between Tanzania and

Mozambique along the Ruvuma River. These data support the importance of protecting the SNWC as an important elephant range and corridor, linking two of the largest protected areas in Africa, the Selous and Niassa Game Reserves in Tanzania and Mozambique, respectively.