

# RESEARCH

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## Law enforcement, illegal activity and elephant status in Mago and Omo National Parks and adjacent areas, Ethiopia

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### Abstract

A project to monitor the strength of law-enforcement effort and the extent of illegal activities was undertaken in Mago and Omo National Parks and the surrounding areas in south-west Ethiopia from July to December 2002. The study was also aimed at collecting data to estimate total elephant populations, based on observations and indirect signs. Information on the nature of movements and distribution was gathered. Twelve sightings of elephants and signs of their presence were recorded in Mago National Park. By field observation, a maximum of 167 elephants was counted in one day. The present educated guess for the number of elephants in Mago National Park is about 200. A decline of 33% was observed in elephant numbers as compared with the 1997/98 estimate. It is estimated that only about 48% of the park area was occupied by elephants. In Omo National Park, only three signs indicating the presence of elephants were noted and only one big group was observed, estimated to number 324. No elephants were seen as permanent residents in this park. In Mago National Park, the number of scouts deployed increased from 8 (270 km<sup>2</sup> per scout) in 1996 to a maximum of 23 (94 km<sup>2</sup> per scout) for the year 2002. The number of scouts in Omo National Park declined from about 40 (152 km<sup>2</sup> per scout) in the 1970s to 11 (370 km<sup>2</sup> per scout) in 2002. Following the killing of two wildlife scouts by poachers in 1998 and 2002, patrols in both parks have become irregular. Severe shortage of scouts in the study areas is caused by an insufficient operational budget. The high number of offenders in both parks suggests that the number of field scouts needs to be increased. The minimum number of patrol hours per day in four sample areas of both parks was 14 and the maximum 96. Sentences for arrested offenders in district and zonal courts are very lenient. Only 17 cases were recorded in the files of the Bako-Gazer District Judiciary Office. Almost 85% of the cases were acquitted for various reasons. The penal acts currently working in Ethiopia do not sufficiently deter wildlife offenders.

### Résumé

De juillet à décembre 2002, on a voulu contrôler l'efficacité de l'effort d'application des lois et l'étendue des activités illégales dans les Parcs nationaux de Mago et d'Omo et dans les régions environnantes, dans le sud-ouest de l'Éthiopie. Cette étude visait aussi à récolter des données pour estimer la population totale d'éléphants, en se basant sur des observations et des signes indirects. On a rassemblé toutes les informations possibles sur la nature des déplacements et sur la distribution des éléphants. On a rapporté douze observations et signes de la présence d'éléphants dans le Parc National de Mago. Un *maximum* de 167 éléphants furent dénombrés en

un seul jour par des observations de terrain. Une supposition raisonnable situe le nombre actuel d'éléphants dans le Parc National de Mago aux environs de 200 individus. On a observé une diminution de 33 % du nombre d'éléphants par rapport aux estimations de 1997/1998. On estime que les éléphants occupent seulement 48 % environ de la superficie du parc. Dans le Parc national d'Omo, on n'a relevé que trois signes de la présence d'éléphants, et on n'a observé qu'un grand groupe dont on a estimé la taille à 324 individus. On n'a vu aucun éléphant qui réside de façon permanente dans ce parc. Dans le Parc national de Mago, le nombre d'éclaireurs est passé de 8 (270km<sup>2</sup> par éclaireur) en 1996, à un maximum de 23 (94km<sup>2</sup> par éclaireur) en 2002. Le nombre d'éclaireurs du Parc national d'Omo est, par contre, passé d'environ 40 (152km<sup>2</sup> par éclaireur) dans les années 1970, à 11 (370km<sup>2</sup> par éclaireur) en 2002. Suite au massacre de deux éclaireurs par des braconniers en 1998 et en 2002, les patrouilles sont devenues irrégulières dans les deux parcs. Le manque sévère d'éclaireurs dans les zones étudiées est dû à un budget nettement insuffisant pour couvrir ces opérations et les frais généraux. Le grand nombre de contrevenants dans les deux parcs laisse entendre que le nombre d'éclaireurs sur le terrain devrait être augmenté. Le nombre minimum d'heures de patrouille par jour dans les quatre zones échantillons des deux parcs était de 14, et le maximum, de 96. Les peines que les contrevenants reçoivent dans les tribunaux du District ou de la zone sont très légères. On n'a relevé que 17 cas dans les dossiers du Bureau Judiciaire du District de Bako-Gazer. Environ 85 % des cas se sont soldés par un acquittement, pour des raisons diverses. Les lois actuellement en vigueur en Éthiopie ne sont pas assez dissuasives pour les coupables en matière de faune sauvage.

## Introduction

The African elephant is under threat and is listed in Appendix 1 of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (WCMC 1993). Many African nations including Ethiopia have prescribed legislation to protect their elephants, with strict hunting regulations and compensation mechanisms in place for the damage elephants may cause to human life and property.

Elephant conservation is closely linked to the effectiveness of law enforcement in combating illegal activities. Unfortunately, law enforcement is not well developed in Ethiopia. Despite the presence of field staff, the necessary resources required to equip them to carry out law-enforcement activities are not available. This lack has had negative repercussions on developing sound elephant conservation strategies and management plans.

There is still a diversity of large animals living in Omo and Mago National Parks, but expanding human activity is threatening the parks.

Human settlements are spreading and agriculture is continuously expanding unchecked. Local people living both inside and outside these conservation areas practise different types of illegal activities that encourage uncontrolled poaching. Moreover, pastoralists periodically encroach on these protected areas with several thousand head of livestock. Col-

lecting honey and the disturbances associated with it and deliberately setting fires are other forms of threat. As a result of these factors, the population of larger wild animals, particularly mammals, has declined dramatically in recent years (Graham et al. 1996).

A lot of research has been conducted on elephants, but information on law enforcement and illegal killings has not been systematically collected over sufficient time in most areas of Africa (Dublin and Jachmann 1992; Barnes et al. 1999; MIKE 1999). This information is vital for the success of important management actions such as regulating the trade in ivory and other elephant products. Attempts are now under way under the auspices of the CITES Monitoring of Illegal Killing of Elephants (MIKE) programme to address this gap by training law-enforcement personnel in how to collect data at selected sites across Africa. The objective of this site-based programme is to monitor elephant populations and establish trends in the illegal killing of elephants. Data collection and analysis methods have been standardized for all range states (Hunter 2002) to facilitate comparison of the results.

Information collected so far suggests that the ivory trade in south-western Ethiopia forms a long chain that extends from the hunter killing the elephant to the retailer selling a finished ivory product (Largen and Yalden 1987). Owing largely to poor law enforcement, minimal efforts have been made both regionally and nationally to keep this domestic ivory trade within

legal bounds and at sustainable levels. National legislation in Ethiopia has various decrees to protect wildlife areas that have existed since 1909. However, these are often out of date and not in harmony with modern realities and complexities.

Like in many other African elephant range states, the need for monitoring the illegal killing of elephants in south-western Ethiopia is real and is necessary to strengthen existing policies and develop new policies and management actions. This may in turn help with the larger objective of determining the effectiveness of international legislation on African elephants. This project was designed to generate data and information that will provide guidelines for monitoring the effect of law-enforcement efforts on the elephants of Mago and Omo National Parks and the extent of illegal activities concerning them. The duration of the project was six months—July to December 2002.

## Objectives

The main objectives of this study were to

- assess and evaluate the current extent of law-enforcement efforts in both conservation sites and at federal and Southern Peoples' regional governments
- identify the types of illegal activities and the forms of punishment given to arrested offenders and to record tusks seized at check points
- estimate the total elephant population in Mago and Omo National Parks, based on observations and indirect signs
- suggest possible baseline conservation strategies to protect the species further from extermination

## Study areas

The project areas, Omo and Mago National Parks, are located in the Southern Nations Nationalities and Peoples Region, covering about 19% of the total area of the region (ABSR undated). Mago covers an area of 2161 km<sup>2</sup> and Omo 4068 km<sup>2</sup>. These areas lie between latitudes 05°15' and 06°40' N and longitudes 35°20' and 36°35' E in the Lower Omo trough to the west of the main Rift Valley. They lie adjacently on both sides of the Omo River, Omo to the west and Mago to the east. Four small towns—Turmi, Jinka, Key Afer and Gazer—found to the eastern side of these parks are important points for checking to see if ivory is being transferred to the central part of the country and are considered part of the project areas (fig. 1).

The climate of both parks is semi-arid with a high mean annual temperature and moderate rainfall. The two defined rainy seasons are March to April and August to September, with light rains in October and November. The greater part of the areas is bush and the rest is forest, savannah bushland, savannah grassland and open grassland. The bush vegetation consists of *Acacia horrida*, *A. mellifera*, *Grewia bicolor*, *G. villosa*, *Combretum aculeatum* and *Cordia gharaf*. *Tamarindus indicus*, *Terminalia brownii* and *Ficus sycomorus* are important components of the forest, which is mainly riverine. The fauna of both parks is diverse with at least 82 species of mammals, over 350 species of birds, 24 species of reptiles, 14 species of fish (Stephenson and Mizuno 1978; Hillman 1993; Yirmed 1996, 1997) and an unknown number of amphibians and invertebrates. Omo National Park has historically served as a corridor for elephant movements between south-western Ethiopia and south-eastern Sudan. Elephants frequently visit the Murle Controlled Hunting Area and the Tama Wildlife Reserve, south and west of Mago National Park respectively, the Omo West Controlled Hunting Area, and the area north of Omo National Park.

Six distinct ethnic groups reside in the areas bordering Mago National Park, most of whom preserve their traditional ways of life and have direct contact with the park. Similarly, four major distinct peoples with their own distinct culture and lifestyle live bordering Omo National Park (fig. 1).

## Methods

### **Monitoring law-enforcement efforts and illegal activities**

Data on law enforcement and illegal activity were collected from various sources following the work of Bell (1986) and Jachmann (1998). Methods used for data and information collection during this study were as follows:

The current extent of illegal activities was assessed mainly by park scouts regularly patrolling both national parks. Encounter rates per effective patrol days were used as the standard unit of patrol effort to make the encounter rates equivalent to 'catch per unit effort' indices. Therefore, for each day out on foot patrol, each scout recorded encounters. The collective record provides accurate information of events, and the success of anti-poaching patrols undertaking routine law-

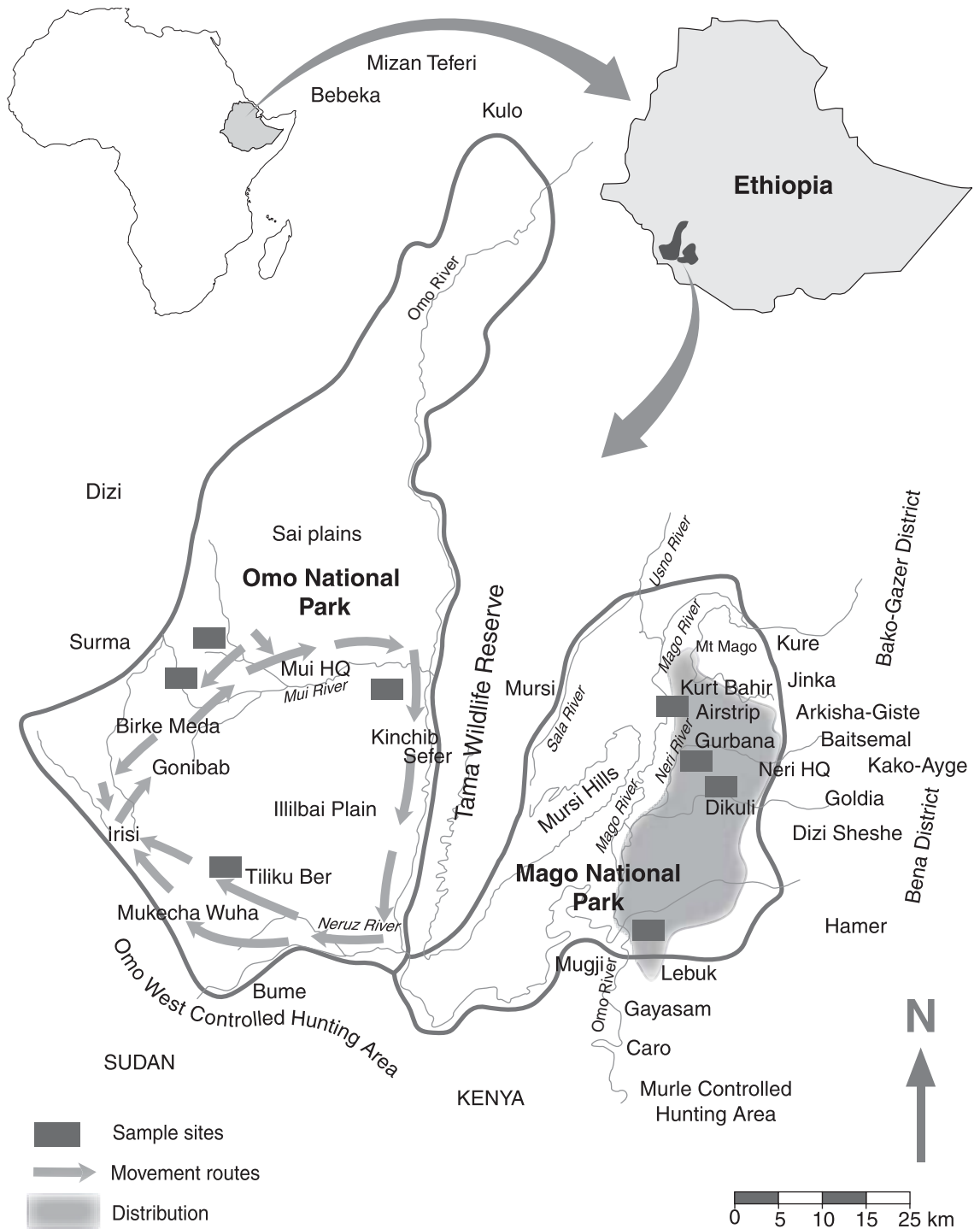


Figure 1. Mago and Omo National Parks, showing sample sites and locations cited in the text.

enforcement duties becomes the focal point. The parameters used included number of patrol days per month, average distance and time the patrol team travelled per patrol day, number of offenders detected or arrested, number of tusks recovered, number of poachers encountered, presence of camps as indication of recent illegal activities, time spent on patrol by each patrol group (to measure the commitment of anti-poaching units) and number of guns recovered or confiscated. Only three visits to the areas adjacent to the park were undertaken during the project. For patrol reports, the standard recording forms developed by the CITES MIKE programme were used.

When recording illegal activities, efforts were made to distinguish between 'serious' and 'minor' offences. Offences considered to be in the serious category were those directly related to illegally killing wild animals. These included sighting and arresting poachers, confiscating firearms, tusks, skins and snares, and hearing gunshots. Minor offences included those that may or may not have been related to poaching, indicated by sighting human footprints and fires and discovering snares.

Information was documented on the number of seizures of tusks at four neighbouring checkpoints. The punishment given to arrested offenders was also noted. Four sample sites were selected in each national park, each 5 x 5 km<sup>2</sup> in area (fig. 1), within which the nature of illegal activities was monitored systematically through regular patrols. Patrolling intensity was the same for all sites as the anti-poaching team monitored each site once a month for six consecutive months.

### ***Elephant population estimates, distribution and age structure***

In addition to law-enforcement activities, routine trips were made to record live elephant sightings. Estimates of elephants were made from direct observation and through indirect signs, particularly elephant tracks. To determine the distribution and movement patterns of elephants, their visible tracks were recorded in different habitats. Any signs of the presence of animals and the location and direction of movement were made using the techniques outlined by Whyte (1993). Signs of elephants on dirt roads and game paths were recorded at two-week intervals between July and December 2002. Because there were no serviceable roads, most of the fieldwork was carried out on foot.

To estimate the age structure of the elephant herds, measurements of impressions of hind footprints left in the mud or dust were taken using the techniques employed by Western et al. (1983).

### ***Questionnaires***

We followed the approach of Cumming et al. (1984) and used questionnaires to obtain additional information on elephant deaths, poacher activities, the presence or absence of elephants in areas close to villages, elephant distribution, movements and population sizes.

## **Results**

### ***Law-enforcement personnel, patrol effort and scout efficiency***

In Mago National Park, the number of scouts deployed increased from 8 (270.3 km<sup>2</sup> per scout) in 1996 to a maximum of 23 (94 km<sup>2</sup> per scout) for the year 2002. Twelve wildlife scouts were recruited in late 2001 and were trained in the main quarter of the park. The number of scouts in Omo National Park, however, declined from about 40 (152 km<sup>2</sup> per scout) in the 1970s to 11 (370 km<sup>2</sup> per scout) in 2002. Consequently, the area covered per scout in 2002 in Mago National Park was reduced to approximately a third of that in 1996 while the area covered per scout in Omo National Park doubled in the period from 1970 to 2002. The increase in the number of scouts in Mago was made possible by a project funded by the US Fish and Wildlife Service, which stipulated the increase of scout numbers as one of its conditions for support to the park.

Until 1998, patrolling in both national parks was conducted almost regularly. However, after two scouts were killed (in 1998 and 2002) during anti-poaching patrols, patrols became irregular and were dependent on the number of poachers inside the park and the level of threat that they were perceived to bring to bear on the scouts.

The minimum number of effective patrol days per month of patrol conducted in both project areas during the study period was 16 and the maximum 32. This is about 31% of the maximum sustainable effective patrol days per scout per month. The minimum patrol hours per day in four sample areas of both parks was 14 and the maximum 96 (fig. 2). The average minimum hours spent for a day patrol in Mago were 4.20 and the maximum 8.25. Much effort was made in

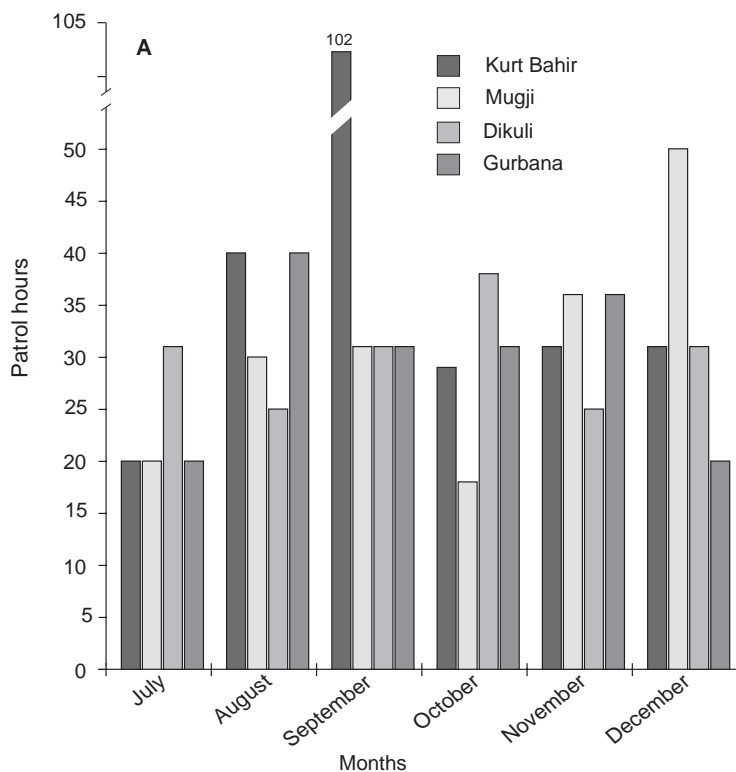


Figure 2. Patrol effort in hours per month in sample patrol areas in Mago National Park, 2002.

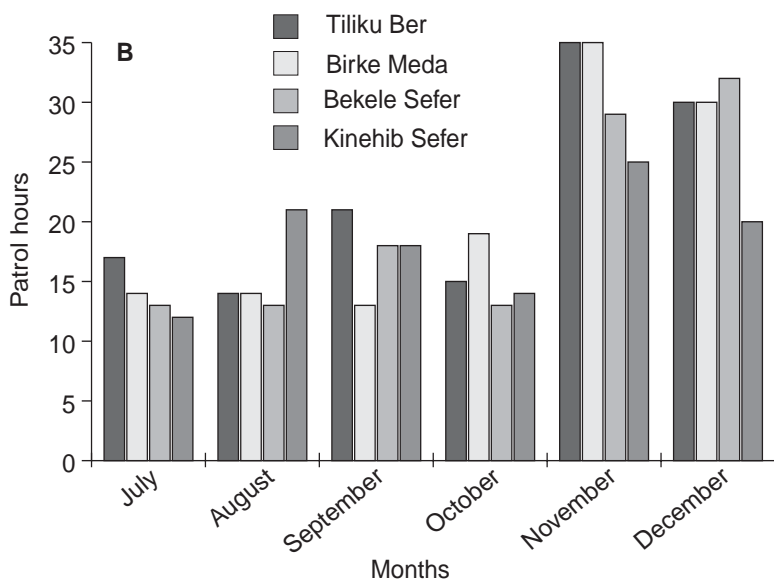


Figure 2. Patrol effort in hours per month in sample patrol areas in A) Mago and B) Omo National Parks, 2002.

Gurbana and Kurt Bahir localities, both of which are a considerable distance from park headquarters. In Omo National Park, maximum efforts were made at Tiliku Ber. The average maximum number of hours spent on patrol was in November and the minimum in December. The length of stay of the patrol team varied depending on the relative distance of the given patrol area from the main headquarters. The shortest patrol distance in any patrol area was 5 km.

No scout camps (outposts) exist in either park, and the scouts are therefore limited to patrol activities in the relative vicinity of the park headquarters, where they are housed, which means less than optimal coverage of more distant areas.

### Illegal activities and sentences for wildlife offenders

Patrols recorded different kinds of illegal activities during the study period. The level of illegal activities was high in both parks. Only two firearms were confiscated during the project. These came from offenders in Gurbana locality, Mago National Park, in September 2002. Four offenders were caught in the field by a patrolling team—in Mago National Park, one was from Mursi District and two from Bena; the offender in Omo National Park was from Surma District. These offenders are currently facing prosecution in court. However, only three of the offences were recorded as ‘serious’, involving hunting with firearms. Evidence was found that heavily armed groups from areas to the east and west of the parks were hunting.

In Mago National Park gunshots, recorded mainly in September, constituted the largest number of indicators of illegal activity. There were also exchanges of fire between

poachers and park scouts (fig. 3). In October, 27% of the total number of human footprints were recorded, suggesting a peak in illegal activities. In July, 34% of the confrontations with offenders took place. The highest number of animals killed (9) was in August. No illegal hunting with wire snares was detected. However, this was probably because the patrolling team did not easily detect them. Data obtained from the judiciary office of Bako-Gazer District show that only one elephant killing was recorded in 2002. The corresponding punishment was recorded as USD 175—a maximum punishment recorded by this office. However, reliable information on elephant killing during the study period was not available.

Encounter rates of illegal activities were high in Mago National Park during the study period, recorded as encounters with armed groups; the discovery of poaching camps, human footprints and dead animals; and gunshots heard.

Indicators of illegal activities were abundant in all study localities of Omo National Park. In Omo, many gunshots were heard, 49% of which were recorded in September. Most of the footprints noticed were in August and November (fig. 4). Few poachers were encountered in the field, however, because few patrol scouts were available to cover large areas and support from district and zonal offices was lacking.

The high number of offenders in both parks suggests that the need is urgent to increase the number of field scouts required to maintain large patrol groups.

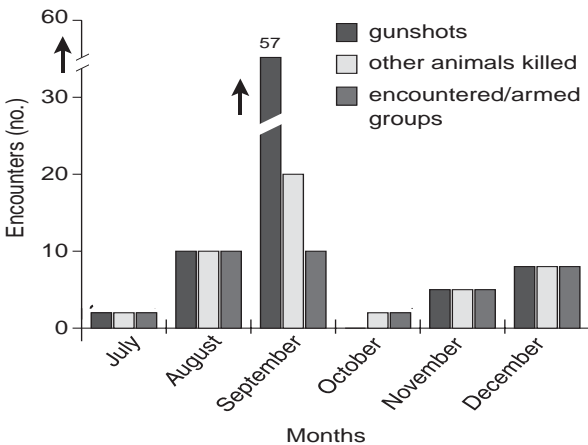


Figure 3. Serious offences recorded in sample sites in Mago National Park, 2002.

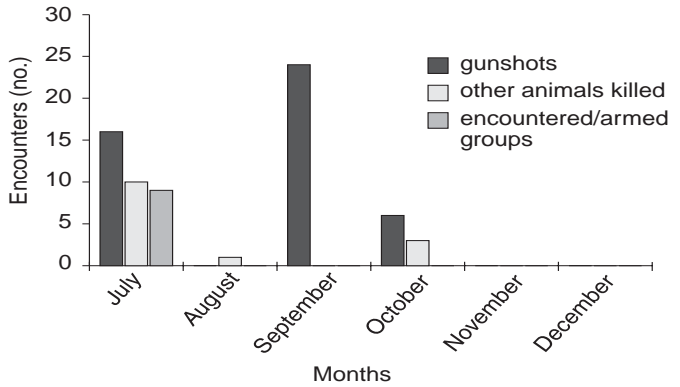


Figure 4. Serious offences recorded in sample sites in Omo National Park, 2002.

### Poaching and the origin of offenders

During this assessment, no direct evidence was obtained of elephants being killed. However, unconfirmed reports were received of three elephants killed in Bena District, Mago National Park. Among other species of wildlife, lesser kudu have been subjected to poaching in Mago National Park and tiangs (a hartebeest) in Omo. These species of large ungulates are generally numerous. Because of an anthrax epidemic in Mago National Park, however, the population of lesser kudu is declining. Records of poached animals for the three years from 1999 to 2002 are given in figure 5; they indicate that most animals were killed in 2000/01. According to these figures, nine elephants were killed by poachers from Bena and Hamer Districts in 2000/01.

About 57% of the offenders in Mago National Park came from Bena District, 25% from Bako-Gazer and the remaining 18% from Hamer and Sala-Mago (fig. 7).

Wildlife offenders arrested in the study areas were usually tried by appearing in court in the district where they were captured. The origin of intruders into the park is verified by patrol teams by following their footprints to the villages they come from. The only available information was for wild-life offenders prosecuted in Bako-Gazer District but most of the poachers originated from Bena District. During the period from 2000 to 2002, there seemed to be a relative increase in the number of offenders coming from Bena District, with the highest increase in 2002. The number of offences in 2002 were 33% more than in 1998 and 11% more than in 2001. This corresponds to an increase in the number of offenders and poachers originating from four districts from 1998 to 2002 (fig. 6). This trend was mainly because the agriculture bureau of the regional

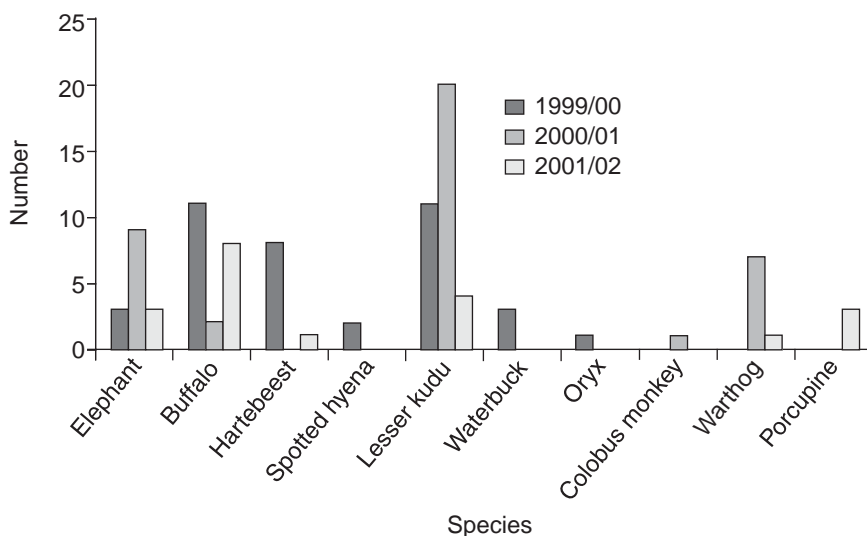


Figure 5. Records of illegal hunting in Mago National Park (1999/00–2001/02, annual park report).

government was scarcely aware of the problem and thus the law-enforcement efforts it undertook were weak. Offenders captured in the field by conventional patrols most frequently came from the two surrounding districts of Bena and Bako-Gazer.

The most aggressive intruders into Omo National Park (fig. 7) are of the Surma ethnic group, who enter the park from the west during the dry season. These people, hunters by tradition, are said to be responsi-

ever in 2001, the Arkisha-Giste area had the highest number of encounters with offenders.

In Omo National Park, 67% of the offenders captured came from Kuraz District (fig. 7); 70% were equipped with modern automatic weapons. In particular, the Surma exhibited high levels of aggression towards law-enforcement personnel, and anti-poaching patrols deliberately avoided contact with them.

Records of elephant ivory were obtained at five localities—four district police offices neighbouring Mago National Park and the park office (fig. 8). The tusks had been confiscated from either poachers or merchants in communities adjacent to the park. Similar information collected from the district offices of agriculture revealed that 64% of tusks were confiscated or kept by the park office.

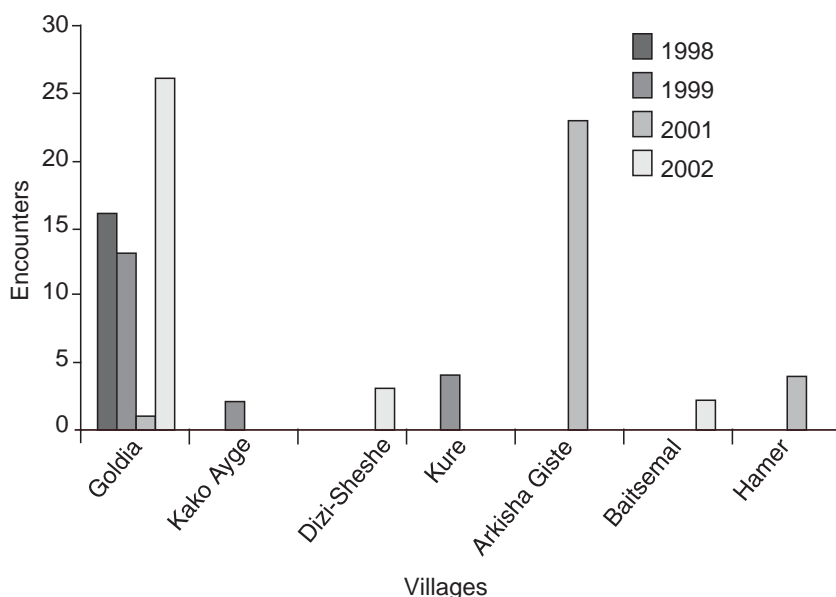


Figure 6. Confronted offenders in Mago National Park. The first three are in Bena District, the next three in Bako-Gazer, the last in Hamer.

**Existing proclamations and sentences for wildlife offenders**

Few of the offenders arrested by anti-poaching patrols are actually sentenced in district



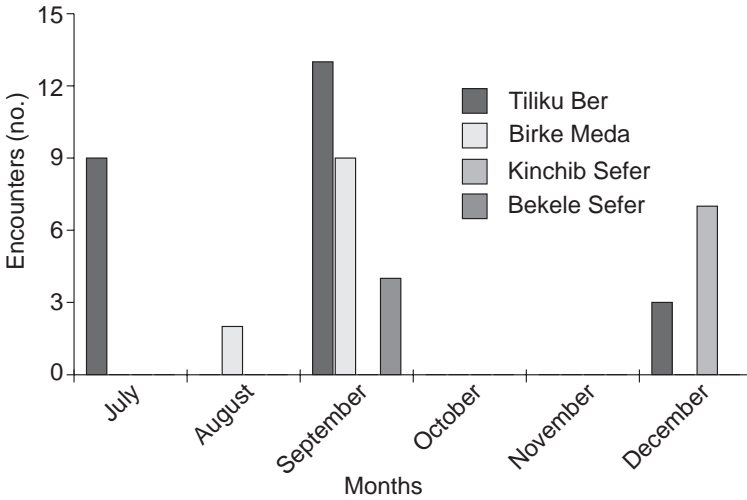


Figure 7. Confronted offenders in Omo National Park.

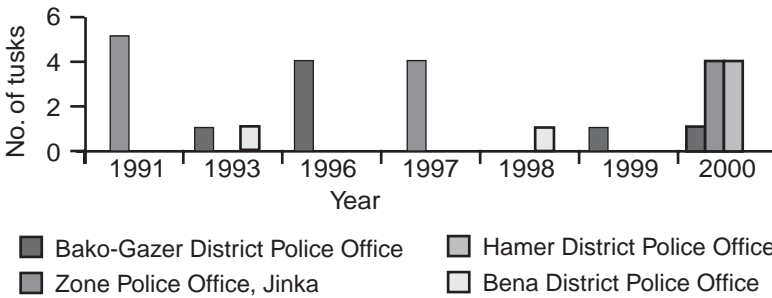


Figure 8. Confiscated elephant ivory, as recorded by district police offices and the Mago National Park office. Some 16 to 18 tusks were also stored in the park store.

and zonal courts. The files of the Bako-Gazer District Judiciary Office mentioned only 17 cases, in which almost 85% of the offenders were acquitted for various reasons, such as inadmissible evidence or loss of trophies. The court outcome ranged from having the case heard in court but without a fine to fine with ‘in default’ imprisonment and custodial prison sentence. During the time of this project, only one Mursi hunter was given a prison sentence, which was for four months, and only one offender was charged with a wildlife-related offence, which involved smugglers attempting to transfer ivory to merchants. The offender was charged USD 175 by the zonal court at South Omo. This was the maximum fine ever imposed in the entire region for a wildlife-related crime.

Fines and punishments in the Ethiopian Wildlife Act are summarized as follows:

*Proclamation No. 416 of 1972* is a wildlife conser-

vation regulation, issued pursuant to the Game Proclamation of 1944 and the Wildlife Conservation Order of 1970. It describes categories of conservation areas—national parks, game reserves, sanctuaries and controlled hunting areas. Under chapter 2 of this proclamation, no. 5(2) prohibits residence, hunting and other human occupation in a national park. No person shall reside, hunt, cultivate, graze livestock, fell trees, burn vegetation or exploit the natural resources in any manner within a national park unless such activities are purely to develop and manage the park. Any person who contravenes or fails to comply with any provision of these regulations shall upon conviction be punishable in accordance with the provision of article 364 and other relevant provisions of the penal code. The court shall in addition to any penalty hereunder order the confiscation of any weapon with which the offence has been committed.

*Proclamation No. 94 of 1994* is a forestry conservation, development and utilization proclamation. Part 2 no. 7(d) of the proclamation states that the ministry or the appropriate regional body is responsible for protecting rare or endangered endemic plants, animals and bird species, and genetic resources in general. Part 4 of Article 13(2d) of this proclamation prohibits hunting of wildlife within a state forest.

In both national parks, a distinction is made between people caught hunting and those simply entering and moving about within protected area boundaries. For lack of a better option at present, honey collectors are given access to both parks, in spite of the likelihood of disturbing animals. Unlawful entry into a national park is limited to offenders captured in the park committing illegal activities. Unlawful hunting and unlawful possession of trophies are related to offenders who are arrested while hunting in national parks. According to Proclamation 416/72, the fine can be up to USD 581 or 2 years of imprisonment or both. In practice, however, the minimum sentence for illegal killing of wildlife and

the unlawful possession of trophies is dependent on the goodwill of the court.

In general, these penal acts are not efficient in protecting the country's wildlife resources, as the penalty structure for wildlife protection in Ethiopia is not a sufficient deterrent for wildlife offenders. There is no sentence for unlawful possession of firearms in a national park as long as one has not been caught engaging in hunting activities. People are free to hold different types of weapons, and traditionally even children tending livestock carry arms. In both national parks, the chance of arresting poachers in the field is small. When an anti-poaching team encounters poachers, the team tries to capture them peacefully, but if this fails the team may give chase and even open fire.

### **Population estimates**

During this study only four elephant sightings were made, three in Mago National Park where six separate sets of elephant tracks were also found. The highest number of elephants the park staff in Mago National Park counted by direct observation during a single day (14 September 2002) was 167 (112 from Neri and 55 from Mugji). The educated guess of the park staff during the study period for the total number of elephants believed to exist was about 200. In Omo National Park there were only two signs of elephants. A small herd of one family unit visited the area close to park headquarters in August 2002, and in September 2002, a group of 324 elephants entered the park following the usual route.

The elephant population estimate was 200 for Mago and 324 for Omo; density estimates were 0.092/km<sup>2</sup> for Mago and 0.079/km<sup>2</sup> for Omo.

### **Age structure of elephant population**

Only 45 elephant footprints were seen in Mago National Park and 54 in Omo. The populations of both parks fall into two main age groups: subadult and adult. Over 38% of the measurements for Mago were adult male elephants and 34% for Omo. Estimates from this figure would make the proportion of adult to young nearly 11:1.

### **Distribution and movement routes**

At the time of the study, elephants occupied only about 48% of the Mago National Park area. Signs of elephant presence were common only in the central and south-

ern portion of the park along the Neri and Omo Rivers. In these areas, however, the animals are found year round with a peak occurrence during the rainy season (March to May). During the study period there was unusual rain in November and December, and signs of elephants were confirmed only in the south and adjacent areas lying outside the park. Judged by the evidence, elephants spent almost two months at the southern edge of the parks including the Gayasam area, the area located between Lebuk and Caro villages. Elephants visited the three sample sites more commonly than other sections of the park. During this project period, elephants completely abandoned areas to the north because the Mursi made incursions into this section of the park. Only one migratory route was identified between Mago National Park and the Gayasam area, where the elephants stay for no longer than one month. This movement may take them about 16 km outside the park boundary. In general, elephants in both parks roam more widely during the rainy season, including into the plains south of the foothills of Mt Mago (fig. 1). The elephants generally feed at night and shelter in dense riverine forests during the day. These movement patterns are believed to be related to increased disturbance by people during the rainy season.

No resident elephants were observed in Omo National Park. During the study period, only three signs of elephant presence were noted. Live elephants were observed only once, in September 2002. The other two signs were tracks. Elephants in Omo normally cross the Mui River through park headquarters during dry seasons. However, they were also observed crossing the same river in September 2002 during the wet season. Two new migratory routes have recently been identified from local reports. The first starts from Irisi (fig. 1), a forested and stable area on the west border of Ethiopia. Information gathered suggests that poachers do not use this remote area, which is considered unsafe. The migration corridor continues eastward to the park and crosses the Mui River, heading down towards the Omo River. As it approaches the Omo, it turns south towards the Neruz River (Gim Wuha), and runs parallel to the Omo. From here, the route proceeds westward to Irisi via Mukecha Wuha. No information exists on whether the elephants ever venture farther west into Sudan. There is also no evidence of an established wet-season movement in this park. The second route also starts from Irisi. According to the Bume people, elephants move from Irisi to the Neruz River in search of water and return to Irisi following the same route. Mukecha Wuha,

situated between Irisi and Neruz (Gim Wuha), is used as a corridor for moving back and forth between the two areas. There is no reliable information as to whether the elephant population occurring north of Omo National Park in Kulo Konta District is connected with elephant groups that move between Irisi and Omo National Park.

## Discussion

### **Law-enforcement efforts (scout forces and running costs)**

The number of scouts deployed in both national parks is too few in areas with serious poaching activities to provide adequate protection against illegal activities—23 scouts for Mago, 94 km<sup>2</sup> per scout, and 11 scouts with 370 km<sup>2</sup> per scout for Omo National Park in 2002. Unlike the Ethiopian situation, the number of scouts employed in Zambia in the Luangwa Integrated Resource Development Project (LIRDP) in 1992 was 286 with staffing density of one scout per 33.3 km<sup>2</sup> (Jachmann 1998), which was a successful period for law enforcement and elephant conservation in that area. Hence, considering the current situation in Ethiopia, 42 additional scouts need to be recruited for Mago National Park and 110 for Omo for law enforcement to be effective in the two parks.

The severe lack of workforce is linked to insufficient operational budget allocated to these areas. The total annual recurrent budget allotted for the year 2002/03 for Mago National Park was only about USD 23,343, and only USD 25,969 was allotted for Omo National Park. This means only USD 11 per km<sup>2</sup> a year for Mago and USD 6 for Omo. In contrast, law-enforcement expenditure allocated for elephant conservation in LIRDP for the year 1992 was USD 651,605 or USD 46.50 per km<sup>2</sup> a year (Jachmann 1998). Therefore, to attain the required level of law enforcement, considering such aspects as the country's economy and security situation, it is recommended that an annual operational budget of USD 100,533 be allocated for Mago National Park and USD 189,115 for Omo.

In addition to the obvious inability to prevent illegal killing, the lack of workforce also contributes to the lack of data necessary for any kind of action to conserve and manage elephants. A minimum of three scouts at each park should be trained to collect and analyse data. The presence of these trained investi-

gators would further help shed light on the exact type and level of effort required to reduce illegal killing. An informer network should be nurtured to help find out more about the nature of the illegal activities in the area, but this requires a proper incentive scheme. Through such a system informers can be paid rewards for bringing about positive law-enforcement actions, such as arrests and confiscations of firearms and trophies, or for information that eventually leads to arrest or confiscation of firearms and trophies (Jachmann 1998).

In the project areas, the total absence of outposts and the consequent lack of regular patrolling in the more remote areas have contributed to the extremely low performance of the scouts and the overall decline in law-enforcement effort. The longest patrol organized in Mago National Park during 2002 took four consecutive days. Patrols of equal duration were never conducted in Omo National Park during the period covered in this project. Security of the patrols is poor and poachers often possess more modern weapons than the law-enforcement staff.

The ability of patrol teams to carry out long-distance movements is further hampered by the lack of porters who have in the absence of vehicles traditionally helped to carry supplies and materials necessary for longer-term anti-poaching operations. The porters were all dismissed in 1998 due to budgetary constraints. This has clearly had a negative effect on the motivation and morale of law-enforcement personnel.

The parks' own patrolling records show a great deal of variability between the two parks and the different areas. In Mago National Park, more poaching has been observed in Gurbana along the Neri River, and in the Kurt Bahir and Dikule localities. Patrol activities in the Mago and Mugji areas were, however, erratic because of the high expenses and large number of scouts required. Since 2002 patrolling in Omo National Park has been limited primarily to within a 10-km radius from park headquarters.

Illilbai Plain and Tiliku Ber, the areas of this national park farthest from park headquarters, were the least patrolled (fig. 3).

### **Penalties for wildlife offenders and existing proclamations**

Court cases relating to illegal killing of wildlife in the areas in question have been inadequately documented because of the lack of prosecution personnel and the

general insufficiency of the Wildlife Act of Ethiopia. All activities in national parks except those related to park management and photographic tourism are illegal. To protect these areas the government of Ethiopia has issued proclamations and regulations (Negarit Gazeta 1972, 1980, 1994). However, these are out of date and crude in form and no longer efficiently protect the country's wildlife resources. The penalties for wildlife crimes are insufficient. For example, a poacher who kills an elephant is punishable with imprisonment not exceeding two years or a fine not exceeding USD 581 or both. Proclamation No. 416 of 1972 sets an additional penalty for offenders such as the confiscation of any weapon with which the offence has been committed. In comparison, in Zambia illegal entrants into national parks are charged a fine of USD 113 plus imprisonment amounting to an average of 14.6 months (Jachmann 1998). The punishment is much more severe if one is proved guilty of killing an elephant.

### **Illegal activities**

The number of patrol days per month deployed in this project was significantly lower than the normally accepted minimum required to detect a significant number of illegal activities, including detection of elephant carcasses. As recommended by Jachmann (1998), an acceptable minimum is between 10 and 13 effective patrol days per scout per month. Therefore efforts should be made to increase the patrol efficiency and frequency in both parks. During the study period, daily 24-hour guarding duties were recorded at the headquarters of both parks. The main gate was guarded 24 hours a day in Mago National Park only.

In Mago National Park, it was common to hear gunshots on more than 66% of the patrol days. September, August and December were the months with the highest number of illegal incidents (illegal hunting and high presence of offenders). In Omo National Park, most of the illegal activities were greatest in September and July. These activities were particularly gunshots, which relate to illegal killing of wild animals. Minor offences like illegal entry into the parks, as indicated by footprints, highest in August and December. The reason for the presence of many footprints but fewer poaching activities during August may be explained by the fact that August is the peak honey-collecting season.

In Mago National Park over 50% of the offences originated from poachers based in Bena District; next

were those based in Bako-Gazer and Hamer Districts. Most of the wildlife-related court cases were also recorded in these districts. Hence the allocation of resources and efforts should be directed towards these areas. The Kuraz, Surma and Mursi were found to be the ethnic groups most actively engaged in illegal activities in Omo National Park, and therefore law-enforcement efforts should perhaps best be focused in areas frequented by these tribes. One of the scouts engaged in investigation duties at Mago National Park was attacked and seriously beaten by Bena tribespeople.

The security situation in both parks is precarious, and the small and isolated anti-poaching teams are constantly at risk of being attacked, especially in the more remote parts of the area. Moreover, the present infrastructure is not adequate to give distant patrols efficient support. Experience from the Luangwa Integrated Resource Development Project in Zambia has shown that concerted law-enforcement efforts over several weeks in a given area act as a strong deterrent to poaching as they give the impression of a constant presence of patrols in the area (Jachmann 1998). In addition to normal daytime patrols, we strongly urge that the anti-poaching patrols conduct overnight patrols, at least to the areas with the highest rate of illegal incidents.

Poaching of large wild animals in Ethiopia dates back to the early 1900s (Largen and Yalden 1987). During the early period when the first conservation areas were established in Ethiopia, local people did not possess modern firearms, and thus poaching constituted a fairly insignificant threat to the wildlife in the country. Without firearms, poaching, particularly of elephants, was a risky and time-consuming activity. Even though the wildlife conservation and management activities implemented during the *derg* regime were blamed for lacking a participatory approach, the protection awarded to national parks and the attention given to wildlife resources were comparatively high. Not only were wildlife conservation activities forcefully implemented but also the punitive measures were so serious that they suppressed the amount of illegal killing. Following the fall of the *derg* regime, and during and after the transition to the present government, however, people living adjacent to areas with wildlife started to practise destructive hunting techniques using modern automatic weapons. The demand for and supply of such weapons is large scale and facilitates rampant smuggling. This wors

ening trend is continuing and will rapidly lead to the extinction of Ethiopia's elephants if left unchecked.

Unless the Surma and Bume people who live adjacent to Omo National Park are disarmed and also the Hamar, Bena, Mursi and Caro people surrounding Mago National Park, the very survival of these parks and their wildlife is highly questionable. It should become a compelling imperative for the Ethiopian government to halt the massive illegal killing of wildlife in these areas. This report confirms that Surma hunters have almost exterminated small- to large-sized animals from the north-west and western portions of Omo National Park. For example, within the past 10 years the populations of giraffes and Burchell's zebras, which were once plentiful in Omo National Park, have declined to a level at which it is virtually impossible to see these animals. In Mago National Park and the surrounding areas, Grevy's zebras and black rhinos have become extinct. As reported by Graham et al. (1997), the population of many species of large mammals is drastically declining in both national parks.

Livestock encroachment into Mago National Park is continuing to increase at an alarming rate. At present, livestock occupy about 12% of the area. Although comparable data for Omo National Park are not available, livestock encroachment into the park area is common. This invasion is much more severe in the southern and western areas of the park, which Bume and Surma pastoralists and their livestock periodically invade.

The Mago National Park office intermittently permits honey gathering, although this activity is illegal, strictly speaking, and not officially recognized or endorsed by the federal government. This disparity makes it difficult in the field for law-enforcement staff to distinguish between the honey collectors and those intruding illegally for other purposes. Collecting honey is also associated with devastating the vegetative cover. Information obtained from the staff of Mago National Park indicates that the number and distribution of beehives in the park has increased drastically from the approximately 10,000 hives estimated by Yirmed and Afework (2000a) in 1997/98.

### **Population estimates, distribution and movement**

Estimates by the staff of Mago National Park made

in 1997/98 indicate that the number of elephants existing in the park then were about 300, while the present estimate indicates only 200. This study compares with estimates made by Yirmed and Afework (2000b), and the number of elephants in the park has declined by 33%. In this study, the maximum number of elephants counted was 167 whereas in 1997/98 the maximum was 182. This again supports what has been said about the decline of Mago elephants.

The only sighting of elephants in Omo National Park was near park headquarters, where the elephants stayed for a maximum of one week. In some years it is estimated that elephants do not visit the park at all. The 1994 estimate of Cherie (1996) suggested the presence of about 350 elephants, and the present observation does not show significant deviation from this estimate. As people nearby have exerted high pressures on both parks, particularly poaching, elephant activities have been restricted to night-time—a fact that has complicated team efforts geared towards identifying sex and age.

Harassment of elephants in Mago National Park is severe; as a result elephants are always moving from place to place within the parks and in adjacent areas. There is evidence of illegal human presence at any time of the year, but the frequency is highest during the dry season as people are free from agricultural work.

Honey collectors hang their beehives and search for wild honey in the elephants' preferred riverine habitats along the Mago, Omo and Neri Rivers. These activities displace the elephants and force them to wander from place to place. Since the 1980s, the situation has worsened, as settlements and cultivated lands have closed their traditional route (Yirmed and Afework 2000a). Because of this, the range of elephant distribution shrank by 18% as compared with 1997/98 estimates, which were 1597 km<sup>2</sup> (0.3/km<sup>2</sup>).

The regularly used previous route to the north-west of Bekele Sefer at Omo National Park has now been closed as Surma people have occupied the highland area of this site. There is no tangible evidence to show whether elephants found north of this park at Kulo move south-west into the park. Elephants have totally abandoned their former site north-west of Omo, around Bebeke and Mizan Teferi, as farming communities now occupy these areas and the south-western side of these areas is also occupied by Surma people.

## **Facts about the project areas and recommendations**

Decades ago, it was said that the viewing of large animals in Omo and Mago National Parks and the variety of vegetation of the areas was exceptional in its diversity. Eland were counted in their thousands, and the world's largest population of tiang are still found here (Stephenson and Mizuno 1978; Graham et al. 1997). The areas' habitats are typical for elephants that move between Sudan and south-west Ethiopia.

The importance of Mago National Park is noted by the IUCN/SSC Antelope Specialist Group, which ranked Mago as extremely important for protecting the many antelope species, notably tiang and lesser kudu (Thouless 1995). The Mago management plan (Mago National Park 1998) and Yirmed and Afework (2000b) also confirm that this park is the only protected area in the country where the remaining small number of elephants has a reasonable chance of surviving into the future.

Unfortunately, conservation areas have faced high pressure from poaching and from settlements and cultivated lands that are expanding into both areas. Pressures are inevitable, with more than 170,000 people living in or near Mago National Park and 54,000 around Omo. Hence, it is strongly urged that present threats to large animals in the parks be minimized.

Appropriate law-enforcement measures taken to mitigate the existing serious illegal activities have been minimal, both federally and regionally. Although the extent of illegal activities varies from one conservation area to the other, the law-enforcement effort overall is similar and poor in virtually all federal and regional parks. Hence, both states should maximize law-enforcement programmes by allocating an adequate budget, increasing the number of anti-poaching wildlife scouts, and strengthening serious law-enforcement measures.

As the result of Proclamation 4/1993, which dictates the duties and responsibilities of regions and the federal system, the Ethiopian Wildlife Conservation Organization (EWCO) handed over the management of all national parks and wildlife sanctuaries to regions when these areas are located specifically within a single region. Those lying in more than one region are managed by the federal government and are under the direct control of EWCO. However, some regions, which include the Southern Nations, Nationalities and Peoples, do not have sufficient conservation meas-

ures. As a result, wildlife conservation in Ethiopia has deteriorated to the point that the larger animals are seriously threatened. Hence it is recommended that management of wildlife conservation areas like Mago and Omo National Parks be returned to EWCO in the federal government. As neither of these conservation areas has yet been gazetted, the government should do this.

Sustainable conservation of elephants in Ethiopia, particularly in Mago and Omo National Parks, should be put into practice. Hunting elephants, for example, can be permitted in the Murle Controlled Hunting Area, an area adjacent to Mago National Park, if the hunting is well controlled. Before elephant hunting in Ethiopia was banned in the late 1990s, an elephant was legally hunted for USD 10,000. Thus, selling permits to hunt two elephants could cover the cost of putting into place two health clinics or four boreholes or two elementary schools for a community located near the parks. Protecting elephants also has the advantage that it promotes the tourist industry. The number of tourists has grown in Mago National Park. Tourists go to see wild animals and the unique cultures and traditions of the nearby people. If the two parks develop facilities for accommodating tourists, they will receive considerable income from this enterprise, which will in turn open job opportunities for people living near the parks. This again will enable the park offices to initiate social services for nearby communities like building health and education facilities and supplying water. Such efforts should be sustained collaboratively for long-term, sustainable conservation.

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