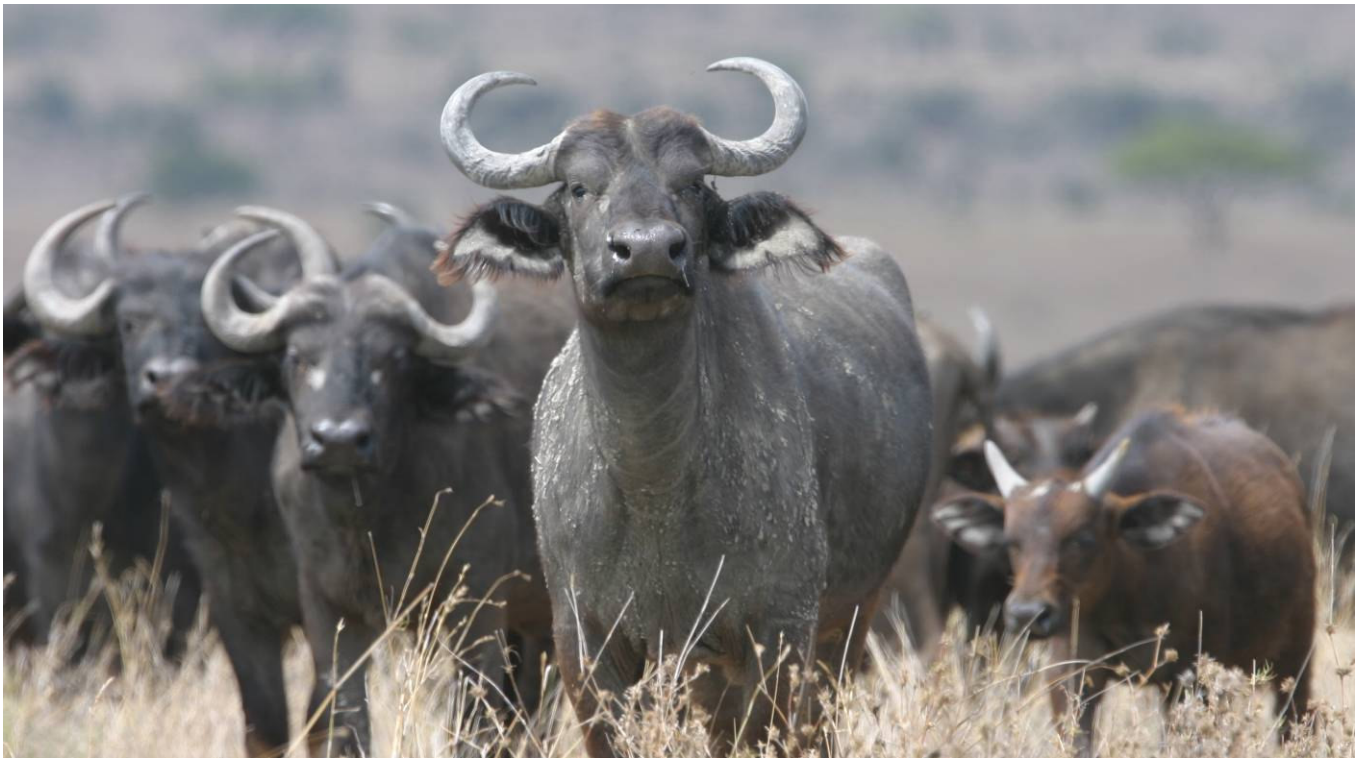
Darwin Initiative Annual Report

A NATIONAL PLAN FOR MAMMAL CONSERVATION IN TANZANIA
THIRD ANNUAL PROGRESS REPORT

April 1st 2007 – March 31st 2008



Zoological Society of London

In collaboration with

Tanzania Wildlife Research Institute

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The Darwin Initiative for the Survival of Species

Darwin Project Information

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Project Title	A national plan for mammal conservation in Tanzania
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Project Leader Name	Sarah Durant and Charles Foley
Project website	www.tanzaniamammals.org
Author(s), date	Dr Charles Foley, Dr Sarah Durant, Mr Alex Lobora, Dr Simon Mduma, March 2008

Abbreviations and Acronyms

CBD	Convention on Biological Diversity
CIMU	Conservation Information Monitoring Unit at TAWIRI
CVTM	Centre for Tropical Veterinary Medicine
DFID	Department For International Development
FZS	Frankfurt Zoological Society
GDP	Gross Domestic Product
GIS	Geographical Information Systems
GNI	Gross national income
QDGS	Quarter Degree Grid Square
MS	Microsoft
TANAPA	Tanzania National Parks
TAWIRI	Tanzania Wildlife Research Institute
TCC	Tanzania Carnivore Centre
TCP	Tanzania Carnivore Programme
TMAP	Tanzania Mammal Atlas Project
US	United States
WCS	Wildlife Conservation Society

1. Background

Tanzania is a country rich in biological resources, the importance of which is well recognised nationally. The conservation of Tanzania's wildlife resources were made a national priority soon after independence under the new president Nyerere's Arusha declaration, by which protection for extensive wilderness areas in Tanzania was assured. Since this time Tanzania has continued to show a commitment to conservation, and, more recently, the maintenance and protection of its wilderness areas are seen as an important component of the path to development, because of the increasing economic importance of tourism to these areas.

Tanzania has an extraordinarily rich mammal fauna. The country ranks 5th in Africa in overall mammal biodiversity, and the Serengeti ecosystem alone boasts the highest diversity of ungulates in the world and the greatest density in Africa. The country's conservation record is exceptional; 15% of the country has been set aside expressly for the purpose of conserving biodiversity, and almost 25% is granted some level of protective status. However, despite these biological riches, Tanzania remains one of the poorest countries in the world. In 2006 the World Bank ranked Tanzania as 18th lowest in its GNI (Gross National Income) and 4th lowest in its Purchasing Power Parity (World Bank 2007). Tanzania has a human population of 39.5 million in 2007 in an area of nearly one million square kilometres and a per capita income of $350 per year (World Bank 2007). The population is growing at 2.6% per year against a sub-Saharan Africa rate of 2.3% (World Bank 2007).

Nevertheless, Tanzania has positive economic growth and over 2004-2006 has had an average annual growth rate of around 6% per year (World Bank 2007. Wildlife tourism, particularly photographic tourism is economically important to Tanzania contributing $824 million in 2005, 25% of the total foreign revenue (Bank of Tanzania 2007; World Bank 2007). This makes Tanzania's biodiversity, particularly the large mammals sought after by tourists, economically important for the country's development. However, despite the importance of tourism, and hence wildlife resources, for the economy, conservation is, by necessity, low on the list of the country's priorities. Far more pressing needs, such as basic education and health, inevitably take precedence. Because of this, Tanzania's rapidly developing wildlife sector depends on external assistance for support. In particular, as a signatory to the biodiversity convention, Tanzania relies on support from other countries to fulfill its obligations to the convention.

Despite the importance Tanzania attaches to wildlife conservation, there is no formal national framework for mammal conservation in the country. Furthermore information on the distribution and status of many mammal species, essential for developing such a framework, is limited since Tanzania lacks capacity for monitoring its biodiversity. These gaps in capacity led to the development and implementation of this project. The project aims at helping Tanzania to fulfill its obligations under articles, 7, 8, 10, 11, 12, 13 and 16 of the Convention on Biological Diversity (CBD) by developing a national conservation action plan for its mammal species. In order to do this, national institutions need to be strengthened and capacity to monitor and conserve mammalian biodiversity increased. This project aimed to achieve this by a) developing capacity to monitor mammal distribution and status in areas where little information is available; b) establishing protocols to monitor small and cryptic species, c) collating all existing information to develop a centralised database regrouping information on distribution, status and, where possible, abundance, of all Tanzanian mammals (excluding rodents, bats, insectivores, and marine mammals). These steps have generated sufficient data to develop an action plan in 2008 that will be used as a framework to guide future conservation management and policy in the country.

2. Project Partnerships

Host Country Partner:

Tanzania Wildlife Research Institute (TAWIRI): TAWIRI is the main host country partner for this project, and the project is operated directly under TAWIRI. The project is closely involved with TAWIRI through its central aim of developing the capacity of TAWIRI to monitor mammal biodiversity. The project is based at the Tanzania Carnivore Centre, which is at the headquarters of TAWIRI in Arusha, and the project partner is the Director General of TAWIRI, Dr Simon Mduma. The project, known locally as the Tanzania Mammal Atlas Project (TMAP), operates as an effective sub-unit of TAWIRI; it reports activities to TAWIRI, exchanges information with the other sub-units, and TMAP employees all play an active role in TAWIRI operation and function.

Other collaborations with projects in Tanzania:

WCS Tanzania Program: Project leaders and the project manager are in regular contact with representatives of the WCS program in Tanzania, who have been extremely supportive of the project, and have been involved at all levels of the project's activities. Lara Foley, a staff member of WCS

Tanzania, continues to provide considerable GIS assistance to the project. The new survey team has been employed through WCS Tanzania country office (see below). Other WCS staff have continued to send in data from areas around the country, notably from the south.

Tanzania National Parks (TANAPA): The project relies on the support of TANAPA for its success. TANAPA have been extremely supportive of the project in many ways. It has continually provided free entry permits to our survey teams to all parks 2007-08 and has also assisted with logistical support in the parks, including allowing the team to set up their camps at ranger posts. The Chief Ecologist of TANAPA has been instrumental to ensure that data from all national parks are forwarded to the TMAP database.

Tanzania Division of Forestry and Beekeeping: Many of the camera trap surveys are carried out in forest reserves or forested areas around the country. These fall under the jurisdiction of the Forest and Beekeeping Division (FBD), which has been extremely supportive by providing permits for project personnel to visit all forests in the country and local forestry officials have provided assistance and logistical support on site during surveys.

The Serengeti Carnivore Disease Project: This is a project established between the Serengeti Lion Project, the CVTM at the University of Edinburgh and the TANAPA Veterinary department. Close links were already established with this project through TCP and have continued with TMAP. Members of this project conduct regular night transects in the Serengeti and have shared relevant data with TMAP. This data includes valuable records of rarely sighted nocturnal species.

Tanzania Carnivore Program (TCP): This program was established in 2002 by a former Darwin Initiative grant culminating, as in the present project, with the development of a conservation action plan. It has always been an aim of the project leader, Sarah Durant, to establish a follow on project targeted at implementing the action plan, as without proactive follow up, there is a danger that action plans, once developed, are not implemented, however there have been problems in raising sufficient funding in order to do this. This year sufficient funding was raised from WCS to appoint a full time coordinator, Rose Arthur Mosha, based at the centre and who is tasked with coordinating the implementation of the Carnivore Action Plans developed by TCP. Since her appointment Rose has taken an active role in the activities of TMAP, and TMAP have helped to support her activities by providing access to the mammal database and contributor and stakeholder network.

Tanzania Cheetah Conservation Program: This program evolved from the Serengeti Cheetah Project, and is led by Sarah Durant. The program therefore has a long history of strong partnership with TCP and TMAP. It has supported TCP and TMAP by the loan of a project vehicle over the entire reporting period, and providing a driver for the project. The previous project manager to TCP, Maurus Msuha, is now doing his PhD with this program, and both he and another PhD student, Amy Dickman, are conducting research relevant to the objectives of TMAP, conducting surveys within two priority areas, the Maasai Steppe and Ruaha region. They, together with the ongoing Serengeti Cheetah Project, have provided data to TMAP.

Tanzania Bird Atlas Project: This project has many objectives and methods similar to ours, and thus we have been in regular communication with this project from the beginning. Both projects have extensive field components, and we have sought to assist each other by collecting relevant data to the other project during field surveys.

Tarangire Elephant Project (TEP): This is a WCS project that has been operating in Tarangire for 14 years. One of the project leaders (Charles Foley) is co-PI on TMAP and TEP has provided logistical support and the time and expertise of Lara Foley in developing the database and providing GIS assistance.

Progetto Oikos: This project is run by an Italian NGO and is conducting a monitoring program in and around Mt Meru and Arusha National Park. TMAP has loaned the project some camera traps, and their personnel are some of our most prolific data contributors.

Grumeti Reserves: This is a private company that manages a large tourism and hunting block on the western border of the Serengeti. They have a full time ecologist and a monitoring team who regularly send us sightings.

Field Museum of Chicago: Through their Mammal Collection Manager, Bill Stanley, the museum has helped train the TMAP survey team in sample collection and preservation, has shared survey logistics, and has provided invaluable advice on survey sites.

Friedkin Conservation Foundation (FCF): FCF is a registered (US & TZ) non-profit, Non Government Organization incorporated in 1994 with the mission to (1) assist the Government and People of Tanzania in their efforts to conserve and protect the indigenous flora and fauna contained within protected areas, (2) actively involve local people in sustainable conservation practices to improve their economic condition and to monitor and (3) provide information about sustainable conservation practices. In 2007 TMAP signed a MoU with FCF to assist them in biodiversity monitoring in the areas in which they operate. In

particular, FCF have provided TMAP with funds to conduct camera trap surveys in FCF priority areas. Data is shared between FCF and TMAP. FCF priority areas all meet the requirements for TMAP survey area priorities.

Others: There are a number of smaller projects operating in Tanzania which work predominantly or partly with mammals. This project seeks to ensure that everyone involved with mammal research or conservation is kept informed of the project's activities and has access to the project's facilities and library resources. To this purpose, we have established and maintained links with all such projects in Tanzania. These include the Serengeti Lion Project, the Serengeti Hyaena Project, the Serengeti Jackal Project, the Tarangire Lion Project, the Serengeti Biodiversity Project, the Southern Highlands Conservation Project, the Katavi Research Project, the Gombe Research Project and the Mahale Mountains Research Project. Within the private sector, Nomad, Sokwe and Dorobo Safari companies and Ndutu lodge have provided important regular information about mammal distribution, and are important collaborators.

Other collaborations with projects internationally:

Frankfurt Zoological Society (FZS): FZS operates a number of conservation programs within Tanzania and is a key player in conservation in Tanzania. The project manager and the project leaders have ensured that FZS is informed of the project activities, and FZS has promised assistance to the project wherever possible. FZS has assisted with the importation and clearance of the TMAP project vehicle and the new TCP vehicle.

WCS International: WCS International (based in New York) has been very supportive of this project from its inception. WCS has provided substantial funding to host a workshop to develop the elephant management plan, which will be the first action plan tackled by TMAP. Furthermore, additional funding from ZSL was able to support a second survey team. This team is employed through WCS, as this organisation has Tanzanian registration, making use of the close working relationship in Tanzania and the institutional MOU with ZSL. The team is comprised of Paul Baran, Allen Mmbaga, Eliamani Soye and Rajabu Makwiro. Paul Baran comes to us after spending two years working with Maurus Msuha as his assistant for his PhD research using camera trapping surveys, for which he had already received training from TMAP.

Global 400 Wildlife Picture Index: This is a new initiative at ZSL and WCS that aims to develop tools for monitoring wildlife, based on camera trapping to address the CBD 2010 targets. TMAP and TCP have obvious interest in helping to ensure that monitoring outputs are able to feed into policy and practice at international as well as national scales. The wildlife picture index aims to do this through standardized camera trapping protocols at key international sites. TMAP is working with this initiative in the mutual interest of addressing wider international aims.

3. Project progress

3.1 Progress in carrying out project activities

3.1.1 Sub-unit of TAWIRI developed to monitor large mammals in data deficient areas using standardised methods

Training in monitoring

During the first year of the project we hired and provided further training to a three person team to carry out camera trap surveys and structured interviews to gather data on mammal distribution across the country. However, as we noted in our previous report, we fell behind on our survey schedule as we had underestimated the time needed to process the data from each survey. This involves developing the film, scanning every negative, identifying all species in the pictures, tagging every picture with the species, date, time and location, and then entering all of these data into an Excel worksheet (see data protocols submitted in our first annual report). Fortunately, due to our growing national and international profile, we were able to find sufficient funding this year to implement the solution we proposed in our last annual report – to employ, train and equip a second survey team (Fig. 1). This was made possible through three funding sources:

1. Funding for a second vehicle from HGBF funds via WCS. This vehicle was allocated to the Tanzania Carnivore Programme (TCP), but could be used for camera trap surveys as these simultaneously address objectives of both projects.
2. Funding from ZSL to the TCP linked to a new cheetah exhibit at Whipsnade Zoo. This funding provided salaries for the second team.
3. Funding for survey consumables provided by the Friedkin Conservation Fund (FCF). This arose out of a multiyear effective collaborative relationship between TCP, TMAP, WCS and FCF, leading to an

MOU whereby FCF provided funding for the project to carry out biodiversity surveys in priority FCF areas. Priority FCF areas match the priorities of TMAP – i.e. data deficient but with probable high biodiversity.

The second team was comprised of staff with whom we had a prior working relationship, either through internships at the TCC, or because they were assistants on partner projects. Hence they were not only known to be capable of undertaking these duties, but had also experienced a substantial amount of prior training before their appointment. If they were to be employed under TAWIRI, government regulations would have necessitated advertisement and an interview process, and resultant incurred costs. We therefore made use of our close working partnership with WCS, which has Tanzanian registration, to arrange WCS contracts for new staff.

Fig. 1 The second survey team with the new project vehicle during the survey of Gelai Game Controlled area. They are pictured in front of an active volcano in the region – Oldonyo Lengai.

We now have two teams of staff, trained and highly competent in implementing camera trap surveys, and, since the inception of the project we have trained a total of seven field staff and two office staff in implementing surveys. Over the current reporting period we have targeted training towards mammal monitoring for project partners and collaborators, to increase the national capacity for carnivore monitoring, and towards database management and analysis for project staff, specific training activities are described below.

We have continued to train wildlife professionals in survey techniques and loan survey equipment, targeting other research teams who are also able to contribute data for us from priority survey areas in Tanzania. Over the current reporting period, two camera traps are on long term loan to researchers in the Usambara Mountains, and four were loaned to researchers from Oikos monitoring wildlife on the western slopes of Mt. Meru. We will continue to train and loan more camera traps to interested researchers who work in areas where we have information gaps, particularly in the southern part of the country.

The project continues to host and provide training for promising undergraduates and recent graduates in the form of internships. Over this reporting period, the project has hosted two project volunteers, Emanuel Lalashe and Bonifas Osujaki, both recent graduates of Sokoine University of Agriculture and Mweka institute of Wildlife respectively, they joined the project team in October 2007 and have stayed

with us for the rest of the reporting period. They have both received training in all aspects of camera trap survey methodology, including data entry and analysis.

The continued success of this project and its predecessor, the TCP, have sparked a number of additional projects. The staff of these projects are hosted in the TCC, and assist, including the provision of additional training, in the activities of TMAP. In return TMAP assists the staff on these additional projects. All staff at the TCC are eligible for training courses provided by project partners, and the project leaders are kept informed of these courses, including potential scholarships, and, where possible, appoint attendees from the project. Training received by any of the staff benefits all staff, as staff disseminate the skills learnt after they return from coursework. In November 2007 two staff, Edwin Konzo and Eliamani Soye participated in a two week training course on the application of Remote Sensing and Geographic Information Systems to Landcover Mapping, which was held at the centre. The course introduced them to the theory of remote sensing and satellite image processing, and provided practical training in how to develop a land cover map from raw satellite imagery. As part of the course, Edwin and Eliamani geo-referenced a satellite image from the Simanjiro plains – where TCC members have carried out extensive camera trapping – and used this to produce a land cover map for the area. The skills developed by TMAP team-members on this course should prove extremely useful when analyzing the factors influencing large mammal distribution around the country.

In addition, Alex Lobora (together with Margaret Waweru, the co-ordinator of the Range-wide Priority Setting for Cheetah and Wild dog in Africa), attended a one week habitat suitability mapping course at the carnivore centre. This course was purpose designed by Nathalie Pettorelli from the Institute of Zoology, London and was aimed at providing Alex with the skills he needed for technical analysis of the substantial amount of data accumulating from ongoing camera trap survey work. Including using state of the art spatial analysis techniques such as Ecological Niche Factor Analysis (ENFA) (Hirzel et al. 2006) on presence data obtained through camera traps. This collaboration with Nathalie was key to the development of the first scientific manuscript from this work (Pettorelli et al. submitted). This manuscript demonstrates the potential of this methodology and dataset to build a predictive analysis of the impacts of climate change and human development on mammal biodiversity. Whilst Nathalie led the analysis and development of this first paper, which was on carnivores, it is intended that Alex, who has now been provided with sufficient training, to lead the analysis and development of the following paper, which will be on ungulates.

Finally, the project has a policy of allowing the meeting room at the centre to be used by partner and collaborating institutions free of charge. This attracts meetings and workshops to the centre, enabling interactions between the staff and the range of wildlife institutions in Tanzania and beyond. Over this reporting period the meeting room was used to house a meeting on carbon trading by the Tanzania Natural Resource Forum, an international WCS GIS remote sensing course, as well as a number of smaller meetings and workshops.

Developing and identifying data contributor network

The project now has a network of 250 individuals and organisations that have received project material and submitted data. The majority of data contributors are from northern Tanzania, but we continue to expand our network to regions of low coverage such as the south and west of the country, mostly through direct contact with people known to be working in those areas. Traditionally we have sent prospective participants printed data collection forms with detailed instructions on how to fill them out. However encouraging people to send in the data forms have typically proven difficult, particularly with the high number of mammal species now being surveyed. In order to facilitate data gathering, project staff have continued to visit potential participants and conduct direct interviews with them, with particular emphasis on people in the safari business who spend a lot of time in the field. This approach is proving successful and staff allocate time in their work schedules every month for these visits, gathering data from drivers and staff. A total of 70 tour companies and tourist hotels were visited over the reporting period and were persuaded to contribute data to the project: project materials such as newsletters and our mammal checklist were distributed during these visits.

Website

The project website has been extremely useful for data gathering and information dissemination. It has been developed in such a way that it allows users to fill in simple sighting information for each grid square (see 2006-7 annual report for more on the website design). The website provides frequent feedback to contributors through the provision of distribution maps. Over the reporting period, the project website www.tanzaniamammals.org has been updated significantly. Current distribution maps have been updated from the database every two months, and historical information maps and their corresponding references have now been added for many of the larger ungulate species. The picture database for each species has been expanded greatly while new species descriptions have been written and uploaded.

Newsletter production

The project has produced 1000 copies of each of the second and third edition of the project newsletter detailing information on project activities for dissemination to interested parties. Copies of the newsletter are included with this report and are available for free download on the project website (http://www.tanzaniamammals.org/content/news.php). In the most recent edition of the newsletter we published a mammal checklist for Saadani national park based on historical review and our survey work in the area. This list has been very well received and we expect to start doing this for subsequent surveys of national parks.

Camera Trap Surveys and Field Interviews

Survey sites were selected during quarterly team planning meetings, based on geographical gaps in the database, and areas thought to hold high mammalian biodiversity. Each survey usually took a minimum of 6 weeks, although the exact period depended on the number of cameras used. All surveys were planned to meet an overall aim of a minimum of 1,000 camera trap days. In all sites surveyed during this reporting period, a grid was set up with single cameras positioned at least 1km apart. A minimum of 41 cameras were used per site. Once the cameras were in place, the team conducted interviews with local villagers (targeting local residents who were more likely to be familiar with the wildlife in the region) using a standardized interview template. During this process the interviewees indicated which mammals they have seen using our photo-identification guide. We conducted a total of six surveys over the reporting period, described below, this, in addition to the total of 5 surveys conducted prior to this report, means we have completed 11 of our planned 15 surveys (Fig. 2).

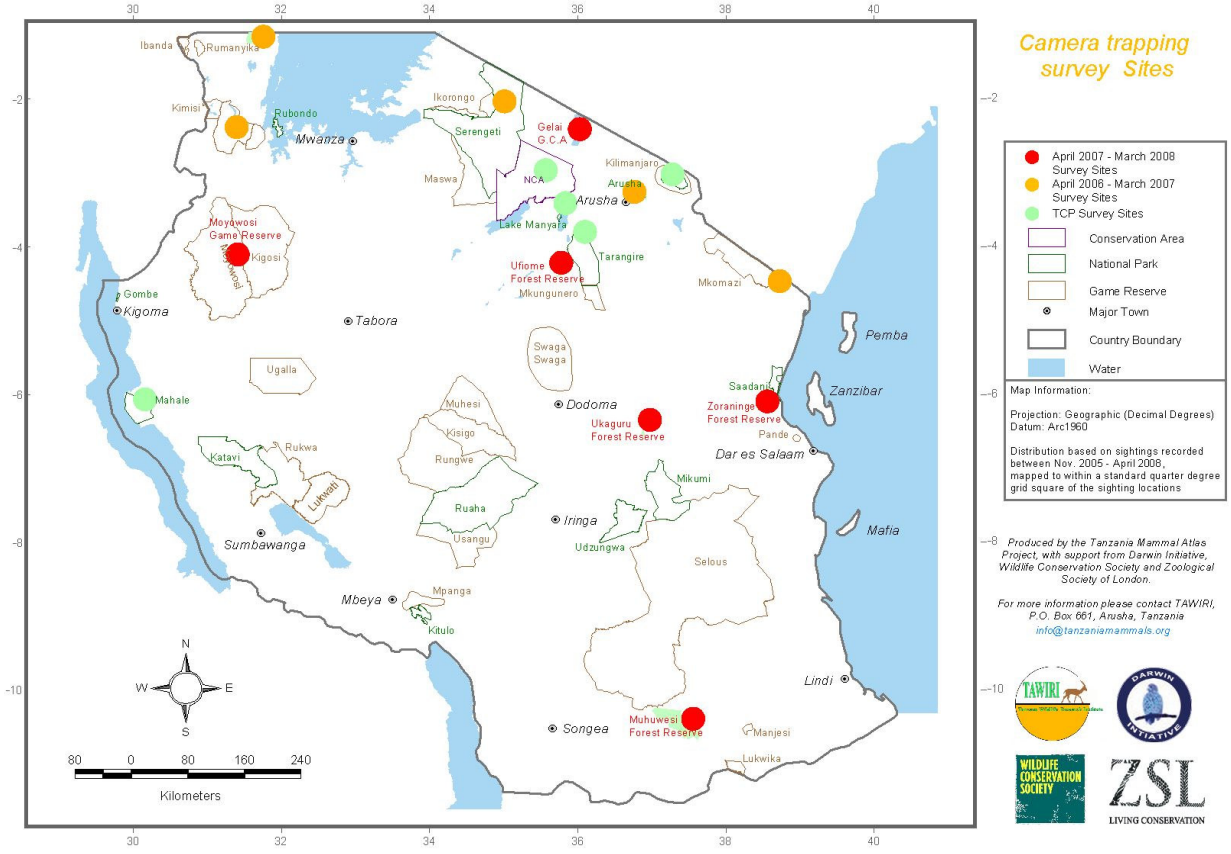

Fig. 2 Camera trapping survey sites. Green circles represent camera surveys done under TCP; yellow circles surveys under TMAP covered in previous reports; and red circles those surveys covered in this report.

After each field survey the team returns to the Carnivore Centre to process and enter data from the surveys into the survey database, and to carry out the analyses necessary for a survey report. Data are verified after entry, and then entered into the TMAP database and added to maps published on the project website at the end of every month.

Saadani National Park survey

Saadani National Park is one of the largest remaining tracts of forest on the Tanzanian coast and considered to be of high importance for biodiversity. It has an area of about 1,100 km^2 (430 miles^2) and is located on the north coast, roughly 100km (60 miles) northwest of Dar es Salaam. Protected as a game reserve since the 1960s, in 2002 it was established as a National Park, and was

expanded to encompass twice its former area by incorporation of the former Zoraninge forest reserve within its boundaries. The reserve suffered greatly from poaching prior to the late 1990s, but, since plans were established to upgrade the reserve to a National Park, there has been a marked turnaround, due to a concerted clampdown on poachers and community outreach programs. Our team surveyed the area between April and May 2007, concentrating their efforts in the Zoraninge forest, which was recently included in the National Park. This is one of the largest remaining tracts of coastal forest which had never been properly surveyed. A total of 41 cameras were set up at 1km intervals, providing data over a total of 1065 trap nights. The survey recorded 409 individual mammals, representing 19 species, providing a trap success (number individuals trapped/number of trap nights) of 0.38. Suni, Harvey's duiker and Yellow baboon were all particularly abundant throughout the park, and other notable species included the Bushy tailed mongoose and Aardvark. The project used the camera trap data and interviews with camp managers, researchers and park staff to compile a new comprehensive mammal list for the park, which was published in the project newsletter (included with this report).

Ukaguru Mountains-Mamiwa catchment forests

This survey took place over a forest reserve covering the sharp mountain ridge southwest of Mandege Forest Station in the Ukaguru Mountains. The survey area ranged from 1500 to 2250m in altitude, across the Eastern Arc forest ecoregion, a habitat with a restricted geographic range, and rich in endemic species. The reserve was chosen as, out of four Ukaguru Mountain forest reserves, it held the highest species diversity and the largest number of endemic and rare plants. The survey took place between August and September 2007 and 60 camera traps were deployed separated by 1km, providing data over a total of 1,588 trap nights. Trapping success was very low: only 131 pictures were taken, giving a trap success of 0.08, matching our trap success in Minziro Forest Reserve (covered in our last report) as the lowest recorded during our surveys. A total of 14 mammal species were recorded during the survey.

Muhuwesi Forest Reserve survey

Muhuwesi Forest Reserve covers an area of 1,700 km^2 and is located to the south of the Selous Game Reserve. It is extremely remote and difficult to access, and is the furthest survey conducted by the team since the beginning of this project. The National Government's Forest Department and the Wildlife Department hold a combined mandate over the reserve because it is classified as a Game Controlled Area, as well as a forest reserve. This means that the reserve is used as a hunting block, and is allocated to a hunting company under the management of the Wildlife Department. Our team visited the area during the 2007 dry season, from October to November, when roads are more likely to be usable, and access to the area is possible. The vegetation is characterized by low Miombo woodland with a thick grass cover. A total of 55 camera traps were set out, providing data over a total of 1288 trap nights. During the survey 441 individuals were recorded, giving a trap success of 0.34. These records covered 31 species of mammal, including the first records of wild dogs and Sharpe's grysbok since TCP and TMAP survey work began at the end of 2004 (Fig. 3). Grey duiker, Sable antelope, elephants and hippopotamus were all particularly abundant throughout the reserve.

Fig.3 Wild dogs were captured for the first time during our camera trap surveys in Muhuwesi Forest Reserve

Moyowosi Game Reserve survey

This survey was our first survey under our FCF collaboration. Moyowosi Game Reserve is located in western Tanzania, within the Malagarasi-Moyowosi wetland, part of the Zambezian flooded grassland ecoregion, and is a large and excellent example of untouched African floodplain wetlands. The wetland was the first designated RAMSAR site in Tanzania (designated in 2000) and provides an important dry season refuge and feeding area for migratory animals including water birds and large mammals. It is also an important breeding area for rare water birds including

the wattled crane and the shoebill stork. As with the previous survey, the area is remote and access is difficult. Our team surveyed the area during the short rainy season in 2007, between November and December. A total of 47 stations were placed in a 1km grid system for a period of 968 trap nights. During the survey 679 individual mammals were recorded, giving a trap success of 0.7, the highest trap success recorded over this reporting period, although below some of our previous surveys. These records covered 28 species of mammals. Success rate was hampered by the heavy rains, which appeared to trigger some of the cameras resulting in a roll of blank pictures. Olive baboons, elephants, bushbucks, giraffes and grey duikers were all particularly frequently recorded during this survey. Roan antelope and sable antelope were also photographed in the area, as well as side-striped jackals which, although probably widespread across the country, have rarely been recorded during our surveys. Because the area is so vast, the team was only able to survey the very northern section of the reserve, and did not penetrate far into the wetland. During the next dry season the team will to return to the Moyowosi to survey the southern areas, where there are reports of chimpanzees, and will attempt to place some cameras in the main wetland.

Ufiome Forest Reserve survey

This is a forest reserve in north-central Tanzania, to the east of Babati, where particularly little is known about the local mammalian biodiversity. The reserve ranges to over 2,000m. The lower slopes are covered by dense secondary thicket and scrub up to 1,750m with forest in the valleys and woodland on rocky soils. Stunted woodland and open grassland occur in rocky areas with forest clumps at higher altitudes. Dry montane forest covers the upper slopes above 1750 m. Fire and grazing appears to have played a role in modifying the vegetation of the lower slopes and the forest edge may be fire maintained. The forest itself is much disturbed by logging and there were also heavy signs of poaching. Large mammals such as elephants and buffalo were previously recorded to be found in the area. Our team surveyed the area between February and March 2008. A total of 43 stations were placed in a 1km grid system for a period of 1052 trap nights. The survey recorded 604 individuals, giving a trap success of 0.6, which is high for a forest reserve given the limited protection they receive, and recorded 24 species of mammals, which is also high for a montane forest. This proved to be one of our most interesting survey areas, as it had a high density of small carnivores (bushy tailed mongoose, large spotted genet and palm civet were all present in good numbers), and we also had our first camera trap records of African hedgehog and Tanganyika mountain squirrel. In addition to this we captured some unique behaviour of a female bushbuck appearing to play with a Greater galago (Fig 4).

Fig. 4 One of our most unusual photos was obtained during the Ufiome Forest survey. Here a bushbuck is seen interacting with a galago.

Gelai Mountains Game Controlled Area survey

The survey area is located 200km north-west of Monduli, close to the Kenyan border, and falls under the Serengeti volcanic grasslands ecoregion. Whilst the area is reasonably close to Arusha, there is limited road access, making it difficult to survey. Within the area the Gelai Mountain rises to an altitude of 2,942m. The area has no formal protection, but leased out as a hunting concession by the Wildlife Division, and is managed by Tanzania Game Trackers. Our team surveyed the area between March and April 2008, and a total of 54 stations were placed in a 1km grid system. Results from the survey will be included in our final report.

3.1.2 Centralized database of mammal distribution and status that integrates historical records, and in formation from CIMU, TCC and proposed project.

Centralised database of mammal distribution

The TMAP database manager has been continually collaborating with the CIMU database manager to extract data from previous aerial surveys; this has added a considerable amount of data into the TMAP

(a) Historical (prior to 1998) range of Cape Eland

(b) Recent (last 10 years) range of cape Eland

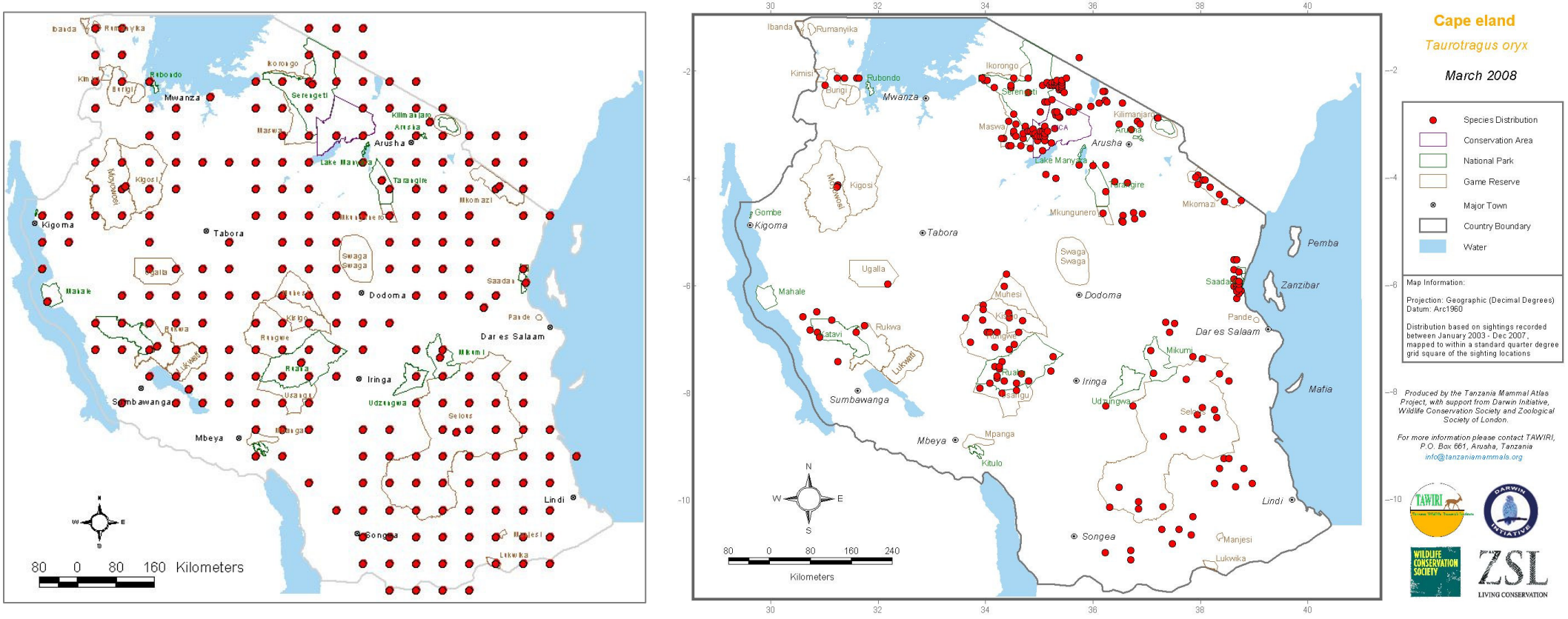

Fig. 5. Historical (a) and current (b) distribution of Cape Eland, as plotted from the TMAP database, demonstrating a recent contraction in range across the country.

database. The TMAP database has expanded significantly during the past year adding a further 9000 records and has now over 21,000 records, covering 87 of our target species. The coverage is much improved since our previous reports, showing more even coverage across the country, although there is still a bias towards protected areas where most survey work is undertaken (e.g. Fig. 5).

Historical distribution

In order to plan effectively for conservation, it is not only important to have updated maps of current distribution of species, but also to consolidate information about historical distribution. This enables the identification of marked contractions (or expansions) in range. Throughout its operation, the project has therefore also continued to collect an extensive library of papers related to mammals in Tanzania, and has located some important unpublished documents detailing historical mammal distribution in the country. Information from these documents has been extracted, and the data entered into the main database. In addition, historical maps obtained from the literature; in particular, those from Sale et al. (1977) have been digitized. As part of the preliminary planning process prior to the action planning workshops to be held in 2008, the project has accelerated this process. A graduate intern with GIS expertise was appointed to assist, Eliamani Soye, who was later appointed as project staff under a WCS contract (see above). A total of 10,600 historical records, covering 70 species, were entered into the database. All of the historical data that we have managed to locate is now included in the database and can be viewed, together with maps of current distribution, on the project website www.tanzaniacarnivores.org. An example of the recent contraction in historical range is clearly demonstrated by the cape eland (*Taurotragus oryx*) (Fig. 5). Whereas the species used to be widespread across the entire country, its range is now largely constrained to protected areas. It should be noted that our data shows presence only, and hence an absence of a record does not necessarily mean absence. Survey data is biased towards protected areas and hence maps should be used as a guide only, and need careful interpretation by experts familiar with wide geographical knowledge, a process that will be incorporated into species action planning workshops. Nonetheless, the map of the distribution of eland does resonate with the impression of most experienced wildlife professionals in Tanzania.

3.1.3 Conservation Action Plan for Tanzania's mammals developed to identify conservation priorities for each species and establish areas of data deficiency.

The conservation action plan will be developed through a participatory and consensual process, using a similar approach to the one used successfully in the previous DI funded project – the Tanzania Carnivore Programme. A series of workshops, involving key stakeholders from government, the research community, conservation NGOs and the private sector, will be conducted to finalise agreed distribution maps and establish conservation priorities. Each workshop will focus on a group of species. In total we anticipate four workshops, large ungulates; primates; rhino and elephant; and small ungulates, pangolins and aardvarks. The planning process has been started for the first in this series of workshops, for large ungulates, which will take place from the 9th to the 11th of April, 2008. This involves ensuring: government attendance for the relevant wildlife authorities; that the historical and current databases are complete; that CIMU data is incorporated into the database; and the consolidation of the scientific library for all the species concerned. Current and historic distribution maps will be prepared for distribution at the workshop. The report for this and subsequent workshops will be included in our final report.

3.2 Progress towards Project Outputs

The project is well on target with a number of its stated outputs reached, namely training of project staff, camera trapping protocol manual, integrated database and enhanced contributor network. Two further outputs have been partially achieved – biannual publication and distribution of the project newsletter and a mammal identification guide has been produced but has been circulated internally only due to concerns about copyright of some of the photographs. An on line version of the mammal identification guide is available on the project web site (including those photographs for which we have permission). A scientific paper has been drafted and submitted to conservation biology on the basis of camera trap results to date. Of our remaining outputs, a few were altered, as described in our previous reports.

In summary, we have already established an extremely effective and professional sub-unit of TAWIRI to monitor large mammals, and have accumulated a substantial database on mammal distribution in Tanzania. This unit is well integrated within the governmental sector due to our ongoing collaborative relationships with other key wildlife authorities in Tanzania, including TANAPA, WD, FBD and NCAA. The strength of these relationships is evidenced by the ease at which our teams are issued permits to enter protected areas, which are often difficult to obtain. This sub-unit is twice the size of that originally anticipated, including two fully trained survey teams and equipment, due to our success in leveraging additional funding. The project operates out of fully functional offices, and the DI funding supports five well trained staff including the project manager; a GIS and database technician; a field coordinator; an administrator; and a field assistant and mechanic. Additional funding supports a further five staff and two

interns, all Tanzanian. Data from historical sources (both published and unpublished) have been extracted, entered into the database and historical distribution maps produced. By the end of the reporting period the database holds over 21,000 records of current sightings and 10,600 records of historical sightings. The database, however, still retains a northern Tanzanian bias, reflecting the location of the project headquarters, though we are increasingly expanding coverage from other areas of the country, particularly the south.

3.3 Standard Measures

Table 1 Project Standard Output Measures

Code No.	Description	Year 1 Total	Year 2 Total	Year 3 Total	Year 4 Total	Total to date	Total planned from application
5	Project staff receives continuous supervision and varied training in all aspects of project operations, and specialised training based on their job responsibility.	6 (on-going)	6 (on-going)	7 (on-going)		9 individuals	2 individuals
6a/b	Project manager trained in Advanced GIS and modeling (2 weeks)	1/2 weeks	0	1 for 1 week		1/3 weeks	1/3 weeks
	Project team members trained in camera trapping monitoring techniques and data analysis (6 weeks)	3/6 weeks	0	6 for 2 weeks		9/8 weeks	4/6 weeks
	GIS analyst receives training in remote sensing and advanced GIS techniques (2 weeks)	0	1/2 weeks	2/2 weeks		2/3 weeks	2/6 weeks
	GIS analyst receives training in database design and maintenance	0	1/4 weeks	0		1 for 4 weeks	1/3 weeks
7	Camera trapping protocol manual, checksheets for mammal distribution database.	2	0	0		2	1
8	Dr Charles Foley Dr Sarah Durant	30 12	30 12	30 12		90 36	90 35
9	Mammal Conservation Action Plan (divided by mammal groupings or species of special importance, e.g. elephants. Goal is 4 chapters for plan by 2008)	0	0	0		0	1
10	Mammal identification guide to use during field survey interviews	1	0	0		1	1
11a/b	2 papers to be published in peer-reviewed journals describing the results of the mammal atlas and the mammal action plan.	0	0	0 (1 paper sub.)		0	2
12a	National mammal distribution database established	1	0	0		1	1
12b	National carnivore database and TAWIRI CIMU database	2 on-going	2 on-going	2 on-going		2 total	2
14a	Workshops hosted with national wildlife authorities, government agencies, and internal/external experts to draft the Mammal Action Plans. Scheduled for 2008.	0	0	0			2
14b	Number of conferences/seminars/ workshops attended at which findings from Darwin project work will be presented/ disseminated.	3	6	7		16 total	0
15a	Parliamentary and newspaper announcement about the finding of Giant pangolin in Tanzania	0	1	0		1	0

16a	Semi-annual newsletter	0	1	2		3	12
16b	Circulation in Tanzania: printed copies (also available free online)	0	1000 each issue	1000 each issue		4000	6000
17a	Data contributor network	1 on-going	1 on-going	1 on-going		1 total	1
17b	Tanzania Carnivore Contributors, Tanzania GIS users group, Tanzania Bird Atlas, camera trap users group	4 on-going	4 on-going	4 on-going		4 total	4
19a	Radio marketing will take place following the release of the Action Plan to disseminate the key findings (2008).	0	0	0		0	1
20	Computer equipment, field survey, camping equipment, camera equipment, new 4x4 Landrover	£37,872	£3,700	0		£41,572	£33,900
21	TAWIRI Mammal Survey Team	1	0	1		2	1
23	Other funding (£value) (excluding project leaders and collaborator salaries)*	£8,000	£10,000	£69,000		£87,000	£25,024

* Note that project salary support (project leaders and project collaborators) has gone ahead on track to that planned in original proposal and is excluded from the funding presented here.

In Table 2, provide full details of all publications and material produced over the last year that can be publicly accessed, e.g. title, name of publisher, contact details, cost. Mark (*) all publications and other material that you have included with this report.

Table 2 Publications

Type * (eg journals, manual, CDs)	Detail (title, author, year)	Publishers (name, city)	Available from (e.g. contact address, website)	Cost £
Newsletter	Mammals Newsbites. October 2007 to March 2008	Tanzania Mammal Atlas Project	www.tanzaniamammals.org	FREE
Newsletter	Mammals Newsbites. April 2007 to September 2007	Tanzania Mammal Atlas Project	www.tanzaniamammals.org	FREE

3.4 Progress towards the project purpose and outcomes

The project purpose was stated as 'to develop a national monitoring system of large mammals that addresses current geographic and taxonomic data gaps in order to produce a detailed distribution atlas and conservation action plan for large mammals in Tanzania'. Our activities, and any subsequent modifications, were designed and implemented to enable us to meet this overall purpose. As such, progress has been pretty much to schedule, allowing for a six month delay in the start of the project. Our surveys are on schedule, the mammal atlas, containing both historical and current records, is largely in place, and we are now initiating the action planning process, with the full support of our stakeholders. This process will follow the successful approach of the TCP, and action plans will be developed through a series of four participatory and consensual workshops for broadly taxonomically based groups: large ungulates; primates; elephants and rhinos; and small ungulates, pangolins and aardvarks. Each workshop will summarize the current knowledge for each species, assess the relevant threats to their conservation and explore tools for their monitoring and conservation. The action plan itself will be more detailed than most of those developed through TCP, and will follow a format similar to that developed in the lion and leopard workshop, including a goal, objectives, targets and specific activities. Such a more systematic approach to this process is possible due to the solid and long term relationships developed over six years of operation of the TCP and TMAP.

The first workshop for large ungulates is planned for the 9th to the 11th of April 2008: the workshop will be attended by representatives from all of the government wildlife agencies (WD, TANAPA, NCAA and FBD have already confirmed attendance), as well as by species experts and representatives of conservation NGOs. The action plan will be available within a few days after the workshop, whilst the full report will take a further two months. The planned further three workshops are scheduled to take place before October.

3.5 Progress towards impact on biodiversity, sustainable use or equitable sharing of biodiversity benefits

The project was devised to ensure that its activities met an ultimate purpose of devising monitoring and conservation strategies to ensure the conservation of all medium to large mammals in Tanzania. These strategies, if implemented, should directly meet the Darwin Initiative (DI) project final goal, i.e. to achieve the conservation of biodiversity (a). It should also partly meet the DI project final goal, i.e. to achieve the sustainable use of the components of biodiversity (b), as Tanzania derives significant financial benefits from tourist trophy hunting and its rural people derive local benefits in the form of access to protein, albeit often through illegal offtake, and increasingly from land lease deals with tourism operators. It is largely on target to meet this purpose. However a bigger issue is how to best ensure the implementation of conservation strategies which is the route to delivering clear impacts on DI goals a) and b). In Tanzania, conservation implementation is largely in the hands of the government sector, and hence requires their support and endorsement. The process devised by TCP, and further developed in TMAP, is effective in terms of attaining an endorsed national action plan that can be used to guide conservation effort, however implementation depends on follow through on this plan, and this does not necessarily automatically happen once the plan is finalised. One means of increasing the likelihood of implementation, and hence impact, is to create a post project position with the responsibility of following up on the plan and checking on progress towards implementation. The TCP has recently obtained funding through WCS for the appointment of a coordinator who has the responsibility to follow up on implementation of the carnivore plan and this post is currently operational since March 2008. The carnivore action plan implementer was employed with close collaboration with stakeholders responsible in the development of the plans and hence their cooperation is apparent.

To ensure that the action plan devised by TMAP is likely to result in sustained conservation benefits, we also aim to use the TCP model of putting in place a coordinator of the implementation of the plan with internally or externally generated funds. We are very much optimistic that this approach will work, due to the engagement, interest and active support of key stakeholders during the formulation of the plan, and due to a governmental environment that is currently extremely supportive to devising and delivering against strategic frameworks, general management plans and action plans. Indeed, the TCP coordinator has already received substantial interest and proffered support for her activities.

4. Monitoring, evaluation and lessons

The project is monitored and evaluated in the same manner as the TCP, as this strategy proved to be extremely effective in implementing this program. The activities of the project are monitored against quarterly work plans drawn up at quarterly planning meetings attended by the entire project team including project leaders. These work plans are based on the logical framework in the original proposal. Each project staff member writes a monthly work plan based on the needs detailed at our quarterly meetings, and this work plan is submitted to the project manager and project leaders who use it to determine progress. The project manager collates the information and submits monthly reports to the project leaders and ZSL which are also used to monitor progress against the work plans. In this way the entire team is engaged in the project implementation and is kept fully aware of project goals and targets and can adjust work plans and timetables to ensure that the project outputs are met. We are particularly fortunate to be able to compare our progress (thus far very satisfactory) against the baseline provided by TCP, which successfully achieved a similar overall aim of national conservation action plans for all carnivore species. Lessons learned are covered above, the key of which is that progress against survey targets is lower than anticipated due to the large amounts of data to be processed and entered after each survey. This problem has been addressed by putting in place a second survey team which is now fully operational.

5. Actions taken in response to previous reviews (if applicable)

We very much appreciated our positive last review, which raised no major queries, however there were a few issues that we would like to take the opportunity to address here, which might be of interest to the reviewer.

- Film vs. digital cameras: This has been a major debate for quite a while within the camera trapping community. Both the project leaders are in constant dialogue about the issue with other projects, and there is substantial expertise in the method at ZSL. Digital models are getting better all the time, however at the time of writing, with the exception of one make (reconyx) they all incorporate a substantial delay between the trigger – most commonly through an infrared or movement detector – and the taking of the photograph. This substantially reduces trapping success. Processing is actually no faster, because more pictures are taken with digital, and so the time saved spent scanning film, is used to inspect and file the additional photographs, and costs saved in film are spent, and exceeded, on the extra batteries needed to run digital cameras. Digital cameras also cost a lot more, and are a greater loss if they are damaged or stolen. Nonetheless, more photographs mean easier identification of species and individual, whilst the higher capacity of digital memory cards compared to film means that running out of film ceases to be a problem. We therefore continue to keep this issue under constant review, and expect to make a switch to digital as soon as a suitable model is available at the right price.
- GIS and the database: There are important advantages in linking analyses between our database and GIS and we are exploring possible options. One approach is using a habitat selection analysis based on where species are recorded, and this is the approach a project collaborator (Nathalie Pettorelli (based at IOZ is investigating). However we are aware that there is a potential danger, when using very high tech techniques, that analyses can become dominated by the UK partner. In order to avert this risk in this situation, we have made use of IOZ funds to bring Nathalie out to Tanzania to provide training to those of our staff who already have sufficient baseline skills, bringing them up to date with the techniques. The training so far has worked very well, and although this slows down the production of scientific outputs, this is a small price to pay to continue to ensure an equal partnership. Furthermore, project staff very much appreciate having the opportunity to learn new skills, which helps to maintain interest and enthusiasm for the project. Our first manuscript covering this analysis has been submitted to Conservation Biology, we will make it freely available should it get accepted. The writing and analysis of our second manuscript will be led by the project manager.

We would be happy to collaborate with the reviewer about these issues should s/he wish to get in touch.

6. Other comments on progress not covered elsewhere

Full list of project staff on TMAP and associated projects:

TMAP, funded by Darwin Initiative

Alex Lobora, Project Manager
Edwin Konzo, GIS and database officer
Godwin Eliamani Soye, GIS and database support
Flora Kipuyo, Project administrator
Zawadi Mbwambo, chief mechanic, driver and field assistant
Eshmael Kipuyo, Gardener
Boniface Osujaki, project intern
Emmanuel Lalashe, project intern

TCP, funded by ZSL, WCS contracts (second survey team)

Paul Baran, Field Assistant
Allen Msafiri Mmbaga, Field co-ordinator
Makwiro Rajabu, driver and field assistance
Rose Arthur Mosha, Coordinator of the Tanzania Carnivore Conservation Action Plan

TCCP, funded by WCS, TAWIRI contract

Jumanne Ramadhani, driver and field assistant.

Range wide conservation planning for cheetah and wild dogs, funded by WCS and St Louis Zoo

Margaret Waweru (as a Kenyan, the only non Tanzanian project staff), RWCP coordinator

Previous employees:

All previous employees on TCP and TMAP remain in conservation, and are completing further studies:

Maurus Msuha, ex carnivore program manager (TCP), currently in final year of his PhD at IOZ and UCL in the UK 'Effects of Land use changes on Carnivore Biodiversity in the Tarangire ecosystem, Tanzania'.
Chediel Kazaeli, TCP field assistant, TAWIRI employee, engaged in studies for first degree in Tanzania.
Jerome Kimaru, TCP education officer, TAWIRI employee, currently completing his masters degree in Tanzania.
Mwemezi Rwiza, TCP field co-ordinator, currently completing his masters degree in Norway.

7. Sustainability

TAWIRI, our main partner organization, has already shown its commitment to the project by having made four of the TMAP project staff permanent TAWIRI employees, as documented in our last report. TANAPA has also been extremely pleased with the results of the project to date, particularly the fact that TMAP is playing a pivotal role in developing comprehensive mammal species lists for the National Parks, something that has thus far been sorely lacking. TANAPA is becoming increasingly involved with TMAP and has now requested all its park ecologists to use and contribute to the project database.

The results of our camera trap surveys have attracted a lot of attention and we continue to envisage that the survey program will become a core long-term activity of TAWIRI. We anticipate it functioning in a similar manner to CIMU, obtaining core costs from biodiversity surveys commissioned by wildlife management authorities or NGOs. The funding recently provided by FCF fits this model. Further funding has been acquired for the following year from St. Louis Zoo to conduct a survey of the Uluguru Mountains. Alex Lobora, the project manager, also recently submitted a proposal to Rufford for funding consideration aiming at surveying mammals in the southern edge of Tanzania, a region where we have large information gaps.

TMAP continues to be involved with an initiative developed by ZSL and WCS to devise a protocol for using camera trap techniques as a component of monitoring for the 2010 CBD biodiversity targets – the Wildlife Picture Index. This will include representation at a forthcoming international conference organized by ZSL in 2009.

8. Dissemination

The team has produced the third issue of the TMAP newsletter detailing information on the project activities. 1000 copies of the newsletter were printed for dissemination to interested parties. These include all data contributors to TMAP as well as partner organizations and potential donor organizations. PDF copies of the newsletters are available for download on the project website. Information on interesting survey findings has been presented to our partner organizations as well as the local media.

Project Expenditure

Table 3 Project expenditure <u>during the reporting period</u> (Defra Financial Year 01 April to 31 March)

Item	Budget (please indicate which document you refer to if other than your project application)	Expenditure	Balance
Rent, rates, heating, overheads etc			
Office costs (eg postage, telephone, stationery)			
Travel and subsistence			
Printing			
Conferences, seminars, etc			
Capital items/equipment			
Others			
Salaries (specify)			
TOTAL	**82,711**	**74,083**	**8,528**

Highlight any agreed changes to the budget and explain any variation in expenditure where this is +/- 10% of the budget.

Our annual budget has shown some deviation from that originally submitted for two main reasons:

1. An initial six month delay (which is documented in previous reports) meant that all the action planning workshops will be held in 2008/2009 – hence there is no expenditure as yet under the 'conferences, seminars budget' item.
2. An allocation from printing to undertaking survey work was documented in our earlier reports, and came about due to a perceived, and documented, need to prioritise information gaps over more frequent information dissemination. This explains the under spend in 'printing' and the overspend in 'travel and subsistence' and 'others' budget items ('others' includes fuel and consumables for surveys).

Decisions for all budgetary adjustments took place during quarterly group meetings, with a consensus from the project team, and were made solely in order to better address overall project aims. The resultant shifts in the emphasis of our activities were additionally supported by our annual reviews.

9. OPTIONAL: Outstanding achievements of your project during the reporting period (300-400 words maximum). This section may be used for publicity purposes

I agree for ECTF and the Darwin Secretariat to publish the content of this section (please leave this line in to indicate your agreement to use any material you provide here)

This project has continued to generate important information about mammal biodiversity in Tanzania. This includes documenting expansion to the range of several species, and combining historical and current information into a single spatially explicit database which can easily be used to document future contractions (or expansions) in species range. All this information is disseminated back to the public, both in Tanzania and internationally, via an active and attractive project website. Throughout its operation, the project has maintained very effective working relationships with government wildlife authorities, and has benefitted from their active support. The project is unusual, in that it works nationally, and actively engages both private and public sectors, in the common purpose of safeguarding Tanzania's rich biological resources. Tangible outputs include two issues of the increasingly popular project newsletter; leveraging substantial extra funding to be able to train and equip a second survey team; an increasingly extensive database; and in depth field surveys using camera trapping and targeted interviews to establish mammalian biodiversity in six protected areas, most of which have never been surveyed before for mammalian biodiversity. Less tangible outputs include a broadening international reputation, as evidenced by an increasing number of enquiries about the project and a wider range of collaborations both within and outside Tanzania. Finally, the project benefits from an exceptionally committed, well trained, enthusiastic and capable team of Tanzanian biologists.

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Annex 1 Report of progress and achievements against Logical Framework for Financial Year: 2007/08

Project summary	Measurable Indicators	Progress and Achievements April 2007 - March 2008	Actions required/planned for next period
Goal: *To draw on expertise relevant to biodiversity from within the United Kingdom to work with local partners in countries rich in biodiversity but constrained in resources to achieve* *The conservation of biological diversity,* *The sustainable use of its components, and* *The fair and equitable sharing of the benefits arising out of the utilisation of genetic resources*		The project has made good progress in data collection that will form the basis of a national conservation action plan for all medium to large mammals in Tanzania. This plan will set out priorities for conservation of each species, which, if implemented will *enable their conservation.*	*(do not fill not applicable)*
Purpose To develop a national monitoring system of large mammals that addresses current geographic and taxonomic data gaps, in order to produce a detailed distributional atlas and conservation action plan for large mammals in Tanzania.	Mammal monitoring system, which addresses current data deficiencies, in place by 2008. Distribution atlas of large mammals developed by 2008. Increased skills in mammal monitoring for TAWIRI staff through creation of a new monitoring unit. Conservation action plan published by 2008.	A functioning monitoring system has been established which targets geographic and taxonomic data gaps. We have two fully trained camera trap survey teams, a large list of data contributors, and a sophisticated database with over 21,000 entries of large mammal distribution. There are still taxonomic and regional data deficiencies that we plan to address through targeted surveys and interviews with our second survey team.	1) Conduct 4 camera trap surveys across the country 2) Initiate species action plan workshops *3)* Start drafting the first chapters of the Tanzanian medium to large mammal conservation action plan *4)* Increase and maintain the national database on medium to large mammals. *5)* Maintain and update project web site and produce one newsletter to provide feedback and encourage data contributors to supply more Information.
Output 1. Sub-unit of TAWIRI developed to monitor large mammals in data deficient areas using standardized methods	All project staff trained as implementers and trainers in mammal monitoring by early 2008. Further data contributors identified and submitting sufficient mammal sightings regularly to ensure wide coverage of the country. Mammal distribution data acquired for at least 15 target areas using remote camera traps Manual of survey protocols produced	Nine current or ex project staff have been trained in camera trap survey techniques including data collection and analysis. Database officer trained in database management, data entry and data analysis, and GIS has 250 data contributors currently identified and submitting data. There are still data deficiencies in the south and west of the country and we are actively recruiting contributors in these areas. 11 camera trap surveys completed to date. A second team has been added to help reach target of 15 by next year. Survey protocol manual completed during last reporting period.	
Activity 1.1 Activity 1.1 Camera Trap Surveys and Field Interviews		Six surveys completed this year. With the introduction of the new survey team, we fully expect to meet our overall goal of 15 camera trapping surveys by the end of the project.	

Activity 1.2 Developing and identifying data contributor network		The network of data contributors is well established and we hope with the creation of online data submission via our website that more data will be submitted. We will continue to encourage data contributions through our website, visits and presentations and request specific data from organisations or individuals who have data of interest or who have contributed in the past.
Activity 1.3 Website development		Website is online at www.tanzaniamammals.org. The website is maintained by project staff with distribution maps updated monthly or news articles updates as necessary.
Activity 1.4 Newsletter production		Third edition of the bi-annual "Mammal Newsbites" have been produced One more edition will be produced in April 2008 and October 2008.
Activity 1.4 Training		Two project volunteers, Mr. Emanuel Lalashe and Bonifas Osujaki recent graduates of Sokoine University of Agriculture and Mweka institute of Wildlife respectively, joined the project team in October 2007 and they have both received training in all aspects of camera trap survey methodology, including data entry and analysis. Two project staff, Edwin Konzo and Eliamani Soye participated in a two week training course on the application of Remote Sensing and Geographic Information Systems to Landcover Mapping. Dr. Margaret Waweru, the coordinator of Range wide Priority Setting for Cheetah and Wild dog in Africa and Alex Lobora, Tanzania Mammal Atlas Project (TMAP) Manager attended a one week habitat suitability mapping course at the carnivore centre offered by Nathalie Pettorelli from Institute of Zoology, London.
Output 2. Centralized database of mammal distribution and status that integrates historical records, and in formation from CIMU, TCC and proposed project.	The TMAP database has expanded significantly during the past year and now has over 21,000 records covering 87 of our target species.	The TMAP database manager has continually been collaborating with the CIMU database manager to extract data from previous aerial surveys and this has added a considerable amount of data into the TMAP database. The project has also continued to collect an extensive library of papers related to mammals in Tanzania, and has located some important unpublished documents detailing historical mammal distribution in the country. Information from these is gradually being extracted and the data entered into the main database.
Output 3. Conservation Action Plan for Tanzania's mammals developed to identify conservation priorities for each species and establish areas of data deficiency.		The first workshop to develop conservation action plans for the large mammals of Tanzania will take place from 9th to 11th April 2008 focusing on Large ungulates. Four workshops (Large ungulates, Small ungulates, Primates as well as Rhino and Elephants combined) have been planned in total one of which has already been conducted. The report for these workshops will be made available in our subsequent report since they do not fall within this reporting period.

Annex 2 Project's full current logframe

LOGICAL FRAMEWORK

Project summary	Measurable Indicators	Means of verification	Important Assumptions
Goal To draw on expertise relevant to biodiversity from within the United Kingdom to work with local partners in countries rich in biodiversity but poor in resources to achieve the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of benefits arising out of the utilisation of genetic resources			
Purpose			
To develop a national monitoring system of large mammals that addresses current geographic and taxonomic data gaps, in order to produce a detailed distributional atlas and conservation action plan for large mammals in Tanzania.	Mammal monitoring system, which addresses current data deficiencies, in place by 2008. Distribution Atlas of Tanzanian mammals developed by 2008. Increased skills in mammal monitoring for TAWIRI staff through creation of a new monitoring unit. Conservation action plan published and widely disseminated by 2008.	Reports summarising database records and a manual covering monitoring protocols produced. Distribution maps published and disseminated via the project website TAWIRI team conducting surveys independently as part of their annual workplan. Conservation Action Plan published by target date.	TAWIRI remains supportive and committed to the project. Key stakeholders endorse Conservation Action Plan.
Outputs			

Sub-unit of TAWIRI developed to monitor large mammals in data deficient areas using standardised methods.	3 new staff and existing TAWIRI staff trained as trainers in mammal monitoring by early 2006. Data contributors identified and submitting sufficient mammal sightings regularly to ensure wide coverage of the country. Mammal distribution data acquired for at least 15 target areas using remote camera traps Manual of survey protocols produced.	Training report submitted and attendees have proven aptitude in survey methods.* Contributor contact list and correspondence on file at TAWIRI HQ. Interview forms and reports from each survey filed and submitted to project library. Copies of survey manual available at TAWIRI HQ	Network of data contributors keen and willing to send in data. Data can be collected from all parts of the country. Key stakeholders support data collection activities.
Centralised database of mammal distribution and status that integrates historical records, and in formation from CIMU, TCC and proposed project.	Centralised database of mammal distribution on file at TAWIRI. Library of historical data established and both hard and electronic filed copies at TAWIRI. Distribution atlas for targeted mammal species	Database accessible to authorised personnel at HQ. Library available for viewing by authorised personnel. Copies to be sent on CD to Darwin and key stakeholders. Atlas distributed to all stakeholders in hardcopy or electronic form and published on the web.	Data contributors prepared to supply data

Conservation Action Plan for Tanzania's mammals developed to identify conservation priorities for each species and establish areas of data deficiency.	Action Plan supported and endorsed by governmental wildlife agencies and NGOs in Tanzania.	Action Plan published and distributed to all stakeholders. Letters of endorsement by government and relevant authorities. Copies to be sent to Darwin Initiative.	Sufficient data exist to produce a meaningful plan. Sufficient buy-in from all stakeholders to ensure endorsement of plan.

Checklist for submission

	Check
Is the report less than 5MB? If so, please email to Darwin-Projects@ectf-ed.org.uk putting the project number in the Subject line.	
Is your report more than 5MB? If so, please advise Darwin-Projects@ectf-ed.org.uk that the report will be send by post on CD, putting the project number in the Subject line.	
Do you have hard copies of material you want to submit with the report? If so, please make this clear in the covering email and ensure all material is marked with the project number.	
Have you completed the Project Expenditure table?	
Do not include claim forms or communications for Defra with this report.	