

Grevy's Zebra Conservation 2011

Report & funding proposal prepared for supporters
& members of the Grevy's zebra EEP conservation projects

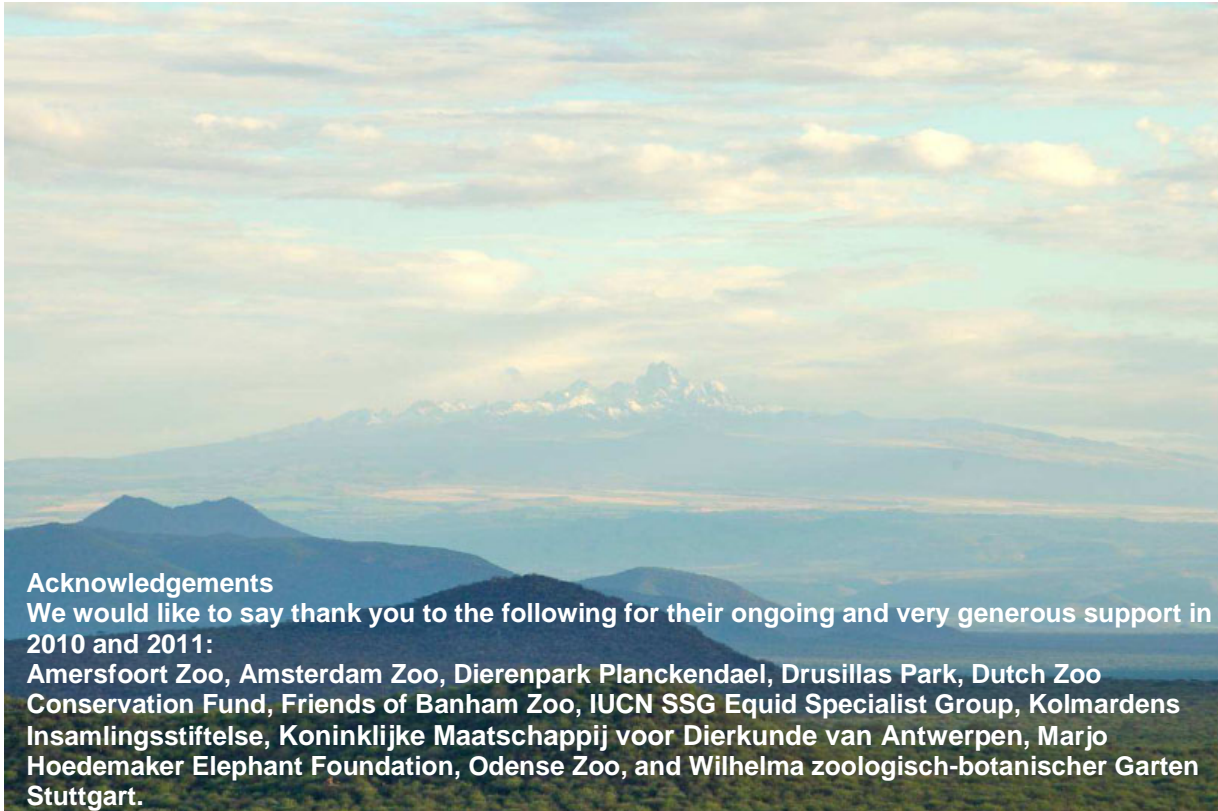
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Marwell Wildlife
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www.marwell.org.uk/conservation



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DUTCH ZOO CONSERVATION FUND



Marjo Hoedemaker Elephant Foundation

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Introduction

A warm Welcome to the 2011 report & funding proposal on Grevy's zebra (*Equus grevyi*) conservation! The document seeks to inform our supporters and members of the Grevy's zebra EEP on all the activities made possible by your generous support. As always, the EEP coordinator, Tanya Langenhorst, will be available during this year's EAZA Conference should you have any questions or comments.

This year has been packed full of action and adventure in Grevy's zebra conservation. From flying low over the El Barta plateau and counting them in ones and twos, to discovering them in tens and twenties on the remote foothills of the Ndoto Mountains. We have tracked them through the dry acacia forests of the northern rangelands and photographed them on the Naibelibeli plain in Samburuland. Our camera traps have monitored them feeding at drought relief stations in El Choro and we have followed them from Laikipia to Wamba using nothing other than their fabulous striped coats and a bit of clever software! Read on to discover how your contributions are changing the way we understand these magnificent African equids!

Section A of this document contains a report of the activities of Marwell Wildlife and its partners in the past year. At the end of this section you will find a list of these partners and please feel free to ask Tanya for any further information you might require..

In section B we present the proposed activities for 2012 and their associated costs.

We begin with a brief summary of the current status of Grevy's zebra.



Grevy's zebra north of Lewa © Marwell

The Status of the Grevy's Zebra

The most recent data available for the status of Grevy's zebra in Kenya remains the national survey of Grevy's zebra which took place in November 2008, followed by a 2010 survey of the more isolated populations in the far north of

the country. As a result we know that, nearly three years ago, the core range for this species held just under 2500 Grevy's zebra (Low *et al.* 2009). The National Conservation and Management Strategy for Grevy's zebra in Kenya 2007-2011 sets out that regular national Grevy's zebra censuses should be conducted to establish good baseline data on population distribution and numbers. These data are needed to accurately assess and prioritise appropriate actions for Grevy's zebra conservation (KWS, 2008). While the strategy suggests a national survey every 5 years, all parties involved are aware of the long time it takes to organise and fundraise for such an undertaking. The Kenya Wildlife Service has therefore asked the GZTC to begin this process so that the next national survey can go ahead in 2013 the very latest.

Studbook

In spring 2011 the latest international studbook for Grevy's zebra was published. It recorded a very small decrease in animals (from 501 to 491) but an increase in holding institutions (from 112 to 114) reporting worldwide to the studbook keeper (Langenhorst 2011). Two populations are formally managed: 91.148.0 (239), respectively. Grevy's are coordinated in 52 EEP institutions, while 64.114.0 (178) are held in 39 institutions of the North American Species Survival Plan (SSP). A third captive population is monitored through a regional studbook in Japan where 8.14.0 (22) Grevy's reside in 6 institutions. All three coordinators and studbook keepers work closely together to ensure that the captive animals remain a demographically and genetically healthy assurance population for their wild counterparts.

A. Summary of Activities in 2010/2011

Once again, we owe a huge debt of gratitude to all our supporters. The last year has been seen a multitude of activities and this would not have been possible without your continued, generous support to our Grevy's zebra conservation projects.

Enhancing Population Census & Monitoring

Digital Stripe Pattern Identification System

We are now well on our way to a centralised national stripe identification database for wild Grevy's zebra in Kenya. We told you last year, (Langenhorst *et al.* 2010) that we had contracted a young Kenyan, Lizbeth Mate, to enter the back log of all GZT photo data and to

compare them to our already existing database including the ones from the Mpala/Laikipia Grevy's project to find any overlaps. We also reported that we did indeed find such overlaps proving that the database can find links between separate populations and movement corridors that were until now unknown to us.

Based on this success and aided through a generous donation from the EEP, we offered Lizbeth a year long contract to carry on with the photo ID work. Happily, Lizbeth accepted and is now working hard to collate and enter photos from all our partner organisations as well as photos taken on dedicated ID safaris which are targeted at collecting Grevy's zebra pictures specifically for the database. In addition we are gaining a lot of photos from the camera traps we are deploying during other projects, e.g. monitoring of supplemental feeding and during a water management project (both are described later in this report). GZT has also begun a campaign inviting tourists in various lodges to submit any high quality photos of Grevy's zebra which they might take during their stay in northern Kenya.

Being able to employ a well trained database manager for such a long period has stabilised the project, created familiarisation of the database manager with all parties involved and allows much better planning ahead. This would not be possible without the funds for Lizbeth's salary, office supplies and travel money provided by our supporters. Thank you.



Lizbeth photographing/entering data in the field
© P.Cross

Survey of the North Zone and Anthropological Survey

An extensive survey of Northern Kenya in 2010 combined transect count data with questionnaires on people's attitudes towards Grevy's zebra and other wildlife. The team not only focussed on Grevy's zebra distribution and numbers, but also included a range of other large mammals. And they investigated how tolerant different communities are and whether Grevy's zebra are still used for traditional

medicinal purposes, rituals, food and skins. This survey was a follow up expedition to an earlier trip in 2005 (Woodfine *et al.*, 2009), also EEP funded, which had shown that these sub-populations were poorly understood and vulnerable to localised extinction. The 2010 expedition confirmed the 2005 findings. Only two sightings of Grevy's occurred and the spoor of several animals was detected, but the team did not find any evidence of Grevy's zebra foals at all. Interviews indicated that other large herbivore species like plains zebra (*Equus burchelli*), Grant's gazelle (*Gazella granti*), beisa oryx (*Oryx gazelle beisa*), tiang (*Damaliscus lunatus tiang*) and gerenuk (*Litocranius walleri*) as well as Somali ostrich (*Struthio camelus molybdophanes*) had also declined significantly across the survey area and exhibited highly vigilant behaviour in most areas.

While a first report has been issued to all EEP members last year, "Reassessing the status of Grevy's zebra (*Equus grevyi*), and other large mammals in the Marsabit region of northern Kenya" (Low *et al.*, 2010), we are awaiting a full report on the survey by the end of 2011 as well as a published paper. Both will, of course, be sent out to all our supporters as soon as they become available.

Grevy's Zebra Collaring

We told you in last year's report about our plans to deploy 25 Grevy's zebra with new collars that use the mobile phone network to download their information. Not only would we replace some old and by now dysfunctional collars but we would add new ones to increase the number of animals being monitored. This will enable us to determine the importance of key resources (e.g. water and vegetation use) and critical seasonal ranges for the population. This information will improve the management of key land and resources for Grevy's zebra.



Grevy's zebra collaring Wamba © Marwell

The collaring operation began in November 2010 and, so far, the Grevy's Zebra Technical Committee has deployed collars on three trips

in the Wamba area, and will continue throughout 2011. Male Grevy's are territorial and tend to remain within these locales for extended periods. For this reason only females are targeted in this project as they move over greater distances and hence reveal the pattern of landscape use. Due to the drought conditions, which naturally weaken the animals' body condition, we have been very selective about when we immobilise the animals in order to avoid the risk of capture stress.



Collared Grevy's zebra © P.Cross

Disease Investigation

Many of you will remember the outbreak of anthrax in Kenya during the winter of 2005/6. An estimated 5-10% of the wild Grevy's zebra population were lost to this disease. An extensive vaccination project for wild Grevy's which was made possible only through the generous and fast response from the Grevy's zebra EEP and SSP members prevented a greater and more devastating loss. Our experiences during this anthrax outbreak indicated that information on diseases in wild Grevy's zebra is lacking and that we need a lot more information about these in order to develop early indicators for the detection, prevention and ultimately the treatment of diseases. We have therefore begun a collaboration with the Royal Veterinary College (RVC) and the Zoological Society of London (ZSL) to carry out a first study, investigating a tick borne disease (Babesiosis) by comparing infection of pastoral domestic stock (donkeys) with that of wild Grevy's zebra. During our Grevy's zebra collaring operations, the immobilisation of study animals offers the perfect opportunity to collect relevant disease related data. We can collect blood and tissue samples providing information e.g. on blood chemistry, disease antibodies and genetics. The project will also provide a wealth of background data for the development of standard indicators of susceptibility and infection of Grevy's by tick borne diseases.



Elaine Hawkins investigating Grevy's © P.Cross

Elaine Hawkins, our RCV/ZSL associated student, has reported some surprising results. While we would have anticipated that the livestock held a reservoir of Babesia which was passed to the zebras while grazing in overlapping areas, it appears that the reverse is true. This may make sense when one considers that livestock are more likely to have received treatment against tick infestation. Despite this, the zebras do not appear to be suffering full blown infections of babesiosis diseases. This might well be owing to their evolutionary fitness and adaptations to coexisting with the disease. We are looking forward to the publication of Elaine's MSc. thesis and hopefully a paper detailing her findings for the rest of us to read!

Drought Relief

You will be all too aware of the drought conditions, the worst in 90 years, which the Horn of Africa is currently enduring. This not only affects the millions of people living Ethiopia, Somalia and Kenya but also the wildlife. GZT has now developed a drought response strategy to ensure the wild Grevy's zebra survival through the extended drought conditions.



Feeding location near Manyatta Lengima © Marwell

We are now providing supplementary feeding of the Grevy's zebra population in the Laisamis area where in parts no food whatsoever is left. This is a very direct species management method and we are therefore taking great care

to monitor the pre-activity condition of the species concerned, the process of intervention, its effect on the target species and the post intervention condition of the target species to ensure that no deleterious effects result from the activity itself. Feeding stations have been set up at water holes in the Laisamis area and fodder is distributed in the late afternoon to ensure that livestock do not have access to it before wildlife. Marwell is monitoring hay utilisation through the deployment of camera traps at feeding sites.



Feeding station in Melako conservancy © Marwell

We will assess the target species by monitoring their body condition, foal survival etc to determine whether the intervention has had a positive effect on them and also on other wildlife. This will show the effectiveness of providing fodder to Grevy's zebra as a management strategy for drought relief and help us decide if this method should be used in future drought periods, at least until the habitat has recovered enough to support the wildlife sufficiently again.

We were in the lucky position to have EEP funds available which allowed a very fast response once the decision on supplementary feeding had been made.

Building Capacity for Conservation & Research

Marwell Research Camp

The research camp has had a productive year in 2010/11 with many students and their mentors visiting from abroad. Two groups from Toronto, Canada, including York University and Upper Canada College, used the facilities and a third group representing the Ntugi Group working on the development of computer literacy at Ntugi school near Lewa also visited for two weeks. A field trip from Princeton University examined vegetative succession on disturbed sites at Lewa and another Princeton project investigated kinship in splendid starlings

(*Lamprotornis splendidus*). A number of visitors from the local community conservancies and the NRT made use of the facilities as well. Marwell's own field biologist has visited the centre and made use of equipment and facilities on 8 different field trips during the year.



MRC photos © Marwell

Wildlife and Vegetation Monitoring

Vegetation surveys were repeated in April this year. Four community conservancies were re-sampled: Sera, Kalama, Westgate and Il Ngwesi. Results showed that, while there has been an improvement in grazing condition over the past three years, this is a very slow process and we expect another three to five years of intervention to be necessary before significant changes are detected.

There are now 19 conservancies in the NRT network and all of them offer a unique opportunity for pastoralism and wildlife conservation to be integrated. They are of great importance to Grevy's zebra conservation; e.g. the Kalama conservancy harbours ~100 individuals, while Meibae conservancy hosts 4-500 Grevy's during certain times of the year. The conservancy system seeks to carefully manage live stock grazing, and at the same time encourage wildlife to co-habit pastoral areas.



Data entry using Trimble Nomad © Lewa

As mentioned in the 2010 report, we assisted in developing the new rangeland management system developed by Mpala research centre (Riginos & Herrick, 2010). The system is now in use for the four monitored conservancies and will be extended to include a fifth conservancy, Ishaqbini, by the end of 2011.

Professional Development

We are very proud to report that Mary Mwololo, (Lewa Research Department), and Rebecca Kariuki, (University of Nairobi), our two bursary MSc students at Lewa, have passed their examinations with flying colours. Their graduation ceremonies took place on Thursday 08 September 2011 and we will be forwarding copies of their Masters dissertations to supporting funders during the next few weeks.



Rebecca & Mary at their graduation © Lewa

Peter Lalampaa (GZT) began his MSc. in Conservation Ecology at DICE (the Durrell Institute for Conservation and Ecology), UK, in September 2010. Just before his return to Kenya, he visited Marwell to discuss and finalise the design and method for the field work part of his degree with our conservation biologists. From May – July 2011 Peter carried out his research 'investigating water use by Grevy's zebra in the West Gate and Kalama Community Conservancies'. He was looking at two different set-ups: 1) The zebra were accessing water points reserved for wildlife (no and very low usage by livestock), and 2) Water points which were shared by wildlife and a large number of people and livestock. With the help of community field assistants in secluded hiding points, Peter monitored all activity at the water points during the day. At night he used EEP camera traps which Marwell had made temporarily available from other projects. Results of this study will provide an important baseline for Grevy's zebra behaviour at watering points during the dry season when competition for this vital resource is most fierce. They will show how often and when Grevy's

come to drink and how far they are travelling to get there. Data on other wildlife, including predators, using the water points was also collected. Following analysis, Peter should be in a position to make recommendations for future water management intervention for the benefit of wildlife, livestock and people alike. All things going well, Peter will graduate in September this year.



Camera photos in water access study © Marwell

Edwin Lan Kisio (Lewa), a young Maasai, who is studying wildlife techniques at the South African Wildlife Management College has written his midterm examinations and returned to Lewa on 24th April 2011 for field work. His course is progressing well and he is achieving high marks on all his modules.

We also took on a new student, Anne Wambui, from the University of Nairobi to continue Rebecca's research into the effects of livestock grazing upon vegetation diversity and productivity at Lewa. Anne hopes to demonstrate that careful grazing management has a positive effect on rangeland, which in turn benefits other grazing mammals, particularly Grevy's zebra and other wildlife. Anne did submit an interim report earlier this year indicating that her work, while progressing well, was being delayed by the lack of wet season data in the absence of rain. Her research will potentially inform grazing management for the benefit of Grevy's zebra, not only on Lewa, but also within community conservancies across northern Kenya.

Lewa Research Department

We have continued to collaborate with the Lewa Research Department during 2011. In December 2010 we ran a two day workshop to develop aims and objectives for a 5 year conservation and monitoring strategy. This is now in the process of being drafted. Marwell is currently reviewing all monitoring activities and methodologies being undertaken by Lewa. Our aim is to ensure that long term datasets are carefully maintained and that oversight of the data collection and analysis process is rigorous

for management decision making. We are planning to produce some analyses and publication of these data over the next six months.

In addition, Marwell has played a strategic role in the development of the new Conservation Education Centre at Lewa. This centre is envisaged to provide disadvantaged students from the vicinity of Lewa with a world class education and learning experience. Working in conjunction with Denver Zoo, lesson planning and experiential learning elements have been developed to bolster the Kenyan student curriculum in life sciences. This is combined with hands on learning in the field through game drives, nature walks and an immersion in conservation concepts through the use of an exploration room that is designed to deliver interactive learning by exposing students to fundamental conservation concepts.

Publication of International Studbook

The International Studbook for Grevy's zebra 2010 with information updated as late as May 2011 has been published. You will find in there not only information on Marwell's conservation work but also some projects that are managed by partner organisations. If you are interested in the studbook you can request it from the EEP coordinator or download a PDF from our website:

<http://www.marwell.org.uk/conservation/resources/Resources.asp>



Zeke training Milgis scouts © Marwell

Grevy's Zebra conservation in the Milgis Ecosystem

The first year of activity has produced some excellent opportunities to partner with the Milgis Trust and we are confident that the work is going to produce strong results for Grevy's zebra conservation in the north of Kenya. By the end of October 2011 we will have undertaken four field trips into the Milgis ecosystem, as per our 2010 proposal. These field trips have been for

the purpose of establishing Grevy's zebra monitoring in an area not systematically monitored for wildlife before now. To date, we have held three training exercises at the Milgis Trust's base, El Kanto, and developed the tracking, navigation and reporting skills of 27 scouts. We have also provided training for the use of computer based data management and instituted systems for the operational management of the scouts by the Trust's field manager. During November and December of this year we will be initiating the analysis of the past four years of sightings data from the Milgis scouts patrols. This will begin the process of directing Grevy's conservation activities in core remaining habitat and population strongholds in the Mathews and Ndoto mountain ranges and their surrounding areas.

While we have been busy training and developing the Trust's capacity to monitor and manage conservation work, we have also had several camera traps deployed on regular long range patrols through the Milgis ecosystem. A rich biodiversity of small, medium and large mammalian species has been detected already. Most promising is the evidence that Grevy's zebra are utilising key water sources and travelling long distances along well defined routes between grazing areas and key springs, wells and pans in the Milgis area. We were very surprised to find larger groups of 10 and more (as determined by their tracks) visiting water points along the foothills of the Ndoto mountains near Arsim.

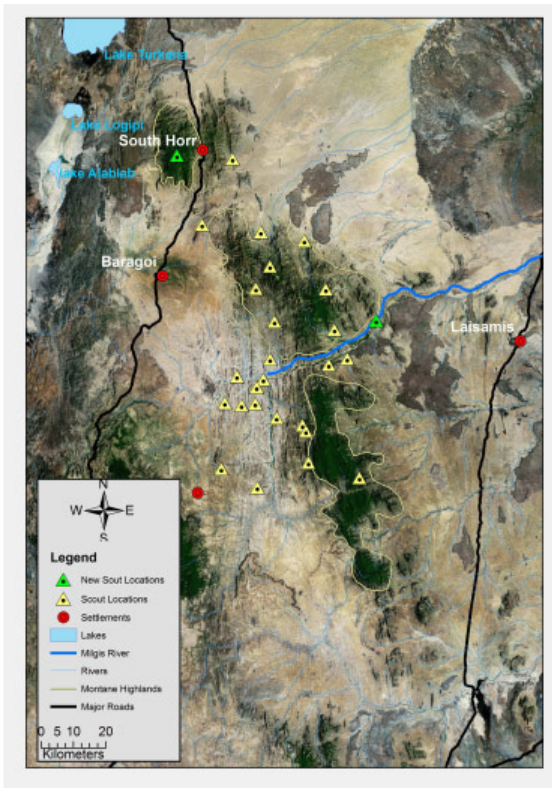


Track to well near Arsim © Marwell



GZ in same track at night © Marwell

With geo-referenced data becoming more available, we have begun to map the study area and a useful picture of the landscape and the Trust's coverage of the area is emerging. Soon we will be able to plot the positions of Grevy's zebra sightings and begin to understand which parts of this landscape function as important resources for their survival here.



Map of Milgis system © Marwell

So far, we have been able to meet three of our initial output goals; firstly, that monitoring has been established for Grevy's zebra and other major wildlife species; secondly, we have begun a program of intensive training and provided the Trust with IT equipment to enable

them to maintain a sightings database; and thirdly, we have developed the management capacity of the Trust's community based scouts.

In 2012 we will continue our programme of training and developing the Trust's members. Additionally, we will be assisting with wildlife water management projects in the Milgis to ensure that water is available for Grevy's despite high densities of livestock. Furthermore, we will be deploying targeted camera trap surveys at key water holes to learn more about how Grevy's access water and whether there are any limiting factors preventing them from doing this.



Scouts during lesson © Marwell

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Our Grevy's zebra conservation colleagues & partners

Marwell works closely with Kenyan conservation partners with whom it develops joint conservation programmes. Our key partners are described briefly below:

Kenya Wildlife Service (KWS)

The Kenya Wildlife Service is the country's statutory wildlife body and is ultimately responsible for the conservation of Grevy's zebra. In partnership with KWS, Marwell and the EEP have contributed significantly to the development of the national Grevy's Zebra Conservation Strategy.

Grevy's Zebra Trust (GZT)

The Grevy's Zebra Trust (GZT) has been established to address the urgent need to conserve Grevy's zebra in the community rangelands of Ethiopia and Kenya. GZT was tasked with implementing the national survey of Grevy's zebra in 2008, and has become an integral part of the Grevy's zebra technical committee

Lewa Wildlife Conservancy (Lewa or LWC)

The Lewa Wildlife Conservancy holds some 20% of the world's remaining free-ranging Grevy's zebra and hosts a dynamic research programme. Marwell continues to support Grevy's zebra monitoring and research within Lewa, and many of the projects planned by the GZTC will be carried out in collaboration with the Lewa Research Department (LRD).

Northern Rangelands Trust (NRT)

NRT supports the development of all community conservancies. Marwell has partnered with NRT to implement a programme of training and capacity building to strengthen wildlife management within all community conservancies. In addition, it has co-developed a system for wildlife and vegetation monitoring which is being introduced to a selection of conservancies.

African Wildlife Foundation (AWF)

AWF have an extensive presence in Kenya and are directly involved in Grevy's zebra research in the northern rangelands. AWF have contributed 5 of the radio collars for the current collaring project and are partners in the Stripe identification project, contributing a significant database of Grevy's photos for the Samburu and Shaba areas. AWF collaborate closely with Marwell and the GZTC in all matters of Grevy's conservation in Kenya

University of Princeton/Denver Zoo (DZ/PU)

Our association with DZ and PU are coordinated through the GZTC, as they are represented on this committee. Both institutions have collaborated on a number of recent Grevy's conservation activities, including, the survey of northern Kenya, the collaring project, supplying 6 collars, and the stripe ID project, which is hosted at Mpala Research Centre in Laikipia thanks to Princeton's close association there.

Grevy's Zebra Technical Committee (GZTC)

Originally formed as the Grevy's zebra Working Group to support the national survey for Grevy's zebra, this collaboration has since diversified into a range of Grevy's zebra conservation activities. These include anthropological surveys, the testing of various survey methods, analysis of GSM radio collar data, and efforts towards a centralised Grevy' zebra identification database. In recognition of the key role GZWG played, KWS has requested that this working group becomes the Grevy's Zebra Technical Committee (GZTC), whose first official function was to advise on the implementation of the national strategy.

The GZTC is a collaboration among seven organisations all committed to conserving Grevy's zebra. These are: GZT, Lewa, Marwell; DZ/PU, NRT, KWS, and the AWF.

Marwell continues to play a key role in the coordination of this group and its activities.

B. Proposed Activities for 2012

The following activities have been planned for 2012 and will be carried out in collaboration with our Kenyan project partners. Each activity addresses a key action point of the national strategy. We are seeking funds for each of the projects detailed below. While several new initiatives are proposed, a number are ongoing and as such the rationale for their continuance is provided here. Future funding requirements are summarised per activity at the end of this section.

1. Grevy's Zebra Collaring

We were thrilled to hear recently that Kolmarden Zoo, Sweden, who were fundraising to support our Grevy's collaring project, have been 100% successful in raising the shortfall for the deployment of our remaining 10 collars in the El Barta and Laisamis areas of Northern Kenya. These collars are now being imported to Kenya and we will do our best to have them deployed before the end of the year, if not by early 2012.

We have been able to purchase collars manufactured in South Africa by African Wildlife Tracking (AWT) with the latest in reliable GSM (mobile phone) data reporting technology. We have selected these collars to provide some insurance against manufacturing defects in the collars we have already deployed from Savannah Tracking – a local Kenyan Supplier. Happily, we can report that to date we have not had any permanent failures with any of our collars and this measure is merely a failsafe in the event of something major going wrong. We have also arranged to be supported by Lewa Wildlife Conservancy for the deployment of collars in the rugged and inaccessible Laisamis area, where we will have the use of a helicopter for darting operations.

Telemetry studies such as this are initially very expensive and operationally demanding to set up. However, the data they deliver are of a very fine scale and highly valuable to making rapid conservation action decisions. Movements of the zebra, that we have already collared, are revealing much about the long distance nature of their travels and the connectivity of the landscape they inhabit. We are very aware that the study should be maintained for the medium term with a view to establishing it as a long term project. This will require a maintenance budget to ensure that we are always able to remove old collars or replace damaged collars that become dysfunctional.

In the short term, however, we will need to make sure we have funding and resources to enable us to keep the study running efficiently. This requires us to hold a small number of collars and immobilisation drugs and some operational costs in reserve.

Outputs

- Purchase of three additional Savannah Tracking collars to be held as reserve units.
- Purchase of tracking equipment to be used to re-locate collars in field.
- Deployment of three collars as required for replacement of faulty or expired collars.

Conservation impact

This activity will extend the life of the collaring project which is designed to provide detailed and representative information on Grevy's zebra movement and ranging patterns within the core of their range. It will enable us to determine the importance of key resources (water, vegetation) and critical seasonal ranges for the entire Grevy's zebra population.

1. Grevy's Zebra Collaring	£
3 x GSM/GPS collars from Savannah Tracking	4,400.00
3 x Zebra capture and immobilisation operations	3,600.00
Tracking Antennae and Receiver for telemetry operations	600.00
	8,600.00

2. Developing Grevy's Zebra Monitoring in the Milgis Ecosystem

We were not successful in attracting support for this project in 2010. However, we believe that this work, and future similar projects, is essential to securing the remaining drought refuges and facilitating range expansion for Grevy's zebra. Marwell has set about beginning the project using core funds to ensure its progress while we continue our fund raising efforts. The Milgis Trust supports wildlife conservation and community development in the Milgis ecosystem. The Trust's activities cover an area of approximately 5000km², within Samburu North, Central and East Districts of Kenya and with the mandate to expand a further 3000km² into unprotected areas to the north. The Milgis River is situated between the Mathews and the Ndoto mountain ranges, and forms the midline of the Milgis ecosystem. This area is within historic Grevy's zebra range and an important migratory corridor between Samburu to the south and Marsabit to the north. In 2010 the Trust approached Marwell for technical support with the aim of improving their scout monitoring work and we immediately grasped the opportunity to access this important Grevy's rangeland.

During 2011, we successfully initiated conservation actions on the ground and enabled our Kenyan based field biologist to participate in operations such as wildlife water provision, game scout recruitment and training, and Grevy's zebra detection with camera traps. In 2012 we hope to expand this project to include a programme of targeted activities for Grevy's zebra conservation:

Sightings and conflict data: Scout patrols currently yield continuous information on the distribution of Grevy's zebras in the Milgis ecosystem. Scout data collection will be expanded to include information on conflict incidents (poaching and competition of grazing and water resources).

Track count surveys: Regular track count surveys will be conducted by each scout on a bi-weekly basis. Track counts provide confirmation of Grevy's zebra presence and allow the development of indices for relative abundance and frequency of occurrence.

Camera trap surveys: Marwell will provide camera trap equipment and training to implement systematic Grevy's zebra distribution and identification surveys. Camera trap photographs of Grevy's zebra stripe patterns are an effective way of collecting this data. These photos could also feed into the national stripe ID database

Environmental data: Baseline environmental data will be collected to provide information to explain changes in Grevy's zebra population trends and behavioural ecology. Standard meteorological data will be collected and vegetation cover, topography, soil quality and drainage will be investigated. Manmade features, artificial water sources and land use categories will be included in a detailed GIS model. A fine scale vegetation monitoring protocol will be deployed to provide data for the development of habitat management recommendations.

Funding is urgently required to enable us to continue these important regular visits to the area for training and management of information we are now collecting, and to develop a rigorous programme using these systematic methods.

Outputs

The anticipated outputs for Milgis are much the same as for Marwell's wider northern rangelands Grevy's conservation plan. We see the Milgis as an opportunity to expand our reach into areas which are seldom surveyed and represent important habitats for Grevy's conservation:

- Increased conservation awareness amongst local communities
- Monitoring skills of community scouts developed
- Ownership of conservation activities by local communities
- Secure and well understood habitat requirements for Grevy's zebra in the Milgis ecosystem.
- Reports produced on the status of wildlife in Northern Kenya, its distribution and abundance
- Longer term outputs will include peer reviewed publications.

Conservation Impact

Our goals for developing Grevy's zebra monitoring in the Milgis remain unchanged since 2010. The project will establish a wildlife monitoring program, collect information for a key Grevy's zebra area, and create a sense of community ownership. Initially, this work will facilitate the expansion of Grevy's zebra conservation efforts into areas which are lacking formal direction and a systematic approach to conserving wildlife. This is a core deliverable for the conservation of the species going forward as we begin to secure its habitat and plan for population recovery. Future goals will be aligned with the wider

project aim of reducing dependency of rural communities on foreign aid and expatriate expertise. The ultimate goal of this effort is to empower communities to conserve their own resources.

2. Developing Grevy's Zebra Monitoring in the Milgis Ecosystem	£
Subsistence for training staff	800.00
Training materials and resources	600.00
Vehicle costs @ £0.50 per km for 2,400km x 4 trips	4,800.00
Field Trip research fees and operating costs for 4 trips per year	700.00
	6,900.00

3. National Photo ID Database for Grevy's Zebra

As reported above, we are now well advanced in developing the central stripe ID database. With the assistance of DZCF (Dutch Zoos Conservation Fund), our new database manager, Lizbeth Mate, has worked tirelessly to gather historic datasets of photographs from the technical committee's partners. There is still much to be done, however, and funding is needed to retain her services in 2012. Field trips to collect data have yielded good results and we plan to continue this strategy of systematically gathering data. Another very exciting thing is that this work will move into a new phase over the next six months and begin delivering peer reviewed publications. This will add to the established knowledge of our combined efforts as Grevy's zebra conservators.

We have now logged over 2500 photographs, representing over 400 individual animals. We have detected movements of over 80Km between foraging sites, a distance not recorded before, and one which might well classify the Grevy's as a migratory species. This information suggests that Grevy's sub populations may well be mixing. This is important as it would indicate one reason why the Kenyan populations are still surviving despite fragmentation and habitat loss. Their gene pool should still be very diverse and their resilience to habitat and climate change strong. More research needs to be carried out before we can verify these potentials, but the data is beginning to point to exciting possibilities.

Soon, we will be able to combine the stripe ID data with our collar and telemetry data to reveal not only how far they travel, where they go and which groups they mix with, but the specifics of their travels and which parts of this landscape provide the refugia needed to travel between locations. These so called 'corridors' must be preserved for the future survival of not only the Grevy's but all wildlife living in the arid northern rangelands of Kenya.

The Stripe ID database is thus definitely showing its strength as a conservation tool for Grevy's zebra. We are gradually exposing their socio-spatial behaviour and may soon be able to provide accurate population census data through the use of capture-recapture analyses using the repeat sightings data the photographs will provide. This is why it is essential that this effort continues as a long term component of the Grevy's zebra conservation strategy.

With your help we can ensure that we capture as many unique identities as possible in an effort to gain an understanding of the entire population over time.

Outputs

- Expansion of the Stripe ID database
- Analysis of movement patterns in conjunction with collar data
- GIS model of linkages between sub-populations and preferred habitats
- Population census data
- Revision of the species range map
- Publication of reports and peer reviewed papers on the biogeography of Grevy's Zebra

Conservation impact

The Stripe ID database is a cost-effective means of monitoring movement, distribution and abundance of Grevy's zebra. As numbers of digital cameras, particularly on mobile phones, increase in Kenya, it will become possible for the stripe ID system to function as an ongoing, real time tool for monitoring Grevy's zebra in remote areas. Furthermore, understanding the socio-spatial behaviour of Grevy's populations will allow conservation efforts to be more effectively deployed for the maintenance of key habitat, connectivity and population expansion.

3. National Photo ID Database for Grevy's Zebra

£

Field Trips to collect Photo ID data	4,000.00
Database manager at 470£/month; Over 12 months (2012)	5,650.00
Operating cost (office/stationary) at £95/month (2012)	1,150.00
	10,800.00

4. Developing Disease Management Strategy for Grevy's Zebra in Northern Kenya

Our efforts to begin dedicated disease management work for Grevy's zebra were able to move forward this year with the help of many generous unrestricted contributions from members of the EEP in 2010/11. The work on babesiosis in livestock and Grevy's, undertaken as part of our collaring operations, is showing significant potential. Not only were we able to provide sufficient blood and tissue samples from the zebras for an analysis of the disease but the student, funded by the EEP to undertake this work facilitated by Marwell, also collected a large sample of similar material from local livestock in the same general areas. Linking data collection with the ongoing collaring operation provides many opportunities to investigate diseases in the wild populations which are important as there is very little knowledge about diseases and base line indicators in wild equids.

There is still an urgent need to develop capacity for local response to disease outbreaks in Grevy's zebra. This is particularly important in view of the emergency response required for anthrax in 2005/6 mentioned above. For this reason the details of a disease response strategy development project have been appended here from last year's proposal. We urge any of our partners in the EEP who have the capacity to assist in even the smallest way to consider this as an "open brief". We will begin to build up a funding base for this response strategy by directing a portion of your unrestricted contributions towards it.

Last year we wrote:

With less than 2,500 individuals in Kenya, the Grevy's zebra is extremely vulnerable to the effects of disease. However, disease ecology as it affects Grevy's zebra has not been well studied in the East African region and there is a large gap in knowledge. In order to address this, conservation organisations who sit on the national Grevy's Zebra Technical Committee, have identified the need for a workshop to bring together international experts with government agencies, conservationists and communities working on protecting Grevy's zebra in Kenya. This action is considered a priority in the conservation of wild, free-ranging Grevy's zebra.

At the same time there is an urgent need for rapid disease diagnosis in the field in order to detect diseases in Grevy's zebra and form an immediate response.

Disease outbreaks can have devastating consequences for populations that are critically endangered. Two recent examples have highlighted the urgency of this situation:

- a) *An outbreak of anthrax was confirmed in the Wamba area of northern Kenya in 2006; it appeared to disproportionately affect Grevy's zebra. Over 100 Grevy's zebra died from the outbreak within a period of three months which was approximately 5% of the total population. However, anthrax is only one of many diseases that threaten Grevy's zebra who live alongside domestic livestock and are thus at high risk of infection.*
- b) *At the height of the drought in 2009 Grevy's zebra started dying in large numbers and in particular geographic locations. The actual cause of the deaths was not established. Although drought was a contributor, disease was also suspected since some animals still showed good body condition. In total 97 Grevy's zebra carcasses were located.*

When a carcass is reported by conservancy game scouts or field researchers the current response is to request a wildlife vet who undertakes a post-mortem in the field and sends samples to a laboratory in Nairobi. Assuming the vet is available, this process takes up to 2 weeks to be completed. There is an urgent need to speed this process up. In addition, many carcasses are currently detected in the field and the cause of death is never established.

Rapid disease diagnosis in the field would require the establishment of a simple field lab with a microscope, sampling equipment and technicians who are trained to take samples, process slides and identify a number of key diseases. These diagnoses would then not be delayed by transferring samples to government laboratories in Nairobi and action could be taken immediately while confirmation would be obtained from the government facilities.

As a major threat to Grevy's zebra, disease has been highlighted in the five-year Conservation and Management Strategy for Grevy's Zebra in Kenya. Undertaking this project will therefore directly fulfil Strategic Objective 4.5 of the strategy and work towards meeting the national targets set for Grevy's zebra conservation.

Outputs

Establishing a field laboratory for diagnosing disease outbreaks

- Field researchers trained in disease diagnosis
- Field lab established in Grevy's zebra range
- Data collected on the epidemiology of disease
- Publications and reports on the prevalence of disease in Grevy's Zebra populations.

Workshop for Disease Management Strategy

- Assess the prevalence and threat of equine pathogens to Grevy's zebra
- Develop practical prevention and control measures, with emphasis on the prevention of disease transmission from domestic livestock
- Design and implement long-term disease surveillance methods and response protocols
- Implementation of a disease management strategy

Conservation impact

The principal goal of this project is to reduce the threat that disease poses to the survival of Grevy's zebra through the development of a comprehensive and practical disease management strategy for the species in northern Kenya as well as the installation of a field laboratory for diagnosing disease outbreaks.

This will dramatically reduce the time needed to detect a major disease outbreak and will thus enable a conservation response to be mobilised far more rapidly than is currently possible. In addition, it would enable field researchers to test every carcass found and establish whether death was a result of disease.

4. Developing Disease Management Strategy for Grevy's Zebra

£

Establishing a field laboratory for diagnosing disease outbreaks

Field lab equipment	2,000.00
Training of field researchers	800.00
Vehicle mileage – sample collection	1,500.00
	4,300.00

Workshop for Disease Management Strategy

Travel: 2 x international flights, local travel for 24 delegates and site visits	4,700.00
Lodging and Meals: 2x international delegates in transit and 24 delegates on site	2,700.00
Equipment and Printing	550.00
	7,950.00

5. Building Capacity for Grevy's Zebra Conservation

As per previous years, the support of personal development, training and capacity building in our partner organisations is a crucial part of our outreach to developing conservation actions on the ground. Bursaries are an important way of delivering improved conservation effectiveness directly at the source of Grevy's zebra conservation need.

For the past four years we have successfully enrolled seven students working directly with Grevy's zebra conservation in programmes of tertiary and continuing education. To date, three of these have completed their courses with great success and by the end of 2011 a further two will be qualified. The remaining two students will continue their work with a view to completing their studies in 2012.

Much of this project's focus has been on members of Lewa Wildlife Conservancy and the Northern Rangelands Trust where staff members have been identified for further training. This year, however, we have also assisted the Grevy's Zebra Trust and in future we will be open to candidates from all our partners in Grevy's zebra conservation.

The work carried out by local biologists is crucial to the survival of Grevy's zebra and for achieving broader conservation goals. In 2012 students will be able to carry out their research projects at our field sites across northern Kenya or, as in previous years, at Lewa where they can make use of the facilities of the Marwell Research Camp.

Outputs

- 2 Kenyan conservationists trained to MSc level or similar continuing education standard

Conservation impact

This activity will further our understanding of Grevy's zebra ecology and will help to improve management of rangeland for the species throughout its range. It also increases the number of well trained conservationists in country.

5. Building Capacity for Grevy's Zebra Conservation

£

Field research bursary 1: Grevy's movement patterns	2,500.00
Field research bursary 2: Investigating reasons for Grevy's movements	2,500.00
	5,000.00

6. Camera Trap Surveys

Camera traps are revolutionising conservation science. Their wide application in determining species occurrence, distribution and abundance has enriched the study of endangered species across the globe. The Grevy's zebra are no exception to this exciting and timely development in wildlife observation. Already, Marwell have applied remote cameras to monitoring Grevy's in five of our study sites.

During 2010 Marwell began piloting a study on the movement of Grevy's and other wildlife between Lewa and surrounding government, communal and private land. In one year, we monitored 435 Grevy's zebra movements (amongst 2,700) through a dedicated wildlife corridor in this one site alone. Four cameras were stationed at the headquarters of the Milgis Trust at El Kanto where Grevy's were detected making regular trips to and from permanent water sources. Three cameras have now been sent out to remote destinations with the scouts of the Milgis Trust in an effort to locate further focal points in the behaviour of these determined equids. Camera traps are currently being used to assess Grevy's response to feeding stations as part of monitoring the success of our assistance to the GZT drought response strategy. These efforts are in addition to the successful monitoring of water points in Peter Lalampaa's MSc. study already mentioned above. Furthermore, each photograph captured by these remote cameras is included in our stripe ID work and these images are making a significant contribution to the detection of new individuals for our database.

We have a stock of 14 cameras in Kenya at the moment and there is much demand from our partners for their use in short term strategic monitoring efforts. The information they have delivered has already

contributed to management decisions and conservation activities. We will soon have the results of several of the projects mentioned above to help with the task of assessing the population's status and distribution.

All this effort relies on good quality images and this is dependant not only on using specialised equipment but on the requirement for that equipment to be robust and capable of withstanding everything from an equatorial downpour to a curious hyena's vice like jaws! This makes for relatively costly equipment. However, this is more than balanced by the value of the data they retrieve and the speed with which this can be collected.

In 2012 we will be taking our camera trap work to the next level. We will be setting out to survey specific Grevy's sites in an effort to secure accurate population data: Group size, demographics and density. To do this we need to develop a set of cameras specifically for census work. Typically, this requires enough units to cover a representative area of habitat for a significant period of time. We have elected to use two types of survey design. Grid designs will be employed to determine stocking densities within blocks of 30Km². We will deploy cameras at a density of 1 per 1Km², and leave them in place for two weeks per deployment. We will rotate to a new block every two week period. The second so called "strip" design will be employed along river beds to detect the animals as they pass across or along these features. Cameras will be placed at one kilometre intervals along both sides of the river channel, covering 15 Km of distance with each deployment. Again, a two week rotation will be applied.

The project will use an adaptive approach and should a longer duration be required, or a higher density of cameras per area, we will make these decisions based on the data we collect. Surveys will run for two months per deployment and extensive use will be made of local community people to safeguard and manage the equipment on site.

Outputs

- Purchase of cameras for use in ongoing dedicated camera trap survey studies
- Employment for a team of 10 camera trap operators
- Training for 10 camera trap operators
- Detailed, ground based density estimates of Grevy's populations in Northern Kenya
- Distribution and abundance indices for Grevy's populations in Northern Kenya
- Publications and management recommendations based on rigorous systematic data

Conservation Impact

Until now, estimates of Grevy's population data have relied on estimates based on line transect or aerial census data. While these methods do provide reliable and repeatable population size estimates, they are necessarily limited by the encounter rate of a limited number of observers over short periods of time. Camera trap surveys effectively place many more "eyes" in the field, over extended periods of time. This still produces estimates of population size, but, crucially, it provides physical evidence of animal presence and group size. Importantly, it allows us to view the animals and make assessments of individual identification and body condition which can deliver estimates of survival and recruitment over time as well. This study will be the only one of its kind on Grevy's zebra and is well positioned to provide critical conservation decision making information in the short term.

6. Camera Trap Surveys	£
30 x Reconyx HC500 Covert Cameras	9,000.00
10 x Bushnell video/still cameras	2,350.00
Subsistence for 10 camera monitoring scouts (for 2 surveys = 4 months)	4,000.00
	15,350.00

Summary of projects and costs in 2012

	£
1. Grevys Zebra Collaring	
3 x GSM/GPS collars from Savannah Tracking	4,400.00
3 x Zebra capture and immobilisation operations	3,600.00
Tracking Antennae and Receiver for telemetry operations	600.00
	8,600.00
2. Developing Grevy's Zebra Monitoring in the Milgis Ecosystem	
Subsistence for training staff	800.00
Training materials and resources	600.00
Vehicle costs @ £0.50 per km for 2,400km x 4 trips	4,800.00
Field Trip research fees and operating costs for 4 trips per year	700.00
	6,900.00
3. National Photo ID Database for Grevy's Zebra	
Field Trips to collect Photo ID data	4,000.00
Database manager at 470£/month; Over 12 months (2012)	5,650.00
Operating cost (office/stationary) at £95/month (2012)	1,150.00
	10,800.00
4. Developing Disease Management Strategy for Grevy's Zebra	
<i>Establishing a field laboratory for diagnosing disease outbreaks</i>	
Field lab equipment	2,000.00
Training of field researchers	800.00
Vehicle mileage – sample collection	1,500.00
	4,300.00
<i>Workshop for Disease Management Strategy</i>	
Travel: 2 x international flights, local travel for 24 delegates and site visits	4,700.00
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Equipment and Printing	550.00
	7,950.00
5. Building Capacity for Grevy's Zebra Conservation	
Field research bursary 1: Grevy's movement patterns	2,500.00
Field research bursary 2: Investigating reasons for Grevy's movements	2,500.00
	5,000.00
6. Camera Trap Equipment	
30 x Reconyx HC500 Covert Cameras	9,000.00
10 x Bushnell	2,350.00
Subsistence for camera monitoring scouts (for 2 surveys - 4 months)	4,000.00
	15,350.00
TOTAL	<u>58,900.00</u>