

# **Grevy's Zebra Conservation in Kenya 2017**

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

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[www.marwell.org.uk/conservation](http://www.marwell.org.uk/conservation)



### Acknowledgements

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- Koninklijke Maatschappij voor Dierkunde van Antwerpen
- Stichting Wildlife
- Wilhelma Zoologisch-Botanischer Garten Stuttgart
- Zoologischer Garten Berlin



Cover: Grevy's during GGR © Marwell  
This page: Northern Kenya © Marwell

## Introduction

We are pleased to present you with detailed updates on our work for the conservation of Grevy's zebra. The last 12 months have not been easy in Kenya. Northern Kenya has experienced one of the worst droughts in decades, pushing both wildlife and people to their limits. This drought has further complicated conservation operations by causing unrest across Laikipia and Samburu as some livestock herders have illegally occupied protected areas, leading to tragic loss of life as Kenyan security forces have attempted to restore order. Further security concerns hampered efforts in the run up to the national election in August this year and these remain serious issues. The resulting insecurity in and around our study areas has caused some inevitable delays in delivery and implementation of our plans. However, our projects remain secure and we are thankful that our teams have suffered no personal or material losses. We continue to act cautiously in the wake of the election as results were disputed in court and the country is now heading for a re-run of the election in October. At the time of writing all is calm and we are operating normally. Despite often trying conditions, the communities and partners we support continue to remain positive and much has been achieved and maintained. We are delighted to share all those accomplishments with you, our donors, in this latest Grevy's zebra conservation report & funding proposal.

We would like to thank all our long-standing and loyal donors as well as welcome new organisations that are joining our efforts for conserving this beautiful and endangered species. We could not do this work to protect the Grevy's zebra without you.

Operating in Africa will always have its challenges. Sometimes you have to go a little slower to get to your destination, but we are confident that the work is achieving its goals and making a significant difference to the communities and the Grevy's zebra that represent the future of these environments in so many ways.

We hope you enjoy reading the report and also the funding proposal at the end of it.

**Section A** of this document contains a report of the activities of Marwell Wildlife and its partners regarding Grevy's zebra conservation in the past year. At the end of this section is a list of these partners and, as ever, please feel free to ask Tanya for any further information you might require.

In **Section B** we are presenting our proposed activities for 2016/17 together with their associated costs.

### **The Status of Grevy's Zebra (*Equus grevyi*)**

An international team of assessors (Dr Dan Rubenstein (IUCN Grevy's zebra Coordinator, Princeton University); Belinda Low-Mackey (GZT); Dr Zeke Davidson (Marwell); Dr Fanuel Kebede (EWCO) and Sarah King (IUCN)) reviewed the status and distribution of the species last year for the IUCN Red List, as Endangered A2acd ver 3.1 (Rubenstein et al., 2016).

The Grevy's zebra is considered stable or increasing in Kenya with approx 2,400 individuals at the last survey (Berger-Wolf et al., 2016), but may be stable or declining in Ethiopia where the last estimate for 2009-2010 was 228 +/- 53 (F. Kebede pers. comm. 2012).

### **International Studbook**

In the latest international studbook for Grevy's zebra 2016 (Langenhorst, 2017) 199.315.0 (514) Grevy's zebra were registered in 118 institutions in 28 countries. This can be broken down into three managed populations: 87.169.0 (256) animals in 52 institutions are in the EEP; 65.109.0 (174) are managed by the North American SSP in 37 institutions (US and Canada), and Japan coordinates 11.9.0 (20) animals in eight zoos. All other Grevy's zebra are kept in private hands or non-associated institutions. Together, these populations provide a genetically and demographically healthy back up to their wild counterparts.

The studbook can be downloaded as a PDF from our website:

<https://www.marwell.org.uk/conservation/achievements/studbooks>

Groups and organisations mentioned in this report are:

EWCA = Ethiopian Wildlife Conservation Authority

GZT = Grevy's zebra Trust [www.grevyszebratrust.org](http://www.grevyszebratrust.org)

GZTC = Grevy's zebra Technical Committee

KWS = Kenya Wildlife Service [www.kws.org](http://www.kws.org)

Lewa or LWC = Lewa Wildlife Conservancy [www.lewa.org](http://www.lewa.org)

MW / Marwell = Marwell Wildlife [www.marwell.org.uk/conservation](http://www.marwell.org.uk/conservation)

NRT = Northern Rangelands Trust [www.nrt-kenya.org](http://www.nrt-kenya.org)

Princeton/PU = University of Princeton [www.princeton.edu/~equids/people.html](http://www.princeton.edu/~equids/people.html)

STE = Save the Elephants [www.savetheelephants.org](http://www.savetheelephants.org)

## **Section A. Summary of Activities in 2015/16**

In this section we provide a detailed overview of the work we have carried towards Grevy's zebra conservation over the last year. Together with our partners from the Grevy's Zebra Technical Committee and with your financial support we have extended the area in which we operate and provided crucial monitoring, cooperation with communities, support for the Kenya Wildlife Service. We would like to thank you for your support, which makes our work in this area possible.

### **National developments**

#### **National Conservation and Management Strategy for Grevy's zebra in Kenya**

The Kenyan Conservation Strategy document that has guided and monitored all Grevy's zebra conservation activities since it was first produced in 2007, was due for another review and update. On the 26 and 27 January 2017, KWS convened a meeting of stakeholders at the Mpala Research Centre, Laikipia, to review the current version and produce the third edition for 2017-2027. The meeting included conservation NGOs (Northern Rangelands Trust, Lewa Wildlife Conservancy, GZT, Marwell Wildlife, Samburu Trust), community conservancies, research institutions (Mpala and Princeton University) and community representatives from Laikipia, Wamba and El Barta (Pic.01). The first two strategy documents (KWS, 2008; 2012) were defined by needs for population Status Review and Stabilisation respectively. To a large extent these mandates have been fulfilled, so the focus is now shifting to Population Growth.

The Vision and Goal of the strategy remain unchanged - (see KWS, 2008 and 2012) and the strategic objectives will not be altered as they stand, but there will be an additional objective added to incorporate the new emphasis on Grevy's zebra Population Growth.

Several models for the strategy revision were produced. Mostly they revolve around maintaining conservation activities in response to the ongoing threats to Grevy's. In addition, the review proposes an increase in the level of engagement with county government and key development players. This aims to ensure that the GZTC has support for activities designed to mitigate the effects of inevitable changes brought about by development, human population growth and climate change.

Marwell's Dr Zeke Davidson, who facilitated the workshop, is currently editing the latest strategy and the writing team is putting the final touches to the document. We will inform you once it is published.

### **Ethiopia**

We are pleased to say that conservation action for Grevy's zebra as well as the other two equid species in Ethiopia (African wild ass and Burchell's zebra) is finally moving up the agenda in Ethiopia. A workshop was convened by the Ethiopian Wildlife Conservation Authority (EWCA) and IUCN/SSC Equid Specialist Group (ESG) in Addis Ababa on 12-13 December 2016. More than 20 participants from government, NGOs, universities, technical aid agencies and local communities attended the workshop. Zeke Davidson from Marwell Wildlife, and Belinda Low Mackey from GZT, travelled from Kenya to provide their expertise.

The workshop was facilitated by Dr David Mallon, member of the IUCN Species Conservation Planning Sub-committee, and member of ESG. Following a status review and analysis of threats, the participants developed the first draft of an Ethiopia National Equid Action Plan for 2017-2026. The plan is currently being finalised and we hope will be published later in 2017. We will make this available for download once it is completed.



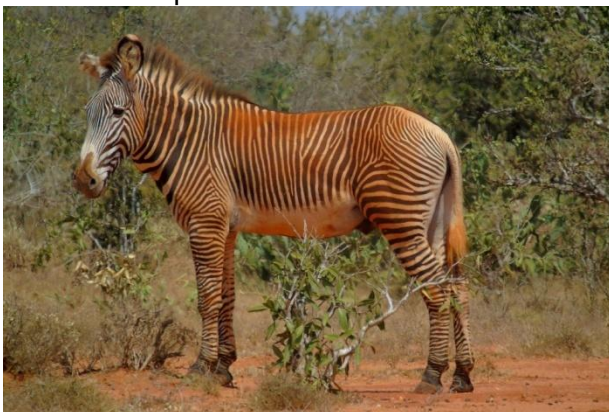
**Pic. 01: Strategy Workshop team © Marwell**

## **Monitoring of Grevy's zebra**

### **National Survey of Grevy's zebra/Great Grevy Rally**

The 2016 Rally was a resounding success, in that it delivered vital population information simultaneously across their range in Kenya and engaged a broad range of people in citizen science. The GGR has provided much impetus for the targeted approach to area specific conservation activities defined in the National Strategy. The GGR estimated 2,350 Grevy's zebra in Kenya, and showed that their population was stable and sustaining. However, since this survey was carried out there has been a devastating drought across much of the Grevy's zebra's range, which has exacerbated tribal conflicts and led to illegal occupation of numerous protected areas and increased wildlife poaching. The results of GGR are vital for local governments, who are mandated and committed to conserving their wildlife, and are taking actions to mitigate the threats to these endangered species. Having robust baseline population estimates and distributions from the GGR, as well as ongoing surveys across the species range will allow us to assess the impacts of these combined disasters.

Together with the Grevy's Zebra Technical Committee (GZTC), Marwell will participate in hosting the second national census of Grevy's zebra on the 27<sup>th</sup> and 28<sup>th</sup> January 2018. The two-day photographic census will monitor the status and health of the endangered and iconic Grevy's zebra in northern and central Kenya, where over 90% of the global population is found. We are excited to announce that we are also including reticulated giraffe surveys in the 2018 rally. This species was assessed to be vulnerable to extinction in 2016, and shares much of Grevy's zebra's range. This addition will add greater strength to the overall assessment of priority species in Kenya. This will not detract from our Grevy's census goals in any way and we are thrilled to be able to leverage more information for the conservation of another great African species from our Grevy's zebra conservation platform.



**Pics 02 & 03: Images taken during the GGR 2016 © Marwell**

Once more the Great Grevy's Rally is an opportunity to engage citizen scientists in order to demystify scientific research that contributes to the conservation of wildlife. A citizen scientist is a member of the public who participates in scientific research. The essence of citizen science is that volunteers collect and share data that can be analyzed by scientists and shared with all participants and relevant stakeholders. In the process, participants gain a greater understanding and awareness of both the species and the work required to protect these magnificent animals and their habitats. We invite local residents and visitors to take part in the science of discovery and to ask questions that will contribute to research and management of key wildlife species.

In 2016 Marwell sent two teams to the most remote northern areas of Grevy's zebra range in Kenya (Pics 02-06). We also organised three aircraft with volunteer pilots and crew to spot often small, isolated and widely dispersed groups. For the forthcoming survey we hope to increase the number of teams and aircraft, and to improve the communication equipment.



**Pic 04 (top):** Survey team taking photos of Grevy's zebra  
**Pics 05 & 06:** Great Grevy's Rally flyers and ID card © GGR

Please see the report from the 2016 GGR (Berger-Wolf et al., 2016) available here:  
<http://www.laikipia.org/wp-content/uploads/2016/09/Great-Grevys-Rally-2016-Report-FINAL.pdf>

The Grevy's zebra Trust has produced a short promotional video that you can see on this link:  
<https://drive.google.com/file/d/0B58yEwgGN28kTG9nR0lySFBJa28/view>

## Digital Stripe Pattern Identification Project

With the generous support of the members of the EEP, Marwell has been collating photos for stripe pattern identification for 10 years now. Pictures are taken of the right hand side of Grevy's zebra encountered in the field, either on targeted photo safaris or chance encounters, and then stored in a national database (Pic.07). Regular contributing partners in this project include Marwell Wildlife, Lewa Wildlife Conservancy, Mpala Research Centre, Grevy's Zebra Trust, OI Pejeta Conservancy, Oserian Conservancy and Kenya Wildlife Services in conjunction with Tsavo Trust. Photos are also added from our camera trap network, which is managed and maintained by a team of scouts that we recruit from local communities. The cameras are placed at water holes or known Grevy routes where we can maximise our chances of recording seldom seen animals that are dispersed across the vast arid landscape in the north of Kenya.

Our pioneering system compares each photo to others in the existing database to determine if the Grevy's zebra in the picture has been previously recorded or is a new entry. Once identified, new entries are then added to the database. To date over 27 thousand images have been uploaded to, with a process that has required over 370 million image comparisons (Hiby, pers. comm., 2017). The developer of the stripe ID database software, Lex Hiby, database manager Lizbeth Mate, and Zeke Davidson, Marwell's Kenya Programme Manager, have begun the task of analysing and writing up the data of the last decade. They are investigating survival rates, population sizes, abundance, subpopulations and their interchanges and movement patterns.

Early indications are that survival of both adults and foals is high, and that the sampled areas have stable or increasing populations. These preliminary findings agree with the recent IUCN assessment and will provide a baseline from which to compare future surveys. In the process of analysing these data, another interesting and important aspect of Grevy's movement behaviour has been revealed. While the species is highly mobile, Grevy's zebra appear to occur in sub-populations, with relatively low levels of movement and mixing between them. This may be a result of increasing human populations and the loss of linking habitat. However, it may also suggest that the species displays habitat selection based on consistent resource availability, more than the quality of resources themselves. There will be more on this in a forthcoming paper and we will circulate this as soon as it is published.

We continue to collect stripe ID data as one of the principle monitoring methods for the population in Kenya. We rely on the generous support of the EEP to maintain the project's staff requirement and the field expenses for travelling to our field sites to collect the data from our scout network

The Digital Stripe Pattern ID project draws a lot of photos and accompanying information from the Northern Kenya Grevy's Zebra Project (NKGZP) and its camera trap and scout network. Please see updates on that below.

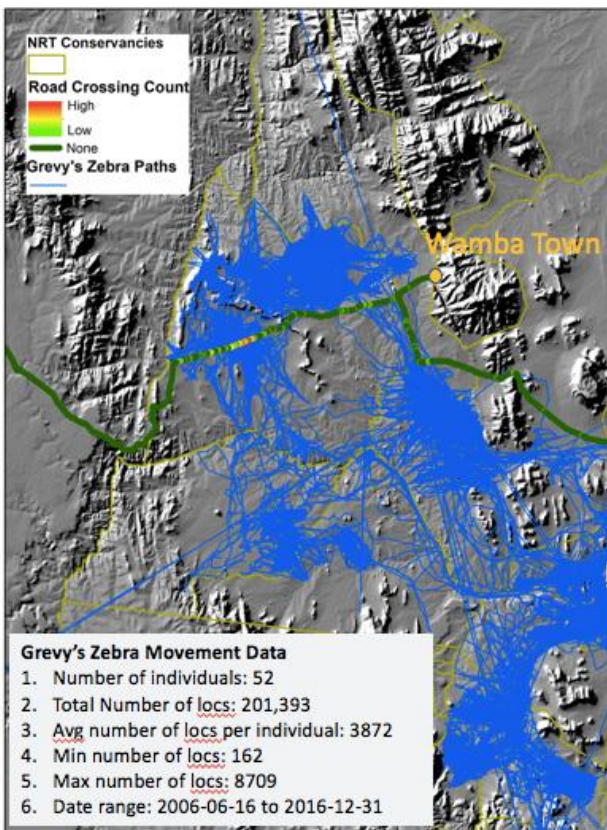


Pic 07: Group of Grevy's zebra during data collection © Marwell

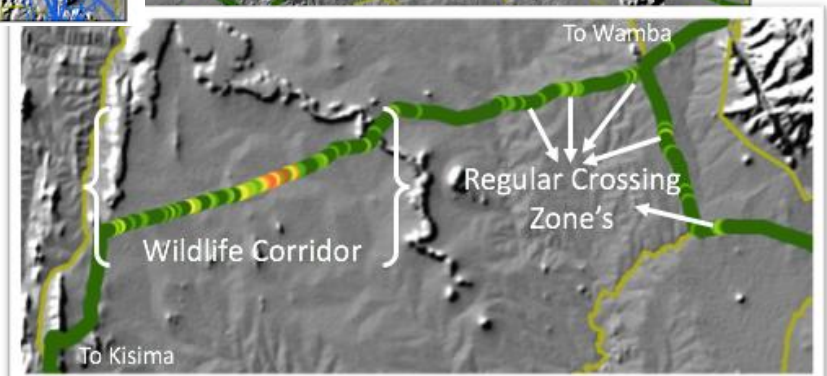
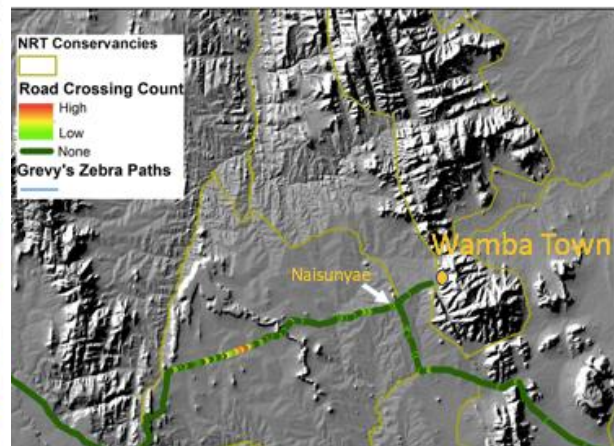
## Collaring

Our Collaring operations form part of the Northern Kenya Grevy's Zebra Project and have now been ongoing in this particular area for nearly three years. While deploying the collars has always been challenging, the data amassed so far already tell a fascinating story of the adaptation and resilience of this amazing species. We have three collars in hand waiting to be put onto suitable animals, but will need assistance with the very high costs for this deployment which requires use of a helicopter and the highly technical and time consuming involvement of a team of scientists and vets. These data are currently being analysed and will provide a full assessment once this work is published. Details of the resources required to continue this vital work are provided below in the funding proposal.

The value of Grevy's zebra movement data from GPS collars has been demonstrated elsewhere in our study area, where they have proved instrumental in informing national and county level development strategies. This year we were able to produce strong recommendations for the upgrading of a rural road in the Wamba zone of the Grevy's zebra management areas. In collaboration with Save the Elephants (STE) we used a track density analysis tool (Wittmeyer unpublished), to pinpoint sensitive crossing points along the road's route (Figs 01& 02). The county government is going to implement mitigation strategies along these sections of the road in order to limit the risk of road mortalities to all wildlife, including Grevy's zebra.



**Fig.01: Movement data for 52 individual Grevy's zebra demonstrating road crossing frequency for the proposed C79 upgrade. High frequency crossing event are depicted in the colours bands along the road (Source GZTC)**



**Fig. 02/03: The C79 Road route expanded to show detail of high frequency crossing segment and regular crossing zones for additional segments of the road between (Source GZTC)**



In a long awaited launch event, Dr. Zeke Davidson was able to participate with the National Task Force in the publication of the National Wildlife Corridor Management Plan (Ojwang' et al., 2017) (Pics08 & 09). This document has been in development since 2012 and our Grevy's zebra collar data have formed a major component contributing to the mapping and gazettement of Kenya's wildlife corridors. A copy of the report is available from Marwell on request.

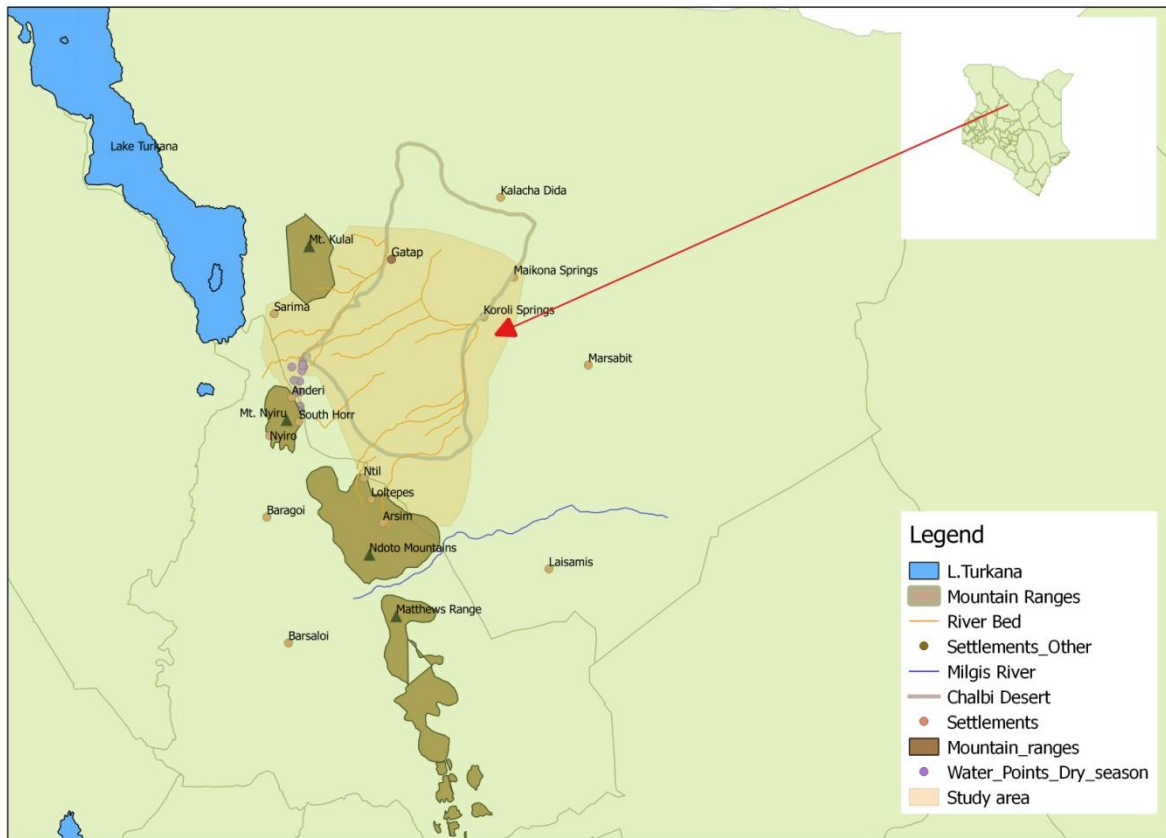


**Pics 08 & 09: Wildlife Migratory Corridors launch event. Marwell's Zeke Davidson shaking hands with Ben Okita from STE, with whom we collaborate closely © Marwell**

The collars we have deployed over the past 11 years throughout the Kenyan Grevy's zebra range have performed well, despite moving far beyond the reach of civilization. Recently, several large data downloads were sent by the collars and we have been able to fill in large gaps in our records. We have learnt that the population in South Horr and those migrating between Mount Kulal and the Chalbi Desert are very much permanent residents of these vast dry lands (Map 01). While they do travel long distances over the rugged terrain, particularly when it is raining, they appear to return to the same areas in the deep dry season. We think these areas are not only safe places with tolerant communities but also represent important foaling sites where lactating females can reliably find water and fodder daily. This part of our work requires dedication and perseverance to deploy sufficient collars for a full assessment to be made.

This year we have also been approached by the Kenya Wildlife Service to consider expanding our collaring operations to Tsavo National Park. A small population of Grevy's zebra were translocated there in the late 1960's and 70's as an insurance against extinction. Now, over 40 years later, the population still persists and though small (we have documented 53 individuals so far) it is resilient and manages to continue despite major disruptions. The new Standard Gauge rail line bisecting their territory in Tsavo and the upgrading of road, power and pipeline infrastructure along the same route threaten their already tenuous existence. KWS have asked Marwell to support the implementation of a telemetry study. The study will be integrated into a PhD level study looking at the impacts of the transport corridor on wildlife in Tsavo. The Student Candidate is a KWS senior ecologist based in Tsavo, Mr. Frederick Lala, and has worked closely with our field biologist since 2014 on large scale aerial surveys. His study will be of high value to conserving this small but important population. We hope that you will join us in the work.





**Map 01: Map of our Northern Kenyan study area.**

## **The Northern Kenya Grevy's Zebra Project (NKGZP)**

### **Peace and Conservation for Grevy's zebra in Northern Kenya**

The key focus for this project is on communities sharing landscape and resources with wildlife for the NKGZP. The project currently employs a total of 12 scouts in the field, five of whom are women. Our scout team plays a vital role in spearheading conservation activities in the region, acting as local ambassadors as well as collecting data. The communities expressly appreciate their involvement in the conservation work as it provides employment opportunities for men and women alike as well as expanded education for the children. Importantly, as long-term custodians of these ecosystems, they clearly understand the needs for sustainable approaches to wildlife management and value species including Grevy's zebra.

In addition to our female scouts, we have trained two women (Pic.11) to set up and maintain camera traps in the Gatap and Sarima areas where we have installed four extra Bushnell cameras to widen our monitoring network (Map 01). Smart phones equipped with CyberTracker software have been deployed to facilitate wildlife tracking, as these provide an easy to use means of collecting data, particularly in communities with low literacy rates (Pic.10). Initial photo analysis for the Sarima area showed, surprisingly, no Grevy's zebra during November and December, but hyenas, black jackals, gazelles and birds were recorded. By January, however, there were no wildlife sightings at all. This could be due to increased disturbance from human activities around the Lake Turkana Wind Power project. The team will move the majority of traps to another priority location to be determined based on gaps in our maps.

The project puts great importance on the inclusion of women. While in the field, Enrita Lesoloyia, our Peace through Wildlife coordinator, and our team of scouts provide training in bead work to women (Pic.12). This aims to empower the women to participate in economic activity, helps them sustain themselves and their families, and will hopefully encourage other women to come on board and join their colleagues in peace and wildlife activity.



**Pic.10: Enrita explaining to our scout, Lekuyie, about the new cyber tracker phones. © Marwell**



**Pic.11: Our lady scout at Sarima trialling the set up of a camera trap during training © Marwell**

In 2015 we participated in the formation of a new collaborative working group for conservation education in Northern Kenya. Enrita, a former teacher herself, is now a member of the Northern Kenya Conservation Education Working Group (NKCEWG). This group aims to promote wildlife education and awareness to school children in Northern Kenya. In a recent meeting all partner organisations discussed their needs for education and decided to agree on one common curriculum as well as to share education resources to streamline school training and avoid any duplication. Apart from formal education, Enrita is going to start wildlife kids camps for children aged between 10- 14years (Pic.13). Most children have negative feelings towards wildlife and believe that it poses danger and should be killed when sighted. Interestingly, this is contrary to our findings amongst the adult members of communities in Northern Kenya who displayed a common positive attitude toward wildlife (Parker et al., 2017). We have a concern that there is a generational gap developing between parents who grew up with abundant wildlife and their children who see so little of it today. We hope that these camps will expose children to wildlife conservation and protection through wildlife lessons, camping activities, field trips and patrols, exchange programmes, and natural encounters with wildlife. The aim is to prepare and inspire the children to be the next generation of park wardens, wildlife biologists, future conservationists and wildlife ambassadors.



**Pic.12: Enrita and our community Women during the bead work training © Marwell.**



**Pic.13: Baragoi kids during a Lewa trip planned to be included in kids camps © Marwell**

We had planned to add a number of scouts (Pics 14 & 15) in the first half of 2017 to increase our monitoring network. Due to the insecurity in the north in particular, and in the country generally, this has not happened yet. Things have been relatively calm in our project area, but Enrita has had some issues going into the field at times. We will therefore wait for the Kenyan elections to pass and for the unrest surrounding those to calm down before we expand further.



**Pics 14 & 15: Scouts during a training session, viewing camera trap pictures © Marwell**

## **Disease Response Committee (DRC)**

### **Drought Relief**

In 2017, Northern Kenya was once again in the grip of a prolonged drought with devastating effects to humans and wildlife alike. The long-term degradation of habitat has led to a point where these ecosystems have almost no ability to recover from further impacts. This means that with every drought wildlife is affected more and more by depleting resources. Grasslands have dried up and strong winds are blowing. Seasonal rivers and shallow wells have also dried up.

Not only did the short rains fail between December 2016 and January 2017 but the long rains of March to June 2017 also stayed away from the north of Kenya. We recorded a severe drop in zebra body condition and in the year to date more than 60 animals including lactating mares and foals have perished (Pic.16). Several poaching events have also been recorded as people desperate for food have turned to wildlife – a new emerging threat to Grevy’s zebra in these dire times and an unexpected consequence of climate change in the region.

In response to the drought, the GZTC activated the emergency supplementary feeding protocol, and Marwell is working closely with the Grevy’s Zebra Trust and communities in the affected areas to distribute supplementary hay to Grevy’s zebra which also benefits other wildlife (Pics.17-19).



**Pic.16: One of many Grevy’s that succumbed to the draught © Marwell**



**Pic.17: Scouts explaining to elders the importance of their support © Marwell**

Enrita has held meetings with people in the area to get their support for this activity. She has explained that Grevy’s zebra and their survival are essential to the communities since all the employment and development support in this area are linked to conservation, and asked them to cooperate and spread the news to other herders in the bush not to steal, but guard the hay (Pic.17).

So far, many hundred bales of hay have been provided at seven sites across the region and we expect to carry on with this until at least October. Marwell’s Conservation Biologists are monitoring the uptake of feed using camera trapping and a local scout network to understand how best to deploy this vital resource (Pics 18 & 19).

Emergency funds from the EEP are always on hand to allow supplementary feeding as and when needed without any delay.



**Pics18 & 19: Scouts on the way to feeding places and Grevy's zebra coming to feed © Marwell**

### Field Laboratory

In 2006 Marwell built a single, low-capacity field laboratory based at the Marwell Research Centre (MRC) on Lewa Wildlife Conservancy. It was furnished and equipped with the support of the EEP. Fridges and freezers as well as a portable fridge allowed us to collect samples in the field and keep them cooled until reaching appropriate storage facilities. Visiting researchers and colleagues have used the lab for preparation, analysis and storage of those samples. This facility is constrained due to its small space, lack of personnel, and diagnostic equipment and now needs updating. Expansion and modernisation are urgently required to meet the need for accurate veterinary intervention. Disease surveillance, health diagnostics and sample banking are critical for maintaining the viability of the diverse wildlife populations found in northern Kenya.

The Lewa-based Kenya Wildlife Service (KWS) veterinarian supports all medical interventions in the vast area of Northern Kenya and is vital to our projects including disease management, radio collaring for ecological research, anti-poaching efforts, and all medical procedures.

For all these reasons we are asking your support to modernise and expand the current laboratory to make it fit for purpose now and to be able to respond to increasing demands into the future. Please have a look at our funding proposal at the end of this report.



**Fig.04: Map of Kenya showing various Kenya Wildlife Service veterinary coverage units. The proposed laboratory would serve the most Northern encompassed area**

## Professional Development & Training

### Data Collection Training: SMART and Cyber Tracker

We reported last year (Langenhorst and Davidson, 2016) on the increased use of the SMART tool (a spatial monitoring and reporting tool developed by the SMART Conservation Partnership, see: <http://smartconservationtools.org/smart-partnership/>) for digital data capture across many of the conservancies. Lizbeth Njeri Mate, our stripe ID database manager, is a SMART Trainer and has implemented a bespoke database for GZT last year, and one for the Milgis Trust this year. Following discussions between Marwell Wildlife, Grevy's Zebra Trust (GZT) and Zoological Society of London (ZSL) it was decided to move all GZT Ambassadors (one group of GZT scouts) from paper based data collection to mobile based data collection. Lizbeth conducted CyberTracker data collection training at the Grevy's Zebra Trust offices at Westgate Community Conservancy from 23-24 November 2016. The GZT research manager worked alongside her to earn experience in training for the use of these tools.

Following the training, a meeting was held to discuss the integration and harmonisation of GZT, Milgis Trust and NKGZP (Marwell) scout data platforms. It is our hope that these three organisations will join the expanding network of organisations using these tools, including Lewa Wildlife Conservancy, The Ngare Ndare Forest Trust, Mount Kenya Trust, Loisaba and Borana Conservancies, allowing an extensive area of Northern Kenya to be systematically monitored in the same way. Enrita, our team leader in the NKGZP, has also been trained, and has been teaching our scouts to use CyberTracker as well.

George Anyona submitted his thesis in November 2016 and received several major amendment recommendations from his supervisors. He has spent much of the year reworking his analysis and resubmitting his thesis to the University of Nairobi. The manuscript is now with his supervisors for marking and we look forward to his graduation in December this year. Meanwhile, George continues his role as the Grevy's Zebra Liaison Officer. He has been financially supported by the EEP in his office for the past three years, without which KWS would struggle to provide this position.

**Please also read the funding proposal (Appendix B) which will give you a lot more details on our plans.**



**Pic.20: Day-old foal during Great Grevy's Rally 2016 © Marwell**

## References and further reading

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<http://dx.doi.org/10.2305/IUCN.UK.2016-3.RLTS.T7950A89624491.en>. Downloaded on **05 April 2017**.



## **Our Grevy's zebra conservation colleagues and partners**

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

### **Disease Response Committee (DRC)**

The Disease Response Committee which began as a standalone sub-committee of the GZT has established strategies and guidelines for the detection, prevention and early response to disease outbreaks over the first two years of its existence. These documents now form a standard operating procedure for use by the KWS vet department and partners in the GZTC to put into practise as and when required. The members of the DRC are represented on the GZTC and so it has been decided to reintegrate the committee into the general GZTC operations in future.

### **Grevy's Zebra Technical Committee (GZTC)**

The Grevy's Zebra Technical Committee is a technical and steering committee with a mandate from KWS to evaluate implications of technical recommendations for Grevy conservation before implementation, develop intervention protocols, set monitoring standards and procedures, and evaluate their implementation and effectiveness, reviewing all Grevy's zebra conservation, management and research proposals.

The GZTC is a collaboration among seven organisations all committed to conserving Grevy's zebra, including: Grevy's Zebra Trust (GZT), Lewa Wildlife Conservancy, Marwell Wildlife, University of Princeton (DZ), Northern Rangelands Trust (NRT), and Kenya Wildlife Service (KWS). Marwell continues to play a key role in the coordination of this group and its activities.

### **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 has become an integral part of the GZTC.

### **Kenya Wildlife Service (KWS)**

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

### **Lewa Wildlife Conservancy (Lewa or LWC)**

The Lewa Wildlife Conservancy holds some 20 percent 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).

### **Milgis Trust**

The Milgis Trust is a non-profit organisation founded by wildlife conservationist and safari guide Helen Douglas-Dufresne and her partner Peter Ilsley to sustain the wildlife, habitat and the pastoral peoples' way of life in northern Kenya.

In January 2010 the Trust approached Marwell with a request to establish wildlife monitoring within the Milgis ecosystem and has since become a close partner in our NKGZP.

### **Northern Rangelands Trust (NRT)**

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

### **University of Princeton (PU)**

University of Princeton have collaborated on a number of Grevy's zebra conservation activities, most notably the Great Grevy's Rally and analysis of the photos collected during the survey. They are also heavily involved in the stripe ID project, which is hosted at Mpala Research Centre in Laikipia thanks to Princeton's close association there.



## B. Proposed Activities for 2017 - 2018

Marwell's main objective in Kenya remains focused on protecting vulnerable, small populations of Grevy's zebra in remote and under resourced areas. Our ongoing programmes maintain a strong community based approach and develop local capacity to ensure long-term viability of our efforts in the field. Despite political, social and security challenges over the past year, our team has continued to deliver its conservation impact across a spectrum of national policy development, species intervention strategy, and community based conservation in remote areas.

The support we receive from the EEP and the wider EAZA community is critical to this effort, and we hope that you will continue with us in this important extension of our zoo based conservation in the field next year.

Our funding proposal echoes and builds on much of the established and successful initiatives we have presented over the past five years and accounts for maintaining these core activities. We include some new initiatives which build the programme in profile, and effectiveness, by implementing new technology such as a field laboratory with high diagnostic capacity. All contributions are helpful and we look forward to you being part of our conservation programme in Africa in 2017.

### 1. Grevy's Zebra Collaring

The collar and telemetry project has come of age with the publication of the Wildlife Migratory Corridors and Dispersal Areas for Kenya. The contribution these data provided for the Grevy's zebra in determining important movement routes and habitat areas for not only this species but for wildlife in general in the North of Kenya, has entrenched the need to improve our understanding of these factors for the conservation of the species. We hope to continue developing this information as we drive our efforts ever further north toward Ethiopia in an effort to re-establish population connectivity, resilience and viability in their natural and historic range.

In addition, we have been asked to partner with the KWS in extending this study to the Tsavo National Park ecosystem where a reserve population of Grevy's zebra were translocated in the late 1960's and 70's. With the development of the new Standard Gauge Railway line between Mombasa and Nairobi in 2017, wildlife movement between the eastern and western sectors of Tsavo National Park have been threatened. The KWS have undertaken to demonstrate the impact of this new infrastructure which bisects the national park with a near impenetrable physical barrier. Although a number of wildlife crossing points have been implemented, the majority of these appear to be more closely related to human needs than wildlife dispersal. By collaring the population of Grevy's zebra in Tsavo National Park we will be able to identify threats and barriers to their movement and any potential population isolation that has resulted.

#### Outputs

1. Movement corridor mapping
2. Resource mapping
3. Human impact (footprint) mapping
4. Population monitoring and evaluation
5. Development of community based monitoring and conservation in South Hoar area
6. Reports and papers published

#### Conservation impact

The collection of fine scale movement data for this population will represent the first detailed study of wildlife movement in the far northern area and secure the population as part of the monitored Grevy's zebra population in Kenya. Community participation will ensure ownership, scalability and legacy for the conservation of Grevy's zebra in this area.

<b>1. Grevy's Zebra Collaring</b>	
<b>a) Northern Kenya location</b>	<b>£</b>
Flying time 20 hours @ £220/hour	4,400.00
2 x Zebra capture and immobilisation operations	2,400.00
5 x Satellite Radio Collars (£2000,00 each)	10,000.00
Biological Sample Storage and Analysis	2,000.00
	<b>18,800.00</b>

<b>b) Tsavo National Park location</b>	<b>£</b>
Flying time 12 hours @ £220/hour	2,640.00
Vehicle Fuel	532.00
1 x Zebra capture and immobilisation operations	1,000.00
Biological Sample Storage	200.00
	<b>4,372.00</b>

## 2. Great Grevy's Zebra Rally

The second National Grevy's zebra census using stripe ID software and citizen science participation will take place on the 27<sup>th</sup> and 28<sup>th</sup> of January 2018. Last year we detailed the 2016 event and the first national results that were not generated by aerial census methods, providing a full report. The methodology is showing a lot of promise as a long term monitoring tool and is driving the development of new automating software (IBEIS) and finer scale monitoring and evaluation. Next year will represent the second data point in a three part trial of the method for its robustness. Apart from providing verifiable population size data, it also presents a unique opportunity to observe a major proportion of the population in a short, two day, time period. This allows us to gauge population health by estimating body condition and to calculate its vital rates including sex ratios and foal survival. It is setting a precedent for emergent technologies and the effective use of wide scale citizen science contributions for the conservation of wildlife in general. Once again we are involved with this hugely important event and hope you will be able to contribute to its success.

### Outputs

1. Rigorous national population estimate
2. Repeatable methodology based on sound science
3. National Grevy's zebra population health and status
4. National population structure

### Conservation Impact

Following the Rally in 2016 we are now able to provide the first reliable population estimate and accurate population structure figures for the species, ever. Subsequent rallies will allow us to develop trends in population performance and survival. The Rally is thus a strategic tool that will guide conservation planning and management going forward. Conservation effort and the mobilization of resources can now be more effectively planned and managed, resulting in greater effectiveness of conservation activities. The results of the Great Grevy's Rally highlight the critical importance of access to grazing and water within a secure environment for Grevy's zebra. Historically, Laikipia County was not a natural part of the Grevy's zebra range; however, today it is supporting over half of Kenya's Grevy's zebra population due its healthy rangelands. This tells us that the Grevy's zebra is a sensitive and reliable indicator of ecosystem health.

<b>2. Great Grevy Rally (2018)</b>	<b>£</b>
Flying Time, 20 Hours @ £220 an hour	4,400.00
4000km @ £0.45/km	1,800.00
Field work facilitation	2,000.00
Contribution to the organisation of the GGR Event	3,000.00
	<b>11,200.00</b>

### 3. National Stripe Identification Database

The Stripe Identification Project is reaching its most exciting stage yet. Not only is it providing the basis for a multiyear analysis of population trends in survival and growth but it is driving the development of cutting edge technology to improve the speed and accuracy with which population data can be monitored. For the first time, using ideas evolved from our long term work on stripe recognition, it is possible to “take the pulse” of a population of wild, free ranging, animals in a single stroke. With the success of the GGR and our continued efforts to collate and collect the impressive dataset this work is developing, it is more important than ever to maintain our effort on the Stripe ID project.

#### Outputs

1. Maintenance of the individual Stripe ID database
2. Contributions to the National Conservation of Wildlife in Kenya
3. Analysis of movement patterns in conjunction with collar data
4. Population census data
5. Revision of the species range map
6. Publication of reports and peer reviewed papers on species biogeography
7. Development of new tools and capacity building through training
8. Publish: Long term population trends and survival indicators for the first time (in prep).

#### Conservation Impact

The Stripe ID database is a cost-effective means of monitoring movement, distribution and abundance of Grevy’s zebra, as evidenced by the recent GGR. Our Database manager is now responsible for general project management of all aspects of stripe ID data gathering and management. In addition, she manages the people and budgets required to achieve these goals, and is a pivotal member of the Marwell Kenya team.

3. National Stripe Identification Database	£
Employment of database manager @ £1050 /month, over 12 months	12,600.00
5000km for vehicles @ £ 0.45/km to cover travel to, from and within field sites	2,250.00
10 community scouts (men and women) £40/scout/month, over 12 months	4,800.00
10 x additional camera traps£ 150/camera	1,500.00
1 x stripe ID database license	1,000.00
	<b>22,150.00</b>

### 4. Wildlife Diagnostic Laboratory

Northern Kenya is one of East Africa’s most important areas for wildlife conservation for several reasons. Firstly, northern Kenya and the adjoining Laikipia County have diverse wildlife habitats comprised of several National Parks and Reserves, private conservancies and over 33 community conservancies.

Secondly, over 87% of the world’s remaining Grevy’s zebra live in this area as well as half of Kenya’s rhinos (N=1,050), the country’s second largest population of elephants (N=6,500), Kenya’s third largest and only stable population of lions, the world’s sixth largest population of African wild dogs, as many as two-thirds of the world’s remaining reticulated giraffe, a globally significant population of cheetah, a unique race of hartebeest and the rare mountain bongo. These diverse and abundant wildlife species require regular and timely veterinary interventions, including emergency treatments that must be supported by accurate diagnostics. The Lewa-based Kenya Wildlife Service (KWS) veterinarian currently supports all medical interventions (including disease management, radio collaring for ecological research, anti-poaching efforts, and all medical procedures) in this vast area for all of the wildlife species including the Grevy’s zebra.

The Marwell Research Camp (MRC) laboratory built in 2006 now contains a -30C freezer, a small -18C freezer and a small refrigerator. There is currently no full-time laboratory staff or technician, so we propose to engage a person with the dual focus of laboratory management and technical support. The current vet, Dr Matthew Mutinda, is an extremely capable, but many times oversubscribed, professional. With the support of a manager/technician his capacity will be secured and greatly improved. Recent partner funded contributions of essential lab equipment including a high end light microscope, additional

centrifuge and simple diagnostics equipment need proper housing for their care and accurate use. The new lab building proposed, additional staff and equipment will mean an exponential leap forward in diagnostic and mitigatory medicine for wildlife. We have been the lead organisations (with EEP support) in developing the laboratory capacity on Lewa for several years, based on our key concern for, Grevy's zebra. The capabilities of the new lab will ensure we are in the best position possible to respond to disease outbreaks and any other diagnostic or analytical work that needs to be undertaken.

It is on this basis that Lewa and Marwell Wildlife in partnership with The Smithsonian Institute, San Diego Zoo, and Chester Zoo envision establishing a robust diagnostics laboratory that will actively meet the needs articulated here. We invite our donors and readers to look at the full funding request available on request for details.

### Outputs

1. Enhanced diagnostic capacity of medical emergencies
2. Comprehensive disease and genetic monitoring capacity, namely: diagnostic blood work, parasitological work, hormone assays, genetic sample storage and extraction, bacterial culture and antibiotic sensitivity tests
3. Better informed wildlife health mitigation and population management strategies
4. Frozen back-up for safekeeping and as source material for onward transfer to national facilities with higher capacity in case of widespread disease outbreaks.
5. Regional hub to train wildlife veterinary providers in strategic intervention practice.
6. Increased capacity for collaborations that support research on population sustainability, wildlife disease characteristics and associated threats to human livelihoods

### Conservation Impact

Diagnostic capacity of medical emergencies will be enhanced and comprehensive disease surveillance and sample reproduction capacity will be provided to better inform Grevy's zebra health mitigation and population management strategies in northern Kenya. We also envisage creating a frozen backup for safekeeping and as source material for onward transfer to national facilities with higher capacity in case of widespread disease outbreaks.

Specifically, the new laboratory will offer five core competencies to support conservation of Grevy's zebra through its disease and genetic monitoring capacity:

- i. Diagnostic blood work
- ii. Parasitological work
- iii. Hormone assays
- iv. Genetic sample storage and extraction
- v. Bacterial culture and antibiotic sensitivity tests

Note: More detail is available in a comprehensive proposal available on request.

4. Wildlife Diagnostic Laboratory	£
Veterinary Laboratory Manager @ £1220/month, over 12 months	14,640.00
Earthworks and Substructure	2,830.00
Walling	1,590.00
Roofing and guttering	1,540.00
Windows and Glazing	450.00
Doors	460.00
Finishes	1,730.00
	<b>23,240.00</b>

NOTE: We have itemised several important components that will help ensure the success of this initiative. However, there are many small items required to develop a laboratory, from windows and fixtures & fittings to the laboratory equipment and staff required to undertake the work. Please request the full proposal and bill of quantities to review your capacity to assist at any level. Every nail, nut and bolt counts

## 5. Peace and Conservation for Grevy's Zebra in Northern Kenya – NKGZP

Despite a turbulent year in Kenya, the NKGZP and its Peace Through Wildlife initiative have kept up efforts to secure the habitat and resources shared by Grevy's zebra, Turkana, and Samburu communities alike. Our expansion objectives have been on hold while we await the outcome of the 2017 presidential election and for the security situation in the northern rangelands to return to normal. However, the project remains secure and no personal or material losses have been suffered. We plan to implement our objectives as funded in 2017, for more scouts to be recruited and trained, to provide more logistic support and more equipment to support the task as soon as possible. We have engaged three large communities in Anderi Springs, Loltepes and Sarima and our study site has expanded based on the detected movements of our collared Grevy's zebra in the far north. We deployed another collar in the zebra population and monitored many of the water points and corridors used by the animals – delivering much new data to our stripe identification database. Children in the community schools received a number of visits by our field manager and participated in many conservation based lessons and activities. Perhaps the most intensive activity was in supplying fodder to the wild population of Grevy's zebra from most of the year already. We began feeding in February and have just sent another delivery of bales of hay to the study site on the 1<sup>st</sup> of September to continue efforts for another month.

The project's activity is underpinned by the team members working on the ground in these locations and their daily patrols, camera trapping activities and community engagements. All this requires resources to continue their operations and while some of the costs are borne under specific project budgets, the ongoing costs of the core operations are equally important in order to facilitate the work.

### Outputs

1. Grevy's zebra population data
2. Biodiversity Data
3. Movement and spatial ecology data
4. Schools engagement
5. Community engagement
6. Employment
7. Peace through common resource conservation

### Conservation Impact

Through community engagement we have sensitized a large and remote population of pastoral people to the relevance of conservation and the importance of wildlife to their health and welfare. Improved social security and an understanding of the role of wildlife and environment provide clear grounds for coexistence of regional communities. This in turn secures habitat and resources that wildlife also depend on for survival.

5. Peace and Conservation for Grevy's Zebra in Northern Kenya, NKGZP	£
Kenyan Project Manager (Enrita Lesoloyia) £740 per month	8,880.00
Field expenses and transport (£ 550/month)	6,600.00
Data processing (Camera Trap Images and Scout Patrol Data)	4,000.00
Camera/video camera	320.00
Projector	250.00
Stationary for school visits & community meetings	530.00
100 x printed shukas (African blankets worn by warriors)	630.00
100 x printed T shirts (for community training and discussion workshops)	630.00
200 x printed caps (for community training and discussion workshops)	600.00
Honda generator	350.00
	<b>22,790.00</b>

## 6. Drought Emergency Fund

As mentioned already, we have been assisting efforts to feed the wild and free ranging populations of Grevy's zebra with baled hay since February 2017. We anticipate that this will need to continue into late October and possibly longer before adequate grazing potential is restored to the rangelands. This year has been the harshest on record for decades. Not only did the short rains fail between December 2016 and January 2017 but the long rains of March to June 2017 also failed in the north of Kenya. We recorded a severe drop in zebra body condition and in the year to date more than 60 animals including lactating mares and foals have perished. Several poaching events have also been recorded as people desperate for food have turned to poaching – a new threat to Grevy's zebra in these dire times.

We need to ensure that we are ready to react immediately and at short notice when feed is required. Any contributions to this fund, large or small, will greatly support our efforts.

### Outputs

1. Critically affected lactating females are supported with food during times of need
2. Foal survival is improved so that breeding success is not negatively impacted.
3. Community participation provides an opportunity for coexistence with wildlife to be integrated to pastoral lives.
4. Depending on severity of drought, many tens to hundreds of individuals may be saved.

### Conservation Impact

By preventing the loss of foals the loss of entire year class cohorts are saved from starvation during harsh droughts. This would otherwise interrupt the recruitment cycle and increase the overall decline in the population. Drought preparedness is a key part of the strategy to conserve the National Grevy's zebra herd. Furthermore, by maintaining body condition and the health of the population, disease is suppressed as well. Drought stress through starvation and insufficient water increases the risk of disease outbreaks which can devastate a population suddenly and without warning.

<b>6. Drought Emergency Fund</b>	<b>£</b>
Provision of supplementary feed -hay & monitoring ~ 8 months @ £500	4,000.00
	<b>4,000.00</b>

Note: there is no cap on our emergency fund. Any small contribution to this fund is welcomed and will be put safely towards emergency response when it is needed. These needs are unpredictable and usually extremely urgent. Please contribute to this fund!

## Summary of funding proposal Grevy's zebra conservation 2017/18

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Biological Sample Storage and Analysis	2,000.00
	<b>18,800.00</b>
<b>b) Tsavo National Park location</b>	<b>£</b>
Flying time 12 hours @ £220/hour	2,640.00
Vehicle fuel	532.00
1 x Zebra capture and immobilisation operations	1,000.00
Biological Sample Storage	200.00
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<b>2. Great Grevy Rally (2018)</b>	<b>£</b>
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Honda generator	350.00
	<b>22,790.00</b>
<b>6. Drought Emergency Fund</b>	<b>£</b>
Provision of supplementary feed -hay & monitoring ~ 8 months @ £500	4,000.00
	<b>4,000.00</b>
<b>Overall Total</b>	<b>106,552.00</b>

