

# Darwin Initiative – Final Report

(To be completed with reference to the Reporting Guidance Notes for Project Leaders  
(<http://darwin.defra.gov.uk/resources/reporting/>) -

it is expected that this report will be a **maximum** of 20 pages in length, excluding annexes)

## Darwin project information

Project Reference	15/040
Project Title	Building Capacity to Alleviate Human-Elephant Conflict in north Kenya
Host country(ies)	Kenya
UK Contract Holder Institution	University of Cambridge
UK Partner Institution(s)	
Host Country Partner Institution(s)	Laikipia Wildlife Forum, Kenya Wildlife Service, Centre for Training and Research in Arid and Semi-Arid Lands Development
Darwin Grant Value	£ 260,909
Start/End dates of Project	01/10/2006 30/09/2009
Project Leader Name	Professor Bill Adams
Project Website	<a href="http://www.geog.cam.ac.uk/research/projects/heccapacity">www.geog.cam.ac.uk/research/projects/heccapacity</a> <a href="http://www.laikipiaelephantproject.org">www.laikipiaelephantproject.org</a>
Report Author(s) and date	Dr Max Graham, Mr Tobias Ochieng, Dr Anthony King, Mr Moses Litoroh and Professor Bill Adams

## 1 Project Background

Crop-raiding by elephants on the small-scale farms in southern Laikipia District is the worst in Kenya. Over 3,000 incidents have been recorded by trained enumerators here every year since 2002. The intense conflict created enormous resentment among smallholder farmers, leading to retaliatory killing of elephants, political tension with conservation actors and the disruption of wider programmes of biodiversity conservation and development. The project's purpose was to alleviate human-elephant conflict and promote tolerance of elephants in Laikipia through 1) assess and disseminate information on HEC mitigation tools; 2) establish a trained human-elephant conflict management team; 3) assess and promote elephant-compatible livelihood systems; 4) create a system and associated institutions for the management of the West Laikipia Fence.

## 2 Project support to the Convention on Biological Diversity (CBD)

This project has assisted the goals of the CBD at three levels: 1) on the Laikipia plateau by creating local capacity through formal and informal training and by assessing and promoting tools to manage and conserve Kenya's second largest population of elephants and alleviate human-elephant conflict; 2) Within Kenya by supporting the government to develop a national elephant conservation strategy and; 3) Internationally by assessing human-elephant conflict alleviation tools and disseminating the associated information generated. These achievements have primarily supported articles 6, 12 and 13 of the CBD, though the project has also, to a lesser extent supported articles 7, 10 and 11.

Cambridge University worked directly with the Kenya Wildlife Service, Kenya's CBD focal point. This collaboration took place in the following ways:

- 1) By sharing monthly reports and organising associated follow up meetings with the KWS Laikipia wardens on the status of HEC and elephant mortality;
- 2) Through conservation committee meetings under the Laikipia Wildlife Forum attended by the KWS regional head of research;
- 3) Supporting and participating in KWS National Elephant Conservation Strategy Workshops and assisting with drafting different sections; 4) Co-hosting a regional East Africa workshop with the KWS to share lessons learned on HEC management.

The project helped to collect information on the illegal killing of elephants in Laikipia in support of the Monitoring the Illegal Killing of Elephants Programme, created under CITES to assess the impact of the trade in ivory.

### **3 Project Partnerships**

Due to the complex nature of land-use on the Laikipia plateau and the interdisciplinary nature of research and remedial activities associated with human-elephant conflict, this project had several project partners on the ground. These partnerships are summarised below. The project was begun at the request of local partners (Kenya Wildlife service, Laikipia Wildlife Forum, Save the Elephants), who remained closely involved in its evolution through direct working partnerships on the ground (e.g. HEC data collection and response), and through the Kenya Advisory Committee. MoUs were established with Save the Elephants, CETRAD and the Laikipia Wildlife Forum. The continuous presence of the co-Pi Max Graham in Laikipia (based in Nanyuki) enabled effective liaison with local partners, including CETRAD, who hosted the project office. The main partner in year one was Save the Elephants, but following construction of the West Laikipia Fence, and the revised project logframe, the main partner became the Laikipia Wildlife Forum.

#### **Save the Elephants ([www.savetheelephants.org](http://www.savetheelephants.org)):**

Save the Elephants (STE) is a Kenya-based elephant research and conservation charity. STE were originally the main project partners in the host country and this project was developed at their request with input from the Laikipia Wildlife Forum and the Kenya Wildlife Service. Initially the development of a GPS/GSM collar-based early warning system was a key focus of this project which provided the basis for a MoU between Cambridge University and STE. With the construction of the West Laikipia Fence in 2007, this element of the project became less relevant and so was handed over to STE to develop further and the Laikipia Wildlife Forum became the main project partner. STE have made GPS collar data available to Cambridge University to use and analyse.

#### **The Laikipia Wildlife Forum ([www.laikipia.org](http://www.laikipia.org)):**

The LWF is a unique membership based organisation whose mission it is to “conserve the integrity of the Laikipia Ecosystem by creatively managing its natural resources to improve the livelihood of its people”. The LWF’s membership is broad, comprised of large-scale landowners, community-based organisations, government departments, small-scale farmers, tourism operators, pastoralists, researchers, conservation organisations and many others. This not-for-profit company is governed through a board of directors, five of which are elected by members from five discrete geographical units. In 2007 the LWF secured funding from the Dutch Government to construct a 163 km electrified fence separating land where elephants are tolerated (mainly ranches or other forest or pastoral land) from areas where they are not (mainly areas of smallholder agriculture). The timing and speed of the proposed development had not been anticipated yet had clear implications for project 15/040 which had been developed in the absence of an electrified fence. In response, we reviewed and amended the project logframe in consultation with project advisory committees in the UK and Kenya. This approved by Darwin. Under it, LWF became the main project partner and legacy organisation and took over management of all local project staff including Tobias Ochieng, who received his MPhil under this project. The relationship with the LWF has progressively strengthened throughout the life of project. Staff were retained by LWF after the end of the project in

October 2009, and LWF requested that Cambridge University support them to apply for a post-project grant to the UK Darwin Initiative (submitted in November of this year). The LWF has provided an excellent platform for implementing the project and disseminating results.

**The Centre for Training and Research in Arid and Semi-Arid Development**

**([www.cetrad.org](http://www.cetrad.org)):** CETRAD (bilaterally established under the Kenya and Swiss Governments in 2002) provided the project with an institutional umbrella, administrative support and dedicated project staff. Initially CETRAD also provided an office in Nanyuki. Dr Boniface Kiteme the director of CETRAD chaired the Kenya Advisory Committee for project 15/040. In 2007 CETRAD secured a Swiss Government grant (ESAPP Q605) of approximately £25,000 to support this project's formal training programme and to cover some of the costs associated with trials of farm-based deterrents.

**The Kenya Wildlife Service ([www.kws.org](http://www.kws.org)):** The Kenya Wildlife Service (KWS) is the national wildlife authority and main focal point for biodiversity conservation in Kenya. This project collaborated with the KWS on a day-to-day basis through local KWS posts (Nanyuki, Rumuruti and Nyahururu) and at the national level through Mr Moses Litoroh, the coordinator for the KWS Elephant Programme who was also an active member of the Kenya project advisory committee. Of the five formal courses run under this project, the KWS participated in four. The last course run under this project, entitled 'human-elephant conflict management' was designed and delivered in partnership with the Kenya Wildlife Service who also comprised the majority of participants. The KWS requested and received support from the project for the development of the national elephant conservation strategy in the form of financial assistance and technical support to deliver a final workshop and the associated written document (due to be released in early 2010). Furthermore the KWS and Cambridge University worked together to deliver a regional workshop on human-elephant conflict mitigation, providing an East Africa-wide forum for dissemination lessons learned on the Laikipia plateau under project 15/040.

**The Symbiosis Trust:** The Symbiosis Trust, a Kenyan charitable organisation focussing on conservation compatible enterprise development, helped to trial and assess the performance of three elephant compatible livelihood activities; elephant dung paper production, chilli farming and honey production among community-based organisations across Laikipia. Scaling up these activities and the implementation of recommendations of the overall assessment has been handed over the Laikipia Wildlife Forum's bioenterprise programme funded by the Royal Netherlands and USAID.

**Mpala Research Centre ([www.mpala.org](http://www.mpala.org)):** The Mpala Research Centre (MRC) is an ecological research organisation, based on the Mpala Conservancy in central Laikipia, and supported by Princeton University and the Smithsonian Institute. MRC provided this project with GIS support (25% of their GIS officer's time) and the director, Dr Margaret Kinnaird, was an active member of the Kenya advisory committee. In 2008 Max Graham supported MRC to secure funding through the KWS to employ and resource an elephant researcher on the Mpala Conservancy with a view to establishing an elephant population study.

A Kenya Project Advisory Committee comprised of Save the Elephants, the Kenya Wildlife Service, the Laikipia Wildlife Forum, Mpala Research Centre, the Symbiosis Trust and chaired by CETRAD, helped guide the project from 2006 to 2008. Initially this was through regular group meetings. From 2007, with the construction of the West Laikipia Fence and the associated changes in the project logframe, the advice needed for project 15/040 was from a different group of actors who had an elephant management focus rather than a research focus and so regular meetings were instead held with the OI Pejeta Conservancy, the KWS and the LWF and with other relevant actors involved in the management of the West Laikipia Fence. While some of these individuals were part of the original project advisory committee not all were but their input was critical for enabling the activities in the reworked logframe to be successfully implemented. While this new group (OPC, KWS, the LWF and those working with the West Laikipia Fence project) was not formally created as a new project advisory committee in practice this is exactly how it functioned, effectively servicing the requirements of the new

project logframe, where the original committee could not. However original members of the advisory committee were regularly consulted through individual rather than group meetings, with the exception of STE whose involvement in the project became negligible once the GPS tracking component was dropped as key focus.

All formal working relationships with Kenya project partners that involved the disbursement of funds from Cambridge University were guided through MoUs or contracts. These relationships worked well, although the relationship with Save the Elephants suffered some tensions. This relationship did not operate smoothly because of divergent perspectives over data sharing and use (Cambridge wanted project partners and managers on the ground to have access to data and maps while STE wished to maintain close control over the circulation of all maps showing the movement of collared elephants), project branding (STE insisted on vetting and branding each and every output of the project including maps at a senior level which caused repeated delay and confusion in communication between offices in Nairobi, Naivasha and Samburu) and the removal of battery dead collars (Cambridge wished to remove GPS collars before batteries died as an ethical precaution while STE preferred to retain collars as long as possible). However, with tact and a great deal of effort on our project's side, a successful collaboration maintained, although the full potential of the GPS tracking activities was not realised. Mpala Research Centre developed a GPRS data management project with STE, and from 2008, STE now issue monthly reports of elephant movement using GPS tracking data to stakeholders. STE has also now (2009) released GPS tracking data to Max Graham which will be useful in ongoing assessment (with LWF) of the performance of the West Laikipia Fence and the effectiveness of management interventions. The lesson for future Darwin Initiative projects is the importance of an MoU, and of the personal relationships necessary to make it effective. There may be a particular issue with project partners that are not local in terms of their management structure, or who have particular needs in terms of brand recognition.

Other UK partners were represented on a UK Advisory Committee which helped to review project progress and outputs. These included Fauna & Flora International (Dr Rob Brett), UNEP- World Conservation Monitoring Centre (Dr Matt Walpole), the Department of Psychology at the University of Stirling (Professor Phyllis Lee) and the Department of Geography at the University of Cambridge (Dr Bhaskar Vira).

## **4 Project Achievements**

The project's achievements are set out in Annex 1. They include:

- Reduction in crop-raiding reduced from 3640 incidents (Oct 06 to Sept 07) to 1646 incidents (Oct 08 to Sept 09)
- Establishment and training of a permanent HEC research and management team.
- Crop deterrence trials, training, workshops and publications on HEC management generated at all levels from community to east African region
- Local Partner Laikipia Wildlife Forum commits to maintain HEC management activities until 2012 and commits to long term maintenance of systems put in place through its members
- Completion of trials and assessment of elephant compatible livelihoods: handed over to LWF bioenterprise programme to scale up

### **4.1 Impact: achievement of positive impact on biodiversity, sustainable use or equitable sharing of biodiversity benefits**

Within the framework of the DI this project's main impact has been a reduction in the cost of the conservation of elephants among the communities that live with elephants on Laikipia. Although some of the project's outputs can also be considered in terms of their contribution towards securing a future of elephants in the wild and the other species that share their range. Here we briefly describe these two impacts at three different levels.

First, at the local level, this project has directly contributed to a significant decrease in levels of crop-raiding by elephants on the Laikipia plateau from 3640 incidents recorded by scouts in the

first year of the project (October 06 to September 07) to 1646 crop raids per annum in the final year of the project (October 08 to September 09). Today there are farmers in Laikipia who are harvesting crops where previously they could not. Furthermore this project has put in place a network of trained local personnel and a system to sustain HEC mitigation on the Laikipia plateau, providing this can be resourced in future by the Laikipia Wildlife Forum and its members. The LWF has secured funding for construction of the West Laikipia Fence and for related HEC management work until 2012, and has committed to raising further funds through its members and executive to ensure the West Laikipia Fence is managed for the foreseeable future. While all of these accomplishments are directed towards reducing the costs to local people of conservation, they are also likely to have a positive impact on the conservation of elephants as local people become more tolerant of elephants. Furthermore if the West Laikipia Fence is viewed a success by local people and their leaders then there is likely to be growing local acceptance that land on the 'elephant tolerant' side of the fence is appropriately used land for conservation of not only elephants but other species sharing the elephant range. This will have longer-term benefits for the conservation of biodiversity on the Laikipia plateau a landscape of conservation significant at the international level due to its size, integrity unprotected status and high mammal diversity.

At the national level this project has helped the Kenya Wildlife Service to develop a national elephant conservation strategy which, if pursued, should contribute to securing a future for elephants in Kenya, at least over the next 20 years. Furthermore this project has provided the KWS with guidance on the application and performance of different HEC mitigation tools and provided associated training among KWS personnel with a view to improving HEC management in HEC sites across the country. Kenya has also benefits from the four Kenyan staff from the project and local partner organisations who have or are in the process of receiving masters degrees in conservation or a related field (Mr Tobias Ochieng, Mr Francis Kamau, Mr Gabriel Kahiro and Mr Samuel Mutisya). Of these four two are currently working in Laikipia, one specifically on HEC as part of the legacy plans for project 15/040 (Tobias Ochieng is the project manager for the LWF) and the other is working with a new conservation foundation in Laikipia (Gabriel Kahiro is working for the Zeitz Foundation on Segera Ranch). Samuel Mutisya is a Darwin Fellow and will return to Laikipia to assist OI Pejeta Conservancy continue with its contribution towards HEC management in Laikipia, particularly in relation to providing technical support with the construction and management of electrified fences.

At the international level this project has disseminated lessons learned from the Laikipia plateau on the performance of different HEC mitigation tools through the creation of published working papers and peer reviewed journals and a regional East African workshop. This will assist other practitioners working on elephant conservation and HEC management with planning appropriate interventions. However the breadth of work accomplished under this project also has applications for the conservation and management of other species. The trial of mobile phone technology for mitigating human-elephant conflict, the use of interactive drama in human-elephant conflict management and the assessment of elephant-compatible livelihoods could all be applied to address a range of conservation challenges and we hope and expect this will be the case in future years if the outputs from this project can continue to be disseminated widely and among the right group of actors. However more work will be required so that this project's outputs do reach this group so that the impact of this project can be maximised in time and space. This is because the conventional channels used by UK research and conservation institutions for communicating project results, such as peer reviewed journals, taught courses and seminars or donor driven marketing, are not always accessible to the actors who could most use the information within developing country contexts. While we have made some attempts, through the use of drama and comic books, to ensure that the lessons learned through the implementation of project 15/40 are disseminated at the local level, even here the impact will be localised. This is a challenge that we expect all Darwin projects currently face and one that we are hoping to address through a post-project application which will involve the production and dissemination of an educational film among practitioners at the site level.

## **4.2 Outcomes: achievement of the project purpose and outcomes**

The purpose of project 15/040 was to alleviate human-elephant conflict and promote tolerance of elephants in Laikipia District, Kenya. Data collected systematically by trained enumerators shows that crop-raiding has reduced by more than half since the project began and we believe the activities implemented directly by our project have contributed significantly to this reduction. Furthermore we have done a great deal to promote tolerance of elephants in Laikipia. This includes the trial and assessment of elephant-compatible livelihoods, the creation of community education tools such as interactive drama, comic books, posters and essay competitions, and the creation of a network of community elephant scouts who act as a bridge between the community and the wildlife authorities. While it would have been desirable to assess the impact of all of these activities on local tolerance of elephants, we lacked the staff or resources to undertake a formal methodology. Furthermore, we believe a questionnaire-based assessment would not have been helpful given how emotive the subject of human-elephant conflict is among farmers on the Laikipia plateau. However we did undertake an informal assessment of one of our major project outputs, community-based drama. This assessment has now been written up and published as a project working paper by the University of Cambridge. The conclusion from this assessment is that the drama contributed to debate, and to the beginnings of changes in attitudes and changes in behaviour. We believe, though cannot verify independently, that the other activities we have undertaken, in particular the establishment of a network of community scouts and the creation of fence management committees, has improved tolerance and understanding of elephants and improved community participation in their conservation and management.

## **4.3 Outputs (and activities)**

The project's performance against each of its planned outputs as per the project logframe is summarised here:

### **Output 1: GPS/GSM collar based HEC early warning system**

This element of the project was undertaken as planned, although limits to the effectiveness with which the technology was managed by project partners meant that results fell short of our hopes. As planned, GPS/GSM collars were deployed 2006-7 on elephants known to be frequent crop-raiders, in human-elephant conflict hotspots on Laikipia. The GIS-based e-fence system management, created by partners Save the Elephants (STE) was activated and trialled with the OI Pejeta Conservancy. The technology worked: when an elephant fitted with a GPS/GSM collar approached specified boundaries between the conservancy and surrounding smallholder agriculture, a text message warning was sent to designated fence management personnel so that resources (men, vehicle, lights etc.) could be mobilised to scare the elephant away from the conflict zone. However, an outdated map was used to set the computerised e-fence boundaries, such that that false warning text messages were sent when the elephants crossed now non-existent fences within the conservancy. This undermined the confidence of conservancy fence managers in the system and made it impossible to really assess how useful the technology would be when it worked. Frustratingly, although the problem was trivial in programming terms, STE were managing this project through a volunteer in Canada, and it proved impossible to persuade STE to allow local management of the overall system by project or partner organisation staff, so that the glitches in the system were not addressed in a timely fashion. Local control and management of the programming component of the system would have allowed any errors to be corrected rapidly, and also made it possible to create digital maps in real time for local partners.

With the emergence of the West Laikipia Fence as a major component of this project, further development of the GPS/GSM collar-based early warning system became less critical to the task of HEC mitigation in Laikipia and was handed back to STE to take forwards. Under a project with Mplala Research Centre, STE now publish monthly reports of the location of our collared elephants, which they send to all interested parties. They have not yet applied these data to HEC management, but there are plans to dedicate a team to this task in 2010. We expect to write a full account of experience with the e-fence as part of a report on non-lethal

management of problem elephants in 2010. We had hoped to finish this in 2009, but there have been repeated delays in securing the GIS data from the collars, and it has been an uphill struggle to persuade STE to agree to publish using them.

However, the data generated by the GPS collars have now been made available by STE and preliminary analyses have been extremely useful for assessing the performance of the West Laikipia Fence. These data will be useful for Cambridge University researchers in the near future for assessing the ecology of crop-raiding elephants living in human land-use mosaics. Therefore while this element of the project did not operate smoothly it has still been valuable and will continue to generate outputs of use to the understanding and management of human-elephant conflict on the Laikipia plateau.

We continue to believe that the e-fence GPS early warning systems has value in managing HEC, where management capacity and investment is sufficient (e.g. on the boundaries between relatively well-capitalised ranches and smallholder farmland).

## **Output 2: Local Knowledge based HEC Early Warning System**

This element of the project evolved from an attempt to use satellite imagery to predict the timing and location of elephant crop raiding. A feasibility study was carried out and reported to Darwin in June 2007. The method proved interesting but expensive, requiring specialist ecological and GIS expertise to develop and operate, limiting its application in rural African contexts where human-elephant conflict is a problem. Therefore, we undertook a trial of the application of mobile phone technology among networks of users as a HEC mitigation tool.

Mobile phone technologies are potentially widely applicable given the growing access to mobile phones across Africa and indeed the developing world. The technology tested was 'Push to Talk over Cellular' Technology (PTT). This enables two-way communication between two individuals, or among a group of people, combining the functionality of a two-way radio with a mobile phone. The trial was undertaken in November and December in 2007, in collaboration with GSMA Development Fund, Safaricom Ltd, Wireless ZT, Nokia, the Nokia Siemens Networks, the Kenya Wildlife Service and the Laikipia Wildlife Forum. The trial showed that PTT improved coordination of responses to human-elephant conflict, bridging problematic relationships between different stakeholders. 'Push to Talk' is in theory cheap to use relative to normal phone use but unfortunately the technology was not rolled out commercially by the commercial partners in the trial. However, there is good mobile phone coverage and widespread adoption. Moreover, there are other mobile-phone based group communication tools available that offer some of the same communication possibilities as PTT, such as group sms.

The trial showed the importance of mobile phone technology to community-based human-elephant conflict mitigation where (as on Laikipia and indeed much of rural Kenya). The assessment was written up and published as a working paper (free download: [www.geog.cam.ac.uk/research/projects/heccapacity](http://www.geog.cam.ac.uk/research/projects/heccapacity))

## **Output 3: Community based HEC management and research programme established**

This output of the project involved two components. The first was the establishment and training of a network of local assistants embedded among communities where human-elephant conflict was a major problem. These assistants were originally tasked with the job of monitoring human-elephant conflict incidents which was later expanded to include monitoring of electrified fences. However their roles also grew to include community liaison, bridging relationships between communities and the wildlife authorities, and outreach for human-elephant conflict mitigation which involved helping to organise communities into functioning groups and disseminating information on HEC mitigation tools. Interestingly this set of roles gave the scouts status within their respective communities, building morale and creating an extremely effective entry point for implementing this project.

The second component of this project involved the dissemination of knowledge on HEC mitigation measures. Initially this involved farm-based deterrents and participatory trials of simple deterrents (chilli rope fences, trip wire alarms, watchtowers, chilli smoke briquettes,

solar powered spotlights). This assessment has been written up and published as a working paper (free download: [www.geog.cam.ac.uk/research/projects/heccapacity](http://www.geog.cam.ac.uk/research/projects/heccapacity)).

With the construction of the West Laikipia Fence, the project focus shifted to disseminating knowledge about effective electrified fences, their maintenance and management. To this end an assessment of the OI Pejeta Conservancy fence upgrade and associated management was undertaken and written up as another working paper (also downloadable from [www.geog.cam.ac.uk/research/projects/heccapacity](http://www.geog.cam.ac.uk/research/projects/heccapacity)).

Knowledge of what makes an effective electrified fences as experienced by OPC was rolled out along the first 84 km of the West Laikipia Fence through the provision of:

- 1) training on technical aspects of fence upgrades so that they become better at deterring elephants and;
- 2) the identification and monitoring of fence breaking elephants. In addition knowledge and capacity to manage fences was enhanced locally through the use of fence management committees.

These created a forum for all relevant stakeholders to understand a) the technical aspects of successful electrified fences and; b) the respective roles and responsibilities of stakeholders (communities, ranch owners, the Kenya Wildlife Service etc in fence management.

#### **Output 4: Dissemination of information on Elephant Conservation and Human-Elephant Conflict Management among vulnerable communities and conservation practitioners**

This project has been highly successful at disseminating relevant information relevant for the conservation and management of elephants and the mitigation of human-elephant conflict. This has occurred at several levels:

Locally: through the creation and dissemination of:

**Two comic books** (one on farm-based deterrents and one on electrified fences, see Annex 5),

**An interactive play** written by project staff and members of a local drama group. The play was performed for the project by the drama group 20 times, involving community groups and others active in human elephant conflict management. The play initially addressed the issue of crop-raiding and the defence of crops, and was then re-written to discuss issues relating to the effective management of the West Laikipia Fence. Both versions of the play are published with an assessment of this element of the work as a project working paper: [www.geog.cam.ac.uk/research/projects/heccapacity](http://www.geog.cam.ac.uk/research/projects/heccapacity))

**A school essay competition.** In 2007-8, an essay competition was organised in collaboration with the Kenya Government District Education Officer among schools located in Human-Elephant Conflict hot spots in Laikipia. There were 240 participants from 30 schools (22 primary schools and eight secondary schools). The national examination board examined the essays and chose eight winners. The three top winners, one from each age group, were taken to Mpala Research Centre (central Laikipia) for two nights in February 2008 to learn about elephants

Nationally: through:

Provision of five formal training courses lasting 3-5 days:

1. Asking questions in the community (2008)
2. Getting to know elephants (2007).
3. GIS for Conservation (2008-9)
4. Proposal writing for conservation (2008-9)
5. Human-Elephant Conflict Management (2008-9)

Support for four Kenyans from project staff and partner organisations to complete masters degree programmes at UK Universities: Tobias Ochieng (Cambridge), Francis

Kamau (ITC Netherlands), Gabriel Kahiro (DICE, Kent) and Samuel Mutisya (DICE, Kent).

Support for the development of a national elephant conservation strategy (co-led planning workshop 2009; strategy currently in draft)

Internationally: Through:

Participation in an international workshop on HEC mitigation organised by FFI and submission of a chapter for the subsequent proceedings which were published by FFI in 2008 (see Annex 5);

Delivery with KWS of an East Africa workshop on human-elephant conflict mitigation (2009)

Publication of papers in two peer reviewed journals (*Oryx* and *Animal Conservation*, see Annex 5);

Publication of 5 project working papers made freely available to download on the project website in Cambridge (see: <http://www.geog.cam.ac.uk/research/projects/heccapacity/publications.html>);

Creation of four short 'Youtube' videos, describing the work of the project, and particularly fences, education and crop-raiding and defence (see <http://www.geog.cam.ac.uk/research/projects/heccapacity/videos.html>)

### **Output 5: Elephant defence livelihood systems established**

Trials of three different elephant-compatible livelihood activities were undertaken on the Laikipia plateau under this project. This was not easy though the activities trialled did show potential as a complementary rather than alternative source of revenue. This work is written up as a project working paper ([www.geog.cam.ac.uk/research/projects/heccapacity](http://www.geog.cam.ac.uk/research/projects/heccapacity)). With the change in the project logframe, this project supported a new initiative, the LWF bioenterprise programme, to take on the community based organisations we worked with and some, if not all, of the activities initiated (in particular honey). Therefore if this new initiative, which is being well resourced by USAID and the Royal Netherlands, is successful it is highly likely that the communities living in some of the HEC hotspots we engaged with will be earning significant revenues from the conservation-compatible livelihood options, though it is unlikely these will ever become alternatives to small-scale farming and pastoralism, though they may provide sufficient surplus to allow individuals involved to become more tolerant of wildlife.

### **Output 6: A strategy and revenue streams established for long term HEC management in Laikipia**

A strategy document and associated budget for the maintenance and management of the West Laikipia Fence was drafted in 2008. This was intended to cover the period between 2008 and 2010 but has been extended up until 2011 and is being resourced by the Laikipia Wildlife Forum through a Dutch Government grant. LWF has adopted the data collection and community relations protocols developed by Darwin 15/040, and the LWF now funds the core team recruited and trained by 15.040. The large-scale properties located along the boundary of the West Laikipia Fence have committed to its long term maintenance and the LWF through its executive has committed to ensuring its members are able to make the fence a success over the long term, through additional fundraising if necessary.

However there are significant ongoing challenges to successful management of the West Laikipia Fence as a barrier to elephant movement. These include:

- 1) Limited management capacity on on large property (ADC Mutara Ranch), which is undermining the upgrade and maintenance of the West Laikipia Fence to the standard agreed in the strategy;
- 2) The wildlife authority are not willing to commit to a clear protocol for the management of persistent fence breaking elephants;

- 3) Theft of wire and poor enforcement in relation to this theft;
- 4) Pastoralists breaking the fence to access grazing on private ranches during times of drought.

Much has been done to address these challenges over the course of the project, in particular the formation and use of fence management committees to control community related damage to the fence, the production and dissemination of monthly reports to all stakeholders including the KWS so that they are able to make informed decisions on the support required to manage the fence (including the management of fence breaking elephants) and a huge amount of direct support to ADC so that they are in a better position to manage their section of the fence. However the latter remains a problem at the end of this project and the LWF may well have to negotiate an agreement between ADC Mutrara and the neighbouring OI Pejeta Conservancy so that the latter can manage the ADC Mutara Ranch section of the West Laikipia Fence. This has been proposed and OI Pejeta Conservancy are willing but resource constraints have been cited as a problem. This is expected to change in future with the recent agreement between ADC Mutara and a commercial tourism partner to construct a substantial tourism entity on ADC Mutara Ranch and the recovery of tourism revenue on OI Pejeta.

### **Objective 7: Support the Laikipia Wildlife Forum to develop the Institutional Capacity to Manage the West Laikipia Fence**

To develop the institutional capacity to manage the West Laikipia Fence this project has developed an integrated HEC management system along the first phase of the fence (84km). This system includes:

- 1) A network of community scouts who were retrained to systematically collect data on fence breakages and voltage;
- 2) A protocol for early warning of HEC incidents using mobile phone text messages;
- 3) Deployment of a mobile rapid response team to scare elephants away from electrified fences and/or crops in response to early warning text messages;
- 4) A trained local elephant research scout to positively identify persistent fence breaking elephants;
- 5) A project officer (Gabriel Kahiro, before his M.Sc. at DICE, and Tobias Ochieng Nyumba, following his M.Phil. in Cambridge from October 2008) to coordinate fence management activities. A monthly report is now published on HEC and fence performance using data collected by community scouts;
- 6) Creation of a HEC management committee comprised of the Kenya Wildlife Service, the Laikipia Wildlife Forum and the OI Pejeta Conservancy and; the creation of local fence management subcommittees comprises of farmers, government officials and neighbouring ranch management to take location action in response to monthly reports.

This HEC management system was not a discrete output planned under the revised logframe, However the system is making a valuable contribution to bringing together relevant actors to ensure those who need to be engaged in ensuring the fence works are engaged. The challenge now is for the Laikipia Wildlife Forum to entrench this system where it is currently being implemented and subsequently to roll it out across the remaining stretch of fence that is under construction. While the LWF have provided for this and plan to do it they also requested Cambridge University to incorporate the technical components of this work in a post-project application to the UK Darwin Initiative which was submitted in November 2010.

## **4.4 Project standard measures and publications**

[See Annex 4 and 5.](#)

## 4.5 Technical and Scientific achievements and co-operation

The key technical and scientific achievements under project 15/040 are the following:

### 1. Assessment of the performance of farm-based crop-raiding deterrents

This was undertaken in collaboration with Kenyan researchers trained under this project and with the support of the Elephant Pepper Trust (based in Zimbabwe) as well as valuable input and support from Noah Sitati (WWF). The outputs from this particular work include one published paper, one book chapter and one working paper See Annex 5 and <http://www.geog.cam.ac.uk/research/projects/heccapacity/publications.html>). Details of this scientific work are provided in the annex and in the copies of each publication submitted with this report. This body of work shares experiences on the application and uptake of farm-based deterrents and highlights the issue of labour availability as a key criteria for success in community-based human-elephant conflict mitigation projects.

### 2. Assessment of elephant movement in a land-use mosaic

Under this project, data collected on elephant movement on the Laikipia plateau collected by Max Graham prior to the onset of project 15/040 was analysed and written up in collaboration with researchers from Save the Elephants, Cambridge University and the University of Stirling. The output from this piece of work was a peer reviewed published paper in *Animal Conservation* (Annex 5 Journal Article B). Details of this work are provided in the annex and in the copies of the publication submitted with this report. This work demonstrates the adaptability of elephants in human dominated landscapes and highlights the implications in terms of opportunities and challenges for future conservation.

### 3. Landscape planning for elephant conservation in north Kenya

Under this project Max Graham was able to collaborate with a wide range of researchers and conservation practitioners working in north Kenya, together with the Wildlife Conservation Society to identify, in a spatially explicit way, challenges and opportunities for the conservation of elephants in the Ewaso Landscape that includes the Laikipia Plateau. The other species that were included in this landscape planning exercise were African Wild Dogs, Grevy's Zebra and Lions, all possessing attributes that make them relevant for planning at the landscape level. Details of this work and the methodology used were written up and published in *Biodiversity Conservation*. Details of this work are provided in the annex and in the copies of the publication included with this report.

### 4. Assessment of other human-elephant conflict alleviation tools

This project worked with a range of different local partners in Kenya and internationally to assess several other important human-elephant conflict alleviation tools. The following have been assessed and subsequently written up as project working papers (<http://www.geog.cam.ac.uk/research/projects/heccapacity/publications.html>), described in the annexes but these have not yet been subjected to peer review (though may at some stage in future):

- The use of electrified fences to mitigate human-elephant conflict (*Working Paper 1*)
- 'Push to Talk' mobile phone technology to mitigate human-elephant conflict (*Working Paper 2*)
- Elephant compatible livelihoods to mitigate human-elephant conflict (*Working Paper 3*)
- The use of drama to mitigate human-elephant conflict (*Working Paper 4*)
- Farm-based deterrents to mitigate human-elephant conflict (*Working Paper 5*)

## 5. The development of a national strategy for elephant conservation

This project helped Dr. Moses Litoro of Kenya Wildlife service to organise and run a workshop to draft an elephant conservation strategy for Kenya. This was held at Mpala Research Centre in September 2009. The workshop brought together a range of expertise from both Kenya and internationally (Sudan, Tanzania, Mozambique and Uganda). Delegates came from Kenya Wildlife Service, IUCN African Elephant Specialist Group, Southern Sudan Wildlife Authority, Tanzania Wildlife Division, Tanzania Wildlife Research Institute, Ngorongoro Conservation Area Authority, Uganda Wildlife Authority, Aga Khan Foundation (Mozambique), WWF, OI Pejeta Conservancy, Wildlife Conservation Society).

Darwin project 15/040 made a significant contribution to the workshop in two ways: 1) Financial support for relevant participants to attend; 2) Technical support from Max Graham and Bill Adams, including coordination of drafting parts of the document. The final draft strategy is due to be published early in 2010.

### 4.6 Capacity building

As described in previous sections, this project has enhanced capacity significantly at the local and national levels through the establishment of two tiers of trained project staff and the creation of new institutions.

At the local level the project has had a major role in enhancing the overall capacity of local partners to manage human-elephant conflict. The greatest achievements have been in years 2 and three of the project, in its contribution to the capacity of the Laikipia Wildlife Forum (and its local partners) to implement the West Laikipia Fence project, through:

- 1) Establishment of a network of trained scouts and fencers has significantly enhanced capacity in Laikipia to monitor and address human-elephant conflict
- 2) Creation of fence management committees has created local level forums for addressing challenges identified through systematic monitoring data.
- 3) Creation of the integrated HEC management section described in the project logframe and previous sections

At the national level the training of four Kenyans to masters degree levels under this project represents a serious investment in conservation capacity. The training provided at the national level through short taught courses is likely to improve knowledge and understanding for improved human-elephant conflict management.

The UK lead institution's capacity to be an effective partner is reflected in a successful bid for a Darwin fellowship ((EIDPS022: Samuel Mutisya) and a post-project application to build on the achievements of 15/040.

### 4.7 Sustainability and Legacy

We anticipate that the lessons learned on the Laikipia plateau under this project in relation to fence maintenance and management are likely to endure in Laikipia as a form of local wildlife management practice. The Laikipia Wildlife Forum has funding to complete the West Laikipia Fence, and undertake the community and outreach work necessary to establish an effective management regime.

We anticipate that in areas without electric fences (or during episodes of poor management when fences are not fully effective), the farm-based deterrents introduced and trialled under this project will continue to be used by local farmers. Once learned, such technologies are readily deployed, and the experience of local collaboration among smallholders that render them effective remain alive. We think the broader lessons gained from this project in terms of the use of other human-elephant conflict mitigation tools are likely to inform management practice elsewhere in Kenya and possibly surrounding countries as our work is more widely disseminated and accessed in the coming years (through access to the working papers, public seminars etc).

Kenya Wildlife Service staff in Laikipia and beyond have been closely involved in the learning undertaken through this project, both about elephants (e.g. learning to identify individual elephants and understanding why and how they move in the landscape and raid crops) and about communities (and the importance of early, timely and effective communication between animal control teams and local people). While such learning can seemingly leak away, we have hopes (based on in-depth personal contacts between project staff at a number of levels and KWS staff) that the project's impacts will endure, or at least lie latent to surface when new threats or opportunities arise.

All project staff have been taken on by local partner organisations in the Laikipia and we anticipate that they will continue to be employed into the future. Some of these are future conservation leaders (notably our Masters graduates), and represent a new generation of Kenyans with knowledge, confidence and motivation of a high order.

The main project partners are active members of the Laikipia Wildlife Forum. As such they already meet regularly and will continue to do so for the foreseeable future. The link between Cambridge University and the LWF is likely to be maintained though the intensity of the interaction may depend on the outcome of a post-project application to the UK Darwin Initiative.

## **5 Lessons learned, dissemination and communication**

The key lessons drawn from this project and our experiences from work undertaken on the Laikipia plateau, generally, are captured in the proceedings from the East Africa workshop on human-elephant conflict mitigation, a copy of which is included with this final report. These lessons relate to the determinants of human-elephant conflict, the implications for the prevention of human-elephant conflict and on the experience of several different mitigation tools that have been trialled on the Laikipia plateau. Rather than repeat these all here, we suggest reviewers refer to that document which provides a good summary of the lessons learned (see <http://www.geog.cam.ac.uk/research/projects/heccapacity/publications.html> and attached papers).

This project's achievements have been disseminated in Kenya with relevant practitioners, in particular drawn from the Kenya Wildlife Service though also including researchers and managers from NGOs, through a short course on human-elephant conflict management. At this level the project's achievements have also helped to inform relevant sections of the national elephant conservation strategy. Regionally this project's achievements have been disseminated through the East Africa workshop already mentioned where the audience was comprised primarily of wildlife managers and some researchers (the attendance list is included in the proceedings).

In Laikipia the project's achievements, in terms of lessons learned, are being directly applied to the management and maintenance of existing and planned electrified fences for the mitigation of human-elephant conflict.

Dissemination will continue after the project ends at two levels. Firstly Professor Bill Adams and Max Graham intend to continue to collaborate so as to write up and where possible, scale up, some of the findings from this project so that these can be published in peer reviewed journals. One paper on the use of mobile phone technology in human-elephant conflict management is in draft and there are two further papers in the pipeline. At another level, the Swiss Government through CETRAD have committed approximately £30,000 pounds of funding to create an educational film on human-elephant conflict and its management based on the lessons learned on the Laikipia Plateau under this project. Max Graham is being hired as a consultant on this project. The intended audience is wildlife managers and relevant stakeholders affected by human-elephant conflict across East Africa. The dissemination of this film is the subject of part of a post-project application to the UK Darwin Initiative by the University of Cambridge.

In addition to these two levels of dissemination it is important to note that Laikipia has become a learning place for those interested in human-elephant conflict management. Individuals from other parts of Kenya and from Tanzania have made contact with the Laikipia Wildlife Forum and travelled to Laikipia so as to learn about what is being done to address human-elephant

conflict. This is in large part thanks to the efforts undertaken under this project with funding from the Darwin Initiative.

## 5.1 Darwin identity

The Darwin logo was used on the project vehicle, two project motorbikes, all community orientated outputs (comic books and posters), all five working papers, short course handouts, workshop proceedings and videos. All these are available through the project's two websites, one in Cambridge, and one in Kenya:

<http://www.geog.cam.ac.uk/research/projects/heccapacity/>

<http://www.silverscript.co.ke/lerp/>

The Darwin Initiative project 15/040 was seen as the major contributor to a programme of work that involved other donors but the outputs from this project are clearly labelled as Darwin Initiative funded and the project partners on the ground recognise the contribution made by the Darwin Initiative.

Many conservation organisations within the region were familiar with the Darwin Initiative. Indeed many have applied but failed to secure funding from Darwin prior to this project. The Kenya Wildlife Service was already very familiar with the UK Darwin Initiative through the funding provided to the development of its Rhino strategy and the work of Noah Sitati in the Maasai Mara. The Darwin Initiative became even more prominent within the KWS and among relevant conservation practitioners in the region through the high profile East Africa and Kenya workshops supported under this project and described in previous sections.

One of the co-PIs on the project (Adams) presented a talk on *Conservation and the management of Human-Elephant Conflict* to the Darwin Initiative Workshop on **Livelihoods and Conservation** on 3 October 2007

The project has provided two articles for *Darwin News*: No. 15 (attached) and 16 (profile of Darwin Fellow Samuel Mutisya).

## 6 Monitoring and evaluation

As described in previous sections, in 2007 the Laikipia Wildlife Forum secured funding for a 163 km electrified fence to mitigate human-elephant conflict. This idea had been current for some years, and the speed with which support was secured and construction began was a surprise to all local partners. It rapidly became clear that project 15/040 would have to adapt if it was to remain relevant. Therefore we altered the logframe, mainly by adding new activities and wrapping some of the original activities faster than had been initially intended. This amended logframe was submitted to the UK Darwin Initiative and approved in early 2008. Performance against the amended logframe is recorded in Annex 1 with most but not all individual activities successfully completed.

One of the strengths of this project has been the careful documentation of the performance of the activities undertaken. The main M&E activity implemented under this project was the systematic collection of information on human-elephant conflict by trained enumerators over the life of the project. However further information of use was also collected through the deployment of GPS collars on elephants and through formal and informal interview surveys. These are all described in some detail in the methods sections of our published papers.

The use of project indicators in the project logframe forced us to consider how we were going to demonstrate progress towards project goals and outputs which did two things. Firstly it made us carefully consider what would be realistic and secondly to identify outputs that were tangible and could be reviewed. While this has been useful in pushing us to generate a great deal of outputs it is worth noting that it has also been extremely time consuming and we are not sure if we got the balance (trade off) between project management in the field and writing up project indicators in the office absolutely right. The emergency of highly trained and competent Kenyan staff towards the end of the project, in particular Tobias Ochieng made this issue over trade-offs less relevant as he was able to play a big role in supporting project implementation and management in the field.

There has been no formal review of the project as such. However the two advisory committees played a key role in evaluating the project. The Kenyan committee did not meet in the last year to formally do this but the UK committee did and has done over the life of the project. This was extremely useful.

## **6.1 Actions taken in response to annual report reviews**

A number of issues have been raised by reviewers of the Annual Reports, and each has been dealt with in subsequent half-year and annual reports. Issues raised by reviewers and UK Advisory Committee) have been discussed with local partners, either at formal Kenyan Advisory Committee meetings, or at regular bilateral meetings with partners.

Key issues have been:

- 1) The relationship with Save the Elephants (raised 2006-7). A careful and detailed MoU was signed with STE at the commencement of the project. Nonetheless, as will be clear from this final report, day to day interactions with STE have remained difficult. This is chiefly due to logistics – STE maintains offices in Samburu and Nairobi, but not in Laikipia – and STE's focus on elephant research and welfare, which made them both reluctant to encourage dissemination of data on elephant movement that might have implications for the welfare of particular animals or official attitudes to elephants in general, and also interested in maintaining a clear 'brand' with respect to GPS collar data. Doubtless also, we in 15/040 might have been more attentive to STT's needs and assiduous in helping g them meet them. Notwithstanding these difficulties, progress was made with the collaboration, with more yet to come.
- 2) The role and diversity of partner organisation (raised 2006-7). This has been a complex project on the ground, with a wide range of partners. This was deliberate, since Laikipia is actually quite rich in potentially effective organisations. However, their efforts are not coordinated and much activity is ineffective. Project 15/040 deliberately tried to bring all parties together into a coherent set of relations that would improve capacity to address human elephant conflict. We have tried to be clear in this project which activities are the direct result of our work, and which are the result of the efforts of others, stimulated by us.
- 3) Handover (raised 2008-9). We have worked hard in the final year of the project to put in place a stable and financially secure set of arrangements to carry forward the work of the project. This we think we have achieved with the Laikipia Wildlife Forum, who now employ the Fence team, data management staff and field scouts. The LWF is not only a lively organisation, with considerable capacity for fundraising, but is also broadly representative of the diversity of landowners and interests on Laikipia. This gives it reasonable political as well as financial legitimacy.

## 7 Finance and administration

### 7.1 Project expenditure

Item	Budget (please indicate which document you refer to if other than your project application)	Expenditure	Balance
Rent, rates, heating, overheads etc			
Office costs (e.g. postage, telephone, stationery)			
Travel and subsistence			
Printing			
Conferences, seminars, etc			
Capital items/equipment (Vehicle, Motorbike, VSAT, Printer, Laptop, 5 x GPS collars)			
Others (Drama Group, Comic Books, Posters)			
Salaries			
<b>TOTAL</b>			

### 7.2 Additional funds or in-kind contributions secured

GSMA Development Fund/Safaricom Ltd/ Nokia/WirelessZT: Supported the work of a seconded management consultant volunteering from Accenture UK to assist with the 'Push to Talk' mobile phone trial and related project management. Also provided were: Safaricom staff time, Safaricom network coverage and free talk time, a PoC (Push to talk) license and 50 PoC compliant mobile phone handsets for the Push to talk trial: Approximate value £xxxx.

Laikipia Wildlife Forum: This project (Max Graham) helped LWF secure a Ksh xxxxx (approximately £xxxxx) grant for the construction and maintenance of the West Laikipia Fence from the Royal Netherlands Embassy. The value of the part of this grant allocated directly to the work associated with this project (together with LWF staff time) is Ksh xxxxx (£xxxx). This investment began in 2008 and will continue until 2011).

The Laikipia Nature Conservancy: Provided logistical support in the form of ranch management support, food and accommodation for project staff members over the course of the 'Push to Talk' mobile phone trial: approximate value £xxxx

OI Pejeta Conservancy: Have provided staff time and logistical support and technical support to facilitate supporting the project's activities in relation to the West Laikipia Fence and in the trial of the e-Fence: approximate value £xxxx

CETRAD: Over and above the original ESAPP grant raised by CETRAD through the Swiss government to support the formal training elements of this project and the farm-based deterrent trial, CETRAD committed an additional £xxxx to making an educational HEC film for East African practitioners which we hope will also form a component of post-project grant from DEFRA.

University of Cambridge: Bill Adams has raised funds through his chair to cover some travel, some of the costs associated with producing and printing a new comic book on electrified fences. The Department of geography has also provided accounting and management services free. More time has been invested into this project that was originally proposed (approx 20% as opposed to the 10% budgeted): Approximately £xxxx

### **7.3 Value of DI funding**

None of the activities or outputs of this project, as described in the section on project impacts, would have been possible without Darwin Initiative funding. Furthermore Darwin Initiative funding has acted as a catalyst to secure further funding during and after the project lifetime. This has been a hugely valuable investment.

## Annex 1 Report of progress and achievements against final project logframe for the life of the project

Project summary	Measurable Indicators	Progress and Achievements October 2006 - September 2009	Actions required/planned for next period
<p><b>Goal:</b> To draw on expertise relevant to biodiversity from within the United Kingdom to work with local partners in countries rich in biodiversity but constrained in resources to achieve</p> <ul style="list-style-type: none"> <li>• The conservation of biological diversity,</li> <li>• The sustainable use of its components, and</li> <li>• The fair and equitable sharing of the benefits arising out of the utilisation of genetic resources</li> </ul>		<p>The project has contributed to the understanding and reduction of a problem (human-elephant conflict) of great importance to both biodiversity conservation and to human welfare.</p>	<p>(do not fill not applicable)</p>
<p><b>Purpose</b> Alleviate human-elephant conflict and promote tolerance of elephants in Laikipia District, Kenya</p>	<ul style="list-style-type: none"> <li>-Reduction in the total number and severity of elephant crop-raids in Laikipia by year three</li> <li>- Permanent community based HEC management and research project established; HEC management training provided at the local, national and international levels.</li> <li>- Sustainable revenue streams secured to maintain project activities beyond Darwin funding</li> <li>- Income generated by local communities through sustainable elephant defence livelihoods</li> </ul>	<ul style="list-style-type: none"> <li>-Crop-raiding reduced from 3640 incidents (Oct 06 to Sept 07) to 1646 incidents (Oct 08 to Sept 09)</li> <li>-Permanent HEC research and management team in place and absorbed by project partners. Training, workshops and publications on HEC management generated at all levels</li> <li>-LWF secures funding to sustain activities until 2012 and commits to long term maintenance of systems put in place through its members</li> <li>-Trials and assessment of elephant compatible livelihoods completed and handed over to LWF bioenterprise programme to scale up</li> </ul>	<p>-If Darwin post-project funding secured then HEC management system developed under this project will be rolled out across remaining HEC hot spots on the Laikipia plateau to reduce HEC to minimal levels.</p>
<p><b>Output 1. GPS/GSM collar based HEC early warning system</b></p>	<p>-5 elephants collared by yr 2; collar-mobile phone text message system working by yr 2</p>	<ul style="list-style-type: none"> <li>-5 elephants fitted with new generation of GPS/GSM collars</li> <li>-Early warning text messages sent and received though requires updated digital maps to improve accuracy</li> <li>-Handed over to partner organisation in 2008 for completion</li> </ul>	

<p>Activity 1.1 Agreement with ranch and elephant collar partner (Save the Elephants, STE)</p> <p>Activity 1.2 Crop raiding elephants identified and collared by Oct 07</p> <p>Activity 1.3. e-fence software developed programming completed by collaring partner STE)</p> <p>Activity 1.4 Elephant warning messages received by ranch</p> <p>Activity 1.5 Ranch fence team respond to warnings and report success</p> <p>Activity 1.6 Analysis report drafted &amp; circulated-Apr 08</p>	<p>Completed</p> <p>Completed</p> <p>Completed</p> <p>Completed</p> <p>Completed though the text early warning messages were not accurate due to the use of inaccurate digital maps and the system needs to be more tightly managed so that reports of problems/glitches are addressed in a timely manner</p> <p>Not completed. Working Paper on non-lethal elephant management is still in progress. Patient engagement with partner is slowly bearing fruit.</p>	
<p><b>Output 2. Local Knowledge based HEC Early Warning System</b></p>	<p>-Mobile phone (Push-to-talk) early warning system trialled among vulnerable communities by year 2</p> <p>-HEC incident Rapid Reporting teams established and trained by year 2</p> <p>-HEC Rapid Response Teams established and trained by year 2</p>	<p>Trial successfully completed and working paper published</p> <p>-Scouts trained on rapid reporting though as push to talk was not rolled out commercially rely on conventional mobile phones</p> <p>-Rapid response team established and protocol for team put in place in 2009.</p>
<p>Activity 2.1 push-to-talk technology trialled with ranch/community teams Dec 07</p>	<p>Completed</p>	

<p>Activity 2.2 Community and private ranches elect personnel to form 'HEC Rapid Reporting Teams' by July 08</p> <p>Activity 2.3 Members of HEC Rapid Reporting Teams provided with mobile phones or radios and trained on protocol for early warning reporting of human-elephant conflict incidents by July 08</p> <p>Activity 2.4 Protocol for HEC Rapid Reporting drafted by Oct 08</p> <p>Activity 2.5 HEC Rapid Response Procedures Document drafted by Oct 08</p> <p>Activity 2.6 HEC Rapid Response Teams formed and trained on protocol for responding to early warning reports of human-elephant conflict incidents and the identification of fence breaking elephants by July 08</p> <p>Activity 2.7 Training provided to elephant scouts on data collection protocol for evaluating effectiveness of HEC rapid reporting and response teams by July 08</p>		<p>Completed</p> <p>Completed</p> <p>Completed</p> <p>Completed</p> <p>Completed</p> <p>Completed</p>
<p><b>Output 3. Community based HEC management and research programme established</b></p>	<ul style="list-style-type: none"> <li>- Local HEC alleviation team trained by yr 3; Farm-based deterrence demonstration sites set up in yr 1; HEC database compiled and farm-based crop-raiding tools assessed by yr 2</li> <li>-Collection and dissemination of knowledge on the design, management and performance of existing fences in Laikipia by year 2</li> <li>-Procedures identified and training provided for monitoring and reporting fence performance and identifying problem elephants by</li> </ul>	<ul style="list-style-type: none"> <li>-HEC monitoring and management team in place; farm-based deterrents assessed and working paper due to be published in December 09; HEC database is in place though the process of extracting HEC data and processing it into simplified reports needs further work in future to make it more accessible to all stakeholders.</li> <li>-Working paper on the performance of the OI Pejeta Conservancy Fence published in 2008</li> <li>-Two dedicated elephant researchers are now employed by partner organisations to specifically monitoring problem elephants. Scouts have been retrained to monitor fence breakages and data generated is used by a fence office to produce monthly reports for management purposes</li> </ul>

	<p>year 2</p> <p>-Fence management committees trained on conflict management skills by year 3</p>	<p>Fence management committees have been put in place but due to time and resource constraints only one committee (that of Matigari) has been given formal training on conflict resolution. However all other committees have been introduced to the issue of conflict resolution through interactive drama created under this project and being sustained by the LWF for future conflict resolution.</p>
<p>Activity 3.1 Identify trial sites by Dec 06</p> <p>Activity 3.2 Select 25 trial farms and 25 control farms by Dec 06</p> <p>Activity 3.3 Carry out baseline surveys for all 50 farms by March 07</p> <p>Activity 3.4 Design data capture forms for measuring performance of deterrents on trial and non-trial farms by March 07</p> <p>Activity 3.5 Evaluate performance of farm-based elephant deterrents by July 08</p> <p>Activity 3.6 Collection of data on design and performance of existing fences in Laikipia by Apr 08</p> <p>Activity 3.7 Circulate report on performance of existing fences &amp; fence management protocol by Apr 08</p> <p>Activity 3.8 Fence management meeting held in Nanyuki by July 08</p> <p>Activity 3.9 Data collection protocol drafted and data capture forms for enumerating fence breakages created by Apr 08</p> <p>Activity 3.10 Elephant scouts and other designated personnel trained on data collection protocol for enumerating fence breakages by elephants by Apr 08</p>		<p>-Completed</p> <p>-Completed (though some of these farms could not be used in the final assessment because they were not cultivated in the year before the trial or because they were not cultivated over the trial period)</p> <p>-Completed</p> <p>-Completed</p> <p>-Completed (working paper published in Dec 09)</p> <p>-Completed</p> <p>-Completed (working paper published in 2008)</p> <p>-Regular meetings held with a unofficial committee (KWS, OPC, LWF)</p> <p>-Completed</p> <p>-Completed</p>

<p>Activity 3.11 Database and data-entry interface designed and office assistant trained on data entry Oct 08</p> <p>Activity 3.12 Conflict resolution course provided to designated members of each fence management committee by Oct 08</p>	<p>-Completed</p> <p>-Only one committee (Matigari) provided with a dedicated training. Other fence management committees introduced to conflict resolution through the interactive drama group which is possibly a more appropriate form of information dissemination given the local context.</p>
<p><b>O.4 Dissemination of information on Elephant Conservation and Human-Elephant Conflict Management among vulnerable communities and conservation practitioners</b></p>	<p>-Booklets, play performances, training courses, website; newsletters and posters disseminated each yr; East African training workshop in year 2; ongoing 'outreach' support provided to vulnerable farmers/stakeholders; website construction</p> <p>-Two comic books completed (one on farm-based deterrents and one on electrified fences)</p> <p>-Four LWF newsletter articles published, one Darwin Initiative</p> <p>-Five training courses and one East Africa regional workshop delivered</p> <p>-Local website constructed and upgraded (final version due to be completed in Dec 09)</p> <p>-Five working papers published and made available on project website</p> <p>-3 Journal Papers submitted for publication, 2 accepted and published</p> <p>-Support provided for the development of the Kenyan National Elephant Conservation Strategy (due for publication in early 2010)</p>
<p>Activity 4.1 Develop a detailed training plan for project staff and partner organisations 10 July 07</p> <p>Activity 4.2 Carry out informal and formal training elements of the training plan-complete Oct 09</p> <p>Activity 4.3 Organise an East African Training Workshop on HEC Management Aug 08</p> <p>Activity 4.4 Establish a community education programme (drama, posters, booklets, competitions) to improve local knowledge of HEC, fence management, farm-based crop-defence, elephant conservation and elephant management. Complete by Oct 09</p>	<p>-Completed</p> <p>-Completed</p> <p>-Completed (Sept 09)</p> <p>-Completed</p> <p>-Working paper on the interactive drama group completed and published</p>

<p>Activity 4.5 Evaluate the impact of the education programme by Jan 09</p> <p>Activity 4.6 Generate an elephant conservation and management strategy for the Laikipia Elephant Population by July 08</p>	<p>by Cambridge University Dec 09</p> <p>-Draft strategy for Laikipia elephant population completed (though final editing and a budget may still be required) and sections of national elephant strategy also drafted at the request of the KWS</p>
<p><b>O.5. Elephant defence livelihood systems established</b></p>	<p>-3 community groups trained to produce dung paper, honey and hot chillies by yr 3; Markets established for sustainable products by yr 2.</p> <p>-Elephant defence livelihoods trialled and assessed with working paper published in 2009</p> <p>-This element of the project was handed over to the LWF bioenterprise programme in 2008 to develop further and scale up and this project's technical expertise and resources was focussed into support for the West Laikipia Fence</p>
<p>Activity 5.1 Identify partner organisations that can provide support for livelihood activities by Jan 07</p> <p>Activity 5.2 Establish markets for 'elephant compatible' products (chillies, dung paper and honey) by Oct 07</p> <p>Activity 5.3 Identify community groups to train on the production of honey, chillies and dun paper by Apr 07</p> <p>Activity 5.4 Train communities on the production of 'elephant compatible' products by Oct 09</p> <p>Activity 5.5 Link community products with markets by Oct 09</p> <p>Activity 5.6 Evaluate the impact of livelihood activities by Oct 09</p>	<p>-Completed</p> <p>-Completed (though on a very small scale)</p> <p>-Completed</p> <p>-Completed</p> <p>-Chillies and honey generated under this project was not sufficient to generate interest within commercial market though dung paper was sold in the domestic market and the producer group continues to supply a local market. The legacy organisation for this activity (LWF bioenterprise programme) will take on the user groups worked with under this project and where possible scale up production of these and other conservation compatible products.</p> <p>-Completed; working paper published by Cambridge University in 2009</p>

<p><b>O.6. Strategy &amp; revenue streams established for long term HEC management in Laikipia</b></p>	<ul style="list-style-type: none"> <li>-Future HEC management activities identified by year 3</li> <li>-Long term costs identified by year 3</li> <li>-Assessment of capacity and commitment among key stakeholders to implement activities and carry costs by year 3</li> <li>-Commitments secured by year 3</li> <li>-Identify long term finance strategy to plug funding gaps if needed by year 3.</li> <li>-Web-based fundraising interface set up by yr 3; Fundraising and proposal writing training for project assistants by yr 3.</li> </ul>	<ul style="list-style-type: none"> <li>-Completed</li> <li>-Completed</li> <li>-Completed</li> <li>-Completed</li> <li>-The LWF has committed funds until 2012 to put in place systems for long term fence maintenance and management and is committed to raising further funds through its members and executive to ensure the West Laikipia Fence is functioning.</li> <li>-Local website has been established and upgraded and will be launched by the legacy organisation in early 2009. However a direct link for donating to the project through the website was complicated to set up (due to the requirement of charitable status in the UK and USA). However this task has been taken up by the legacy organisation (the LWF) and introductions made with a suitable provider (WildlifeDirect).</li> </ul>
<p>Activity 6.1 Identify activities still needed for long term fence maintenance and HEC management by Oct 09</p> <p>Activity 6.2 Collect data on annual expenditure on fence maintenance and HEC management activities by Oct 09</p> <p>Activity 6.3 Generate a budget for long term fence maintenance and HEC management by Oct 09</p> <p>Activity 6.4 Identify stakeholders responsible for implementing and funding HEC management activities over long term by Oct 09</p> <p>Activity 6.5 Assess existing capacity and commitment among</p>		<ul style="list-style-type: none"> <li>-Completed (though second phase of electrified fence yet to be put in place complicating assessment of further needs for this phase)</li> <li>-Fence wasn't up for long enough to undertake such an assessment</li> <li>-Completed for long term HEC management</li> <li>-Completed</li> </ul>

<p>stakeholders identified in step to implement and carry costs associated with long term fence maintenance and HEC management by Oct 09</p> <p>Activity 6.6 Develop a sustainable finance strategy for long term HEC management and secure commitments in relation to this strategy by Oct 09</p> <p>Activity 6.7 Create a web-based fundraising interface by July 09</p> <p>Activity 6.8 Establish legacy institution for the project by July 08</p> <p>Activity 6.9 Train project staff on grant proposal writing by Oct 08</p>	<p>-Completed</p> <p>-With the LWF and its members taking on responsibility for long term fence maintenance and management this no longer was an appropriate activity under this project</p> <p>-Local project website created to generate interest among potential donors</p> <p>-Completed</p> <p>-Completed; proposal writing course delivered in 2009</p>
<p><b>O.7 Support the Laikipia Wildlife Forum to develop the Institutional Capacity to Manage the West Laikipia Fence</b></p>	<p>-A West Laikipia Fence Committee and four sub-committees, comprised of key stakeholders established by year 2</p> <p>Before vs. After Questionnaire survey among beneficiary communities by year 3;</p> <p>HEC incidents and fence breakages quantified before vs. after fence construction by year 3</p> <p>-All committees and sub-committees established and functioning well</p> <p>-A baseline questionnaire was completed prior to fence construction but there was insufficient time and resources to undertake the post construction survey nor would this be appropriate as the fence has not been completed and the system for its management has not been fully implemented.</p> <p>-Crop-raiding levels based on data systematically collected by community scouts over the three years of the project has been quantified and assessed showing a significant decline.</p>
<p>Activity 7.1 Support the Laikipia Wildlife Forum to carry out a survey along each of four sections of the fence to identify beneficiaries within the community by Apr 08</p> <p>Activity 7.2 Help the LWF with meetings with beneficiaries identified in objective 2.1.a and election of community representatives for each fence</p>	<p>-Completed</p> <p>-Completed</p>

section by Apr 08	
Activity 7.3 Assist the LWF to identify other appropriate stakeholders to be represented within each of four fence sub-committees by Apr 08	-Completed
Activity 7.4 Assist the LWF to establish fence management committees by Apr 08	-Completed
Activity 7.5 Support the LWF in meetings with each fence management committee to establish roles, responsibilities and secure commitments (labour, financial resources, materials etc) among/from members by Apr 08	-Completed
Activity 7.6 Collect baseline data on livelihood activities and perceptions among a sample of farmers prior and after the construction of the fence by Oct 09	-Partially completed (before only)
Activity 7.7 Collection and analysis of crop-raiding data before and after fence construction by trained enumerators by Oct 09	-Completed
O.7.8 Analyse data collected on fence breakages and voltage along each fence section (from activity 3.1.d) by Oct 09	-Done on a monthly basis. Voltage data collected by ranch staff is not reliable and so cannot be used in any assessment.

## Annex 2 Project's final logframe, including criteria and indicators

Project summary	Measurable Indicators	Means of verification	Important Assumptions
<b>Goal:</b> To draw on expertise relevant to biodiversity from within the United Kingdom to work with local partners in countries rich in biodiversity but poor in resources to achieve <ul style="list-style-type: none"> <li>the conservation of biological diversity,</li> <li>the sustainable use of its components, and</li> <li>the fair and equitable sharing of benefits arising out of the utilisation of genetic resources</li> </ul>			
<b>Purpose</b> Alleviate human-elephant conflict and promote tolerance of elephants in Laikipia District, Kenya	-Reduction in the total number and severity of elephant crop-raids in Laikipia by year three	-HEC database, field reports, published papers	-Sustained support from the Kenya Wildlife Service, the Laikipia Wildlife Forum and landowners in Laikipia District.
	-Permanent community based HEC management and research project established; HEC management training provided at the local, national and international levels.	-Maps, booklets, posters; training manual; conservation and management plan; elephant fencing impact assessment; workshop assessments/ reports; meeting minutes; newsletters; published papers; popular articles	-Regional expertise in HEC alleviation remains limited
	Sustainable revenue streams secured to maintain project activities beyond Darwin funding	Project website; Successful grant applications by trained project assistants	-Content of the web magazine is sufficiently interesting and marketable to attract paying subscribers -Funding bodies continue to value project activities
	-Income generated by local communities through sustainable elephant defence livelihoods	-Financial statements by partner organisations; project reports	-A market exists for products developed through sustainable elephant defence livelihood programme.
<b>Outputs</b> O.1. GPS/GSM collar based HEC early warning system	-5 elephants collared by yr 2; collar-mobile phone text message system working by yr 2	-journal paper x 1 submitted -text messages sent -1 report	-GPS/GSM collars function properly -Partner organisation remains committed and able to support collaring operation

<p><b>O.2. Local Knowledge based HEC Early Warning System</b></p>	<p>-Mobile phone (Push-to-talk) early warning system trialled among vulnerable communities by year 2</p> <p>-HEC incident Rapid Reporting teams established and trained by year 2</p> <p>-HEC Rapid Response Teams established and trained by year 2</p>	<p>-1 x report</p> <p>- 1 journal paper submitted</p> <p>- 1 x HEC rapid reporting procedure document</p> <p>-1 x HEC rapid response procedure document</p>	<p>-Partner organisation able and willing to finance mobile phone trial</p> <p>-Local stakeholders willing to work together and share communication networks (radio call signs, mobile phone groups)</p> <p>-Partner organisations able to provide and sustain communication tools (mobile phones/radios) among teams</p> <p>-Fence management committees able to source personnel and resources to establish and sustain rapid response teams</p> <p>-Sufficient expertise and resources exist to collect and analyse data and write up results.</p>
<p><b>O.3. Community based HEC management and research programme established</b></p>	<p>- Local HEC alleviation team trained by yr 3; Farm-based deterrence demonstration sites set up in yr 1; HEC database compiled and farm-based crop-raiding tools assessed by yr 2</p> <p>-Collection and dissemination of knowledge on the design, management and performance of existing fences in Laikipia by year 2</p> <p>-Procedures identified and training provided for monitoring and reporting fence performance</p>	<p>-1 x report</p> <p>-1 x journal paper submitted</p> <p>- 1 x HEC database</p> <p>- 1 x report on existing fences</p> <p>- 1 x journal paper submitted</p> <p>-1 x fence meeting proceedings</p> <p>-1 x Fence management protocol</p>	<p>-Local farmers willing and committed to participate in grassroots elephant management project</p> <p>- Documented knowledge of existing fences remains limited</p> <p>-Local stakeholders interested and willing to participate in a workshop</p>

	<p>and identifying problem elephants by year 2</p> <p>-Fence management committees trained on conflict management skills by year 3</p>	<p>-Data on fence breakages</p> <p>-Problem elephant ID database established;</p> <p>-conflict management course assessments</p>	<p>-Local fence managers are willing to follow standardised fence monitoring procedures</p> <p>-Local stakeholders find course material sufficiently interesting</p>
<p><b>O.4 Dissemination of information on Elephant Conservation and Human-Elephant Conflict Management among vulnerable communities and conservation practitioners</b></p>	<p>-Booklets, play performances, training courses, website; newsletters and posters disseminated each yr; East African training workshop in year 2; ongoing 'outreach' support provided to vulnerable farmers/stakeholders; website construction</p>	<p>-Posters</p> <p>-Maps</p> <p>-Booklets</p> <p>-Script &amp; Video clip</p> <p>-Course evaluations</p> <p>-GIS course certificates</p> <p>-Community Education Programme Report x 1</p> <p>-Workshop proceedings</p> <p>-Elephant conservation and management strategy</p> <p>-Website up &amp; running by year 3</p>	<p>-Partner organisations are committed to local dissemination of training and education materials</p> <p>- Partner organisations committed to providing GIS support and software</p> <p>-East African conservationists and wildlife managers value content of proposed training workshop</p>
<p><b>O.5. Elephant defence livelihood systems established</b></p>	<p>-3 community groups trained to produce dung paper, honey and hot chillies by yr 3; Markets established for sustainable products by yr 2.</p>	<p>Purchase and sales reports by partner organisations</p>	<p>Economic incentives are sufficient for local producers and partner organisations to develop and sustain production</p> <p>- construction of West Laikipia Elephant Fence (from Autumn 2007) does not make this work irrelevant in Laikipia</p>

<p><b>O.6. Strategy &amp; revenue streams established for long term HEC management in Laikipia</b></p>	<ul style="list-style-type: none"> <li>-Future HEC management activities identified by year 3</li> <li>-Long term costs identified by year 3</li> <li>-Assessment of capacity and commitment among key stakeholders to implement activities and carry costs by year 3</li> <li>-Commitments secured by year 3</li> <li>-Identify long term finance strategy to plug funding gaps if needed by year 3.</li> <li>-Web-based fundraising interface set up by yr 3; Fundraising and proposal writing training for project assistants by yr 3.</li> </ul>	<ul style="list-style-type: none"> <li>-1 x Long term fence strategy document</li> <li>-Letters of endorsement by appropriate stakeholders</li> <li>-Web-based fundraising interface up and running by year 3 (will be linked with activity O.4)</li> </ul>	<ul style="list-style-type: none"> <li>-Sufficient resources and expertise exist to generate report</li> <li>-Key stakeholders willing to share information on current revenue sources</li> <li>-Well resourced stakeholders accept and commit to costs and implementation of activities associated with long term HEC management</li> <li>-Under resourced key stakeholders accept and commit to strategy.</li> <li>-Web-interface sufficiently well marketed and interesting to attract donors</li> <li>-Project assistants have the capacity to write proposals and secure funding</li> </ul>
<p><b>O.7 Support the Laikipia Wildlife Forum to develop the Institutional Capacity to Manage the West Laikipia Fence</b></p>	<ul style="list-style-type: none"> <li>-A West Laikipia Fence Committee and four sub-committees, comprised of key stakeholders established by year 2</li> <li>Before vs. After Questionnaire survey among beneficiary communities by year 3;</li> <li>HEC incidents and fence breakages quantified before vs. after fence construction by year 3</li> </ul>	<ul style="list-style-type: none"> <li>-Meeting minutes</li> <li>-Report x 1</li> <li>- Journal paper x 1 submitted</li> </ul>	<ul style="list-style-type: none"> <li>-LWF need and value project support.</li> <li>-Key stakeholders are willing to work together to manage the West Laikipia Fence</li> <li>-Sufficient resources and expertise exists to collect and analyse data and write up results.</li> </ul>

Activities	Activity milestones (summary of project implementation timetable)	Assumptions
<b>O.1 GPS/GSM collar based HEC early warning system</b>	<p>O1.1 Agreement with ranch and elephant collar partner (Save the Elephants, STE)</p> <p>O1.2 Crop raiding elephants identified and collared by Oct 07</p> <p>O.1.3. e-fence software developed programming completed by collaring partner STE)</p> <p>O1.4 Elephant warning messages received by ranch</p> <p>O1.5 Ranch fence team respond to warnings and report success</p> <p>O.1.6 Analysis report drafted &amp; circulated-Apr 08</p>	<p>O1.1 Parties agree to commit resources</p> <p>O.1.2 Logistics, support and permissions obtained.</p> <p>O1.3 e-fence software developed successfully</p> <p>O1.4 Warning timely and GPS accurate</p> <p>O1.5 Ranch fence team able and willing to respond; monitoring completed</p> <p>O.1.6 Staff resources sufficient to complete analysis</p>

<p><b>O.2.1 Local Knowledge based HEC Early Warning System</b></p>	<p>O2.1 push-to-talk technology trialled with ranch/community teams Dec 07</p> <p>O2.2 Community and private ranches elect personnel to form 'HEC Rapid Reporting Teams' by July 08</p> <p>O.2.3 Members of HEC Rapid Reporting Teams provided with mobile phones or radios and trained on protocol for early warning reporting of human-elephant conflict incidents by July 08</p> <p>O.2.4 Protocol for HEC Rapid Reporting drafted by Oct 08</p> <p>O.2.5 HEC Rapid Response Procedures Document drafted by Oct 08</p> <p>O.2.6 HEC Rapid Response Teams formed and trained on protocol for responding to early warning reports of human-elephant conflict incidents and the identification of fence breaking elephants by July 08</p> <p>O.2.7 Training provided to elephant scouts on data collection protocol for evaluating effectiveness of HEC rapid reporting and response teams by July 08</p>	<p>O.2.1 technology and handsets made available by partner organisation GSMA</p> <p>O.2.2 Community members and private ranch management willing to participate together in HEC Rapid Reporting Teams</p> <p>O.2.3 Sufficient resources exist among partner organisations to provide resources for rapid reporting.</p> <p>O.2.4 Resources and capacity sufficient to draft protocol</p> <p>O.2.5 Resources and capacity sufficient to draft protocol</p> <p>O.2.6 Sufficient resources exist (vehicles, staff, torches) to establish and sustain rapid response teams. Team members able to understand course materials and have access to means of elephant identification (binoculars, camera)</p> <p>O.2.7 Sufficient resources exist to continue to employ elephant scouts and/or ranch management committed to collecting such data</p>
--	---	---

<p><b>O.3.1 Community based HEC management and research programme established</b></p>	<p>O.3.1 Identify trial sites by Dec 06</p> <p>O.3.2 Select 25 trial farms and 25 control farms by Dec 06</p> <p>O.3.3 Carry out baseline surveys for all 50 farms by March 07</p> <p>O.3.4 Design data capture forms for measuring performance of deterrents on trial and non-trial farms by March 07</p> <p>O.3.5 Evaluate performance of farm-based elephant deterrents by July 08</p> <p>O3.6 Collection of data on design and performance of existing fences in Laikipia by Apr 08</p> <p>O3.7 Circulate report on performance of existing fences &amp; fence management protocol by Apr 08</p> <p>O3.8 Fence management meeting held in Nanyuki by July 08</p> <p>O3.9 Data collection protocol drafted and data capture forms for enumerating fence breakages created by Apr 08</p> <p>O.3.10 Elephant scouts and other designated personnel trained on data collection protocol for enumerating fence breakages by elephants by Apr 08</p> <p>O3.11 Database and data-entry interface designed and office assistant trained on data entry Oct 08</p> <p>O.3.12 Conflict resolution course provided to designated members of each fence management committee by Oct 08</p>	<p>O.3.1 Laikipia West Fence doesn't render trial sites irrelevant</p> <p>O.3.2 Farmers are willing to participate with the project</p> <p>O.3.3 Capacity sufficient to design survey/monitoring forms and carry out surveys</p> <p>O.3.4/5 Sufficient data collected; analytical capacity sufficient</p> <p>O.3.6 Staff resources sufficient to carry out survey</p> <p>O.3.7 Staff resources sufficient to analyse and write up results</p> <p>O.3.8 Key local stakeholders find proposed content of meeting interesting</p> <p>O.3.9 Capacity sufficient to design survey/monitoring forms and carry out surveys</p> <p>O.3.10 Scouts and other personnel committed to learning data collection protocols</p> <p>O.3.11 Sufficient resources exist to create database entry interface</p> <p>O.3.12 Potential participants find proposed course contents interesting</p>
---	---	---

<p><b>O.4 Dissemination of information on Elephant Conservation and Human-Elephant Conflict Management among vulnerable communities and conservation practitioners</b></p>	<p>O.4.1 Develop a detailed training plan for project staff and partner organisations 10 July 07</p> <p>O.4.2 Carry out informal and formal training elements of the training plan-complete Oct 09</p> <p>O.4.3 Organise an East African Training Workshop on HEC Management Aug 08</p> <p>O.4.4 Establish a community education programme (drama, posters, booklets, competitions) to improve local knowledge of HEC, fence management, farm-based crop-defence, elephant conservation and elephant management. Complete by Oct 09</p> <p>O.4.5 Evaluate the impact of the education programme by Jan 09</p> <p>O.4.6 Generate an elephant conservation and management strategy for the Laikipia Elephant Population by July 08</p>	<p>O.4.1 Training materials and opportunities are valued by targeted groups</p> <p>O.4.2 Course participants available and resources are sufficient to carry out training exercises</p> <p>O.4.3 Sufficient interest exists among East African wildlife institutions to attract workshop participants</p> <p>O.4.4 Resources and capacity is sufficient to create an education programme with enough geographical coverage to improve awareness in all major HEC hotspots in Laikipia.</p> <p>O.4.5 Sufficient resources to collect, analyse and write up data on the impact of the education programme activities.</p> <p>O.4.6 Partner organisations endorse the strategy</p>
--	--	---

<p><b>O.5 Elephant defence livelihood systems established</b></p>	<p>O.5.1 Identify partner organisations that can provide support for livelihood activities by Jan 07</p> <p>O.5.2 Establish markets for ‘elephant compatible’ products (chillies, dung paper and honey) by Oct 07</p> <p>O.5.3 Identify community groups to train on the production of honey, chillies and dun paper by Apr 07</p> <p>O.5.4 Train communities on the production of ‘elephant compatible’ products by Oct 09</p> <p>O.5.5 Link community products with markets by Oct 09</p> <p>O.5.6 Evaluate the impact of livelihood activities by Oct 09</p>	<p>O.5.1 Partner organisations have sufficient resources and capacity to support livelihood activities</p> <p>O.5.2 Market exists; sufficient resources are available to market products</p> <p>O.5.3 Suitable community groups exist and/or can be organised</p> <p>O.5.4 Capacity exists or is available to train communities on production of honey, chillies and dung paper</p> <p>O.5.5 Revenue generated by partner organisations is sufficient for continued support of product supply chain to be financially viable</p> <p>O.5.6 Sufficient information is collected and capacity exists to assess the impact of the livelihood activities.</p>
---	---	--

<p><b>O.6. Strategy &amp; revenue streams established for long term HEC management in Laikipia</b></p>	<p>O.6.1 Identify activities still needed for long term fence maintenance and HEC management by Oct 09</p> <p>O.6.2 Collect data on annual expenditure on fence maintenance and HEC management activities by Oct 09</p> <p>O.6.3 Generate a budget for long term fence maintenance and HEC management by Oct 09</p> <p>O.6.4 Identify stakeholders responsible for implementing and funding HEC management activities over long term by Oct 09</p> <p>O.6.5 Assess existing capacity and commitment among stakeholders identified in step to implement and carry costs associated with long term fence maintenance and HEC management by Oct 09</p> <p>O.6.6 Develop a sustainable finance strategy for long term HEC management and secure commitments in relation to this strategy by Oct 09</p> <p>O.6.7 Create a web-based fundraising interface by July 09</p> <p>O.6.8 Establish legacy institution for the project by July 08</p> <p>O.6.9 Train project staff on grant proposal writing by Oct 08</p> <p>O.6.10 Apply for legacy funding by Oct 09</p>	<p>O.6.1 Staff resources sufficient to collect these data</p> <p>O.6.2 Relevant stakeholders willing to divulge information on current and future HEC management costs</p> <p>O.6.3 Sufficient expertise exists to draw up detailed budget</p> <p>O.6.4 Stakeholders that are able and willing to take on HEC management and associate costs exist</p> <p>O.6.5 Sufficient resources and expertise exist for assessment and existing stakeholders are cooperative</p> <p>O.6.6 Sufficient resources and expertise exist to develop finance strategy and key stakeholders accept this strategy.</p> <p>O.6.7- Resources are sufficient to create the web-based fundraising interface</p> <p>O.6.8 An existing institution is willing to take on the project and/or there are sufficient resources to create a new institution</p> <p>O.6.9 Project staff have sufficient capacity to write proposals independently</p> <p>O.6.10 Donors are available and are willing to support the project</p>
--	--	---

<p><b>O.7 Support the Laikipia Wildlife Forum to develop the Institutional Capacity to Manage the West Laikipia Fence</b></p>	<p>O7.1 Support the Laikipia Wildlife Forum to carry out a survey along each of four sections of the fence to identify beneficiaries within the community by Apr 08</p> <p>O7.2 Help the LWF with meetings with beneficiaries identified in step O2.1.a and election of community representatives for each fence section by Apr 08</p> <p>O7.3 Assist the LWF to identify other appropriate stakeholders to be represented within each of four fence sub-committees by Apr 08</p> <p>O.7.4 Assist the LWF to establish fence management committees by Apr 08</p> <p>O.7.5 Support the LWF in meetings with each fence management committee to establish roles, responsibilities and secure commitments (labour, financial resources, materials etc) among/from members by Apr 08</p> <p>O.7.6 Collect baseline data on livelihood activities and perceptions among a sample of farmers prior and after the construction of the fence by Oct 09</p> <p>O.7.7 Collection and analysis of crop-raiding data before and after fence construction by trained enumerators by Oct 09</p> <p>O.7.8 Analyse data collected on fence breakages and voltage along each fence section (from activity O.3.1.d) by Oct 09</p>	<p>O7.1 Staff resources sufficient to carry out survey</p> <p>O7.2 Outreach staff personnel sufficient. Community willing to participate in the management of the fence.</p> <p>O7.3 Other stakeholders willing to participate in the management of the fence</p> <p>O7.4 Different stakeholders willing to work together</p> <p>O7.5 Different stakeholders willing to take on responsibility and commit resources to fence management.</p> <p>O.7.6 Staff resources sufficient to carry out survey</p> <p>O.7.7 Sufficient resources exist to monitor crop-raiding and fence breakages</p> <p>O.7.8 Partner organisations make these data available</p>
---	---	---

## Annex 3 Project contribution to Articles under the CBD

### Project Contribution to Articles under the Convention on Biological Diversity

Article No./Title	Project %	Article Description
6. General Measures for Conservation & Sustainable Use	10	Develop national strategies that integrate conservation and sustainable use.
7. Identification and Monitoring		Identify and monitor components of biological diversity, particularly those requiring urgent conservation; identify processes and activities that have adverse effects; maintain and organise relevant data.
8. In-situ Conservation		Establish systems of protected areas with guidelines for selection and management; regulate biological resources, promote protection of habitats; manage areas adjacent to protected areas; restore degraded ecosystems and recovery of threatened species; control risks associated with organisms modified by biotechnology; control spread of alien species; ensure compatibility between sustainable use of resources and their conservation; protect traditional lifestyles and knowledge on biological resources.
9. Ex-situ Conservation		Adopt ex-situ measures to conserve and research components of biological diversity, preferably in country of origin; facilitate recovery of threatened species; regulate and manage collection of biological resources.
10. Sustainable Use of Components of Biological Diversity		Integrate conservation and sustainable use in national decisions; protect sustainable customary uses; support local populations to implement remedial actions; encourage co-operation between governments and the private sector.
11. Incentive Measures		Establish economically and socially sound incentives to conserve and promote sustainable use of biological diversity.
12. Research and Training	50%	Establish programmes for scientific and technical education in identification, conservation and sustainable use of biodiversity components; promote research contributing to the conservation and sustainable use of biological diversity, particularly in developing countries (in accordance with SBSTTA recommendations).
13. Public Education and Awareness	30%	Promote understanding of the importance of measures to conserve biological diversity and propagate these measures through the media; cooperate with other states and organisations in developing awareness programmes.
14. Impact Assessment and Minimizing Adverse Impacts		Introduce EIAs of appropriate projects and allow public participation; take into account environmental consequences of policies; exchange information on impacts beyond State boundaries and work to reduce hazards; promote emergency responses to hazards; examine mechanisms for re-dress of international damage.
15. Access to Genetic Resources		Whilst governments control access to their genetic resources they should also facilitate access of environmentally sound uses on mutually agreed terms; scientific research based on a country's genetic resources should ensure sharing in a fair and equitable way of results and benefits.

<b>Article No./Title</b>	<b>Project %</b>	<b>Article Description</b>
16. Access to and Transfer of Technology		Countries shall ensure access to technologies relevant to conservation and sustainable use of biodiversity under fair and most favourable terms to the source countries (subject to patents and intellectual property rights) and ensure the private sector facilitates such assess and joint development of technologies.
17. Exchange of Information		Countries shall facilitate information exchange and repatriation including technical scientific and socio-economic research, information on training and surveying programmes and local knowledge
19. Bio-safety Protocol		Countries shall take legislative, administrative or policy measures to provide for the effective participation in biotechnological research activities and to ensure all practicable measures to promote and advance priority access on a fair and equitable basis, especially where they provide the genetic resources for such research.
Other Contribution	10	Smaller contributions (eg of 5%) or less should be summed and included here.
Total %	100%	Check % = total 100

## Annex 4 Standard Measures

Please quantify and briefly describe all project standard measures using the coding and format of the Darwin Initiative Standard Measures. Download the updated list explaining standard measures from <http://darwin.defra.gov.uk/resources/reporting/>. If any sections are not relevant, please omit or delete them.

Code	Description	Totals (plus additional detail as required)
<b>Training Measures</b>		
1a	Number of people to submit PhD thesis	1
1b	Number of PhD qualifications obtained	1
2	Number of Masters qualifications obtained	3 (+ 1 due to complete in 2010)
3	Number of other qualifications obtained	6 people completed ESRI online GIS courses
4a	Number of undergraduate students receiving training	0
4b	Number of training weeks provided to undergraduate students	0
4c	Number of postgraduate students receiving training (not 1-3 above)	0
4d	Number of training weeks for postgraduate students	0
5	Number of people receiving other forms of long-term (>1yr) training not leading to formal qualification( ie not categories 1-4 above)	15 people (9 project scouts, 6 core project staff) received 'on the job' research methods training (involving some or all of the following: research design, field methods, data analyses and report writing) of over a year or more
6a	Number of people receiving other forms of short-term education/training (ie not categories 1-5 above)	68 individuals received training from five different short courses delivered under this project
6b	Number of training weeks not leading to formal qualification	5
7	Number of types of training materials produced for use by host country(s)	5: Plays x 2; Comic Books x 2; Posters x 1
<b>Research Measures</b>		
8	Number of weeks spent by UK project staff on project work in host country(s)	132-Max Graham 4-Bill Adams
9	Number of species/habitat management plans (or action plans) produced for Governments, public authorities or other implementing agencies in the host country (s)	1-Kenyan National Elephant Conservation Strategy
10	Number of formal documents produced to assist work related to species identification,	

<b>Code</b>	<b>Description</b>	<b>Totals (plus additional detail as required)</b>
	classification and recording.	
11a	Number of papers published or accepted for publication in peer reviewed journals	3
11b	Number of papers published or accepted for publication elsewhere	6
12a	Number of computer-based databases established (containing species/generic information) and handed over to host country	1
12b	Number of computer-based databases enhanced (containing species/genetic information) and handed over to host country	0
13a	Number of species reference collections established and handed over to host country(s)	
13b	Number of species reference collections enhanced and handed over to host country(s)	
<b>Dissemination Measures</b>		
14a	Number of conferences/seminars/workshops organised to present/disseminate findings from Darwin project work	1
14b	Number of conferences/seminars/ workshops attended at which findings from Darwin project work will be presented/ disseminated.	2
15a	Number of national press releases or publicity articles in host country(s)	0
15b	Number of local press releases or publicity articles in host country(s)	4
15c	Number of national press releases or publicity articles in UK	0
15d	Number of local press releases or publicity articles in UK	2
16a	Number of issues of newsletters produced in the host country(s)	4
16b	Estimated circulation of each newsletter in the host country(s)	2000
16c	Estimated circulation of each newsletter in the UK	
17a	Number of dissemination networks established	1 x UK project advisory committee 1 x Kenya project advisory committee 1 x East African elephant management network
17b	Number of dissemination networks enhanced or extended	
18a	Number of national TV programmes/features in host country(s)	

<b>Code</b>	<b>Description</b>	<b>Totals (plus additional detail as required)</b>
18b	Number of national TV programme/features in the UK	
18c	Number of local TV programme/features in host country	
18d	Number of local TV programme features in the UK	
19a	Number of national radio interviews/features in host country(s)	
19b	Number of national radio interviews/features in the UK	
19c	Number of local radio interviews/features in host country (s)	
19d	Number of local radio interviews/features in the UK	
<b>Physical Measures</b>		
20	Estimated value (£s) of physical assets handed over to host country(s)	£xxxx (one used vehicle, 2 used computers, a used printer and a used satellite-based internet system)
21	Number of permanent educational/training/research facilities or organisation established	Laikipia Elephant Project is now a permanent project under the LWF
22	Number of permanent field plots established	
23	Value of additional resources raised for project	CETRAD: £xxxx LWF: £xxxx STE: £xxxx ESRI: £xxxx Rivercross Technologies: £xxxx
<b>Other Measures used by the project and not currently including in DI standard measures</b>		

## Annex 5 Publications

Type *	Detail (title, author, year)	Publishers (name, city)	Available from	Cost £
Journal Article A	Graham, M.D. & Ochieng, T. (2008). Uptake and performance of farm-based measures for reducing crop-raiding by elephants <i>Loxodonta africana</i> among smallholder farms in Laikipia District, Kenya. <i>Oryx</i> <b>42</b> , 76-82.	<i>Oryx</i>	Cambridge University Press	
Journal Article B	Graham, M.D., Douglas-Hamilton, I., Adams, W. & Lee, P (2009). Elephant movement in a human-dominated landscape. <i>Animal Conservation</i> <b>12</b> , 445-455.	<i>Animal Conservation</i>	Cambridge University Press	
Journal Article C	Didier, K.A., Wilkie, D., Douglas-Hamilton, I., Frank, L., Georgiadis, N., Graham, M., Ihwagi, F., King, A., Cotterill, A., Rubenstein, D. & Woodroffe, R. (2009). Conservation planning on a budget: a “resource light” method for mapping priorities at a landscape scale? <i>Biodiversity Conservation</i> (forthcoming)	<i>Biodiversity Conservation</i>	Springer Journals	
Book Chapter D	Graham and Ochieng (2008) Human-elephant conflict mitigation in Laikipia District, Kenya. In <i>Mitigating human-elephant conflict: case studies from Africa and Asia</i> . (ed. M. Walpole and M.Linkie), pp. 83-95.	Fauna & Flora International	Fauna & Flora International	
Project Working Paper 1	Graham, M.D., Gichohi, N., Kamau, F. Aike, G., Craig, B., Douglas-Hamilton, I. and Adams, W. (2009) <i>The Use of Electrified Fences to Reduce Human Elephant Conflict: A Case Study of the Ol Pejeta Conservancy</i> , Working Paper 1, Laikipia Elephant Project, Nanyuki, Kenya	Department of Geography University of Cambridge	<a href="http://www.geog.cam.ac.uk/research/projects/heccapacity">www.geog.cam.ac.uk/research/projects/heccapacity</a>	
Project Working Paper 2	Graham, M.D., Greenwood, C. Kahiho, G. and Adams, W.M. (2009) <i>The Use of ‘Push to Talk’ Mobile Phone Technology to Reduce Human Elephant Conflict, Laikipia District, Kenya</i> , Working Paper 2, Laikipia Elephant Project, Nanyuki, Kenya	Department of Geography University of Cambridge	<a href="http://www.geog.cam.ac.uk/research/projects/heccapacity">www.geog.cam.ac.uk/research/projects/heccapacity</a>	
Project Working Paper 3	Graham, M.D., Wren, S., and Adams, W.M. (2009) <i>An Assessment of Elephant-Compatible Livelihoods: Trials of Beekeeping, Chilli Farming and the Production of Dung Paper in Laikipia, Kenya</i> , Working Paper 3, Laikipia Elephant Project, Nanyuki, Kenya	Department of Geography University of Cambridge	<a href="http://www.geog.cam.ac.uk/research/projects/heccapacity">www.geog.cam.ac.uk/research/projects/heccapacity</a>	
Project Working Paper 4	Graham, M.D., Ochieng, T.N., Kahiho, G., Mutugi, K. and Adams, W.M. (2009) <i>The Use of Community Drama in the Mitigation of Human Elephant Conflict, Laikipia, Kenya</i> , Working Paper 4, Laikipia Elephant Project, Nanyuki, Kenya	Department of Geography University of Cambridge	<a href="http://www.geog.cam.ac.uk/research/projects/heccapacity">www.geog.cam.ac.uk/research/projects/heccapacity</a>	
Project Working Paper 5	Graham, M.D., Ochieng, T.N., Kahiho, G., Ngotho, M. And Adams, W.M. (2009) <i>Trials of Farm-Based Deterrents to Mitigate Crop-raiding by Elephants, Adjacent to the Rumuruti Forest in Laikipia, Kenya</i> , Working Paper 5, Laikipia Elephant Project, Nanyuki, Kenya.	Department of Geography University of Cambridge	<a href="http://www.geog.cam.ac.uk/research/projects/heccapacity">www.geog.cam.ac.uk/research/projects/heccapacity</a>	

## Annex 6 Darwin Contacts

<b>Ref No</b>	15/040
<b>Project Title</b>	Building Capacity to Alleviate Human-Elephant Conflict in North Kenya
<b>UK Leader Details</b>	
Name	Professor Bill Adams
Role within Darwin Project	Project Leader
Address	Downing Place, Cambridge, CB2 3EN, UK
Phone	
Fax	
Email	
<b>Other UK Contact (if relevant)</b>	
Name	Dr Max Graham
Role within Darwin Project	Co-leader
Address	Downing Place, Cambridge, CB2 3EN, UK
Phone	
Fax	
Email	
<b>Partner 1</b>	
Name	Dr Anthony King
Organisation	Laikipia Wildlife Forum
Role within Darwin Project	Main Project Partner
Address	PO Box 764 Nanyuki Kenya 10400
Fax	
Email	
<b>Partner 2 (if relevant)</b>	
Name	Tobias Ochieng
Organisation	Laikipia Wildlife Forum/Laikipia Elephant Project
Role within Darwin Project	West Laikipia Fence Project Manager
Address	PO Box 764 Nanyuki Kenya 10400
Fax	
Email	