

## *Darwin Initiative Annual Report*

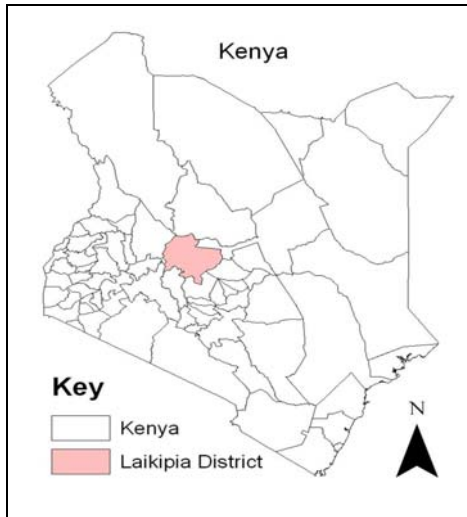
### Darwin Project Information

Project Ref Number	15/040
Project Title	Building Capacity to Alleviate Human-Elephant Conflict in North Kenya
Country(ies)*	Kenya
UK Contract Holder Institution	University of Cambridge
UK Partner Institution(s)	
Host country Partner Institution(s)	Kenya Wildlife Service, Laikipia Wildlife Forum, Centre for Training and Integrated Research for ASAL Development, Save the Elephants, Symbiosis Trust
Darwin Grant Value	£ 260,909
Start/End dates of Project	1 <sup>st</sup> Oct 2006-30 <sup>th</sup> Sept 2009
Reporting period (1 Apr 200x to 31 Mar 200y) and annual report number (1,2,3..)	1 Apr 2007 to 31 Mar 2008
Project Leader Name	Professor Bill Adams
Project website	<a href="http://www.geog.cam.ac.uk/research/projects/heccapacity/">http://www.geog.cam.ac.uk/research/projects/heccapacity/</a> <a href="http://www.laikipiaelephantproect.org">http://www.laikipiaelephantproect.org</a>
Author(s), date	Professor Bill Adams Dr Max Graham April 26 2008

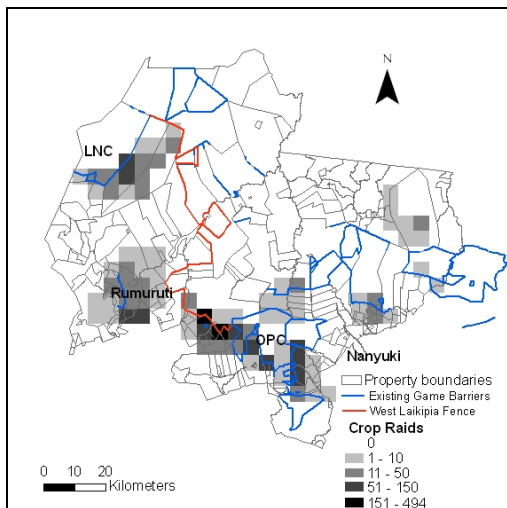
### 1. Project Background

Laikipia lies northwest of Mount Kenya (Figure 1). Land in the district is held in large-scale private ranches, communally owned group ranches, forest reserves and smallholder cultivated land. There are no government designated wildlife protected areas.

Kenya's second largest elephant population, comprised of over 5000 animals, ranges across this land-use mosaic. Inevitably they come into conflict with local people, particularly on smallholder farms, in the wetter, southern portion of this district. Laikipia probably experiences the greatest levels of human-elephant conflict in Kenya. For example in 2004 alone a total of 3668 human-elephant conflict incidents were recorded by trained enumerators, of which 2420 involved damage to crops. People are injured and killed by elephants every year. In addition more elephant deaths in Laikipia can be attributed to human-elephant conflict than to any other single source of mortality (Figure 2). As a consequence the Kenya Wildlife Service and local conservation organisations are under enormous pressure to address the conservation issue of human-elephant conflict (HEC).



**Fig 1: Location of Laikipia District in Kenya**



**Fig 2: Crop-raiding in Laikipia District in a one year period between 2003 and 2004, showing existing barriers and the West Laikipia Fence, currently under construction**

The management of crop-raiding by elephants in Laikipia has traditionally taken several forms. Elephants have been shot in defence of crops since the 1920s and continue to be shot (legally) by wildlife authorities where they threaten people, or killed illegally by local farmers. In 1978, a different approach was tried: at considerable expense, a large-scale elephant drive attempted to try to push elephants out of the arable southern portion of Laikipia and north into the arid and semi-arid rangelands of Samburu and Isiolo Districts. This was completely unsuccessful. Subsequently proposals for HEC management in Laikipia focused on electrified fencing. In 1982 a district-wide elephant fence was proposed separating elephant tolerant from elephant intolerant areas. Designs for the configuration of this fencing 'solution' were proposed in 1993, 1998 and 2002. However, the construction and maintenance of such fences is very expensive, and until 2007, the only fences were those built by private ranches, to separate ranch and smallholder farm land. Much of the human-elephant interface in Laikipia remains unfenced and/or porous to elephant movement, leaving smallholder farmers highly vulnerable to crop-raiding. It was against this background, and at the request of local partner organisations, that this project was developed.

In late 2007, the Laikipia Wildlife Forum, against expectations, secured a substantial grant from the Royal Netherlands to construct a 150km electrified elephant fence in West Laikipia, to effectively complete the fencing strategy proposed in 2002. The timetable of the proposed development and its speed were not anticipated; the first 84 km of the fence has nearly been completed at the time of writing this report. While many of the activities we have undertaken remain relevant, the nature of human-elephant conflict and its management will change dramatically as a result of the construction of this fence. As a consequence we submitted a revised project logframe to Darwin in February 2008, which was subsequently reviewed and accepted in March (email 28 March 2008).

## **2. Project Partnerships**

Within the UK a project advisory committee oversees the implementation of the project and provides feedback on proposed activities and work plans. A meeting was held with the UK project advisory committee in March of this year. Cambridge University (UK lead institution) established a Kenya Advisory Committee in 2006, comprised of a network of local partners (Kenya Wildlife Service, Mpala Research Centre, Save the Elephants, the Laikipia Wildlife Forum, Symbiosis Trust and the Centre for Training and Integrated Research for ASAL Development) to oversee the local implementation of this project. This committee meets annually, although the number of meetings will increase this year as per the request of the KWS. The last meeting of the committee, chaired by Dr Kiteme, the director of CETRAD, was held on February 18 2008 in the CETRAD seminar room in Nanyuki. Progress with project activities were presented and discussed, together with proposed changes to the project logframe.

More specific details of partnerships with local institutions over this reporting period are provided below:

[Save the Elephants\(www.savetheelephants.org\)](http://www.savetheelephants.org): Save the Elephants are an elephant conservation charity, based in Kenya, that specialise in GPS radio-tracking. Cambridge University have supported Save the Elephants to trial a GPS collar early warning system ('e-fence') through the provision of funds for GPS collars, together with on the ground personnel, research support and expertise. The system has two components. The first of these is a web-linked programme that visually displays up-to-date elephant movement, showing the latest, real time, tracks of collared elephants on a google earth background. The second component is an early warning text message system. This is designed so that when a problem elephant fitted

with a GPS/GSM collar approaches a designated boundary, a text message warning is sent to a designated manager. Since the last reporting period (April 2007) the Cambridge University Darwin team have assisted STE by coordinating the deployment of GPS collars on a further four potential crop-raiding bull elephants in West Laikipia. The total number of 'problem' bull elephants now collared under this collaborative programme is eight elephants. Cambridge University, with the support of project staff employed by CETRAD, and using STE animal tracking software, are in the process of compiling a progress report for two GPS collars on which the e-fence system has been activated. Under the new project logframe (see Annex 2), this component of the project will be handed over to STE to continue to develop the e-fence software. Data from the collars will continue to be available to the University of Cambridge.

The Centre for Training and Integrated Research for ASAL Development ([www.cetrad.org](http://www.cetrad.org)): CETRAD (bilaterally established under Kenya and Swiss Governments in 2002) have provided the project with an institutional umbrella, administrative support, dedicated project staff, and an office in Nanyuki. In addition CETRAD chair the Kenya advisory committee for this project. Cambridge University assisted CETRAD to successfully secure a Swiss Government grant (ESAPP Q605) to support CETRAD's contribution to this project's training programme and the demonstration of farm-based deterrents. Two formal training courses have been provided with CETRAD over this reporting period and a further course will be run between the end of April and early May (GIS for conservation). Components of the project will begin to move from CETRAD to other local partners as part of the legacy plan from May 2008.

The Laikipia Wildlife Forum: The Laikipia Wildlife Forum (LWF) is the key local partner in the project area and is the intended legacy organisation. The Executive Director, Dr Anthony King, is an active member of the Kenya project advisory committee. The LWF and Cambridge University worked together to secure support from the GSMA, a global umbrella organisation for GSM providers, to trial Push to Talk Technology, where mobile phones are used like vhf radios, enabling communication among multiple users, as a local early warning system for human-elephant conflict (see further description below). The trial was carried out in late 2007.

The LWF is leading the new fencing strategy to reduce HEC, raising funds for the West Laikipia Elephant Fence. The project is supporting the LWF develop a long term strategy for the management of the West Laikipia Fence, under the new project logframe.

Kenya Wildlife Service: The Kenya Wildlife Service (KWS) is the national wildlife authority and is working closely with the project on a day-to-day basis through local KWS posts (Nanyuki and Nyahururu). Moses Litoroh, the coordinator for the KWS Elephant Programme, sits on the Kenya project advisory committee. In May 2007, the project was invited to attend a KWS workshop in Nanyuki to provide input for the development of a national strategy for the conservation and management of elephants and in March 2008 further written input was requested from the project to help with the development of this strategy. Both formal courses (one for the identification of elephants and one for carrying out a questionnaire survey), run by this project during this reporting period were attended by KWS rangers from Nanyuki and Nyaharuru posts. The forthcoming GIS course will also be attended by KWS personnel.

The Symbiosis Trust: The Symbiosis Trust continues to market and sell elephant dung paper produced by a women's group from northeast Laikipia. In collaboration with the project, a new group has been identified for training in south-west Laikipia within the next quarter.

### 3. Project progress

#### 3.1 Progress in carrying out project activities

##### O.1 E-fence trial

In August 2007 the project coordinated the deployment of three GPS/GSM collars on potential crop raiding bulls on the Laikipia Nature Conservancy in West Laikipia to assist with the STE e-fence system being developed by Save the Elephants. STE provided the University of Cambridge with GPS collar data downloading software, together with Google Earth real time elephant tracking visualisation software. Both software programmes have glitches but these are being dealt with.

The ‘collar to manager’ text message early warning system (‘e-fence’) was evaluated on OI Pejeta Conservancy, where two elephants who regularly broke fences to leave the property to crop raid were collared. Evaluation involved checking that the GPS location of the elephants sent in early warning text messages was consistent with where the elephant was (i.e. outside of the Conservancy fence). In addition informal interviews were held with the management at OI Pejeta to explore their perspectives on the effectiveness of the system. The result of this experiment is currently being analysed.

The experiment at OI Pejeta has shown that the e-fence system works, in the sense that collars do signal GPS locations, and trigger warning texts to the mobile phones of designated managers. There are a number of technical aspects of the software and information management that need to be sorted out. On OI Pejeta, for example, there was a major problem with false early warning messages: 100% of the early warning messages sent out by one collar, were false alarms (Table 1). The problem here was a simple computer programming error in the GIS layer used to define the property boundary (an old internal fence separating a rhino sanctuary from the rest of the property was used by mistake, even though it was removed in early 2006, with the change in ownership of the property (Figure 3). The collars and e-fence system were in fact triggering text warnings correctly, but for the wrong boundary. As a result, the warnings were not found useful by OI Pejeta Conservancy staff. Better management of such problems encountered by users will be needed to make the system effective.

Results from this simple analysis, and the project’s and partners’ experience of using the e-fence technology more generally, suggests that it could be a useful HEC management tool to limit fence breakages, under two conditions. First, that it is operated in association with landowners with a strong fence management team, such as large scale ranchers. It does not at present seem to offer a tool that could be used by smallholders at risk of crop raiding, but only by their elephant-tolerant larger neighbours. Second, that the system is managed sufficiently closely that problems such as those of mis-programmed boundaries are quickly identified and corrected. STE intend to continue to develop the e-fence system, and propose to carry the trial further. The project proposes (under its revised approved logframe) to phase out their direct involvement in this work. However, the project will continue to support STE where possible in its work with landowners on Laikipia.

**Table 1: Accuracy of text message alarms sent out by E-Fence collars**

Elephant ID	Inside OI Pejeta			Outside OI Pejeta			Total SMS
	Total No.	TRUE (%)	FALSE (%)	Total No.	TRUE (%)	FALSE (%)	
OI Pejeta	13	11(85%)	2 (15%)	113	0 (0%)	113 (100%)	126
Kimani	13	8 (62%)	5 (38%)	19	14(74%)	5 (26%)	32

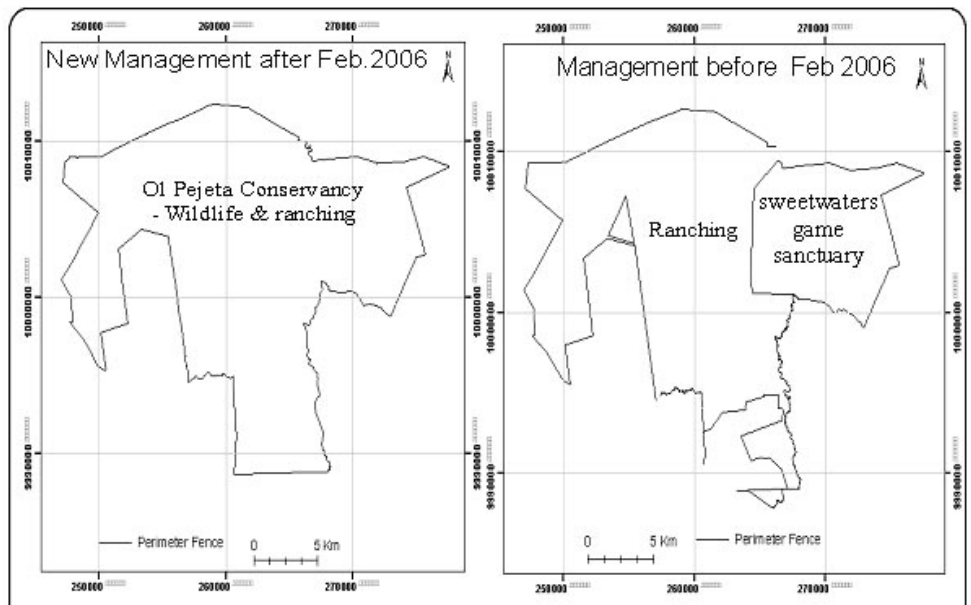


Fig. 3 Shows the old internal fence around Sweetwaters Game Sanctuary, incorrectly used to trigger the early warning text message stating that the collared elephant was 'outside Ol Pejeta', and the new unfenced conservancy.

## O.2 Local Knowledge Based Early Warning System

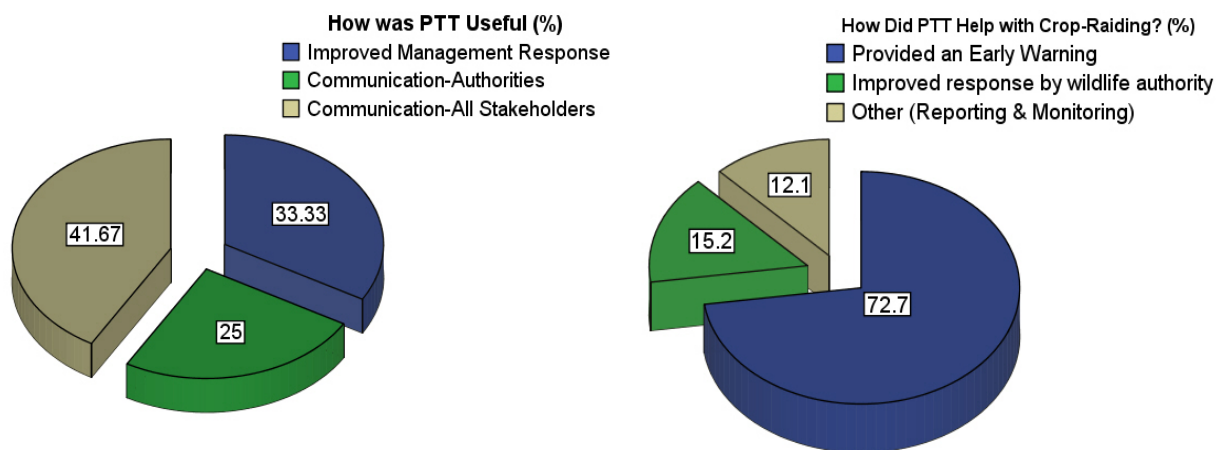
With the rapid construction of the West Laikipia Fence (commencing late 2007), the proposed HEC prediction maps, created using local knowledge and reported cultivation patterns, has become of limited usefulness. Construction of the fence has already disrupted elephant movement patterns. It is likely to have a substantial and permanent impact on elephant movements on Laikipia, and quite possibly (hopefully) to reduce crop raiding dramatically. It will therefore be a) extremely difficult to predict if, where and when elephants will crop-raid on the basis of past raiding patterns; and b) impossible to evaluate the prediction maps against actual crop-raiding. Under these circumstances, we decided to instead adapt the local knowledge based early warning system element of our project to trial push to talk technology with support from the GSMA Development Fund and Safaricom Ltd.

Push-to-Talk over Cellular (PoC) combines the functionality of a walkie-talkie or two-way radio with a mobile phone. PoC enables communication between two individuals, or a group of people, and is particularly useful in connecting a user group intermittently over a period of time (e.g., a working day). A benefit of PoC is that it can be used alongside voice and data services on a single mobile phone handset. Users can make standard phone calls and send SMS, while also accessing two-way communication and group talk through the press of a button. Because network resources are used only for the duration of each talk 'spurt,' PoC technology requires less airtime, demands less energy, and is less costly than a conventional phone call. The PoC pilot was carried out in three different sites in Laikipia in late 2007. Fifty people, including community-elected scouts, government rangers, and private landowners, received mobile phone handsets (provided by Nokia) and associated training on how to make group and one-to-one PoC calls, together with a protocol for communication between users (e.g., "copy that" to mean you have received a message, or "over" to indicate that a user has finished speaking). The impact of the trial was evaluated through daily monitoring of use and a post-trial questionnaire, together with informal interviews.

Preliminary results suggest the trial was highly successful, empowering local communities to provide a timely early warning for human-elephant conflict by allowing different actors (farmers, ranch fence patrols, KWS rangers) to communicate on the location of a potential crop-raiding elephant. The trial at Mwenje, one of the three PoC trial sites, illustrates the application of this technology. Twenty one PoC users were provided with handsets. Of these 12 were community members, seven were rangers from the neighbouring Laikipia Nature Conservancy (LNC) and

two were KWS rangers posted at stations within the smallholder farming area, adjacent to the LNC. Between the 3<sup>rd</sup> of November and 3<sup>rd</sup> of December PTT was used to report incidents on 28 of the 31 days. Fifty-one reports were made using the PTT system, of which 48 were for HEC management and security. Twenty-nine of these management reports provided early warning messages resulting in preventative action being taken, while the remaining management reports were used to report an incident.

Results from a questionnaire suggest that the technology improved the response of the management authorities to reports of HEC and other security incidents (including stock theft and forest destruction) as shown in fig.4. A report on the trial is currently being drafted for circulation.



**Fig. 4 PTT users' responses to a post-trial questionnaire survey (n=35)**



**Fig. 5 Training a community group at Mwenje, adjacent to the Laikipia Nature Conservancy in West Laikipia**



### O.3 Community-based HEC management and research programme established:

Farm-based trials of crop-raiding deterrents were carried out in Salaama location, south-west Laikipia, between August and November, 2007. Twenty-five trial farms and 25 control farms were selected. Profiles for each of the farms included in the sample, in terms of historical crop-damage, were compiled using the existing HEC database. The trial farms were provided with farm-based deterrents while the control farms were not. All farms were systematically monitored using a standard data form on a weekly basis. A questionnaire was administered after the trials to evaluate perceptions of effectiveness. These data are in the process of being analysed.

The methodology used for the trial was adapted from previous trials carried out in Laikipia, analysed and written up under this project (Graham and Ochieng, 2008). The trials that were carried out in the latter part of 2007 varied from earlier trials in the monitoring methodology used and single area focus. However problems with variable uptake, motivation and differences in labour availability, reported as an issue in previous trials, continued to be an issue in these trials, possibly compromising the experimental design. These issues will be discussed further in a dedicated report, once the data analysis is complete.

Due to the construction of the west laikipia fence, the potential for further farm-based deterrence trials among smallholder farmers living in West Laikipia has been affected. This is because: a) crop-raiding should, if the fence works, decline and; b) as the fence is built, farmers have been less willing to participate in farm-based trials, perceiving the fence to be the 'final solution'. For these reasons, efforts to demonstrate farm-based deterrents have been refocused to south-west Laikipia, in Marmanet and around the Lariak Forest, areas which are likely to continue to experience crop-raiding by elephants, after the construction of the west laikipia fence. Due to the shifting focus of the project, and associated resource demands, these demonstration farms will represent a form of outreach support, rather than experimental trials.

### O.4 Dissemination of CBPAC approaches among vulnerable communities and conservation practitioners

This project has continued to support a local drama group to develop their interactive plays to build community awareness of HEC management tools. A further four plays have been performed since the last annual report. An adapted interactive play has been developed, and a script drafted to build awareness of issues around the management of electrified fences, and to engage smallholder farmers in the management of the West Laikipia Fence (Annex 3).

Community orientated booklets, in a comic book style, previously produced with CETRAD, were printed in English (500 copies), Kiswahili (500 copies), Kikuyu (500 copies) and Kimeru (500 copies) and disseminated to schools and farmers living in HEC hot-spots around Laikipia and Mt.Kenya

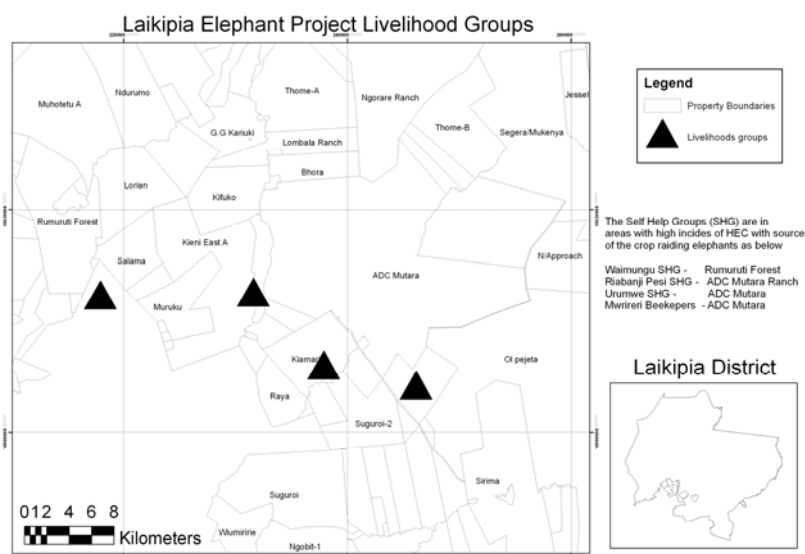
A further 100 posters for the project were printed and disseminated to schools in south Laikipia (Annex 4).

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 8 secondary schools). The national examination board examined the essays and chose 8 winners in total. The three top winners, one from each age group, were taken to Mpala Research Centre (central Laikipia) for two nights to learn about elephants in February 2008.



## O.5. Elephant defence livelihood systems established

The project has continued to support five community based organisations (CBOs) to strengthen their capacity to establish and develop alternative livelihood systems in Laikipia. These include Waimungu in Salaama, Riafanje in Pesi, Urumwe in Kiamariga, Mwireri Beekeepers in Ex-Erok and the Mukogodo Elephant Women in Anongoro (Figure 6).



**Figure 6. Darwin Laikipia Elephant Project Livelihood Groups**

Training was provided to Waimungu and Riafanje community based organisations. 27 chilli seedbeds were established, although there were problems when these seedlings were transplanted. It was felt this may be due to the type of seed used. We have now secured the support of the Kenya Horticultural Development Programme (funded by USAID) to improve our training and support for chilli production. Maize foods continue to offer a market at Ksh 80 (approx US\$ 1.20) a kg of chillies.

Since the provision of training to Waimungu CBO through a field trip, six of their 10 beehives have now been colonised by bees. Urumwe, who collectively own 19 hives and were also provided with training, have had less success with only 6 of their hives colonised. The project linked Lucy King, an Oxford University PhD candidate working for Save the Elephants with Mwirere beekeepers, located in Ex-Erok. Mwirere own over 40 beehives, 13 of which were provided by Lucy King.

While meetings have been held with SITE Enterprise Promotion, a Kenyan NGO, to promote improved connection of producers with the market, it is clear that a great deal more work is needed to create a network of beekeepers in Laikipia, that can generate sufficient bulk, to merit the involvement of a third party buyer. This is possible but may be beyond the capacity of this project to achieve. In the next phase of this project meetings will be organised with the LWF, who have community liaison officers on the ground, and SITE to establish what more can be done to improve the supply of honey from smallholders in Laikipia.

The Symbiosis Trust continues to support the Mukogodo Elephant Women's group to generate elephant dung paper. The project intends to support the expansion of dung paper training to south-west laikipia in the next quarter.

With the creation of the West Laikipia Fence, the establishment of elephant-compatible livelihoods is no longer important in most of south and south-west Laikipia, as elephants will, in theory, be removed from smallholder land in southern Laikipia. Therefore under the revised project logframe, the livelihood component of this project will be handed over to partner

organisations on the ground early in the final year of the project. Meetings with relevant partners will be held in the next quarter to generate a strategy to help facilitate moving each of the livelihood activities forward.

### O.6 Sustainable revenue streams established for permanent HEC management team in Laikipia

A project website has been created ([www.laikipiaelephantproject.org](http://www.laikipiaelephantproject.org)) as a first step in building the profile of the project for legacy purposes. In addition meetings have been held with wildlife direct, to plan the creation of a project specific blog, for raising funds in the future.

With the emergence of the West Laikipia Fence, the need for a dedicated community outreach team for helping to alleviate HEC has lessened considerably, and therefore the long term strategy for generating sustainable revenue, will instead focus on ensuring that the appropriate stakeholders who have pledged to support the maintenance of the fence (large-scale ranches in West Laikipia), fully understand and are able to meet the costs.

## **3.2 Progress towards Project Outputs**

Overall the project is in on track to deliver most, if not all, of the project outputs originally planned.

With the GPS/GSM early warning system, this is illustrated and can be verified, with the early warning text messages that have been sent and evaluated by the project and the progress report is nearly complete.

In the case of the local knowledge-based early warning system, where we have had some difficulties with implementation, the trial of push-to-talk technology could be a major breakthrough in the empowerment of local communities living with elephants (that is where there is mobile phone coverage), and the success of this trial can be verified through the data collected and analysed on PTT use in relation to HEC and other security issues, to be submitted with the next report and we hope through a peer reviewed paper.

We have had some success with the establishment of a community based HEC research programme, having trained a network of local, Kenyan, personnel, both formally and informally, in field methods and basic data analysis, which will be verified through their contribution to project reports and papers to be provided in this and subsequent Darwin reports.

Farm-based deterrence and electrified fences have been evaluated, and will be verified through a report to be submitted with the next paper, and, we hope, another journal paper.

The outputs associated with elephant defence livelihoods have been more difficult to implement, due to the particular levels of expertise required to help with chilli farming and honey harvesting and associated marketing. However, the connections made with technically proficient partners over the last year, including SITE and the Kenya Horticulture Development Organisation, to whom these activities will be handed over within the coming months, should improve the outlook for these livelihood activities in Laikipia. The dung paper project, implemented by the Symbiosis Trust, is generating revenue for the members of the Mukogodo Women's Group, and there are plans to expand this activity to south-west Laikipia, However this expansion can only be sustained providing support exists for further marketing within Kenya and beyond. While this is beyond what was proposed under the original logframe, appropriate partners and potential sources of funding will be identified to help support these conditions for expansion, during the next 6 months, for the purposes of securing the project legacy.

While progress has been made with the original plan to generate sustainable project revenue, through a web interface with the project, for a legacy team, this has become less appropriate with the emergence of the west laikipia fence, which needs to be effectively maintained by a network of landowners, many of whom have or should have the resources to make the fence effective. This is reflected in the agreed changes to this element of the project under the new logframe, where the focus will be on ensuring the true cost of fence maintenance, monitoring and enforcement is identified and agreed to by the appropriate stakeholders (large-scale property owners, smallholder farmers and Government of Kenya). That said, options will be explored to graft the share web development work undertaken for the 'Laikipia Elephant Project' to the LWF, to support their efforts to maintain the West Laikipia Fence into the future.

The emergence of the West Laikipia Fence will transform the nature of HEC management in West Laikipia. For these reasons we proposed, and Darwin have agreed (March 2008, see Annex 2), to a revised logframe, incorporating new activities that support the long term management of the West Laikipia Fence. To implement the new activities, some old activities are being phased out including the GPS/GSM early warning system, farm-based deterrents and the livelihood elements of the project. However enough information has been generated on these activities in the first 18 months of the project to help build understanding of their usefulness both in Laikipia, and other areas with acute HEC problems.

### 3.3 Standard Measures

**Table 2: Project Standard Output Measures**

Code No.	Description	Year 1 Total	Year 2 Total	Year 3 Total	Year 4 Total	Total to date	Total planned from application
Established codes							
2	Project staff member completes M. Phil in Society, Environment and Development, University of Cambridge; Project staff members applied for an M.Phil. place at two UK universities		1			1	0
			1			1	0
3	2 X Official ESRI Online GIS Courses		5			5	6
5	8 Elephant scouts training on data collection and recording; 1 LWF Community Liaison Officer trained on project planning; 4 senior project staff provided with 'on the job' training in data collection, analysis, and project management; 1 Office assistant trained on data entry and office administration		8			14	18
			1				
			4				
			1				

6 A	8 x elephant scouts 3 x project officers 1 x scout supervisor 1 x office admin LWF CLO Riabanji Youth Group (12); Waimungu Youth Group (15); Mukogodo Elephant Women (10); Urumwe Group (28); Formal course participants (20); 100 smallholder farmers	8    12 15 10 28	3 1 1 1   20 25			124	108
6B	Farm-based deterrence; Chilli Farming; Beekeeping; Dung paper production; Getting to know elephants course; Asking questions course; Field methods; Research Design;	1 1    1 1	3  1  1 1 1			11	8
7	Comic book, plays, maps and posters	4				4	5
8	Max Graham Bill Adams	18 1	44 2			62	132 4
9							1
11B	1 x Oryx Paper (08) 1 X Book Chapter (08) 1 x Spatial analysis of crop-raiding paper submitted (being revised) 1 x elephant GPS/GSM movement paper drafted		1 1 1 1			4	5
12A	HEC database created (still being improved)	1				1	1
14A	Chilli farming seminar (Dr Guy Parker)	1				1	2
14B	HEC Meeting; (FFI/KWS) Nairobi Workshop for Development of Kenya National Elephant Strategy (KWS)	1	1			2	3

15A 15 B  15C 15 D	LWF Newsletters x 2 Travel News Articles x 1	1	2			3	1 1  1 1
17A	UK Advisory Committee Meetings Kenya Advisory Committee Meetings	1  1	1  1			2  2	
New - Project specific measures							

**Table 3: Publications**

Type * (e.g. journals, manual, CDs)	Detail (title, author, year)	Publishers (name, city)	Available from (e.g. contact address, website)	Cost £
Journal *	Uptake and performance of farm-based deterrents for reducing crop-raiding by elephants among smallholder farms in Laikipia District, Kenya. Graham and Ochieng, 2008	Oryx Cambridge	<a href="http://journals.cambridge.org/download.php?file=%2FORX%2FORX42_01%2FS0030605308000677a.pdf&amp;code=628c85d23cef01cc28e851f47f408cbf">http://journals.cambridge.org/download.php?file=%2FORX%2FORX42_01%2FS0030605308000677a.pdf&amp;code=628c85d23cef01cc28e851f47f408cbf</a>	
Book Chapter	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 and Flora International Cambridge		

### 3.4 Progress towards the project purpose and outcomes

We have now applied and assessed a range of tools in the field to reduce human-elephant conflict and to promote tolerance of elephants. Some of these tools were applied on a ‘trial’ basis (such as the farm-based deterrents and Push-to-talk technology), and their impact, is currently being assessed, though is likely to have been limited in space and time. However dissemination of results from these trials and the possibility of rolling out the technology (particularly in the case of PTT), is likely to have a far bigger impact, in terms of reduced HEC, both within and beyond the project site.

The project facilitated in the planning and impact assessment stages of the West Laikipia electrified fence, which enabled the LWF to secure the grant to construct the fence. In the construction phase of the fence, local research into effective electrified fences, carried out by

the project, will support the development of an appropriate fence management protocol to ensure fence is successful beyond the construction phase. This should reduce HEC dramatically in West Laikipia, although we will only be in a position to verify this, towards the end of the life of this project, once sufficient data have been collected. Furthermore it is hoped that the fence management protocol will be adopted by the KWS, to assist with fence management in other parts of Kenya. Based on personal observations, the communication tools developed by this project, in particular the interactive drama, are clearly having an impact on local knowledge of elephants and elephant management. We will be exploring tools to verify this impact within the next year. The network of support for the project, particularly the Kenya advisory committee and local government institutions is very encouraging.

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

We fully expect that with the tools and personnel put in place by this project, the cost of living with elephants in West Laikipia will reduce dramatically by the end of the life of the project. This will be verified through an analysis of data consistently collected by local scouts. In addition, we expect that the dissemination of tools assessed by this project, such as the farm-based deterrence analysis carried out by Graham and Ochieng (2008) will influence HEC management elsewhere. Unfortunately we are not yet in a position to fully evaluate the impact of the livelihood elements of the project, at this stage, in terms of income generated. We plan to be able to do this by the end of the next reporting period.

## **4. Monitoring, evaluation and lessons**

Data collection by a network of trained enumerators on HEC is continuing. These data are being entered into a dedicated database which will be used to evaluate the performance of the fence towards the end of the project. We hope that the GPS tracking data collected from known crop-raiding elephants, together with standard questionnaire data collected on household economies will also help with the evaluation.

During our last UK advisory committee meeting we discussed the issue of project evaluation and how this might be implemented for some elements of our project, where quantitative methods were inappropriate (such as perceptions of the new fence and the impact of the drama group). In this regard we are particularly encouraged by input from Dr. Matt Walpole, one of our UK project advisors, who has helped to pioneer the application of 'Most Significant Change' method, typically used in the Development sector. This method standardizes the collection and analysis of stories of change, and will be presented in detail in forthcoming journal papers published by Walpole and Wilder in *Oryx* this year. We will be looking at ways to try and integrate these innovative evaluation tools and/or something similar, where conventional quantitative tools will be limited in their usefulness.

One area we have learned a great deal is in the area of attempting experimental trials of farm-based deterrents. Based on an analysis of previous work and experiences over the last year with these trials, we feel we have learned that the question of uptake, by participating farmers, is a key factor for consideration in trials. Where uptake or the ability to uptake tools provided is likely to be highly variable (which is probably the case in most community situations), the usefulness of experimental designs in evaluating performance, may be limited. As such we recommend experimental designs be carried out in more controlled contexts, and probably not within communities. Where trials are to be carried out in communities, other evaluation tools may be more appropriate, such as those being developed by Wilder and Walpole.

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

We responded directly to several queries raised in the review of the Annual Report 2006-7. One of these was in relation to a MoU with one of our partners, Save The Elephants. The development of the working relationship with STE has been a major priority this year. Substantial progress has been made, and a substantial amount of collaborative work has been completed. Under the new Logfrane, STE will now take forwards the e-fence work. The project will continue to provide support, help and practical advice where possible and where needed.

The second query was in relation to the role of the project in the implementation of activities in relation to other partners. We also submitted a revised concept for a local knowledge based early warning system, which was approved in July 2007. As described in this report, this has since been adapted to trial 'Push to Talk' technology, given the limited applicability of the proposed system in the face of the rapid construction of the West Laikipia Fence.

It was also suggested in our review that we explore the possibility of evaluating changing levels of tolerance towards elephants, through a questionnaire survey or some similar methodology. In response to this suggestion in the last year we piloted a questionnaire among farmers, before and after an interactive educational drama performance. With the shifting conditions on the ground in Laikipia, as far as project activities have been concerned, we have not taken this further but we intend to do so in the next project year.

## **6. Other comments on progress not covered elsewhere**

None

## **7. Sustainability**

Prior to the construction of the west laikipia fence, our strategy for sustainability was to aim to put in place a permanent, qualified HEC team, possibly under the LWF and novel tools to generate finance for this team, including a project web interface, so that outreach services could be provided to communities suffering from HEC indefinitely. With the construction of the fence, there is really no longer a need for a permanent HEC team to provide outreach support. Instead what is critical is that those entities, particularly the large-scale ranches, although also including smallholder farmers living on the 'intolerant' side of the fence, have in place protocols for monitoring, maintaining and enforcing the fence, and are fully committed to covering the associated costs (which must be clearly identified). As such the sustainability strategy has shifted to cater for these changing circumstances. Our strategy is now (in no particular order):

- Support the LWF to employ and train a full time fence officer to provide permanent support for the local landowner/smallholder groups that are being established to maintain the West Laikipia Fence.
- Support OI Pejeta Conservancy to take on responsibility for overall management of the fence, along the entire stretch of the West Laikipia Fence. This will include supporting the development of protocols and training for monitoring and management
- Hand over database management, future supervision of scouts and GIS services to Mpala Research Centre and CETRAD under a joint long term programme (the new director at Mpala would like to establish a long term elephant research project and so this would complement her planned ecosystem level research).
- Shrink our project office, and work through staff outposted in partner organisations to meet the project goals, objectives and outcomes
- Graft the Laikipia Elephant Project website and planned fundraising tool (Wildlife Direct blog), onto the LWF website.
- Work with large-scale ranches to take over employment of the elephant scouts directly, to support with fence management and community relations.



## 8. Dissemination

In the last year dissemination at the international level has taken place through publication of one peer reviewed paper (*Oryx*) and one peer reviewed book chapter. One paper on spatial analysis of crop-raiding has been submitted, and has been accepted subject to revision (*Biological Conservation*). Another journal paper, on elephant movement in Laikipia, has been drafted, and will be submitted shortly to *Conservation Biology*.

At the national level, considerable input has been given to the development of the KWS national elephant conservation and management strategy, through participation in workshops and direct communication with the acting consultant, Dr Keith Lindsey.

At the local level information has been disseminated through the printing and distribution of booklets, posters and through interactive performances by the elephant thespians.

## 9. Project Expenditure

**Table 1 Project expenditure during the reporting period (Defra Financial Year 01 April to 31 March)**

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

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

Due to 2007 post-election problems in Kenya, we were unable to implement all the activities as planned for the first quarter of 2008 (including a GIS course, livelihoods training, interactive web fundraising tool), explaining the underspend under several of the budget headings. Darwin agreed to allow us to carry these forward.

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

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

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

Project summary	Measurable Indicators	Progress and Achievements April 2007 - March 2008	Actions required/planned for next period
<p><i>Goal: To draw on expertise relevant to biodiversity from within the United Kingdom to work with local partners in countries rich in biodiversity but constrained in resources to achieve</i></p> <p><i>The conservation of biological diversity,</i></p> <p><i>The sustainable use of its components, and</i></p> <p><i>The fair and equitable sharing of the benefits arising out of the utilisation of genetic resources</i></p>			<p><i>(do not fill not applicable)</i></p>
<p>Purpose:</p> <p>Alleviate human-elephant conflict and promote tolerance of elephants in Laikipia District, Kenya</p>	<p>-Reduction in the total number and severity of elephant crop-raids in Laikipia by year three</p>	<p>-Provision of ongoing training and materials for farm-based defence of smallholder farms                      -Support provided (in the form of data and maps) to the LWF to secure a grant for construction of West Laikipia Fence</p>	<p>-Protocol/s and training for monitoring and managing the West Laikipia Fence put in place                      -Support for the LWF to establish fence management committees                      -Dissemination of farm-based methods to areas not affected by West Laikipia Fence</p>
	<p>-Permanent community based HEC management and research project established; HEC management training provided at the local, national and international levels.</p>	<p>-Training programme developed and half-way through implementation                      -Tobias Ochieng, Project officer, secured a full scholarship to Cambridge for MPhil in Environment and Development                      -Core project staff trained on research design data collection and basic analysis</p>	<p>-Complete training programme                      -GIS formal course, HEC research formal course                      -HEC workshop for East African managers</p>
	<p>- Sustainable revenue streams secured to maintain project activities beyond Darwin funding</p>	<p>-Project brand developed                      -Project website created (still being developed)                      -Meetings held with Wildlife Direct on setting up a fundraising Blog</p>	<p>-Discussions to be held with LWF about grafting project brand and website onto LWF                      -Sustainable fence finance strategy to be developed with LWF and pledges secured with appropriate</p>

			stakeholders
	-Income generated by local communities through sustainable elephant defence livelihoods	-Outreach support to strengthen community-based organisations (CBOs) -Ongoing training provided to CBOs on chilli farming and beekeeping. -Technical outreach support secured from Kenya Horticultural Development Programme	-Hand over chilli and honey production to partner organisations -Facilitate improved production, through support for training and facilitate marketing by partner organisations. -Support training and marketing for dung paper project
Outputs <b>O.1. GPS/GSM collar based HEC early warning system</b>	-15 elephants collared by yr 2; collar-mobile phone text message system working by yr 2	7 Crop-raiding elephants near Rumuruti (Pesi & Ngorare) fitted with GPS/GSM collars  Test message alarms received, entered into a database and analysed	This work to be taken forwards by Save The Elephants
<b>Activity O.1. GPS/GSM collar based HEC early warning system</b>  O1.1 Agreement with ranch and elephant collar partner (Save the Elephants, STE)  O1.2 Crop raiding elephants found and collared  O.1.3. efence software developed programming completed by collaring partner STE)  O1.4 Elephant warning messages received by ranch  O1.5 Ranch fence team respond to warnings and report success  O.1.6 Analysis report published		-Completed in October 2006  -7 crop-raiding bulls have been fitted with GPS/GSM collars  -Original software provided by manufacturer working. STE software not yet complete.  -Warnings were received by OI Pejeta and conservancy management  -Many warning appeared to be 'false alarms'. Ranch subsequently ignored messages and didn't use system.	This element of the programme has been handed over to STE

		-Preliminary analysis complete. Report still being compiled.	
<b>O.2. Local Knowledge based HEC Early Warning System (formerly Remote sensing (NDVI) HEC early warning system)</b>	-Prediction maps distributed to designated project assistants and partners by yr 2	-This element of the project was adapted to cater for the construction of the West Laikipia Fence. Under this element of the project, Push-to-talk technology was instead trialled on the basis that the technology also relies on local knowledge and community involvement to provide an effective early warning system.	-If commercial viability assessment by Safaricom Ltd is favourable, technology could be rolled out across HEC sites in Laikipia in year 3 of the project.
Activity O.2. Local knowledge based HEC Early Warning System  O.2.1. identify crop-raiding risk zones in Laikipia  O.2.1. identify local expert informant panel in each zone and carry out conflict and crop scoring exercise  O.2.1. Collate data into a single GIS.  O.2.1. Generate and circulate predictive maps of human-elephant conflict  O.2.1. Evaluate predicted crop-raiding against actual crop-raiding and effectiveness of system		Carried out in 2007  Carried out in 2007	Abandoned after rapid construction of West Laikipia Fence, PTT trialed instead. Monitoring of PTT system carried out in late 2007, data analysed, presentation to safaricom with GSMA made. Report still being compiled. Hope to publish results in year 3, if accepted by a journal ( <i>Pachyderm</i> )
<b>O.3. Community based HEC management and research programme established</b>	-5 demonstration sites set up in yr 1; Local HEC alleviation team trained by yr 3; HEC database compiled and alleviation tools assessed by yr 3	-25 farms provided with farm-based deterrents -demonstration plots established around Lariak forest and new scout recruited -Ongoing training of core team (research design, data collection, basic analysis and report writing)	-Ongoing training of core team (research design, data collection, basic analysis and report writing) -HEC database compiled. Data entry for all data collected since October 06 will be completed in 2 <sup>nd</sup> quarter of 2008. -Assessment of effective fence (OI

			Pejeta) vs. non effective (Laikipia Nature Conservancy) fence underway.
<b>Activity 0.3. Community based HEC management and research programme established</b>  O.3.1 Identify trial sites  O.3.2 Select 100 trial farms and 100 control farms  O.3.3 Carry out baseline surveys for all 200 farms  O.3.4  Design data capture forms for measuring performance of deterrents on trial and non-trial farms  O.3.5 Evaluate performance of farm-based elephant deterrents		Completed in 2007  Completed in 2007  Carried out baseline for first 25 in Salaama. Did not continue with other sites due to construction of West Laikipia Fence  Completed in 2007	
<b>O.4. Dissemination of Farm-based Elephant deterrence approaches among vulnerable communities and conservation practitioners</b>	-Booklets, play performances, newsletters and posters disseminated each yr; East African training workshop; ongoing 'outreach' support provided to vulnerable farmers	-2000 booklets distributed around Laikipia and Mt Kenya (Darwin paid for 500 copies in English, UNDP paid for Kiswahili, Kikuyu and Kimeru translations). PI (Max Graham) attended translated version launch in Meru -Outreach support provided on farm-based elephant defence provided to farmers on request. -4 HEC plays; new script created, catering for the West Laikipia Fence -100 project posters printed -School essay competition and winners trip to Mpala Conservancy	- continuation of outreach work - performance of new play on West Laikipia Fence



<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>-Five community groups strengthened to provide a platform for livelihood activities (Waimungu in Salaama; Riafanje in Pesi, Mukogodo Elephant Women in the Mukogodo Forest, Urumwe in Kiamariga; and Mwirere in Ex-Erok) -Training provided on chilli farming, beekeeping and continued support for dung paper production</p>	<p>-Production issues need to be resolved prior to further marketing. Handover to project partners in 2008</p>
<p><b>Activity O.5. Elephant defence livelihood systems established</b></p> <p>O.5.1. Identify partner organisations that can provide support for livelihood activities.</p> <p>O.5.2 Establish markets for 'elephant compatible' products (chillies, dung paper and honey)</p> <p>O.5.3 Identify community groups to train on the production of honey, chillies and dun paper</p> <p>O.5.4 Train communities on the production of 'elephant compatible' products</p> <p>O.5.5 Link community products with markets</p> <p>O.5.6 Evaluate the impact of livelihood activities</p>		<p>-Meetings and support pledged from KHDP (USAID), SITE and Symbiosis Trust</p> <p>-Maize Foods continue to offer a market for chillies (Ksh 80 per kg) -Site offer a market for chillies - See above</p> <p>See above</p>	<p>Continue</p> <p>Continue</p> <p>More work needed. Scale up production of honey and chillies.</p>
<p><b>O.6. Sustainable revenue streams established for a permanent HEC management training team in Laikipia</b></p>	<p>-Web-based Laikipia wildlife magazine subscription service set up by yr 3; Fundraising and proposal writing training for project assistants by yr 3.</p>	<p>-First cut and project website up and running (<a href="http://www.laikipiaelephantproject.org">www.laikipiaelephantproject.org</a>). Will be updated in the next quarter</p> <p>-Discussions held with WildlifeDirect (<a href="http://www.wildlifedirect.org">www.wildlifedirect.org</a>) to establish</p>	<p>-Need to graft website onto existing LWF website and redesign as appropriate prior to end of project</p>



		a project blog for future fundraising purposes.	
<p>O.6. Sustainable revenue streams established for a permanent HEC management training team in Laikipia</p> <p>O.6.1. Create a project brand, website, web magazine and fundraising interface</p> <p>O.6.2 Establish legacy institution for the project</p> <p>O.6.3 Train project staff on grant proposal writing</p> <p>O.6.4 Apply for legacy funding</p>	<p>-Brand and website created</p> <p>Discussions held with LWF, OI Pejeta, CETRAD, MRC and Symbiosis Trust. No single organisation will be the legacy, rather the project will continue, in some capacity, through a range of organisations. With the construction of the West Laikipia Fence, this strategy has changed dramatically (see section 7)</p> <p>- Training ongoing</p>	<p>- Training ongoing</p> <p>-Funding available from LWF to support some elements of the revised lograme (long term fence management strategy) into 2010.</p>	

## Annex 2 Project's full current logframe

### DARWIN INITIATIVE Project 15/040: Building capacity to alleviate human-elephant conflict in north Kenya (October 06 – September 2009)

Revised Logical Framework, Implementation Timetable and Outputs, February 2008

#### REVISED LOGICAL FRAMEWORK, February 2008

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	-5 elephants collared by yr 2; collar-mobile phone text message system working by yr	-journal paper x 1 submitted  -text messages sent	-GPS/GSM collars function properly  -Partner organisation

<b>system</b>	2	-1 report	remains committed and able to support collaring operation
<b>O.2. Local Knowledge based HEC Early Warning System</b>	<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>
<b>O.3. Community based HEC management and research programme established</b>	<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 and identifying problem elephants by year 2</p> <p>-Fence management committees trained</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>-Data on fence breakages</p> <p>-Problem elephant ID database established;</p> <p>-conflict management course assessments</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>-Local fence managers are willing to follow standardised fence monitoring procedures</p> <p>-Local stakeholders find course material sufficiently interesting</p>

	on conflict management skills by year 3		
<b>O.4 Dissemination of information on Elephant Conservation and Human-Elephant Conflict Management among vulnerable communities and conservation practitioners</b>	-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	-Posters -Maps -Booklets -Script & Video clip -Course evaluations -GIS course certificates -Community Education Programme Report x 1 -Workshop proceedings -Elephant conservation and management strategy -Website up & running by year 3	-Partner organisations are committed to local dissemination of training and education materials  - Partner organisations committed to providing GIS support and software  -East African conservationists and wildlife managers value content of proposed training workshop
<b>O.5. Elephant defence livelihood systems established</b>	-3 community groups trained to produce dung paper, honey and hot chillies by yr 3; Markets established for sustainable products by yr 2.	Purchase and sales reports by partner organisations	Economic incentives are sufficient for local producers and partner organisations to develop and sustain production - construction of West Laikipia Elephant Fence (from Autumn 2007) does not make this work irrelevant in Laikipia
<b>O.6. Strategy &amp; revenue streams established for long term HEC management in Laikipia</b>	-Future HEC management activities identified by year 3 -Long term costs identified by year 3 -Assessment of capacity and commitment among key stakeholders to implement activities and carry costs by year 3 -Commitments secured by year 3 -Identify long term finance strategy to plug funding gaps if needed by year 3.  -Web-based fundraising interface set up by yr 3;	-1 x Long term fence strategy document  -Letters of endorsement by appropriate stakeholders  -Web-based fundraising interface up and running by year 3 (will be linked with activity O.4)	-Sufficient resources and expertise exist to generate report  -Key stakeholders willing to share information on current revenue sources  -Well resourced stakeholders accept and commit to costs and implementation of activities associated with long term HEC management  -Under resourced key stakeholders accept and commit to strategy.  -Web-interface sufficiently well marketed and interesting to attract

	Fundraising and proposal writing training for project assistants by yr 3.		donors  -Project assistants have the capacity to write proposals and secure funding
<b>O.7 Support the Laikipia Wildlife Forum to develop the Institutional Capacity to Manage the West Laikipia Fence</b>	-A West Laikipia Fence Committee and four sub-committees, comprised of key stakeholders established by year 2  Before vs. After Questionnaire survey among beneficiary communities by year 3; HEC incidents and fence breakages quantified before vs. after fence construction by year 3	-Meeting minutes  -Report x 1  - Journal paper x 1 submitted	-LWF need and value project support. -Key stakeholders are willing to work together to manage the West Laikipia Fence  -Sufficient resources and expertise exists to collect and analyse data and write up results.
<b>Activities</b>	<b>Activity milestones (summary of project implementation timetable)</b>		<b>Assumptions</b>
<b>O.1 GPS/GSM collar based HEC early warning system</b>	O1.1 Agreement with ranch and elephant collar partner (Save the Elephants, STE)  O1.2 Crop raiding elephants identified and collared by Oct 07  O.1.3. e-fence software developed programming completed by collaring partner (STE)  O1.4 Elephant warning messages received by ranch  O1.5 Ranch fence team respond to warnings and report success  O.1.6 Analysis report drafted & circulated-Apr 08		O1.1 Parties agree to commit resources  O.1.2 Logistics, support and permissions obtained.  O1.3 e-fence software developed successfully  O1.4 Warning timely and GPS accurate  O1.5 Ranch fence team able and willing to respond; monitoring completed  O.1.6 Staff resources sufficient to complete analysis

<p><b>O.2.1 Local Knowledge based HEC Early Warning System</b></p>	<p>O.2.1 push-to-talk technology trialled with ranch/community teams Dec 07</p> <p>O.2.2 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>
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<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>
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<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>
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<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 dung 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>
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<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>
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<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>
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Revised Project Implementation Timetable, February 2008

Project implementation timetable		
Date	Financial year	Key milestones
-1Oct-1Dec	Apr-Mar 2006/7	-UK project advisory meeting x 1; Kenya project advisory meeting x 1 and project launch; GPS/GSM collars ordered; NDVI data procured; purchase of equipment; project staff recruitment; ESRI 'online' GIS training for project staff begins; Project website design begins
-2 Dec-1 Feb	Apr-Mar 2006/7	-Phase 1 of informal training begins; Field methods training week x 1; 5 x community based crop-raiding deterrence demonstration plots established and systematically monitored; Ad hoc field day training on community based HEC management for further 2000 households begins
2 Feb-1 Apr	Apr-Mar 2006/7	-Satellite imagery (NDVI) based crop-raiding early warning system refined and tested against HEC data collected; 1 x newsletter drafted; Drama group x 2 HEC plays; 1000 booklets, 50 maps and 50 posters distributed
2 Apr-1 July	Apr-Mar 2007/8	-Elephant defence livelihood systems training field days x 3 (dung paper production, honey production and chilli production) and ongoing training for 1 community group; GPS/GSM collar testing and software programming (for collar-mobile phone early warning system); 1 x Getting to know elephants formal course
2 July-1 Oct	Apr-Mar 2007/8	-5 GPS/GSM collars deployed on elephants in Laikipia; 1 x asking questions formal course; 1 x darwin-half year report drafted; 1 x news letter drafted; data collection on performance of GPS/GSM collar based early warning system; Begin phase two of informal training (see training plan)
2 Oct-1 Jan	Apr-Mar 2007/8	-Trial Push-to-talk (PTT) local knowledge early warning system; Project assistants complete three out of five ESRI GIS courses; Drama group performs 2 x HEC plays; 2 x peer reviewed papers submitted (Spatial analysis of crop-raiding and evaluation of farm-based deterrents); 1000 booklets; 50 maps and 50 posters distributed; Collect data on the performance of existing fences;
2 Jan-1 Apr	Apr-Mar 2007/8	-Report on performance of existing fences and fence management protocol drafted & circulated; Report on PTT trial drafted & circulated; Sustainable elephant deterrence agriculture and product development handover to partner organisations; Fence sub-committees established; Fence monitoring protocol and associated data forms drafted; Re-training of elephant scouts and project partner personnel on fence monitoring and identification of problem elephants; 1 x news letter drafted; 2 x HEC plays performed by drama group; 1 x paper submitted on (GPS tracking of elephants in Laikipia); 1 x formal course 'GIS for conservation'; 1 x Kenya project advisory meeting; 1 x UK project advisory meeting; Publish project website

2 Apr-1 July	Apr-Mar 2008/9	- End of year report to Darwin submitted; Fence meeting x 1 and associated minutes/proceedings circulated; Elephant conservatoin and management strategy drafted and circulated; Report on farm-based deterrence trials and demonstration filed days drafted & circulated; Report on elephant defence livelihoods drafted and circulated; 1 x formal course 'Monitoring human-wildlife conflict'; HEC rapid reporting and HEC rapid response teams established and associated monitoring put in place; Problem elephant database established; 2 x HEC plays performed by drama group; Project handover to legacy instituion begins
2 July-1 Oct	Apr-Mar 2008/9	1 x East African HEC workshop; 1 x newsletter drafted; Fence maintenance handbook drafted; HEC rapid reporting and rapid response protocols drafted and circulated; 1 x formal course community-based HEC management; 1 x conflict resolution course
2 Oct-1 Jan	Apr-Mar 2008/9	-Phase 3 of informal training begins (see Training Plan); HEC plays performed by drama group; Project assistants complete final two of five online ESRI GIS courses; 2 x project assistants apply for UK post-graduate degree programmes; 1000 booklets, 50 posters and 50 maps distributed; 1 x formal course on proposal writing and fundraising; 1 x report on community education drafted
2 Jan-1 Apr	Apr-Mar 2008/9	- Analysis of fence breakage and crop-raiding data; 1 x newsletter drafted; 1 x end of year report drafted; 1 x Kenya advisory meeting; 1 x UK advisory meeting; Laikipia elephant conservation and management strategy drafted
2 Apr-1 July	Apr-Oct 2009	-Laikipia HEC database compiled and disseminated;; 2 x HEC plays; Report on the impact of the West Laikipia Fence drafted & circulated; Fundraising web-interface completed
2 July-1 Oct		Draft half-year report; Long term fence strategy document completed, Final report compiled and disseminated; UK-Kenya knowledge transfer and project handover workshop x 1; 1 x newsletter drafted; Paper on impact of west laikipia fence submitted.

# Annex 3

## Laikipia Elephant Project

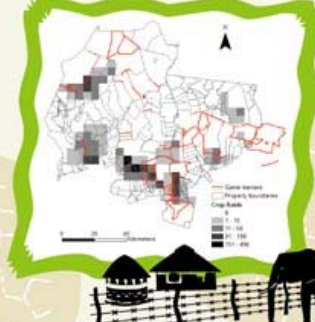
Building capacity to alleviate human-elephant conflict in North Kenya



Laikipia, covering almost 10,000km<sup>2</sup> in north-central Kenya, is a complex mix of different land uses and forms of land tenure



Smallholder cultivated plots lie alongside large-scale ranches, wildlife conservancies and pastoral lands



Kenya's second largest elephant population (over 5000 animals) move across this landscape, sometimes coming into conflict with local people

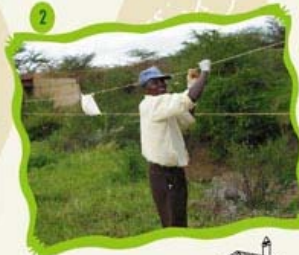
**This project aims to increase local capacity to manage human-elephant conflict (HEC). This is being achieved through four activities**

1



1. HEC early warning systems
2. Community-based elephant deterrents
3. 'Elephant compatible' revenue generation
4. Community education

2



Tracking elephants in partnership with Save the Elephants ([www.savetheelephants.org](http://www.savetheelephants.org)) to study movements of elephants and to provide an early warning for farmers/managers through the E-fence. The GPS collars we fit on elephants contain a mobile phone sim card. This allows us to programme the collar to send a text message to a local farmer or manager when a collared elephant moves into certain locations (i.e. near a smallholder farming area). The elephant can then be scared away using non-lethal deterrents.



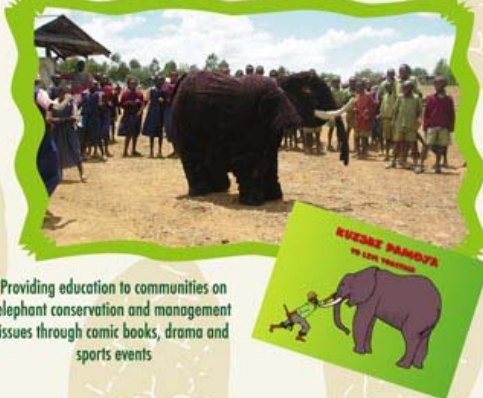
Working with local farmers to develop simple and affordable community-based elephant deterrents and early warning systems

3

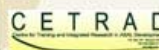


In partnership with local organisations, facilitating elephant-compatible income generating activities including chilli farming, bee keeping and the production of elephant dung paper

4



Providing education to communities on elephant conservation and management issues through comic books, drama and sports events





### ***Checklist for submission***

	Check
Is the report less than 5MB? If so, please email to <a href="mailto:Darwin-Projects@ectf-ed.org.uk">Darwin-Projects@ectf-ed.org.uk</a> putting the project number in the Subject line.	Yes
Is your report more than 5MB? If so, please advise <a href="mailto:Darwin-Projects@ectf-ed.org.uk">Darwin-Projects@ectf-ed.org.uk</a> that the report will be send by post on CD, putting the project number in the Subject line.	No
Do you have hard copies of material you want to submit with the report? If so, please make this clear in the covering email and ensure all material is marked with the project number.	No
Have you completed the Project Expenditure table?	Yes
Do not include claim forms or communications for Defra with this report.	