



## AN ELEPHANT CORRIDOR IN A FRAGMENTED CONSERVATION LANDSCAPE: PREVENTING THE ISOLATION OF MOUNT KENYA NATIONAL PARK AND NATIONAL RESERVE

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### ABSTRACT

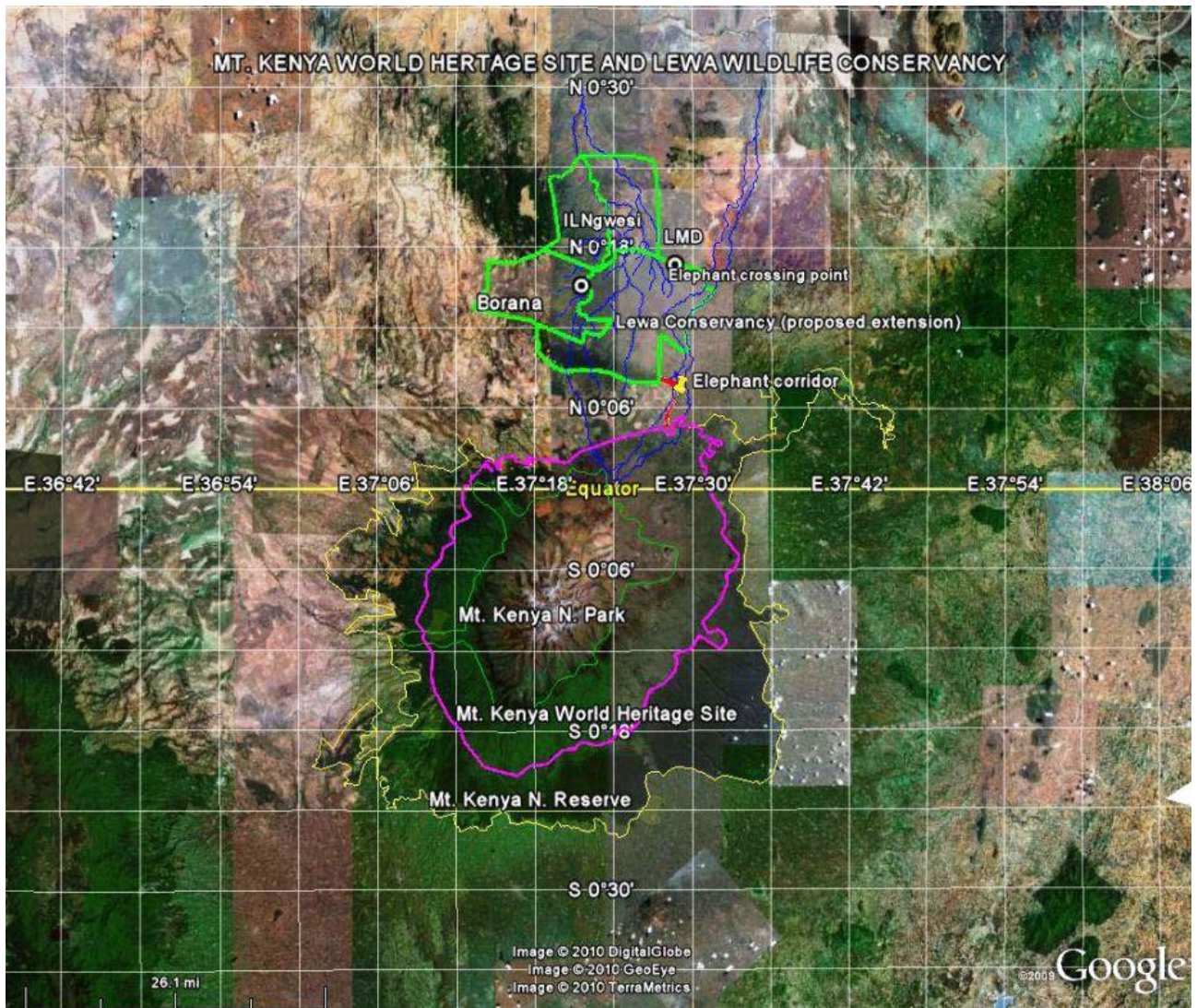
Increasing human population, land fragmentation, fencing and the spread of agricultural development around the lower slopes of Mount Kenya are progressively isolating the fauna and flora of Mount Kenya National Park and National Reserve. The consequence of this fragmentation around the mountain is a reduction in the total area available for wildlife and disruption to movements of large mammals between the mountain and the grassland/savannah habitats of the surrounding plains. The disappearance of two large mammals from the forest ecosystem over the past three decades, the Black Rhino (*Diceros bicornis*) and the African Wild Dog (*Lycaon pictus*), can in part be attributed to the isolation of upland forest habitats preventing occasional movements of wildlife from lowlands where they are more common. A 14 km strip of land on the north-western section of the Mountain has been developed to help mitigate this isolation. The strip has recently been secured as a habitat and migratory pathway to the north for wildlife within the 2,000 km<sup>2</sup> ecosystem. Using the Elephant Corridor on Mount Kenya as a case example, the authors highlight issues and theoretical considerations that have led many scientists, planners and conservation managers to recognize the importance of maintaining connectivity for species, communities and ecological processes within rapidly fragmenting conservation landscapes. The principle argument is that connectivity can be achieved for wildlife species and communities by managing the entire landscape mosaic through appropriate habitats such as corridors.

**KEYWORDS:** Elephant, corridor, Mount Kenya, fragmentation, migration, connectivity

### INTRODUCTION

The general concern within Kenya's protected area landscape of wildlife habitats becoming isolated and in need of conservation redress was brought to light in a recent initiative by the Government of Kenya. The ongoing process seeks to map all wildlife migratory pathways, linkages and corridors in the country in light of recent conservation challenges <sup>1</sup>. This initiative also comes against the backdrop of continuing efforts at protecting the few remaining wildlife and habitat linkages between the Mount Kenya forest ecosystem and lowland grassland and savannah habitats by the Kenya Wildlife Service (KWS), private wildlife conservancies, large scale farms and non-governmental conservation bodies including the Mount Kenya Trust <sup>2</sup>. The role of corridors and connectivity in wildlife conservation is seen as a high priority area for the conservation of large mammal fauna particularly charismatic herbivores such as the African Elephant (*Loxodonta africana africana*).

It is also noteworthy that these concerns are being addressed at a time when fencing as a conservation strategy has been adopted in virtually every major wildlife habitat in Kenya including National Parks, Private Conservancies and Community lands. The KWS and Kenya Forest Service (KFS) Management Plan for Mount Kenya (2009 - 2019) states that several areas adjoining the park and reserve will be "... fenced off to mitigate human- wildlife conflict....", despite the fact that there has always been movement of wildlife between the high country on Mount Kenya and the dry low country to the north and west (KWS & KFS, 2008). While the ecological consequences of fencing are yet to be fully assessed especially within the Laikipia/Samburu/Mount Kenya region by conservation practitioners, policy and decision makers alike, the complementary role of habitat and migratory corridors as effective means of promoting landscape connectivity is just beginning to take cognizance amongst policy and decision makers in the



**Figure 1: General location of the Elephant Corridor in relation to the Mount Kenya/Laikipia ecosystem. The map shows the two connected ecosystems of Mount Kenya and Laikipia (Lewa wildlife conservancy, Ngare Ndare Forest, Borana and Il Ngwesi all shown in green). The purple colour shows the boundary of Mount Kenya National Park – which is also the boundary of the current WH property. Source: Lewa Wildlife Conservancy.**

country. Such corridors within Africa have been variously termed ‘wildlife corridors’, ‘dispersal corridors’, or ‘movement corridors’ where they are known to be used by animals for movement (Newmark, 2008).

This article reflects on an Elephant Corridor on the north-western side of Mount Kenya; an area of ecological importance linking a core area of Mount Kenya with the surrounding lowland forest of Ngare Ndare and the savannah areas of Lewa Wildlife Conservancy and Il Ngwesi Community Conservancy (Figure 1). The Corridor is also seen as central to a nomination for an extension of the Mount Kenya World Heritage property to include the Ngare Ndare Forest and the Lewa Wildlife Conservancy under natural criteria *vii* and *ix* (Government of Kenya, 2012; UNESCO, 2012; Mount Kenya Trust, 2012).

## THE SETTING: MOUNT KENYA / LAIKIPIA CONSERVATION LANDSCAPE

The Mount Kenya ecosystem which includes the National Park and Reserve, is located to the east of the Great Rift Valley, along Latitude 0° 10'S and longitude 37° 20'E. It bestrides the equator in the central highland zones of Kenya. The ecosystem is situated in two provinces and five counties of Kenya. The Park and National Reserve <sup>3</sup> also serve as a Man and Biosphere Reserve and a Natural World Heritage property <sup>4</sup> (IUCN, 1997).

The forest zone is the largest single contiguous forest stand remaining in Kenya and its ecosystem as a whole plays a critical role as a water tower for the two main rivers in the country, the Tana and Ewaso Ngiro which are relied upon by millions of Kenyans. Additionally, varying geographical conditions on Mount Kenya

contribute to a diverse range of flora and fauna. The forest zones alone hosts a rich biological diversity with 81 known endemic bird species (Birdlife International, 1998; 2000) 5. There are several wildlife species dwelling within the natural forest including mammals of international conservation interest such as Bongo (*Tragelaphus eurocerus isaaci*), Elephant (*Loxodonta africana africana*), Giant Forest Hog (*Hylochoerus meinertzhageni*) and Leopard (*Panthera pardus*). Given its global significance as a Man and Biosphere Reserve complex, a World Heritage Site and a region of significance conservation interest, a systematic approach to the conservation of the landscape is long overdue.

A refinement of the landscape approach within the Mount Kenya /Laikipia ecosystem is to consider the need for movement of species in the face of ongoing threats. Owing to land use patterns, population dynamics and political constraints, the expansion of conservation linkages through corridors in the Laikipia /Mount Kenya landscape will take time. This constraint requires a strategy that maximises the retention of habitat patterns (or minimises loss and extinction) by scheduling the allocation of limited conservation resources to areas with high biodiversity values (in terms of irreplaceability and vulnerability) (Jodi, *et al.*, 2006).

Providing ecological connectivity via habitat and migratory corridors to areas with high concentrations of threatened species within the Mount Kenya ecosystem will fulfill conservation goals in the short term but will not buffer the ecosystem from long term negative impacts on biodiversity from changes in climate and land use outside of protected areas. Several steps, informed by elephant corridor experience and outlined below are required to identify and implement a conservation landscape strategy designed for persistence of biodiversity.

- Identify types, patterns and rates of threatening processes on Mount Kenya and Laikipia
- Identify natural features to be protected. These will be elements of biodiversity attributes, e.g. species, habitats, as well as spatial components of the region that act as surrogates for ecological and evolutionary processes
- Set targets for representation and design
- Lay out options for achieving representation and design targets
- Locate and design potential conservation areas to achieve representation and design targets
- Implement conservation actions in priority order.

## LINKING THE LANDSCAPE IN MOUNT KENYA/ LAIKIPIA REGION

For most contemporary conservationists involved with the conservation and management of protected areas, the inevitable and deeply challenging question is how much of the original complement of wildlife habitat / biodiversity will any given protected area system protect in 50, 100 or 1,000 years time? In the case of the Mount Kenya /Laikipia ecosystem, the rapidly receding glaciers (Lambrechts *et al.*, 2003) mean that in the not too distant future the National Reserve and its surrounding will be subject to a great deal of change. It is predicted that climate change will have influenced all aspects of ecosystem structure and function inside the protected areas and under the influence of a growing human population, the un-conserved matrix outside the reserve will have been almost entirely transformed. Studies elsewhere have shown the need to manage such systems for overall ecosystem resilience (Stolton & Dudley, 2010). The challenge in Kenya as in many other African countries is how to provide appropriate connectivity between the existing protected area networks, so as to protect unique compliments of species and habitats, as well as absorb the impacts of change within and outside their boundaries and so allow the persistence of species and habitats far into the future.

The benefits of protected area connectivity have been discussed extensively throughout the conservation world (e.g. IUCN, 2005; UNEP, 2012; SCBD, 2010; AWF, 2001). The park management system in Kenya cannot achieve its potential if conservation areas become isolated fragments surrounded by incompatible land uses. While there are numerous definitions of, and approaches to, identifying spatial scales for connectivity conservation planning and management (Bennett, 2003), the Mount Kenya case is primarily concerned with the role of corridors in linking protected areas to enhance wildlife conservation. One of the earliest practical recommendations on land use to arise from studies of habitat fragmentation was the suggestion that fragments that are linked by corridors of suitable similar habitat are likely to have greater conservation value and be more resilient than isolated fragments of similar size (Lindenmayer & Fischer, 2006). This initial recommendation was based entirely on theoretical considerations, primarily stemming from 'Island biogeography theory' (McArthur & Wilson, 1967). Subsequently, protection or provision of continuous corridors to link isolated habitats has been widely recommended as a conservation measure to counter the impacts of habitat reduction and fragmentation.



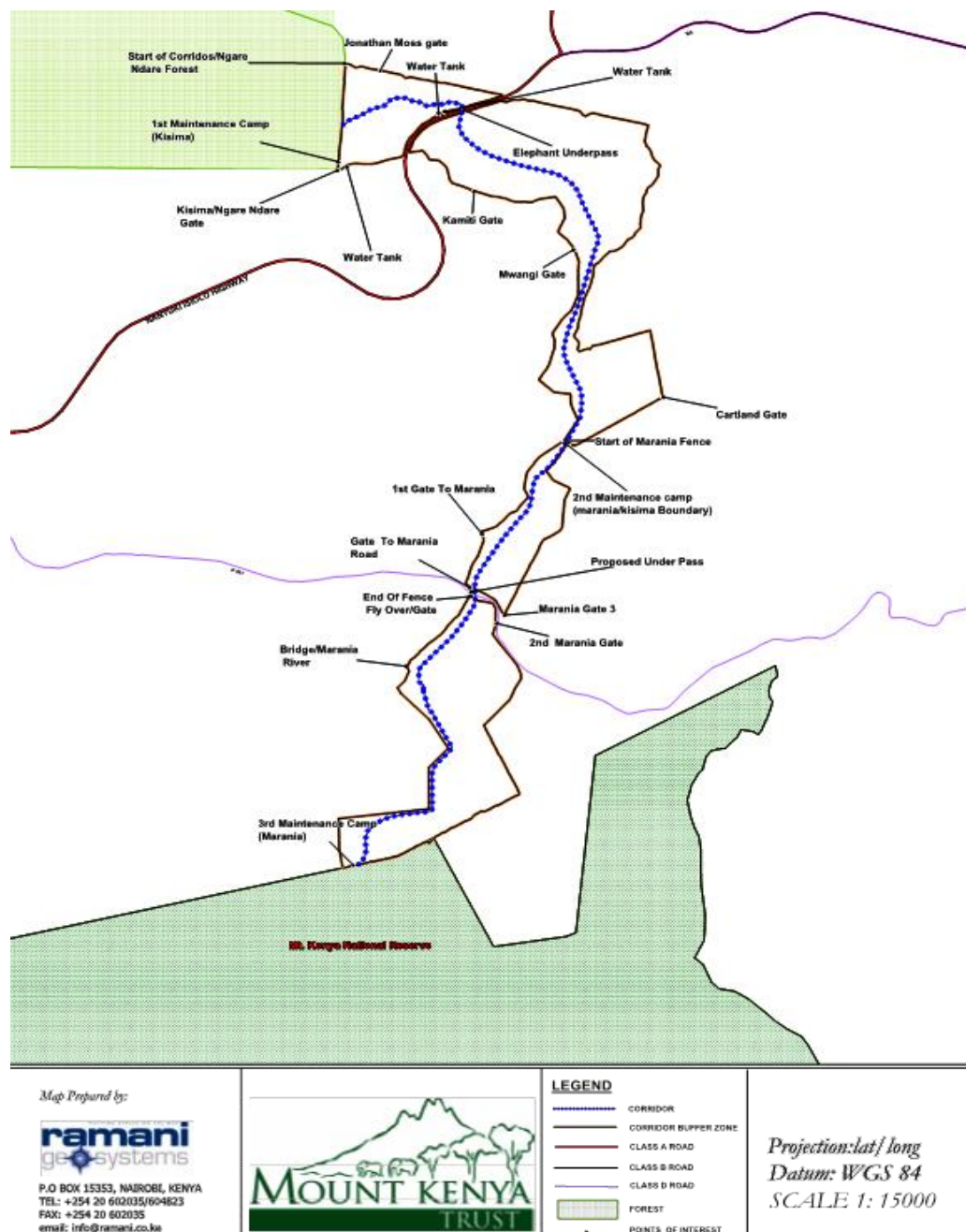


Figure 2: Detailed map of the elephant corridor

There had been no previous holistic conservation approach that works with multiple landowners in Kenya, and there is therefore a need to learn how to work across fragmented jurisdictional distinctions, such as those between public, communal and private land; national park and state forest; or one local government area and another. The goal within the Laikipia/Mount Kenya project is to achieve connectivity conservation, to establish networks of protected areas and to manage these cooperatively in the context of sustainable management of the whole matrix of land uses. The region being a multiple land use area would also benefit immensely from conservation strategies at landscape level (Sara, et al., 2008).

This strategy would be in conformity to other global agendas such as the Convention on Biological Diversity which advocates for protected area systems and networks as a key strategy for conservation. Parties to the convention, including Kenya, have an imperative to mobilize these at the national scale, and to collaborate with neighbouring countries to achieve these goals at the scale of regional networks. This approach is also in tandem with the 2003 World Parks Congress which had as its central theme 'Benefits beyond boundaries' where concern was raised as to how integrated landscape management could support protected areas, and recommend that governments, NGO's and communities:



*Aerial view of the underpass © Mount Kenya Trust*

- Adopt design principles for protected areas that emphasize linkages to surrounding ecosystems and ensure that the surrounding landscapes are managed for biodiversity conservation
- Recognize the need to restore ecological processes in degraded areas, both within protected areas and in the surrounding landscapes, to ensure the ecological integrity of protected areas
- Recognize that the presence and needs of human populations, consistent with biodiversity conservation within and in the vicinity of protected areas, should be reflected in the overall design and management of protected areas and the surrounding landscapes; and
- Recognize the importance of participatory processes that link a diverse array of stakeholders in stewardship of the landscape linkages (IUCN, 2005).

### THE ELEPHANT CORRIDOR

Theoretical plans to establish wildlife corridors between Mount Kenya/Laikipia and the adjacent landscapes were conceptualized several years ago by concerned parties including the Mount Kenya Trust, Kisima Farm, Marania Farm, Lewa Wildlife Conservancy, Ngare Ndare Forest Trust and the Kenya Wildlife Service. Though a World Heritage Site and a Biosphere Reserve, Mount Kenya's rich biodiversity is under extreme threat from external influences. Activities such as poaching, logging, livestock grazing, encroachment and charcoal burning continue to threaten the integrity of the property and undermine the values of the ecosystem in the medium and long-term. It was against this background that through a consultative

mechanism, surrounding landowners to the northwest of the National Reserve boundary agreed to cede a critical part of the northern sections of their farms to serve as migratory pathways for wildlife (mainly Elephant) (Coulson Harney Advocates, 2011). This corridor 14 km in length and an average width of 100 m+ links the existing property to the northern historical dispersal areas of Laikipia and Samburu. The Corridor is entirely fenced and acts as a buffer between adjacent farmlands and the corridor habitat (Figure 2).

A detailed study and Environmental Impact Assessment of the corridor was undertaken from 2006 to 2007 with funding to commence fencing of the corridor and construction of the Elephant underpass procured in 2008<sup>6</sup>. The project cost was around US\$1 million plus annual maintenance costs. The formation of this corridor through to the Ngare Ndare Forest aimed to strengthen the protection of the protected area and help create a more continuous and contiguous protected zone to enhance conservation in the area. The corridor was initially envisaged as providing protection for a significant population of the African Elephant (3,000+) (Vanleeuwe, 2000); ensuring genetic diversity and freedom of movement within natural migration zones; and reducing human-wildlife conflict in the area. Although the corridor was developed primarily for migration of elephants and other large mammals, the overall integrity of Mount Kenya is enhanced through improved security, complimentary management regimes, co-ordinated tourism activities, research and monitoring between Park /Forest authorities and the private sector (Mount Kenya Trust, 2007). Also, conservation



**Camera trap evidence of multiple species using the corridor in 2012: Hyena (*Hyaena hyaena*), Caracal (*Caracal caracal*), and Aardvark (*Orycteropus afer*) © Mount Kenya Trust**

initiatives for charismatic herbivore species continue to be enhanced under this partnership with the presence of rare and endangered species at the Lewa Wildlife Conservancy (Grevy's Zebra – *Equus grevyi* and the Black Rhino). These, together with similar values within Mount Kenya specifically the presence of critically endangered and rare species such as the Bongo (*Tragelaphus euryceros issaci*) made the case for World Heritage extension of a joint property with an additional natural criterion very strong (Nyaligu & Abungu, 2007; Lewa Wildlife Conservancy, 2007).

#### **USING ELEPHANT CORRIDOR DATA TO IDENTIFY CONSERVATION PRIORITIES**

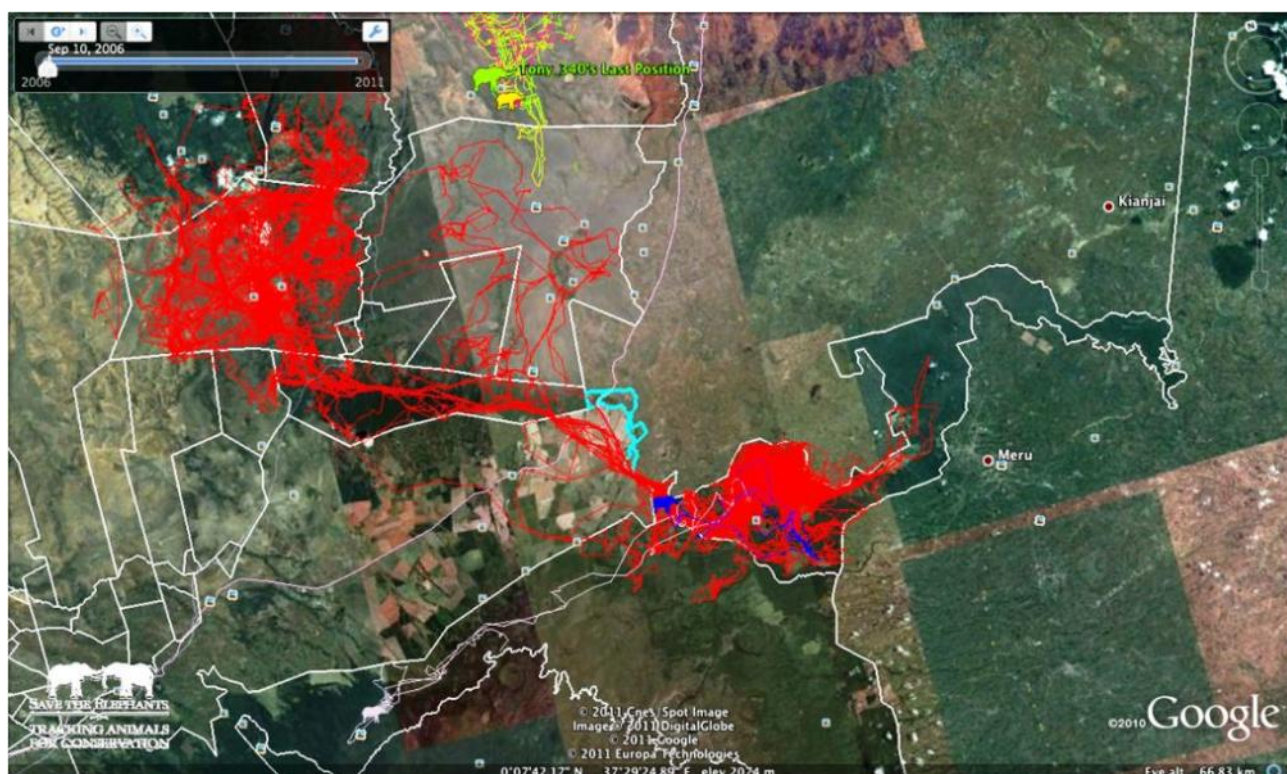
Months after opening the Elephant Corridor, conservationists began receiving the first concrete evidence of an elephant using the underpass as a

throughway between the Ngare Ndare Forest and Mount Kenya. The pioneering elephant (known as Tony) walked the full length of the corridor on 26<sup>th</sup> January 2011 (Figure 3). Tony was also the first elephant to use the corridor's underpass which crosses the Nanyuki - Meru Highway on New Year's day, just a couple of days after the access was opened and joined to the elephant underpass. The elephant was collared shortly after his walk beneath the busy highway and has since been monitored by satellite tracking. His lead resulted in hundreds of elephants using this vital link between the historical elephant rangelands. 123 elephants have been recorded using the underpass (45 towards the Ngare Ndare and 78 towards Mount Kenya) in May and June of 2011 alone and several more since. Within the corridor itself there are large numbers of elephants counted on a daily basis. The most elephants sighted in a single day were a herd of 26 which included three calves.

Within the Mount Kenya/Laikipia ecosystem, there exist clear opportunities to connect areas of conservation-compatible land-use, through strategic investment in areas of high potential wildlife habitats, where land-use is currently incompatible with wildlife conservation. Further opportunities exist, within a regional context, to assess and build on the gaps created in electrified fences (constructed around wildlife conservancies) to allow wildlife movement between areas of similar natural habitat. Similarly there exist certain fence designs which appear to allow the movement of most wildlife species, with the exception of Rhinos. Understanding what options exist for enabling desirable wildlife movement through fenced landscapes should be a priority for further research and conservation action, and experiences gained through the Elephant Corridor, could feed directly into these processes.

Work is also ongoing amongst the Elephant Corridor stakeholders on how to utilize incoming data to prioritize conservation action plans especially for keystone species and species of conservation interest. It is well understood that protected areas in the region are under some degree of threat. This pessimistic analysis is a good common sense background to any assessment but does not help in prioritizing funding or programmatic activities for conservation. Based on Elephant Corridor data analysis, threats that are either only of minor consequence or are still remote possibilities should receive less attention than major threats that are undermining the whole reason for protection. Data analysis of the corridor will therefore serve to identify migratory patterns of several species within the ecosystem.





**Figure 3: Specific location of the Elephant Corridor showing movement of collared elephants. The red lines indicate satellite tracking movements of the pioneering elephant Tony, while the blue lines indicates the locality of the Elephant corridor in relation to the two connected ecosystems (Laikipia to the north and Mount Kenya to the south). Source: Save the Elephants**

### REPLICABILITY OF THE ELEPHANT CORRIDOR TO SIMILAR SCENARIOS IN THE EAST AFRICAN REGION

The Mount Kenya Corridor is offered as a conservation model in a challenging environment. The position has been clearly validated by data (acquired via camera traps, foot print counts and actual sightings) showing other wildlife species utilizing the corridor and underpass almost on a daily basis in addition to elephants. This scenario provides a template on the design and use of underpasses as well as stakeholder approaches relevant to such fragile ecosystems and offers some hope for similar plans for a corridor between Laikipia and the Aberdare Mountain range as well as Aberdare and Mount Kenya within the immediate neighbourhood and for similar initiatives elsewhere in the country. Other areas of interest would be the Kilimanjaro/Amboseli ecosystem which is part of the transboundary landscapes of Kenya and Tanzania still endowed with large populations of free ranging wildlife species. However, over the past three decades, significant land use changes coupled with a rapid human population increase have occurred in prime wildlife dispersal areas creating all manner of threats to wildlife populations. There have been localized extinctions of at least three large mammals reported

along this transboundary frontier; the African Wild Dog (*Lycaon pictus*), the Klipspringer (*Oreotragus oreotragus*) and the Mountain Reedbuck (*Redunca fulvorufula*) (AWF, 2001). This situation calls for urgent interventions that will help secure wildlife dispersal areas and thus ensure wildlife conservation for posterity. In this regard, the African Wildlife Foundation (AWF) has begun a study to specifically examine land use changes and land tenure systems within the unsecured Kitenden wildlife corridor and their impacts on conservation of wildlife (Kiringe & Okello, 2012).

### INSTITUTIONAL ARRANGEMENTS FOR COLLABORATING WITH GOVERNMENT AGENCIES, PRIVATE SECTOR AND COMMUNITIES

Given the international recognition that public/private/community partnership arrangements have attained since the World Parks Congress of September 2003 especially in relation to the themes: 'Linkages in the landscape and seascape', 'Building broader support for Protected Areas' and 'Governance of Protected Areas – New ways of working together', (IUCN, 2005); Governments and conservation agencies have increasingly been faced with the question of whether all private wildlife habitats are to be considered protected

areas? This question was the subject of discussion at the World Parks Congress and has been extensively considered and reviewed within fora such as the Elephant Corridor stakeholder committees (Mount Kenya Trust, 2007). The landscape scenario on Mount Kenya/Laikipia conforms to 'Protected Areas' as defined by the Convention on Biological Diversity (CBD) as '*a geographically defined area which is designated or regulated and managed to achieve specific conservation objectives*' and IUCN '*A clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values*'. (Dudley, 2008). Key elements according to these definitions which are equally relevant to the Elephant Corridor and Mount Kenya are:

- Geographical limits or boundaries
- Predominantly aimed at achieving conservation benefits, but not excluding other related benefits
- Designation and management by legal or other effective means
- Existence of a body of governing rules; and
- A clearly identified organization or individual with governance authority.

Sources such as Mount Kenya Trust (2007) suggest that the Mount Kenya, Ngare Ndare, Elephant Corridor, and Lewa Wildlife Conservancy have all these elements in place. Of equal importance has been the ability of the Elephant Corridor stakeholders to institutionalize and manage local and landscape level conservation programmes on Mount Kenya, the Elephant Corridor, Lewa Wildlife Conservancy and Ngare Ndare Forest. Managing protected area challenges within the Mount Kenya/Laikipia landscape, demands organization at a number of scales. At the connectivity level, effective management includes identifying the reasons for establishing the Corridor link, maintaining or putting in place a management system, including a statement of objectives, the implementation options for management, the means to ensure adaptive management of the protected area in relation to its objectives and purpose, and maintaining relationships with stakeholder groups including local communities and KWS.

## KEY MOTIVATIONS

National governments often establish and manage protected areas with the primary objective of biodiversity conservation; a concept understood as having a positive impact for the provision of goods and services to human communities, but which may impose local separation between humans and nature. Biodiversity is perceived as

having intrinsic value, independent from consideration of other human and social interests and concerns. Private entities and local communities, on the other hand, are motivated by a diversity of interests and concerns, while establishing their own conserved areas, or entering into a partnership to manage protected areas established by other social actors or the state. These may include one or more of the following motivations:

- A concern for wildlife protection. In this case the Elephant Corridor stakeholder's movement and dispersal of elephants to and from the Mount Kenya Forest Reserve
- Mitigation of human-wildlife conflicts
- Promotion of tourist related activities.

## EXPERIENCES IN CO-MANAGEMENT

Co-management by the stakeholders has become entrenched within the Elephant Corridor, where it is seen as a mechanism of improving management by supplementing the limited resources available to the KFS and KWS with those of the private wildlife conservancies and NGOs. It also formalizes the rights and responsibilities of management partners. There exist two products of a management partnership within the Elephant Corridor arrangement. The first is a stakeholder structure of large scale farm land owners, the Mount Kenya Trust, Lewa Wildlife Conservancy and the Ngare Ndare Forest Trust detailing the management purpose and the roles, rights and responsibilities of each of the parties. This arrangement is reviewed regularly within the Elephant Corridor Committee meetings and engagements. The second is a pluralistic management arrangement structure designed to remain in charge at all times and includes representatives from the principle government agencies – the Kenya Wildlife Service and the Kenya Forest Service. This arrangement also concerns itself with policy and governance provisions at the national level.

## CONCLUSION

The key issue this article has attempted to illustrate is that of community/private/public participation in the management of protected area habitats through the provision of linkages within Kenya's conservation landscape.

The following are some conclusions that can be derived from this assessment:

- The long-term persistence of biodiversity within the Mount Kenya/Laikipia ecosystem depends on a system of conservation links that will capture not only examples of various habitats but





*Some of the first elephants to make it through the underpass © Associated Press*

biodiversity that is both irreplaceable and vulnerable to various threatening processes throughout the region.

- These examples could be replicated elsewhere in the country as for example in the Kitenden Corridor on the Amboseli – Kilimanjaro ecosystem.
- The present capacity of Kenya to provide effective conservation links within the wildlife habitat landscape is limited, partly due to complexities in the land tenure system, rights accorded to private land owners, and prohibitive costs of land acquisition. However, as capacity and awareness to identify potential wildlife migratory corridors (based on the ongoing survey in the Ministry of Environment and Mineral Resources under the Department of Resource Surveys and Remote Sensing) increases, the country will be able to add significant areas as corridors and other habitat linkages to enhance the existing network of protected areas in the country. This optimism is seen in light of new developments; the new constitution and proposed wildlife bill make provision for compulsory acquisition of land to allow for free movement of wildlife and for ecosystem services and this understanding is

rapidly gaining ground amongst landowners, policy and decision makers.

- The key to making the system work from the onset, is to map out, in an explicit and transparent manner which conservation areas are most urgently in need of linkages and which areas can be negotiated and traded for other alternatives (Jones, *et al.*, 2009). In the Kenyan case, this process will require consultations with land owners, private entities and community members if success is to be registered. Provisions within the proposed wildlife bill provide for the creation of Community Wildlife Associations (CWA's) a mechanism that provides for private and community landowners to conserve wildlife outside of mainstream government agencies.

It is also noteworthy that the Elephant Corridor provides a crucial link to the application for an extension of the Mount Kenya World Heritage Property to the Lewa Wildlife Conservancy under natural criteria *vii* and *ix*. Should this application be successful, the proposed site '*Mount Kenya - Lewa Wildlife Conservancy World Heritage Site*' will provide a conservation template for future private/public partnership arrangement under the World Heritage label. Private natural heritage properties

would serve as an important instrument complementing government efforts in biodiversity conservation, providing as in the case of Mount Kenya Trust, Lewa Wildlife Conservancy and Ngare Ndare Trust, a conservation benefit that is public in essence but does not originate with the state agencies concerned.

At a more localized level and in line with the 2003 World Parks Congress theme '*Benefits Beyond Boundaries*', this arrangement will induce sustainable development, creating a cluster of activities such as ecotourism, scientific research and environmental education, as well as providing non-timber forest materials such as seeds and seedlings that can be profitable to their owners and local communities.

Such landscape linkages through private property are also contributing to a rapid and substantial increase in the amount of protected areas in the country. They represent a positive cost/benefit equation to the Government of Kenya which does not have to buy or expropriate important parcels of land for conservation. At the same time, land owners gain recognition as conservationists and receive support from environmental law enforcement, and benefit from co-operation with local and foreign universities and NGO's to develop research and sustainable activities on their lands. The rights given to private land owners under the new constitution (Government of Kenya, 2010) and the Wildlife Bill (Government of Kenya, 2011), has facilitated the proactive participation of private land owners in the national effort to restore and protect biodiversity (Ministry of Tourism and Wildlife, 2007). Private protected areas and community conservancies constitute one of the most conspicuous types of protected areas in the country, be it by their fast growth in number and area or by the attention these areas are receiving from landowners, government, NGO's and the local and international media. While conservation lands under private ownership may be vulnerable to land-use change, in the context of the Elephant Corridor, this is unlikely to be the case as a deed (covenant agreement) exists and this involves the two principle state agencies – KFS and KWS. In addition, the Government of Kenya is encouraging private/public partnership arrangements along this front (the World Heritage extension is a case in point). As such, the authors of this article do not envisage any change in land-use in the immediate Corridor vicinity for the foreseeable future.

## ACKNOWLEDGEMENTS

The authors are grateful to the principle stakeholders of the Elephant Corridor, the surrounding communities on the upper and lower ends of the Corridor, the KWS and KFS for transforming what was essentially a conceptual theoretical idea into a practical Elephant Corridor. Special appreciation goes to Marania and Kisima farms for dedicating land for conservation posterity, several donors who made it possible to secure funding for this project, other like minded conservation agencies including the Ngare Ndare Forest Trust, the Lewa Wildlife Conservancy, the organization Save the Elephants and the Government of Kenya for creating an enabling environment that has in turn led to the creation of viable private/public partnership arrangements.

## NOTES

<sup>1</sup> <http://www.environment.go.ke/archives/2030>

<sup>2</sup> The Mount Kenya Trust is a not for profit organization dedicated entirely to the conservation of the Mount Kenya ecosystem. <http://www.mountkenyatrast.org>

<sup>3</sup> In 1999, a detailed forest status report by UNEP and other stakeholders' highlighted the challenges facing the conservation of the mountain and brought Mount Kenya to the national and international limelight. This report in part acted as the basis of conservation support by Mount Kenya Trust to KWS and KFS.

<sup>4</sup> The property was inscribed on the UNESCO World Heritage List in 1997 and two years later inscribed on the list of World Heritage in Danger

<sup>5</sup> <http://www.birdlife.org/datazone/sitefactsheet.php?id=6395> accessed 17th December 2012

<sup>6</sup> Major donors for the Elephant underpass were: The Royal Netherlands Embassy through the Laikipia Wildlife Forum, Virgin Atlantic, The Nature Conservancy and supporters of the Lewa Wildlife Conservancy. Maintenance costs since construction have been met by the Safaricom Foundation and the immediate Corridor stakeholders.

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## ABOUT THE AUTHORS

**Maurice Nyaligu** has over twelve years of protected area experience in the Eastern Africa region. His engagements have previously involved work with the Kenya Wildlife Service, the IUCN and independent consultancy assignments for various conservation agencies. A Kenyan by birth, Maurice is a member of the WCPA. He holds a post-graduate degree (MA) in International Relations (Washington International Univ.) and a bachelor's (Bsc.) degree in Wildlife Management (Moi Univ.). His interest in the Mt. Kenya ecosystem stems from a childhood passion. His hobbies include mountaineering and outdoor sports.

**Susie Weeks** is a Kenyan conservationist with extensive wildlife and environmental knowledge of East Africa. She graduated from the School of Oriental and African Studies at the University of London with a Bachelor of Arts (BA) and obtained a postgraduate Masters degree in Environmental Protection and Management from the University of Edinburgh a few years later. She is a gazetted Kenya Wildlife Service Honorary Warden, a member of the Kenya Professional Safari Guides Association. Susie has participated in many private/public partnership arrangements within conservation circles in Kenya and has been responsible for the successes of several projects on Mount Kenya since 2001 including playing a major role in the establishment and construction of the Mount Kenya Elephant Corridor.



## RESUMEN

El aumento de la población humana, la fragmentación de las tierras, el cercado y la proliferación del desarrollo agrícola en las faldas del Monte Kenia están aislando progresivamente la fauna y flora del Parque Nacional/Selva Natural del Monte Kenia. Esta fragmentación alrededor de la montaña se traduce en la reducción de la superficie total disponible para la fauna silvestre y la interrupción de los movimientos de grandes mamíferos entre la montaña y los pastizales y sabanas de las llanuras circundantes. La desaparición de dos grandes mamíferos del ecosistema forestal en las últimas tres décadas, el rinoceronte negro (*Diceros bicornis*) y el perro salvaje africano (*Lycaon pictus*), puede atribuirse en parte al aislamiento de los hábitats forestales de altura que impide los movimientos ocasionales de la fauna silvestre desde las tierras bajas donde son más comunes. Se ha desarrollado una franja de 14 km de tierra en el sector noroccidental de la montaña para ayudar a mitigar este aislamiento. La franja ha sido recientemente afianzada como hábitat y ruta migratoria hacia el norte para la fauna silvestre dentro del ecosistema de 2000 km<sup>2</sup>. Usando el Corredor de Elefantes en el Monte Kenia a modo de ejemplo, los autores destacan cuestiones y consideraciones teóricas que han llevado a muchos científicos, planificadores y administradores de la naturaleza a reconocer la importancia de mantener la conectividad para las especies, las comunidades y los procesos ecológicos dentro de paisajes de conservación que son objeto de una acelerada fragmentación. El principal razonamiento es que la conectividad se puede lograr para las especies silvestres y las comunidades gestionando el mosaico completo del paisaje a través de hábitats adecuados, como es el caso de los corredores.

## RÉSUMÉ

La croissance de la population humaine, la fragmentation des terres, les clôtures et le développement de l'agriculture sur les pentes les plus basses du mont Kenya isolent de plus en plus la faune et la flore du Parc national du mont Kenya et de la Réserve nationale. Cette fragmentation des terres du mont Kenya entraîne une réduction de la surface totale disponible pour la vie sauvage, et perturbe les déplacements des grands mammifères entre leurs différents habitats – la montagne et les pâturages/la savane des plaines environnantes. La disparition de deux grands mammifères de l'écosystème forestier au cours des trente dernières années, le rhinocéros noir (*Diceros bicornis*) et le chien sauvage africain (*Lycaon pictus*), peut d'ailleurs en partie être imputée à l'isolement des habitats forestiers des terres supérieures, qui empêche les déplacements occasionnels de la faune sauvage occupant les terres plus basses, où elle est plus commune. Une bande de terre de 14 kms dans la région nord-ouest du mont Kenya a récemment été délimitée pour atténuer cet isolement. Au sein d'un écosystème de 2000 km<sup>2</sup>, cette zone a été déclarée couloir d'habitat et de migration vers le nord pour la faune sauvage. Prenant l'exemple du couloir de l'éléphant sur le mont Kenya, les auteurs soulignent les problèmes et les considérations théoriques ayant conduit de nombreux scientifiques, planificateurs et gestionnaires de la conservation à reconnaître à quel point il est important de préserver la connectivité pour les espèces, les communautés et les processus écologiques au sein de paysages naturels qui se fragmentent rapidement. En effet, il est possible d'améliorer la connectivité entre les espèces de la vie sauvage et les communautés en gérant l'ensemble de la mosaïque du paysage par des habitats appropriés comme des couloirs.