Taking action against wildlife crime in Uganda

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Cover photos: Uganda kob at Murchison Falls National Park; Hippo at Queen Elizabeth National Park; Mother and baby elephants at Queen Elizabeth National Park
(Credit: Tiziana Zoccheddu 2010)

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Summary

In recent years, wildlife crime has come under increasing international scrutiny. A multitude of policy responses has emphasised strengthening law enforcement in order to protect wildlife. In contrast, developing community-based responses to wildlife crime has been given very little attention. The immediate threat escalating wildlife crime poses has been used as a justification, but this one-sided approach risks missing opportunities: both to find long-term solutions by addressing the underlying drivers of crime, and also to alleviate the disproportionate impact living close to conservation areas has on local livelihoods.

This report presents the key findings and outputs of the 'Building capacity for pro-poor responses to wildlife crime in Uganda' project, a collaborative initiative aiming to:

1. Understand the current state of wildlife crime in Uganda, and investigate the underlying drivers of this crime

2. Investigate the preferences of local people and conservation staff for different types of interventions aimed at addressing wildlife crime, and assess the likely impact of these interventions on local people's attitudes and behaviour, and

3. Develop new or improved approaches to increase the capacity of the Uganda Wildlife Authority (UWA) to tackle wildlife crime more efficiently and effectively.

To understand the current state and drivers of wildlife crime, we started by conducting a review of existing evidence (from journal articles, press coverage and so on), to get a picture of the overall situation within Uganda. We then conducted a large scale socio-economic household survey in villages bordering Uganda's two largest protected areas, Queen Elizabeth Protected Area (QEPA) and Murchison Falls Protected Area (MFPA). The survey showed that involvement in wildlife crime was widespread. Indirect questioning estimated that 42 per cent of interviewed households had been involved in illegal hunting, and 29 per cent in illegal fishing or grazing of livestock inside one of the two parks. Households most likely to be involved in wildlife crime included those that were better off, those that reported crop raiding or livestock predation by wildlife, and those that reported no benefit from the parks' revenue-sharing schemes.

At both parks, activities put in place to combat wildlife crime focus heavily on law enforcement, with ranger patrols receiving a significant proportion of annual budgets. However, interviews with known hunters cast doubt on patrols' effectiveness, suggesting only one or two in a thousand illegal incursions resulted in an arrest. Households told us that patrols did not deter hunters from entering the parks.

UWA does run activities to address some of the drivers of wildlife crime — such as human-wildlife conflict mitigation and livelihood support. However, these types of interventions receive far less support than would be required to influence prevalent wildlife crime.

Our study investigated a number of alternative approaches to combating wildlife crime using two empirical predictive methods: choice experiments and scenario-based interviews. Both methods allow participants to pick the types of interventions that would be most likely to deter them from wildlife crime. The interventions explored were:

- Improved mitigation of human-wildlife conflict

- Appointment of local wildlife scouts

- Establishment of, and support for, 'wildlife-friendly' enterprises

- Increased ranger patrols

- Removal of resource access arrangements (around each park, UWA allows for a limited number of certified individuals to access certain resources at certain times of the year)

- Regulated hunting.

Local people preferred different interventions at the two parks. At QEPA, people preferred increased funding for activities that reduce human-wildlife conflict, whereas people living around MFPA preferred support for creating 'wildlife-friendly' enterprises (ie small enterprises that do not damage wildlife conservation). At both parks there was support for appointing 'wildlife scouts' from the community to respond to human-wildlife conflict. When UWA staff were consulted separately and asked which interventions they thought would be most effective, their priorities aligned strongly with the local communities — although they also emphasised continued and improved law enforcement.

As well as potentially being more effective, local people thought the three community-focused interventions (wildlife-friendly enterprises, wildlife scouts and human-wildlife conflict mitigation) were fairer than the enforcement-focused approach to tackling wildlife crime. These interventions were also predicted to increase the time local people spend on legal livelihood activities and make them more likely to inform UWA about illegal activities. The findings suggest that greater support for community engagement is likely to significantly improve UWA's ability to combat wildlife crime.

The project team then worked with UWA staff at each of the two parks to develop park-specific strategic action plans to combat wildlife crime. The aims were to prioritise addressing offences with the greatest impact on wildlife, identify where these wildlife crimes are most prevalent (and the communities involved), and specify the actions required to combat these offences.

The action plans were guided by three central principles:

- Developing strong relationships and mutual trust with local communities

- Providing positive incentives for behaviour change, and

- Fair and effective law enforcement.

The plans sought to combine law enforcement, such as ranger patrols and intelligence gathering, with community engagement and so produce a better balance between combating crime, deterring would-be offenders and addressing underlying causes of wildlife crime. The plans included actions for combating three high priority offences:

- Illegal hunting and trade of high value species

- Commercial bushmeat hunting and trade, and

- Subsistence bushmeat hunting.

In addition to developing the action plans for the two parks, our study recommended action at UWA headquarters, including:

- Greater balance between law enforcement and community conservation budgets

- Updating UWA's 2004 Community Conservation Policy to reflect the strategic priorities of the new Community Conservation Directorate

- Ensuring all wardens and rangers are trained in community engagement, and

- Prioritising recruitment of community conservation staff.

1

Introduction

Wildlife crime is high on international political agendas because of its conservation, development and security implications. This attention has been largely driven by a surge in the illegal harvest and trade of high profile species, including elephants and rhinos, over the last 5–10 years. Illegal wildlife trade is estimated to be worth US$7–23 billion per year (UNEP-Interpol 2016). However, it covers a wide variety of fauna and flora, and much illegal use of wildlife is for subsistence purposes (Kaltenborn *et al.* 2005; Jachmann 2008).

The response to wildlife crime has focused on investing in law enforcement to restrict illegal wildlife products all along the commodity chain from hunter to consumer (Roe *et al.* 2014). Law enforcement is, however, a blunt instrument that can bring significant hardship to communities where subsistence hunting and using natural resources are important to household livelihoods (Duffy 2014). Recent reports (eg Survival International 2017) have documented abuses meted out to local people in the quest to protect valuable wildlife from poachers. Furthermore, while increased investment in patrolling protected areas makes detecting illegal activities more likely (Jachmann and Billiouw 1997) and can reduce illegal hunting (Hilborn *et al.* 2006; Johnson *et al.* 2016), it is still far from clear that enforcement alone is the most cost-effective approach (Travers 2016). For example, it can be ineffective when under-resourced and implemented in isolation (Lindsey *et al.* 2014).

The drivers of wildlife crime are invariably complex and are often tied to a web of social, economic, cultural and historical factors that vary according to local context (Duffy and St John 2013). Increasing law enforcement (and hence the risk of getting caught and punished) may do little to affect these wider factors. Indeed, in many cases, inappropriate law enforcement may actually exacerbate any existing resentment of wildlife and the authorities that manage it (Infield and Namara 2001, Roe *et al.* 2014). This can in turn

increase wildlife crime. It is also questionable how far greater enforcement can influence individual decision making and increase compliance (Keane *et al.* 2008).

The 'Building Capacity for Pro-Poor Responses to Wildlife Crime in Uganda project' was established to explore the complex causes of wildlife crime in Uganda and to work with the Uganda Wildlife Authority (UWA) to adapt (if necessary) its strategies in response. Funded by the UK Illegal Wildlife Trade Challenge Fund, the project was a collaboration between the International Institute for Environment and Development (IIED), the Interdisciplinary Centre for Conservation Science (ICCS) at the University of Oxford, the Wildlife Conservation Society (WCS) Uganda Programme and UWA. In recommending modifications to UWA's approach, the programme aimed to maximise expected outcomes for wildlife while ensuring that any change in interventions did not unfairly disadvantage poor or vulnerable households whose livelihoods rely on wildlife.

In this project we took 'wildlife crime' to mean illegal use of wild living resources, for whatever purpose and by anyone. This broad definition aimed to keep our discussions value-neutral, avoiding loaded terms such as 'poaching' and not prejudging whether certain types of hunting are appropriate or not.

The project focused on Murchison Falls National Park (the largest and oldest national park in Uganda) and on Queen Elizabeth National Park – both are elephant strongholds. The project was broadly separated into two main phases: a research phase lasting two years, and a programme design phase that sought to incorporate the research recommendations into a wider strategy to combat wildlife crime in the two parks, while also generating lessons applicable elsewhere.

The primary objectives of the research phase were to investigate:

- The overall prevalence of different types of wildlife crime, and the profile and motivations of households that participate in those crimes, both at study sites and across Uganda

- The preferences of individuals living in 'frontline' parishes for potential interventions to reduce involvement in wildlife crime, and

- The potential impacts of alternative intervention options on the underlying causes of wildlife crime identified in the study.

The primary objective of the programme design phase was to build on the research findings to help UWA develop action plans for each park and to provide a strategic vision for addressing wildlife crime within the two case study sites and surrounding communities. This was done with the intention of providing a blueprint for UWA to extend the approach to other protected areas throughout Uganda.

Section 2 of this report summarises current conservation practices in Uganda. Section 3 presents our findings on the prevalence and causes of varying types of wildlife crime. Section 4 reports how different interventions to combat wildlife crime are likely to affect local people's attitudes and behaviour. Section 5 discusses the development of action plans to tackle priority offences at each of the two parks. Sections 6, 7 and 8 present the plans for each of three priority offences: illegal hunting and trade of high value species; commercial bushmeat hunting and trade; and subsistence bushmeat hunting. Section 9 discusses what must be addressed to ensure the action plans are successfully implemented; and Section 10 presents some concluding thoughts.
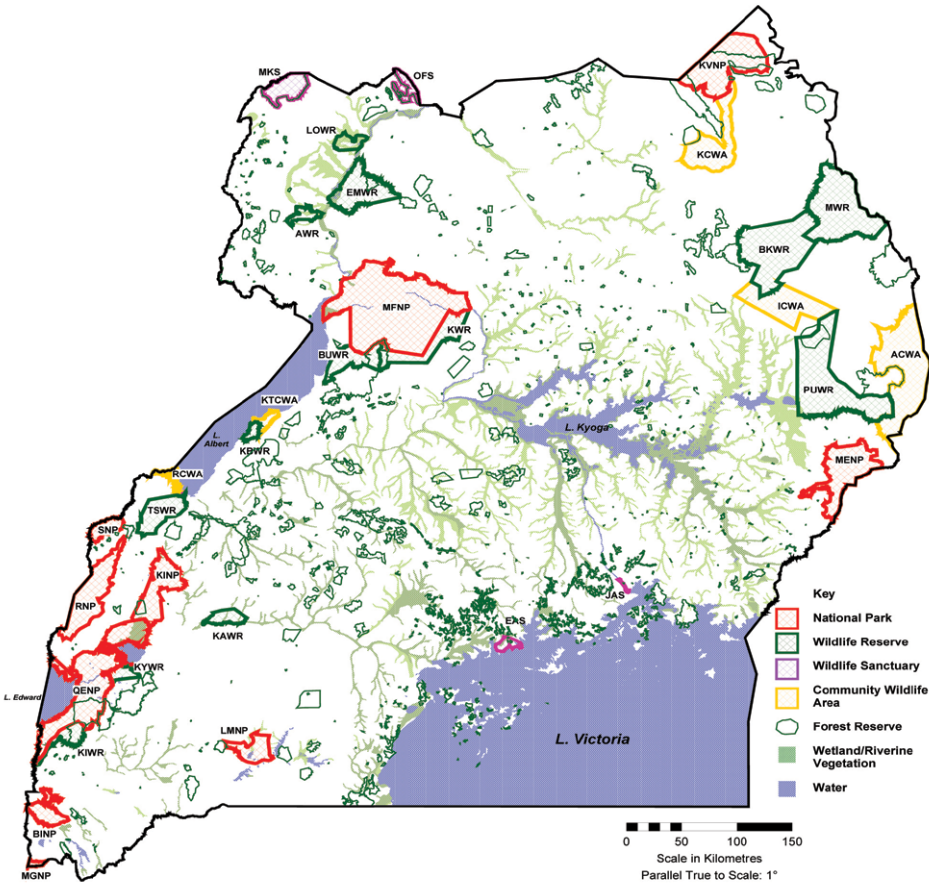
2

Conservation in Uganda

Uganda's protected areas

Conservation in Uganda predominantly focuses on the country's extensive protected area network (Figure 1). The largest protected area is Murchison Falls Protected Area (MFPA), which comprises Murchison Falls National Park (MFNP), Karuma Wildlife Reserve and Bugungu Wildlife Reserve, and covers a combined area of 5,056 square kilometres. Located at the northern end of the Albertine Rift Valley, a biodiversity hotspot and Global 200 ecoregion, MFPA contains a large range of endangered species.

Wildlife populations in MFPA have been particularly affected by conflict and civil unrest. From 1975 to 1990, it is estimated that populations of some large mammals declined by 90 per cent (UWA 2012). Recent aerial censuses indicate that population numbers are recovering but remain well below historical figures for many species, particularly elephants (Wanyama *et al.* 2014a).

Queen Elizabeth Protected Area (QEPA), part of the UNESCO Man and Biosphere Reserve network, comprises Queen Elizabeth National Park (QENP), Kyambura Wildlife Reserve and Kigezi Wildlife Reserve. It is also located within the Albertine Rift Valley and covers 2,465 square kilometres. As with MFPA, wildlife populations are mostly recovering from significant declines suffered in the 1970s and 1980s (Wanyama 2014b). There are 11 enclave fishing villages within the boundaries of QEPA, with an estimated population of 45,000 people in 2011 (UWA 2011). Overall, the surrounding area is more highly populated but has lower rates of poverty than around MFPA (UBOS 2014a; UBOS 2014b). However, humans are thought to put significant pressure on the protected areas' resources.

Figure 1: Map of Uganda's protected area network (source: MoTWA 2014).

Key
- National Park
- Wildlife Reserve
- Wildlife Sanctuary
- Community Wildlife Area
- Forest Reserve
- Wetland/Riverine Vegetation
- Water

L. Victoria
L. Kyoga
L. Albert
L. Edward

0   50   100   150
Scale in Kilometres
Parallel True to Scale: 1°

National Parks (10)		Wildlife Reserves (12)		Community Wildlife Areas (5)		Wildlife Sanctuaries (10)	
1. BINP	Bwindi Impenetrable	1. AWR	Ajais	1. ACWA	Amudat	1. EAS	Entebbe
2. KINP	Kibale	2. BKWR	Bokora Corridor	2. ICWA	Iriri	2. JAS	Jinja
3. KVNP	Kidepo Valley	3. BUWR	Bugungu	3. KCWA	Karenga	3. MKS	Mt. Kei
4. LMNP	Lake Mburo	4. EMWR	East Madi	4. KTCWA	Kaiso-Tonya	4. OFS	Otze Forest
5. MENP	Mount. Elgon	5. KAWR	Katonga	5. RCWA	Rwengara	**Sanctuaries in QENP/Kyambura**	
6. MFNP	Murchison Falls	6. KBWR	Kabwoya			5. KHAS	Kahendero
7. QENP	Queen Elizabeth	7. KWR	Karuma			6. KSAS	Kashaka
8. RNP	Rwenzori Mountains	8. KIWR	Kigezi			7. KYAS	Kayanja
9. SNP	Semliki	9. KYWR	Kyambura			8. KZAS	Kazinga
10. MGN	Mgahinga Gorilla	10. MWR	Matheniko			9. KIAS	Kisenyi
		11. PUWR	Pian-Upe Toro –Semliki			10. RWAS	Rwenshama
		12.TSWR					

Uganda's approach to combating wildlife crime

Law enforcement

At both MFPA and QEPA, law enforcement activities receive the highest proportion of the parks' operating budget. In the 2016/17 management year, law enforcement received 25 per cent of the annual operational budget in QEPA and 33 per cent in MFPA (staff salaries are not included in this figure). Most of the budget is spent on ranger patrols. For example, MFPA patrols accounted for 26 per cent of the annual operational budget in 2016/17. Other activities include gathering intelligence and bringing prosecutions. UWA's emphasis on law enforcement as the main way to combat wildlife crime is also clear from the General Management Plans for both parks. Although each plan does address community-focused interventions, the sections on tackling threats to resources are almost entirely concerned with law enforcement.

Community engagement

Community engagement has long played a part in Ugandan conservation policy. A key component of UWA's community engagement strategy is a protected area revenue-sharing scheme that redistributes 20 per cent of park entry fees back to adjacent villages. The money is spent on community infrastructure such as clinics and schools, or for livelihood enhancement projects such as livestock rearing. Local government, not UWA, distributes the revenue-sharing funds. This means that, although local communities benefit from the park, the funds are rarely targeted to change behaviour or local attitudes towards wildlife conservation (UWA 2010).

Within UWA 'community conservation' staff are responsible for community engagement. This community engagement is allocated a much smaller proportion of the UWA budget than law enforcement. For example, the budget for community engagement interventions in 2016/17 was 17 per cent of the total operational budget in QEPA and 10 per cent in MFPA. Community conservation staff offer conservation education (through school programmes and outreach via radio broadcasts) and help 'reformed poachers' strengthen their legal livelihoods, but their current focus is mitigating human-wildlife conflict such as crop raiding or livestock predation by park animals. In 2016/17, 47 per cent of UWA's community conservation budget was spent on mitigating human-wildlife conflict at MFPA and 79 per cent at QEPA. By contrast, the budget for livelihood enhancement activities was just 2.5 per cent of the community conservation budget at QEPA (0.4 per cent of the total budget). The Wildlife Act does not provide compensation for households already affected by conflict, so most activities aimed at mitigating human-wildlife conflict are

preventive, such as digging trenches or supplying local people with equipment to use in deterring wildlife.

UWA also has a resource access programme that allows for limited access to certain park resources for communities living next to the protected areas. Typically, resource access agreements cover low conservation value, but locally important, resources such as fish, grasses and firewood. They may also allow beehives on protected land. In return, so-called 'authorised resource users' are required to tell UWA about any illegal activities and to keep the areas they use clear of snares.

3

How widespread is wildlife crime and what drives it?

Our research first reviewed a broad range of evidence on what is driving wildlife crime in Uganda, and what consequences it has, focusing on interactions between wildlife crime and poverty (see our publication Harrison *et al.* 2015). The next stage examined case studies and involved a socio-economic survey of 1,968 households between February and May 2015.

Prevalence of wildlife crime

Understanding how widespread and common illegal activity is among communities neighbouring protected areas is crucial for developing and evaluating strategies to combat wildlife crime. Such knowledge allows conservation authorities target interventions towards the most involved communities (where interventions are most likely to work). It can also indicate the success or failure of current crime-prevention strategies.

Investigating prevalence through indirect questioning

Wildlife crime (and particularly individuals' involvement in it) is a highly sensitive issue. Fear of arrest and prosecution mean direct questions are unlikely to receive honest and open answers. To account for this problem, we investigated the scale of household involvement using an indirect questioning approach, called the unmatched count technique (Nuno *et al.* 2013) (see Box 1).

Box 1: Why use indirect questioning?

Indirect questioning methods allow sensitive topics to be investigated because they ensure people do not give away any sensitive information about themselves (Nuno and St John 2015). This makes people more likely to respond truthfully and such methods produce higher prevalence estimates of sensitive behaviours than direct questions about individuals' involvement in a sensitive activity (St John *et al.* 2010).

Building on our evidence review, we selected five illegal activities commonly detected in the study sites: fishing, collecting firewood, hunting for meat to eat, hunting for selling (including hunting meat and other animal products) and grazing livestock inside the conservation area. For each of these five activities, people were shown one of two types of card: a treatment card or a control card (Figure 2). Both types of card contained a series of pictures illustrating potential sources of the resource (eg firewood, meat) being investigated. The control cards contained four pictures illustrating non-sensitive (legal) activities (for example, farming as a source of income), while the treatment cards contained the same four pictures plus a fifth illustrating the sensitive behaviour being investigated (for example, illegal hunting as a source of income).

Figure 2: Control (left) and treatment (right) cards used to estimate prevalence of illegal hunting
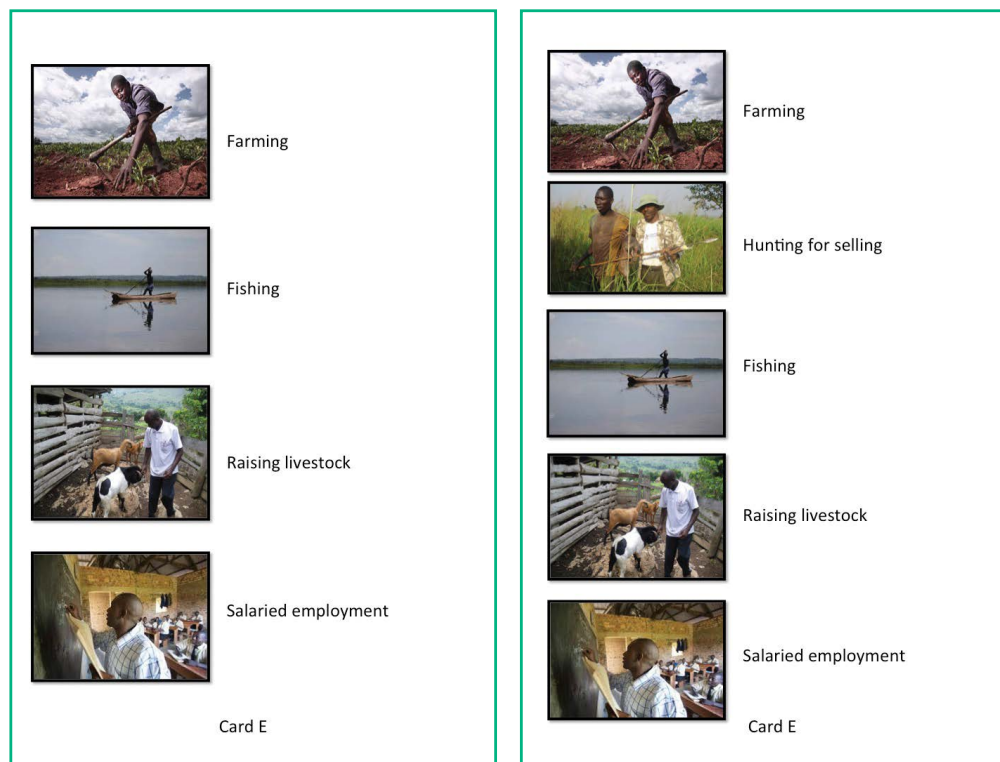
Before each interview, a coin was tossed to determine whether the interviewee would be shown the set of control or treatment cards. The interviewee was then shown one card for each of the five types of illegal activity we wanted to explore. For each card they were asked how many of the activities pictured their household had been involved in over the previous year. Of the four control pictures, at least one represented an item expected to be relevant to everyone interviewed and at least one represented an item expected to be relevant to none of the people interviewed. Therefore, each interviewee was expected to identify one to three of the four images on the control cards and one to four of the images on the treatment card. This is an important feature of the method that ensures the interviewer cannot be sure which items on the card are relevant to the interviewee. For more detail on the unmatched count technique method, please see Nuno *et al.* 2013

Prevalence of different types of wildlife crime in the study areas

Analysing the responses given during the unmatched count technique provided us with estimates for the proportion of households that had engaged in each of the five illegal activities at least once in the preceding year (Figure 3). The results suggested that illegal hunting was the most common wildlife crime in both study sites. Across the two study sites, we estimated 35 per cent of households had been involved in subsistence hunting and 42 per cent in commercial hunting (in practice, many of the households that hunt to sell will also hunt to eat). From this result, it is clear that bushmeat hunting, and wildlife crime more generally, is a very common activity in the studied villages. Less prevalent, although still common, were illegal fishing and illegally grazing livestock inside the protected areas. Collecting firewood from within the parks was the least prevalent activity — estimated to occur amongst 11 per cent of households. Furthermore, because of the resource access agreements that are in place with UWA, some firewood collection is legal. Once such agreements were taken into consideration, the proportion of households involved in illegal firewood collection was non-significant.

These aggregate results mask significant spatial variations in the prevalence of the different activities around the two protected areas (Figures 4 and 5). They also hide differences between the two areas. We found that all of the activities considered were more common around MFPA than QEPA. In particular, we found that in some areas around MFPA over half of households are involved in commercial hunting. However, this is confounded by the higher population density around QEPA, which means that more people (even if a lower proportion) are involved in wildlife crime around QEPA than around MFPA.

Figure 3: Estimated prevalence of resource harvesting activities in QEPA and MFPA. Note: Error bars indicate 95% credible intervals.

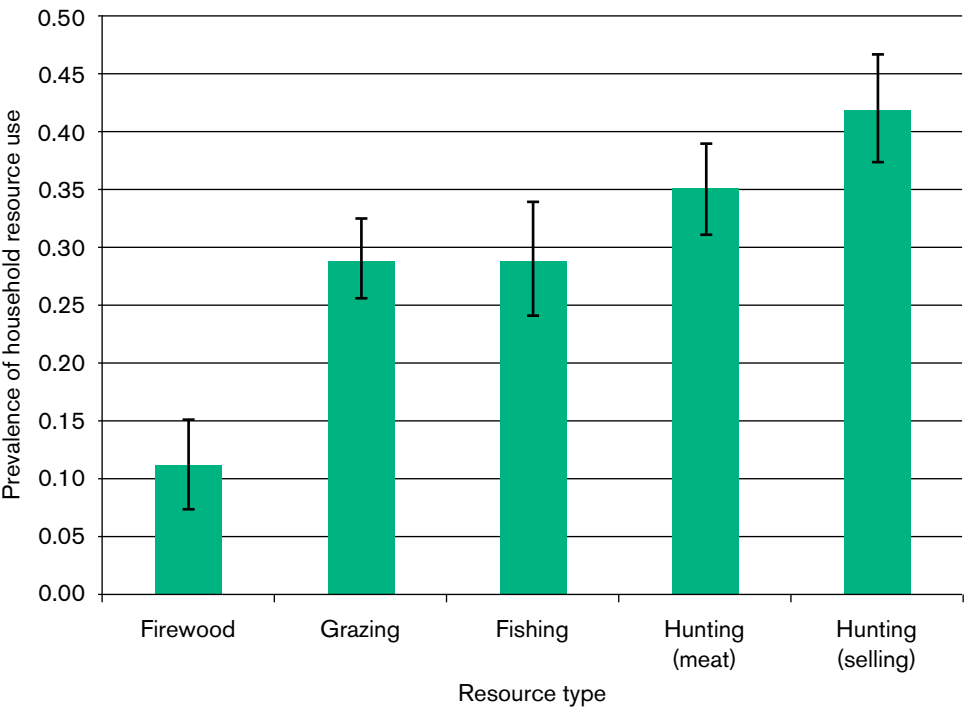Figure 4: Spatial variation in illegal activities around MFPA.
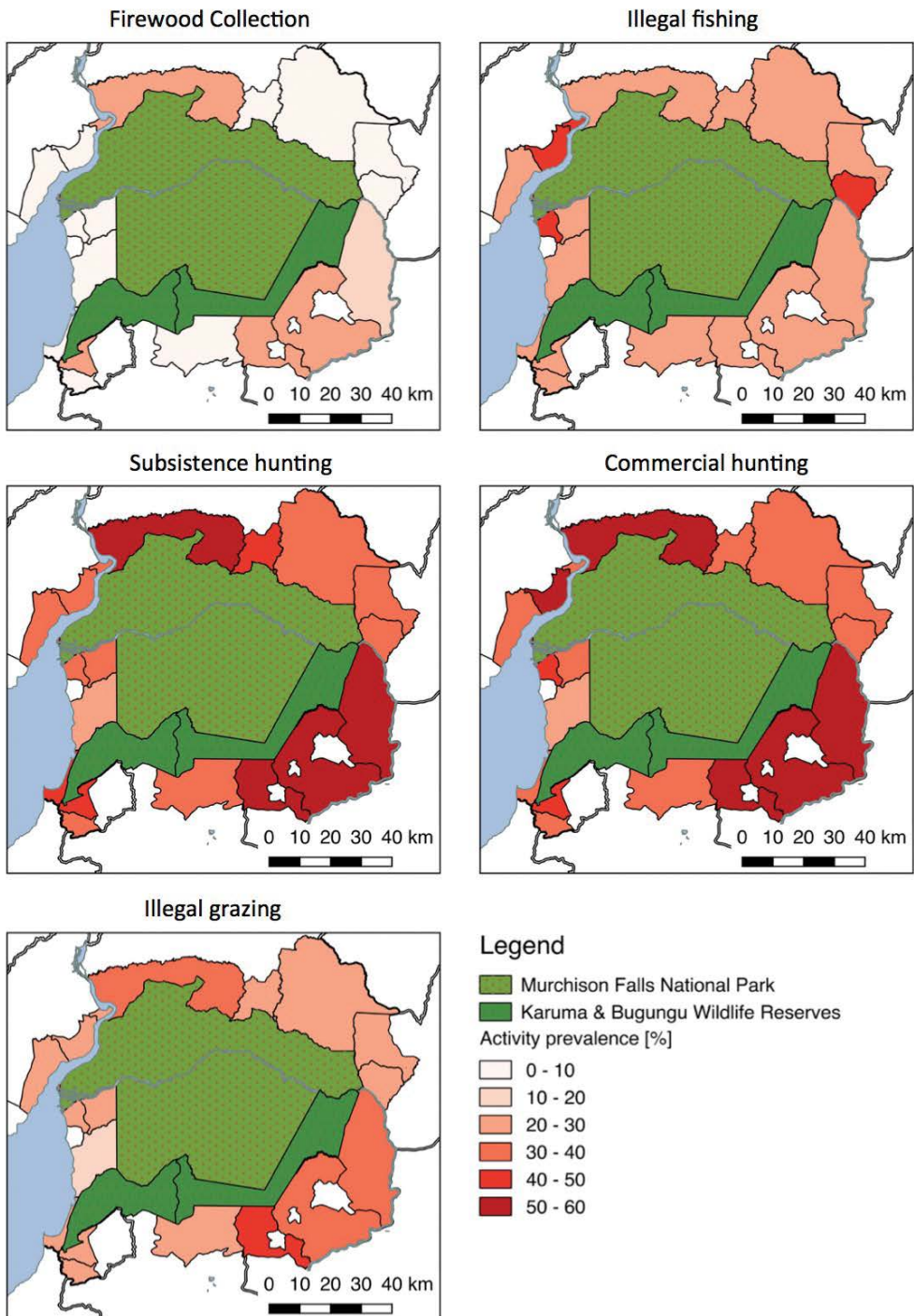
Figure 5: Spatial variation in illegal activities around QEPA.

Firewood Collection

Illegal fishing

Subsistence hunting

Commercial hunting

Illegal grazing

Legend

Queen Elizabeth National Park

Kyambura and Kigezi Wildlife Reserves

Activity prevalence [%]

0 - 10

10 - 20

20 - 30

30 - 40

40 - 50

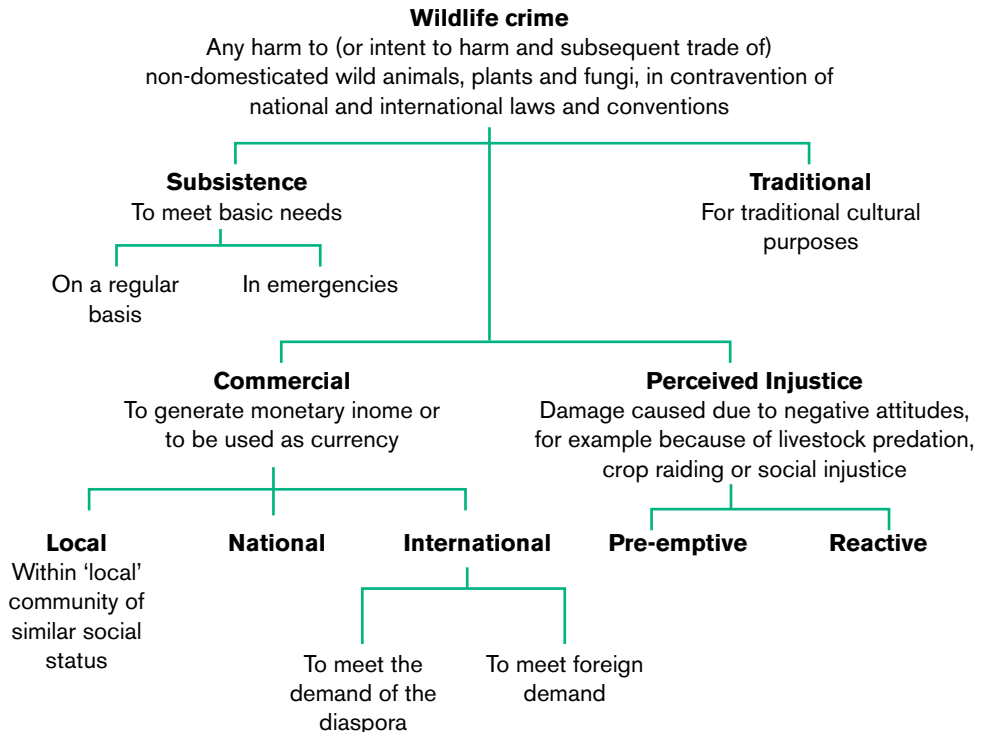50 - 60
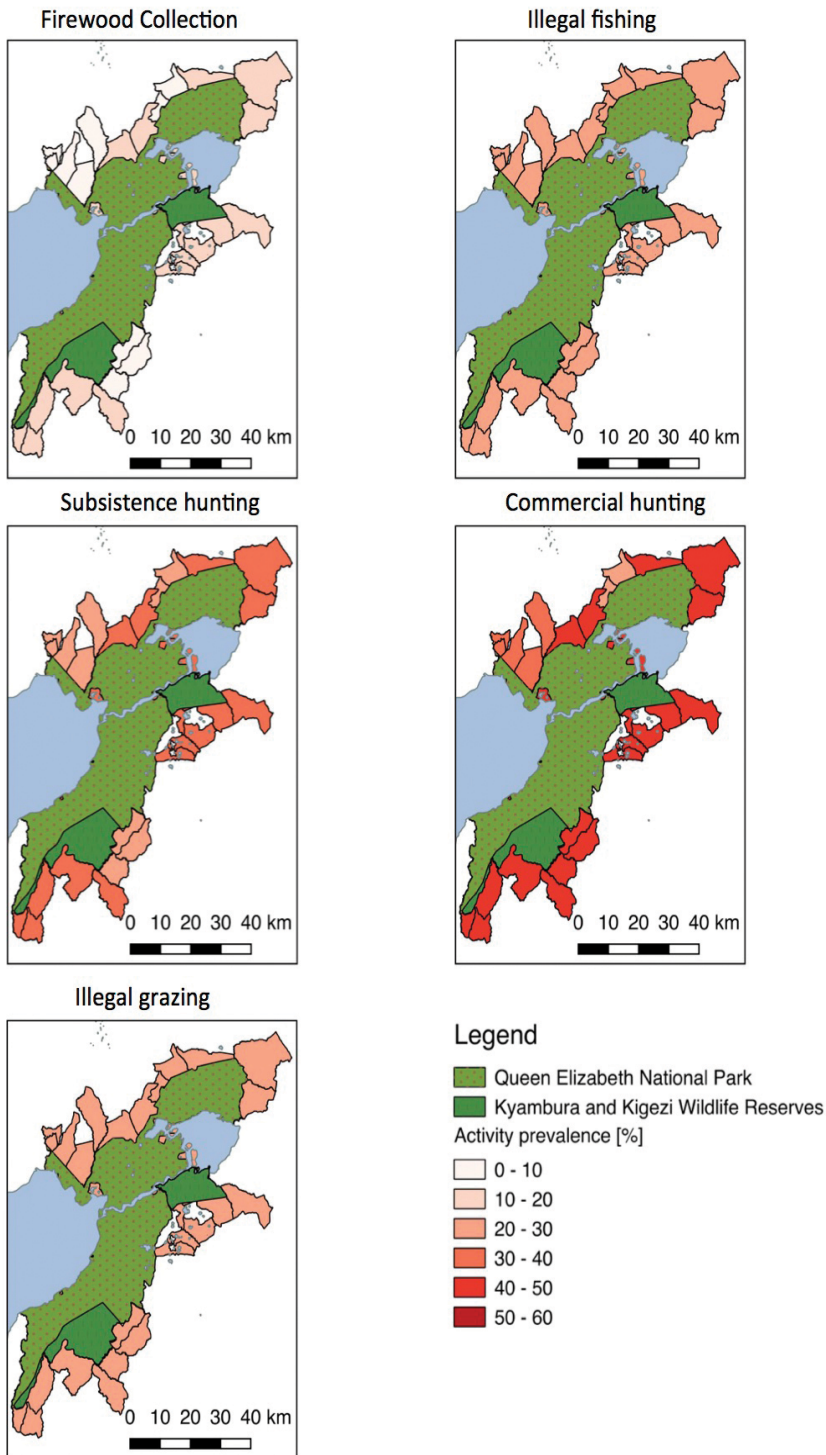
Understanding the drivers of wildlife crime

Understanding the factors influencing individuals to engage in wildlife crime and building socio-economic profiles of those involved is critically important if conservation managers are to address the root causes and target interventions towards the people most likely to be involved.

Investigating socio-economic profiles of people engaged in wildlife crime

The evidence review conducted in the first phase of this project (Harrison *et al.* 2015) identified several underlying factors driving household involvement in wildlife crime (Figure 6). These were:

- Basic needs (subsistence)
- Generating income above and beyond basic needs (commercial)
- Responses to perceived injustice (such as human-wildlife conflict)
- Cultural traditions

Figure 6: A typology of factors driving wildlife crime in Uganda (from Harrison *et al.* 2015).

Wildlife crime
Any harm to (or intent to harm and subsequent trade of) non-domesticated wild animals, plants and fungi, in contravention of national and international laws and conventions

Subsistence
To meet basic needs

Traditional
For traditional cultural purposes

On a regular basis   In emergencies

Commercial
To generate monetary inome or to be used as currency

Perceived Injustice
Damage caused due to negative attitudes, for example because of livestock predation, crop raiding or social injustice

Local
Within 'local' community of similar social status

National

International

Pre-emptive

Reactive

To meet the demand of the diaspora   To meet foreign demand

Our research defined subsistence use as using natural resources to meet basic household subsistence requirements, either to provide a desired resource (for example bushmeat) or as a substitute for unavailable or expensive goods (such as grass thatch substituting for zinc roof sheets or medicinal plants substituting for medical care). Some households may depend on wildlife products to meet their subsistence needs throughout the year, whereas others may use wildlife as a coping strategy for seasonal need or during crises.

We defined commercial use as illegally harvested wildlife sold locally or within national or international markets. Commercial use may be to meet basic cash needs, such as paying household bills or buying inputs for farming or for supporting higher levels of consumption. Put simply, subsistence use is using wildlife products whereas commercial use is selling them. In reality the two overlap as households will often keep a portion of anything they sell for home consumption.

Perceived injustice refers to local people's disenfranchisement because of the direct and indirect costs associated with living close to wildlife (for example, the costs of crop raiding, livestock predation or the fear of injury; Barua *et al.* 2013) or their anger about seemingly unfair practices such as conservation management (particularly perceived inaction to reduce human-wildlife conflict) or the way benefits are distributed. Traditional practices refers both to using wildlife products in cultural practices, such as traditional clothing or medicine, and to the role harvesting or hunting wildlife plays in cultural identity.

Is poverty a driver of wildlife crime?

Our household survey collected data on a range of factors thought to influence involvement in wildlife crime, such as socio-economic status, participation in resource access agreements or revenue-sharing schemes, the extent of crop raiding experienced, perceived impacts of living close to conservation areas, or the reported presence of markets for illegal commodities (for example, local bushmeat markets, wildlife traders and so on).

A key socio-economic characteristic we investigated was household poverty, which is commonly linked to wildlife crime. We measured poverty using two approaches for each household: a method called the basic necessity survey (BNS) (Davies and Smith 1998) and a list of indicators used by the Uganda Bureau of Statistics to calculate a Ugandan multi-dimensional poverty index score (UBOS 2014a). We included some items in the basic necessity survey specifically so that our data would be comparable with the multi-dimensional poverty index score, facilitating comparisons with national poverty assessments.

The BNS provides a locally relevant way to measure household poverty as it assesses how many items from a list of common assets and services a particular household can access. The list of assets and services was generated through six participatory workshops held in November 2014. The workshops selected items that capture poverty's many dimensions. Lists assessed access to education and health care amongst the assets and services, and represented a variety of livelihood strategies. During interviews we asked people whether the listed items and services were 'basic necessities'; that is, were they "the minimum requirement for living that all households of the community should have and nobody should not have".

Only items that at least half the people said were basic necessities were used to calculate each household's poverty score. The items were also 'weighted' by the proportion of people who thought that each item was a basic necessity, such that items that everyone thought were essential got a greater weighting than items fewer people thought were basic necessities. Household poverty scores were then calculated by adding the scores for each item owned. In general, the more listed items each household owned or could use, the higher their score and the better off they were.

Although household poverty has often been blamed for driving wildlife crime, particularly hunting, little evidence has so far been found to support this link (Duffy and St John 2013). The main argument is that poor households with few other opportunities to earn money will be more willing to risk imprisonment or other penalties given the potentially high rewards wildlife crime offers. Yet, in reality, the links between poverty and wildlife crime are almost certainly more complex than this simple narrative suggests.

In our research, the results from the unmatched count technique suggest that poorer households around MFPA and QEPA were in fact less likely to be involved in illegal hunting (whether for commercial or subsistence purposes) than better off households (Figure 7). It could be argued that better off households are more likely to hunt due to greater access to capital, time or hunting equipment. However, it seems more likely that households engaged in hunting are better off *because* of hunting, rather than that better off households can afford to hunt.

Figure 7: How hunting varies with household poverty score.
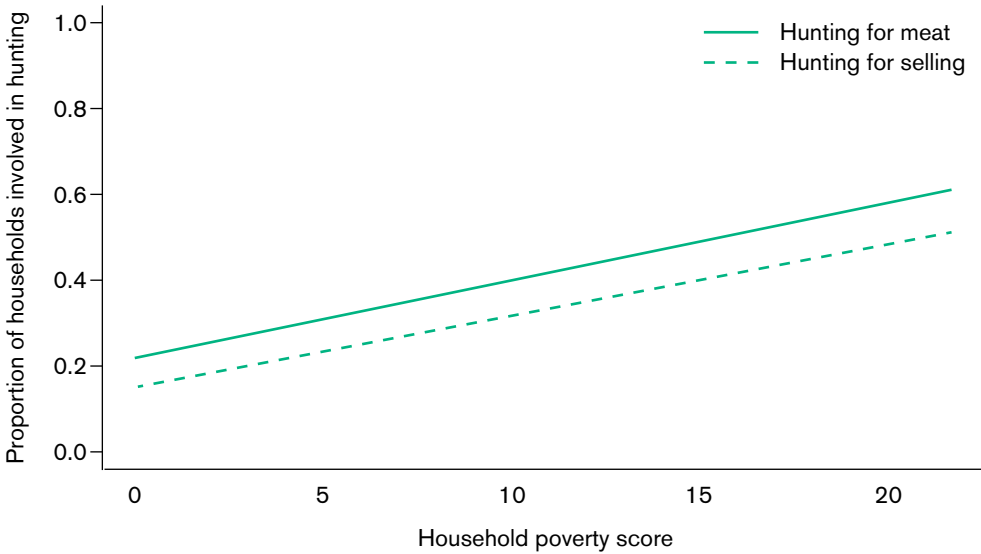
In addition to the unmatched counting technique interviews, we interviewed some known hunters in order to gain further insights into the drivers of wildlife crime. They told us that average monthly earnings from hunting were 430,000 shillings (approximately US$120) during the dry season (when people hunt most frequently). The dry season pattern is because most people in these areas are wet season farmers. During the dry season there are few opportunities to earn money, and those opportunities that do exist — such as labouring — are poorly paid in comparison with hunting. For example, the average expected return from a single one day hunting trip was reported to be approximately 50,000 shillings (US$14), while the average daily wage for labouring is 20,000–30,000 shillings (US$5.5–8.5). For people who hunting as a primary livelihood, expected earnings can be as much as 1,500,000 shillings (US$420) per month, which is significantly higher than average earnings in rural areas (UBOS 2014a). Not only are hunters able to earn more than other households, some can earn an income that puts them firmly among Uganda's middle class (Box 2).

Box 2: Household income levels around MFPA and QEPA

The basic necessity survey (BNS) and the Ugandan multi-dimensional poverty index (UMPI) scores of households interviewed for our socio-economic survey (Figure 8) show that while many households living around the two parks are poor, many are also well off by Ugandan standards. Applying the national threshold score of 0.7 to the household UMPI score reveals that 53 per cent of households, including 62 per cent of households around MFPA and 46 per cent of households around QEPA, would be categorised as poor by the Uganda Bureau of Statistics. These figures closely match regional averages for the Northern and Western regions. Assuming this relationship holds true for households with higher UMPI score suggests that approximately 30 per cent of the households interviewed would be considered to be middle class.

Figure 8: The Ugandan multi-dimensional poverty index (UMPI) and basic necessity survey (BNS) scores of households interviewed as part of the socio-economic survey. The dotted line shows the national UMPI threshold for poor households.
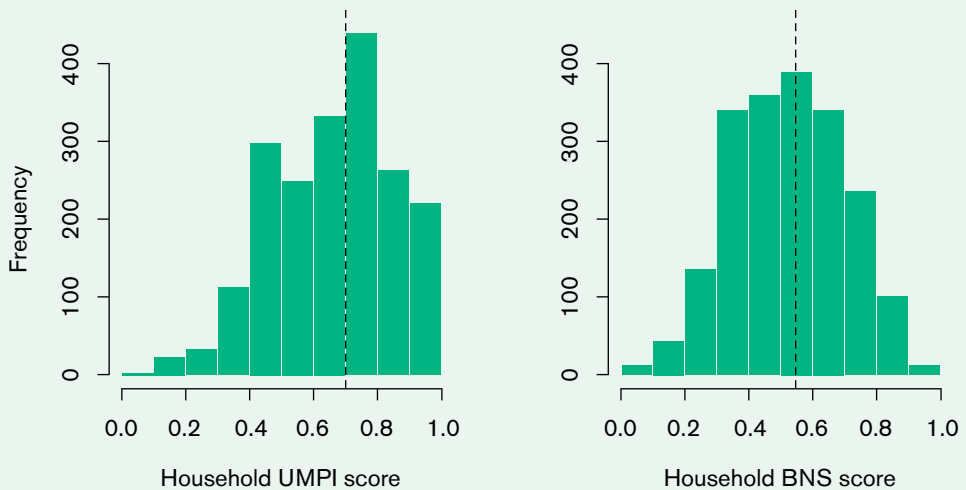
Our findings appear to suggest that poverty and basic subsistence needs are not a major driver of illegal hunting. Certainly, households that do not hunt are on average poorer than those that do. However, many hunting households are also poor and choose to hunt only during times of need, particularly to raise money for cash payments such as for school fees or medical bills, or to tide themselves over when other sources of income are not available. Others may choose to hunt initially through need, but become accustomed to the more comfortable lifestyle that the increased income affords (see Box 3). In these cases, poverty may be the initial driver of illegal behaviour, even if other motivations subsequently supersede this.

In many ways, focusing on poverty misses the point, at least as far as these case study areas are concerned. Whether households are poor and seeking to meet their basic needs, or are better off and seeking to earn enough money to support a comfortable lifestyle, the primary driver of hunting is the desire to earn money. The fact that there are few income earning opportunities other than hunting — particularly during certain periods of the year — is the key, rather than poverty. Over 90 per cent of the known hunters we interviewed said the ability to earn money was their primary motivation for hunting. Similarly, most households that the indirect survey suggested were hunting were doing it in order to sell meat. Hunting's attraction is particularly strong because it has very low barriers to entry, unlike most salaried positions, which have minimum education requirements, and unlike businesses opportunities, which require capital investment.

> ## Box 3: Hunters' motivations, as given during interviews
>
> "If you worked for that money, you couldn't get it easily."
>
> "I cannot stop hunting without another way of earning money."
>
> "I am addicted to this way of earning money — you cannot leave it."
>
> "You get money and then you go again when the money runs out."

Perceived fairness of conservation

Within the household survey, people were asked to rate their agreement with the following statements about the protected area's management and its impact on their lives:

- "I feel that revenue sharing (RS) has been managed well and fairly."

- "My household is disadvantaged from living close to a conservation area."

- "I feel secure about my continued access to the natural resources my household depends on."

- "My household has not benefited from park revenues being shared with local communities."

- "I feel secure about my continued access to the land that my household lives and farms on."

- "My household benefits directly from tourists visiting the conservation area."

Their responses show clearly that local people see a cost to living near wildlife. Over 73 per cent agreed or strongly agreed with the statement "my household is disadvantaged from living close to a conservation area". Conversely, only 10 per cent of people agreed or strongly agreed with the statement "my household benefits directly from tourists visiting the conservation area", while 66 per cent of people agreed or strongly agreed with the statement "my household has not benefited from park revenues being shared

with local communities". These responses support other studies that find people often fail to link projects funded by revenue sharing to the conservation that paid for them. Finally, although most people were confident in their land tenure, 64 per cent either disagreed or strongly disagreed with the statement, "I feel secure about my continued access to the natural resources my household depends on". Local people's overall perceptions are that they have not benefited much from the park, or from the activities associated with it (eg tourism or revenue sharing) (Figure 9).

Figure 9: Local perceptions of living near protected areas
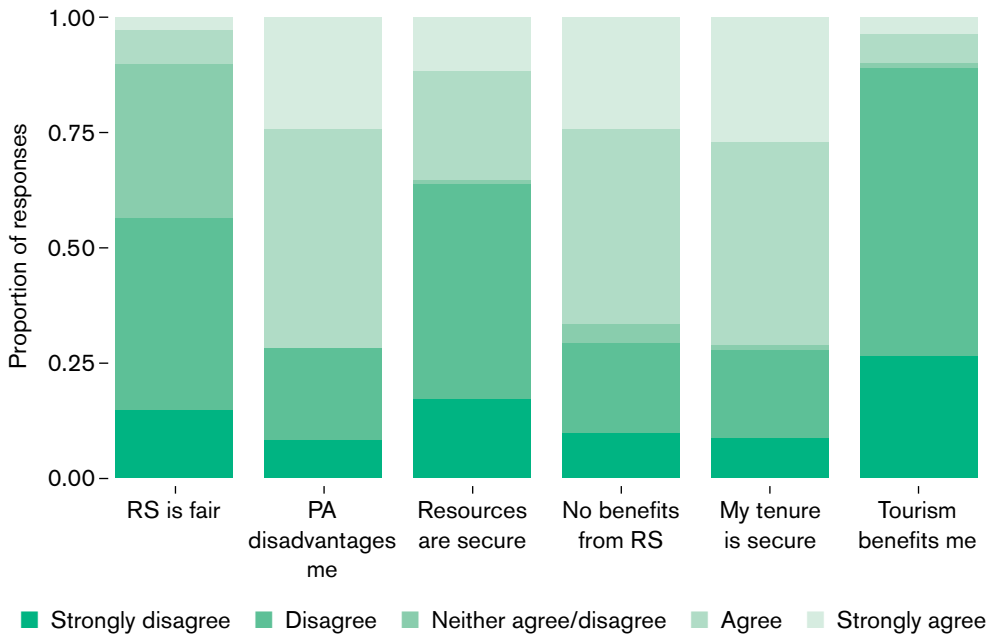
The results of the unmatched count survey suggest that these negative perceptions of conservation are associated with wildlife crime behaviour. Households that reported suffering from human-wildlife conflict (crop raiding or livestock predation) were 65 per cent more likely to have been engaged in hunting for selling and 80 per cent more likely to have been engaged in hunting for subsistence than those that had not. This suggests that households who have lost livestock or crops to wildlife may either hunt as a means of replacing losses or as a way to retaliate against the park. Similarly, households that strongly agreed with the statement "my household has not benefited from park revenues being shared with local communities" were 27 per cent more likely to hunt to sell than those who neither agreed nor disagreed, and were 36 per cent more likely to hunt for meat. Taken together, these findings support the idea that perceived injustice plays a defining role in driving illegal hunting in both study sites, as it also does in other parts of Uganda (Harrison *et al.* 2015).

Effectiveness of current interventions to tackle wildlife crime

Given the strong emphasis placed on law enforcement activities within Uganda's protected areas, it is important to understand how effectively protected area ranger patrols deter would-be offenders. On this, the evidence from interviews with known hunters is mixed. For regular hunters, the ranger patrols appear to have very little deterrence effect (Box 4). Although the reasons hunters reported varied, one main reason was that, despite common encounters with rangers, very few interactions result in an arrest. The figures hunters reported rely on recall over long periods and are inevitably vulnerable to bias, so must be interpreted with care. Yet they suggest that there is a notable difference between the frequency with which hunters run up against patrols and the frequency with which hunters are arrested. From 40 interviews, we found that hunters encountered ranger patrols on only one in five trips into the park, and that only one or two in a thousand trips resulted in an arrest. Hunters who had been arrested reported that beatings by the rangers were common, and that the average sentences received were three months in prison and fines of 400,000 shillings (US$110). These are broadly in line with reported data from all national parks in Uganda (Plumptre 2016) and so corroborates hunters' reported experiences, suggesting that they are largely correct in their assertion that the risk of arrest is minimal.

Box 4: Regular hunters' attitudes towards ranger patrols

"I am not afraid —I am too fast for the rangers to catch me."

"You go with fear but you have to be alert."

"Even though there is fear, problems will force you to do what you are not supposed to do."

A small number of the interviewed hunters for whom hunting was a main livelihood activity also reported that they colluded with rangers to find out patrol routes in advance and took cash with them to bribe rangers if they got caught. This suggests that law enforcement activities may disproportionately affect poorer households, which are less able to afford bribes for information about patrol patterns, for release if caught, or to pay any fines.

However, these findings do not mean that ranger patrols have no effect on behaviour. While the unmatched count technique results suggest 42 per cent of households hunt in areas surrounding the two study sites, it is impossible to know what proportion of households may have chosen to hunt if ranger patrols were not conducted. Interviews with individuals who have given up hunting indicate that the presence of ranger patrols influenced their thinking. Hence, it is reasonable to conclude that even though a

significant proportion of local people still choose to hunt despite the patrols, there would be more hunting without patrols.

As well as deterring hunting, patrols also play an important role in removing snares and other traps from within the protected areas. For example, between 2004 and 2013, rangers removed an average of 916 snares from MFPA each year, with 3,448 snares removed in 2013 alone. Furthermore, controlling access to firearms has played an important role in limiting hunters' ability to deliberately target large game species, such as buffalo and elephants. Several of the hunters interviewed stated that they would be willing to target elephants if they could get suitable guns but were either afraid of the consequences of being caught with such a gun or did not know how to obtain one.

4

Looking forward: how to tackle wildlife crime more effectively

This section focuses on the policy assessment component of our research, which encompassed investigating local people's preferences for interventions aimed at combating wildlife crime and the likely impact these interventions would have on attitudes and behaviour. The aim of this component was to improve understanding of how various intervention options might perform in reducing wildlife crime and benefiting residents of 'frontline' villages. We investigated the interventions that the earlier evidence review (Harrison *et al.* 2015) suggested could be most effective at combating wildlife crime. These included mitigating human-wildlife conflict, establishing community wildlife scouts to respond to such conflict, support for wildlife-friendly enterprises, regulating hunting, making patrolling more effective and removing resource access agreements (see Table 1). These interventions are designed to reduce either the incentives or opportunities for wildlife crime or to make legal livelihood activities more profitable.

Table 1: Intervention options considered for combating wildlife crime at QEPA and MFPA.

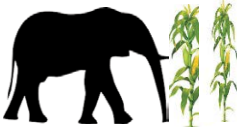| Intervention	Description
Mitigating human-wildlife conflict	Half of the revenue-sharing funds currently shared with local communities (ie the 20 per cent of park gate fees) would be spent on mitigating human-wildlife conflict.
Establishing wildlife scouts	Two people from each village would be employed by UWA to respond to incidents of human-wildlife conflict.
Supporting wildlife-friendly enterprises	A wildlife-friendly enterprise, such as chilli growing or bee-keeping, would be set up. Participants should earn on average 500,000 shillings (US$143) per year and participation would depend on agreeing not to participate in wildlife crime. Any household breaking this rule would be removed from the scheme for one year.
Increasing patrol effectiveness	The probability that illegal activities within the parks are detected would be increased by a factor of 10.
Removing resource access	All memorandums of understanding (MoUs) between UWA and local communities that allow resources to be harvested from the parks by authorised resource users would be withdrawn.
Allowing regulated hunting	Resource access MoUs would be expanded to allow certain species to be hunted using permitted methods. Only hunting for home consumption would be permitted, and offtake numbers and zones in which hunting was permitted would be set each year.

Which interventions do local people prefer?

Understanding preferences

In order to understand which of the intervention options local people preferred, we used an empirical choice experiment. Choice experiments are a quantitative method in which people are asked to make a series of discrete choices between different scenarios that contain varying combinations of attributes (Mangham *et al.* 2009).

Each person interviewed was given a series of six cards, each of which described two alternative scenarios. Interviewees were asked which of the two scenarios on each card they preferred. Each scenario represented a different combination of the interventions described in Table 1 (with the exception of removal of resource access due to methodological constraints). See Figure 10 for an example choice card.

Figure 10: An example choice card exploring preferences for interventions. Note UGX stands for Ugandan shillings.

Attributes		Scenario 1	Scenario 2
	Human-wildlife contact	1/2 (50%) RS funds to HWC	No RS funds to HWC
	Employ eco-guards	No eco-guards employed	2 eco-guards in your village employed
	Chances of being caught hunting illegally	1 out of 1000 people caught hunting illegally	1 out of 10 people caught hunting illegally
	Sustainable hunting for meat (domestic use)	Hunting allowed for domestic consumption	Hunting not allowed
	Wildlife-friendly enterprise schemes	No scheme; no benefit	Scheme; participants earn UGX 1,000,000/yr
Which scenario do you prefer (tick one)?			

In addition to the choice experiment, we interviewed individuals with significant local knowledge of wildlife crime, including UWA staff and over 50 reformed, current or convicted offenders. The interviews aimed to uncover any insights into the possible impacts of intervention that the choice experiments missed. A workshop was also held with UWA staff to understand which intervention options were best supported by staff at the two parks and UWA headquarters.

Local preferences for interventions to combat wildlife crime

Preferences varied between the two sites (see Table 2), with wildlife-friendly enterprises proving most popular at MFPA and designating revenue-sharing funds to mitigate human-wildlife conflict most popular at QEPA.

Table 2: Local people's preference for intervention options aimed at reducing wildlife crime at QEPA and MFPA.

	MFPA		QEPA	
	Preference score	Rank	Preference score	Rank
Mitigating human-wildlife conflict	0.00	4	1.00	1
Wildlife scouts	0.34	2	0.61	2
Improved patrols	0.03	3	0.18	4
Regulated hunting	−0.18	5	−0.10	5
Wildlife-friendly enterprises	0.45	1	0.34	3

Note: Preferences range from −1 to 1, with 1 indicating a strong preference for an intervention and −1 indicating a strong aversion to an intervention.

Surprisingly, the least popular intervention in both sites was regulated hunting, which received negative preference scores (indicating aversion to the intervention). Also surprisingly was the support — albeit weak — for increased law enforcement at QEPA. At both sites, appointing local wildlife scouts and establishing wildlife-friendly enterprises were well supported. At MFPA, people were indifferent to using revenue-sharing funds to mitigate human-wildlife conflict, whereas at QEPA this was a clear preference. Overall, the results suggest that finding the right balance between interventions for a specific site is likely to be important.

UWA staff preferences for interventions to combat wildlife crime

A two-day workshop in July 2016 investigated UWA staff preferences for interventions to combat wildlife crime. UWA staff were separated into three groups (those working at UWA headquarters, MFPA and QEPA) and were asked to identify the interventions they believed would be most effective at combating different types of wildlife crime.

Overall, UWA staff focused on law enforcement activities, with ranger patrols, intelligence gathering, working with magistrates to increase sentences and spot checks of markets identified as the most effective means of combating wildlife crime. However, staff also highlighted the importance of community-focused interventions and, in line with the community preferences, they favoured better human-wildlife conflict mitigation, increased opportunities for improved livelihoods and establishing local wildlife scouts as likely to be the most effective approaches.

How would the preferred interventions change behaviour related to wildlife crime?

Understanding behaviour change

In order to investigate how local people's behaviour might change under the different intervention options described in Table 1, we presented people living around the two study sites with a series of discrete scenarios and asked them how they would respond (see Box 6 for an example scenario). We did not ask how they would respond to increased enforcement efforts as we anticipated their responses would have been biased.

Box 5: An example scenario presented to local people to investigate their likely responses to interventions designed to combat wildlife crime.

"I'd like you to imagine that UWA set up a scheme which will help people receive a stable income from certain plants or resources. These resources would be chosen on their ability to deter problem wildlife. For example, chilli plants or honey could be grown or produced and used to deter wildlife on the park boundary. This scheme would be open to everyone and whoever participates would be guaranteed a fixed price for these products on the agreement that they do not partake in any wildlife crime. If you are found to have committed a wildlife crime, you will be removed from this scheme."

"An average income for selling honey as part of this scheme would be in the region of 500,000 shillings per year."

Because involvement in wildlife crime is highly sensitive, the responses given to a direct questioning approach would most likely be unreliable. To overcome this problem, we used three non-sensitive proxy measures to investigate how behaviour might change under different scenarios. We asked how household time spent on legal livelihood activities would be likely to change, how the different intervention options would be perceived by local people in general, and how likely people would be to inform conservation authorities about illegal activities. These measures were intended to explore the impact of future interventions without asking people to directly report on their illegal behaviour.

We used semi-structured interviews to allow for follow up questions for each response. This helped to generate qualitative information on why people expected the three measures to change.

Time spent pursuing legal livelihoods

The first proxy measure investigated the time people would allocate to legal livelihood activities (Figure 11). As with the choice experiment, there were significant differences between the predicted changes in behaviour at QEPA and MFPA. Predicted behaviour also varied depending on whether a household had suffered from livestock predation or crop raiding.

Figure 11: The predicted probability of households increasing, decreasing or keeping constant the time spent on legal livelihood activities under different interventions aimed at reducing wildlife crime.
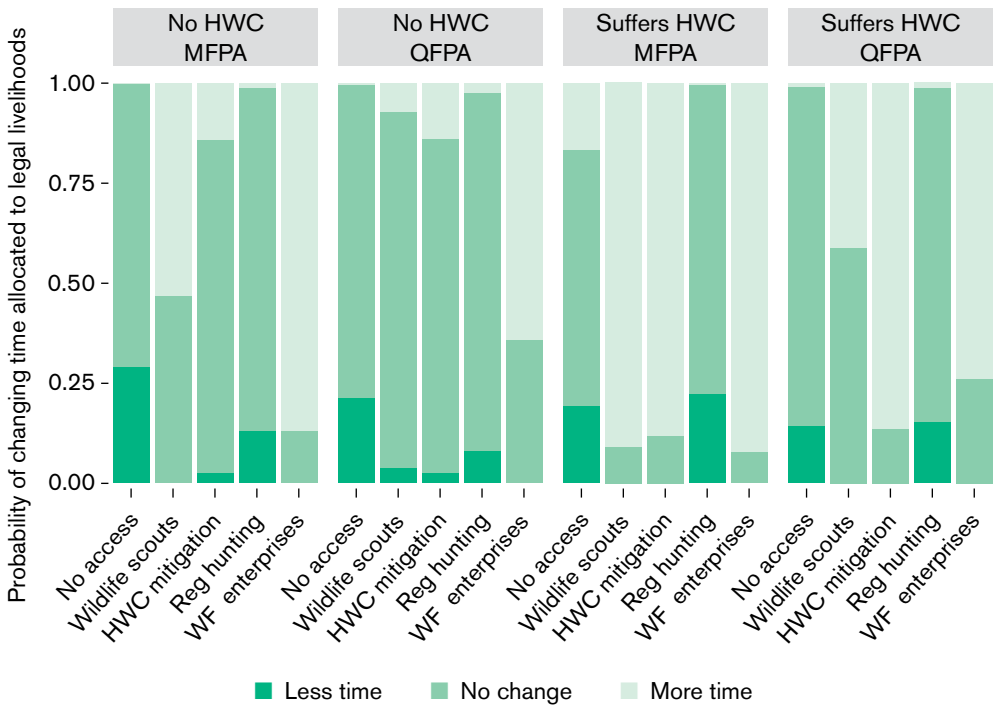
The left two panels of Figure 11 show the predicted behaviour change for both MFPA and QEPA for households that have not experienced human-wildlife conflict. They indicate that a significant proportion of households at both sites would increase the time allocated to legal livelihood activities if wildlife-friendly enterprises were established in their village. Additionally, even where there is currently no human-wildlife conflict at MFPA, people said introducing wildlife scouts would significantly increase the amount of time households invest in legal livelihood activities — possibly because people thought they might be able to gain employment as scouts.

The remaining panels of Figures 11 show the predicted behaviour change for households that do suffer from human-wildlife conflict. Again, both sites indicated that establishing wildlife-friendly enterprises would provide an alternative source of livelihood and that households would allocate time to this (and away from hunting). In addition, at both sites, appointing local wildlife scouts and allocating revenue-sharing funds to mitigating human-wildlife conflict were predicted to result in a significant proportion of households increasing the time allocated to legal livelihood activities. This is probably because arable and livestock farming becomes more profitable, and supplying subsistence needs becomes easier, if wildlife damage can be reduced. This is an important result as it suggests that households who are more likely to hunt (including those that report suffering from human-wildlife conflict) are also the ones that are more likely to invest more time in other livelihood activities if conflict can be mitigated.

Likelihood of informing on illegal activities

The likelihood of local people informing law enforcement personnel about illegal activities is an important measure of people's willingness to engage with conservation. It also has significant implications for UWA's ability to address the most serious wildlife crimes, such as elephant poaching and trade in wildlife products, for which law enforcement activities can be made significantly more effective when supported by local informants (Linkie *et al.* 2015). Figure 12 suggests that the likelihood of local people passing information to UWA would increase significantly under at least three of the intervention options considered: establishing wildlife-friendly enterprises, introducing wildlife scouts and increasing spending on human-wildlife conflict mitigation (from revenue-sharing funds).

Perceived fairness of interventions to combat wildlife crime

How fair local people consider interventions to be is important in determining how well interventions influence social norms. Across the two parks, 79 per cent of people interviewed viewed the current system of enforcement–dominated management as being unfair. This is problematic because interventions perceived to be unfair are highly unlikely to be widely accepted, and also unlikely to attract social pressure to comply with expected behaviours. This discrepancy can be seen by comparing the results for the perceived fairness of different interventions (Figure 13) with the likelihood of informing (Figure 12). Wildlife-friendly enterprises were thought to be the fairest intervention. Introducing wildlife scouts and using revenue-sharing funds to better mitigate human-wildlife conflict also performed well. These interventions are also the ones which are most likely to incentivise to people to inform on illegal activities.

Figure 12: The predicted changes in the probability of people reporting illegal activities under different interventions.
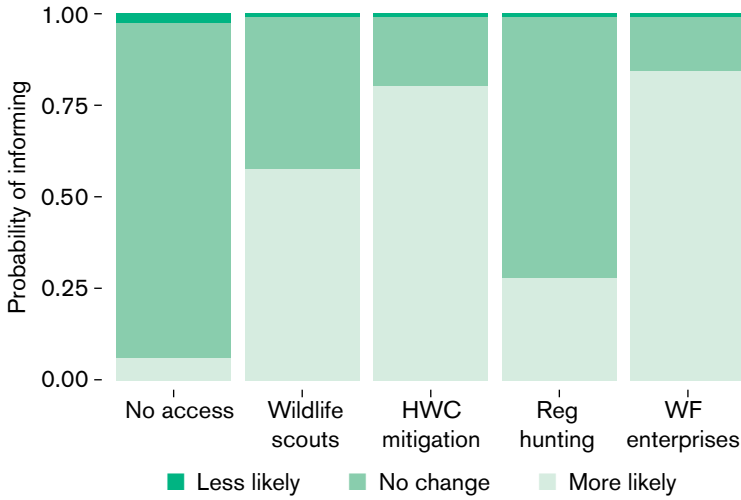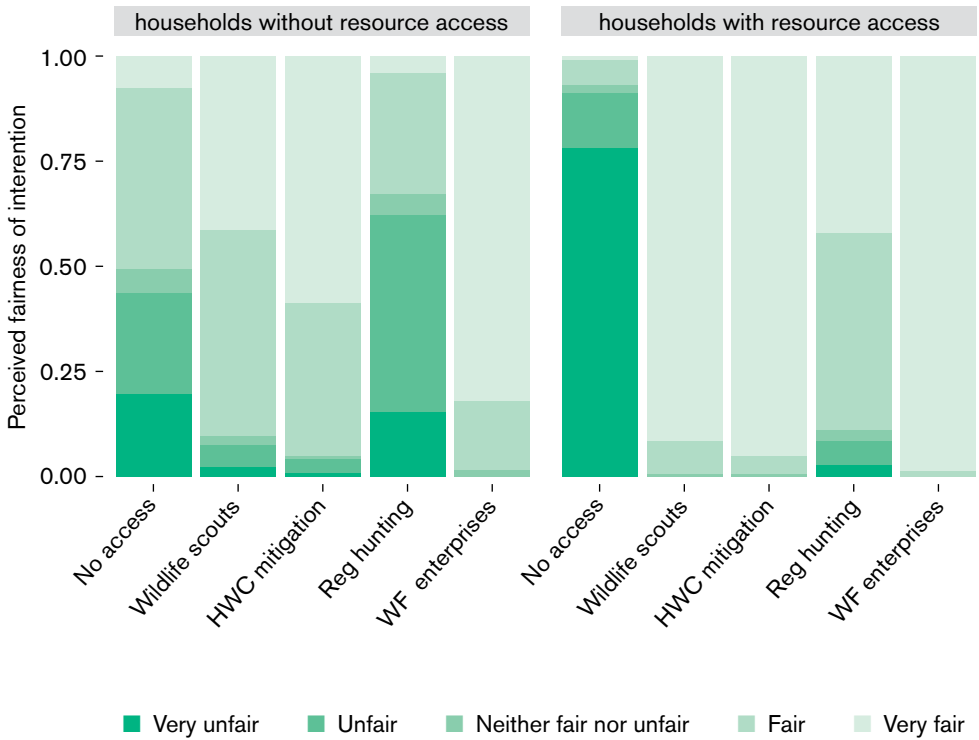

Figure 13: Perceived fairness of the intervention options among authorised resource users (right hand side) those without resource use agreements (left hand side).

Households that are authorised resource users (those allowed to access certain resources from within the parks) also thought that introducing regulated hunting would be fair, while removing resource access rights would be very unfair (Box 6). By contrast, households without resource access agreements thought regulated hunting would not be fair, and had mixed opinions about removing resource access rights. This suggests that households that already benefit from resources within the two parks are more likely to support continued access to resources and the expansion of resource rights.

Box 6: An authorised resource user's opinion on removing access to natural resources.

"If they do this, it means there is no proper relationship between the community and the park —we would no longer be neighbours as we would be suffering strongly. It would not be fair. We would have to increase our time looking for resources as they are being depleted, so we would have to reduce our time farming which will impact us. Telling the park about people hunting would be difficult as there is no longer a relationship, so why should I help them?"

Preferences summarised

Community preferences for different types of intervention designed to help combat wildlife crime showed significant agreement between the choice experiment and the scenario interviews. Of the different intervention options considered, the three that were most preferred by local people, and that were thought to be most likely to change behaviour away from engaging in wildlife crime were: using revenue-sharing money to support human-wildlife conflict mitigation, instituting wildlife-friendly enterprises and introducing wildlife scouts. Those that were considered the least preferable and the least likely to change behaviour were: removing all regulated access to resources within the two parks and introducing regulated hunting. Increasing the effectiveness of law enforcement activities received only limited support from people around QEPA in the choice experiment, but was the intervention most strongly supported by UWA staff.

5

From research to action: park-specific action plans

The next phase of the project focused on turning findings into actionable recommendations to help UWA combat wildlife crime at both QEPA and MFPA. A project workshop held in May 2016 brought together UWA staff from headquarters and the MFPA and QEPA with conservation NGOs operating in and around the park as well as other stakeholders. It was agreed that the best option would be to produce an anti wildlife crime action plan for each of the case study protected areas. UWA could then implement these on a pilot basis to test whether a) such an approach could make actions against wildlife crime more effective, and b) whether the approach could be rolled out to other protected areas in Uganda.

At each site, the action plans were developed by a planning team that consisted of the key park staff, including the conservation area manager, law enforcement warden, community conservation warden, as well as staff of NGOs working at the park and members of the project team. The draft plans were subsequently reviewed by UWA's directors and senior management staff.

The action plans detail interventions to combat three priority offences identified by staff at each park: poaching for high value international trade; commercial hunting and trade of bushmeat species; and subsistence hunting. Within each five-year action plan, clear priorities were set out for key target groups and intervention options.

Guiding principles

The process of developing the park action plans was guided by three principles: building relationships and developing trust with local communities; providing positive incentives; and effective and fair law enforcement (Figure 14).

Figure 14: The three guiding principles on which the park action plans are based.
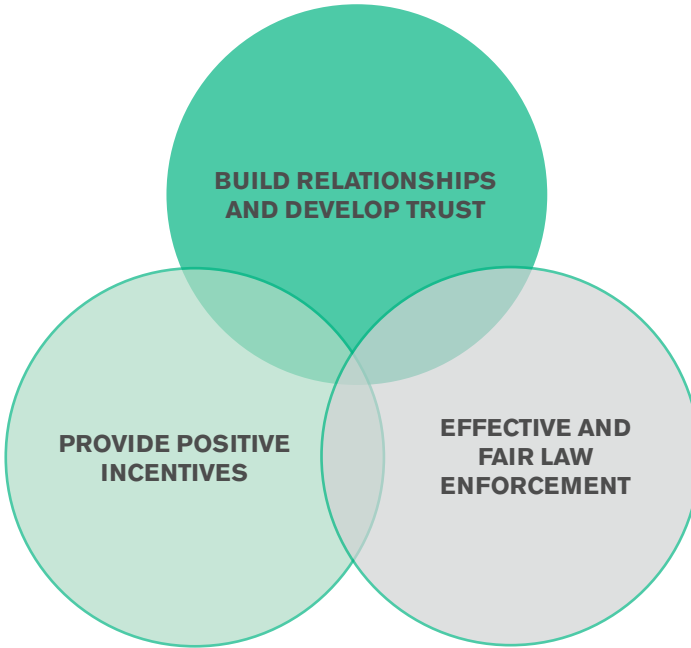
Building relationships: developing trust

A common lesson from successful conservation programmes that aim to bring about sustainable behaviour change is the need to develop long-term working relationships with communities (Gruber 2010). In this way, it is possible to develop mutual trust and an understanding of shared goals, as well as to resolve conflicts when they arise. Failure to commit to working long-term with target villages can result in ill-feeling towards wildlife and conservation activities, which our research suggests drives further wildlife crime.

Inevitably, there are times when conservation authorities and local people come into conflict, particularly in situations where expectations on either side are not realistic (Kellert *et al.* 2000). Such conflicts can arise when communities feel that they are not benefiting from the park or from activities implemented by UWA or conservation partners; when they experience high costs as a result of human-wildlife conflict; when individuals are penalised unfairly or disproportionately (as they judge it) for wildlife crime or for not complying with conservation activities; or when community members are killed

or go missing in the park. Failure to resolve such conflicts can damage people-park relationships for the long-term and resolving these conflicts swiftly is critical to avoiding escalating problems.

Providing positive incentives for conservation

The research findings show people commit wildlife crimes for various reasons, but the lack of viable or realistic alternatives is used by many as a justification. For others, committing wildlife crimes is simply the easiest means of earning money. Although law enforcement has a vital role to play in deterring potential offenders, the risks of getting caught and penalised are often insufficient to change people's decision making, particularly for those driven to crime through necessity. Providing incentives to encourage people to change their behaviour is therefore a crucial part of the action plans. Such incentives work best when they are directly linked to wildlife conservation (for example, the park revenue-sharing scheme) and/or tied to compliance with pro-conservation agreements (such as on resource access). The benefits that people derive from the incentive schemes may be different (for example, resource access rights, performance payments, livelihood training, etc) but should be set at a level that people collectively feel is appropriate and should be distributed in a way that is widely perceived to be fair. If the benefits from incentives are accepted as appropriate compensation for the costs of conservation, a gradual shift in behaviour can be expected. This can be particularly evident in cases where benefits are conditional on collective behaviour change and efforts are made to build the capacity of local institutions (so that individuals within the community feel pressure from their peers to comply).

Effective and fair law enforcement

Effective and fair law enforcement underpins all efforts to tackle wildlife crime. While behavioural and attitudinal change can be promoted by providing positive incentives, certain individuals may not stop undertaking wildlife crime. For these people, effective law enforcement may be the only way to alter behaviour. Conversely, ineffective law enforcement, which allows rule breakers to go undetected or unpunished, can be seen as unfair and can damage or undermine compliance with conservation measures.

Setting priorities

Workshops with UWA staff at both MFPA and QEPA were used to identify the priorities for the action plans. Staff at each park identified three priority offences that they wanted to address in the next five years (Table 3). Strategies to tackle these were developed for each park.

Table 3: Priority offences to be addressed at QEPA and MFPA.

	QEPA	MFPA
1	Armed hunting (bushmeat and high value species)	Hunting and trade of high value species
2	Commercial bushmeat hunting and trade	Commercial bushmeat hunting and trade
3	Subsistence hunting	Subsistence hunting

The planning teams at each park also identified 'priority areas' where interventions would be focused, based on staff's existing knowledge of the parks and the findings of the unmatched count technique (Figures 4 and 5). This was done to ensure that resources could be targeted where the three priority offences were most prevalent and where their underlying drivers could be addressed.

Identifying interventions

The interventions chosen to combat each of the priority offences are a mix of existing activities that require strengthening and new interventions. Many of the existing interventions currently receive too little support for them to have any meaningful impact. For example, establishing wildlife-friendly enterprises, which is identified as one of the main interventions for addressing commercial bushmeat hunting, received only 0.4 per cent of the annual operational budget for QEPA in 2016/17 (approximately US$800). Hence, the action plans indicate where current support needs to be increased.

To fund additional interventions or increase investment in existing interventions, UWA will need to rebalance its support for different activities or secure supplementary funds from external sources, such as donor agencies or through strategic partnerships with NGOs, private sector companies, local authorities or national government agencies. Once funding has been secured, detailed implementation plans will need to be developed for new and expanded activities. This is particularly true for activities involving local communities, as it is important that the beneficiaries of such activities have the opportunity to participate meaningfully in all stages of designing, developing and implementing the interventions.

6

Actions to combat illegal hunting of high value species

Illegal hunting and trade of high value species

Illegal hunting and trade of high value species, particularly involving firearms, was the highest priority for combating wildlife crime in both parks. UWA was particularly interested in the illegal hunting of elephants and pangolins.

Elephants

In recent years, Uganda has escaped the large-scale elephant poaching, carried out by organised criminal gangs, that is affecting other range states within the region (Chase *et al.* 2016). Our 'key informant' interviews suggest that elephant hunting is predominantly carried out by individuals who live in villages close to the parks but have connections to 'middlemen' involved in international wildlife trafficking. As such, interventions at park level are critical to stemming the killing of elephants in MFPA and QEPA even though targeting individuals higher up the value chain is also important.

The favoured strategy for hunting elephants is using illegally acquired firearms. Hunters report entering the park at night when patrol numbers are at a minimum, shooting an animal at first light and leaving again within hours. Tusks are quickly removed with machetes. This strategy minimises the risk of encountering ranger patrols. However, the

limited availability of firearms means that few hunters are able to employ this approach. Poison-injected fruit and traditional traps designed to injure elephants are also used, but these approaches are reported to be significantly less effective, and carry greater risk.

The key informant interviews with known hunters also suggest that a significant proportion of elephant deaths from hunting (estimated to be 20–40 per cent) are opportunistic killings. In such instances, elephants were not the original target species but hunters encountered a vulnerable elephant (for example, one injured by a snare). This fits with a study of elephant deaths due to wire snares in Zambia (Becker *et al.* 2013) and suggests that, while focusing on individuals who deliberately target elephants may reduce elephant mortality, some deaths will continue through opportunistic killings unless snaring and other hunting methods for bushmeat can also be reduced.

Further up the 'value chain', the relationships between hunters and middlemen is often ad hoc. On occasion, hunters will be contacted in advance and will hunt specifically to order. Alternatively they may decide to hunt without making a prior agreement with a middleman and then arrange the sale of any harvested tusks on their return. In either case, sale of the tusks is arranged quickly, providing little opportunity to arrest the hunter with evidence of the offence or to recover the ivory. The exception to this is when an elephant has been killed opportunistically. In this case, there may be a longer window between the initial killing of the animal and the sale of the tusks while the hunter finds a buyer, often with a well-known local hunter acting as an intermediary. However, specialist elephant hunters have been known to avoid hunting bushmeat (even to buy it instead) to avoid gaining a reputation as a hunter because this helps them maintain a low profile.

Pangolins

Pangolins are highly prized by some cultures for their scales, which are used in traditional medicine in both Asia and Africa (Soewu and Ayodele 2009; Challender *et al.* 2015), and for their meat. However, little is known about their distribution and population density within the two study sites. Hunters report that they are difficult to find and rarely encountered. As a result, they are not deliberately targeted but are hunted only when the opportunity arises. Consequently, as with elephants killed opportunistically, pangolins can largely be considered to be 'bycatch' of the bushmeat trade.

As with elephant ivory, well-known hunters are contacted by middlemen with connections to international traffickers, who place orders for quantities of scales. However, because opportunities for hunting pangolins are sporadic, hunters have often forgotten any prior arrangement they have made and may not honour their original agreement. When pangolins are caught by hunters without middleman contacts, a well-known local hunter will often broker a deal, making such hunters particularly important links in the sales chain.

Proposed interventions

The action plans propose that law enforcement activities, including ranger patrols, community informants and working with the judiciary, should remain the primary way to address illegal hunting and trade of high value species. However, the law enforcement activities should be supported by community-focused interventions aimed at improving relationships with local people and encouraging them to gather and report intelligence. Figure 15 shows how these interventions are expected to address both the direct and indirect threats to wildlife from the illegal hunting and trading high value species.

Law enforcement patrols

Law enforcement patrols are the first line of defence against illegal hunting of wildlife in MFPA and QEPA and are currently allocated the highest share of UWA's budget at each site. Patrols serve two main purposes: 1) to deter would-be hunters from entering the protected areas; and, 2) to arrest any individuals that do so (Keane *et al.* 2008). Evidence from the Luangwa Valley in Zambia has shown that allocating more resources to law enforcement is associated with declines in elephant killing (Leader-Williams *et al.* 1990; Jachmann and Billiouw 1997). However, where resources are limited, it is important to balance investment in activities that focus on tackling wildlife crime once it has occurred against those that aim to reduce the incentive for individuals to offend in the first place (Cooney *et al.* 2016*)*.

The covert and targeted nature of elephant hunting means that law enforcement patrols have a very short window in which to catch perpetrators. For patrols to be effective, information is required on where, how, and by whom elephants are being killed (Stokes 2012). Data collected by monitoring law enforcement efforts can help identify those areas and times where offences are most likely. This can help increase detection of offenders and, hence, increase both the rate of arrest and the deterrence patrols create. A pilot initiative using monitoring data to improve patrol effectiveness in QENP more than doubled the probability of detection (Critchlow *et al.* 2016). **Building on this demonstrated potential, the action plans propose more strategic use of law enforcement monitoring (LEM) data at both parks**.

Targeted law enforcement patrols are also key in controlling firearms. Without access to firearms, hunters depend on less effective methods, such as poisoning, to kill elephants. Collaborative work with other security agencies is proposed within the action plans in order to reduce the opportunity for hunters to illegally secure firearms.

Figure 15: Conceptual model showing how proposed interventions are expected to address the direct and indirect threats to high value species from illegal hunting and trade.
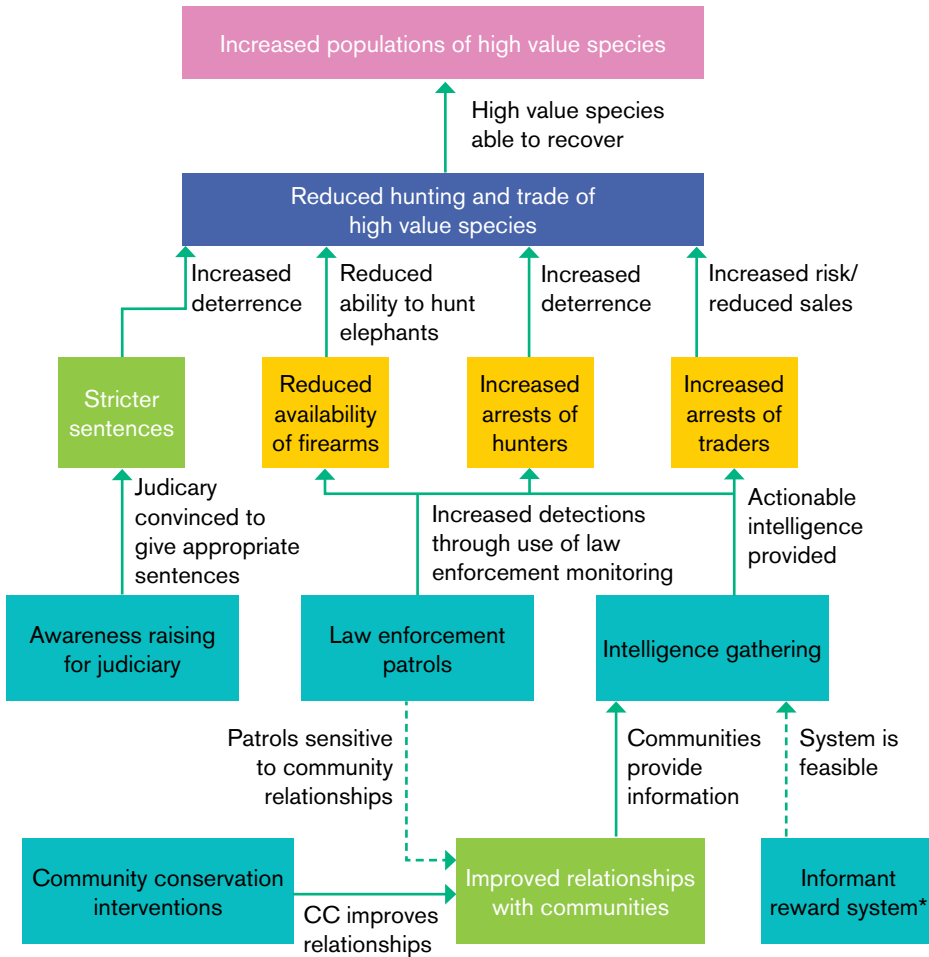
Community informants

Recruiting informants from local communities is a priority for UWA to combat the illegal trade in ivory and wild meat. Given the covert nature of elephant hunting, the limited time hunters spend within park boundaries and the short period of time between an elephant being killed and its tusks being sold, gathering actionable intelligence is critical to improving the chances of arresting hunters and collecting enough evidence to secure convictions. Not only can intelligence-led enforcement help improve

crime detection but it can also act as an extra deterrent, as hunters know there is a greater chance of being arrested and successfully prosecuted.

For intelligence-led law enforcement to be effective, a network of informants providing on-the-ground information about illegal activities is vital (Stokes 2012). Verifing intelligence, a key step in the process, may require information from various sources rather than a single informant, making it desirable to have multiple informants within each community in hotspot crime areas. However, UWA has found recruiting informants difficult, particularly where hunting is prevalent. People are less likely to provide information about their own community (Wilkie and Painter 2016), especially when their relationship with the authorities is poor. **Hence, improving people-park relations is a key step in developing effective informant networks at each site**.

Our research suggests that people living near the two protected areas are significantly more likely to inform on illegal activities if they are benefiting from conservation interventions or if human-wildlife conflict is being tackled effectively. **The action plans therefore propose significant increases in efforts to mitigate human-wildlife conflict and to increase benefits from conservation. Further work is required to ensure that people with resource use agreements and wildlife scouts understand their responsibilities and are incentivised to provide UWA with information on illegal activities.** So far, this process has not met UWA's expectations.

Individuals who inform against members of their own community risk both physical reprisals and ostracism. UWA has a duty of care to protect those providing information. It is essential that informants' identities remain strictly confidential and that direct interaction with UWA staff is kept minimal. It is also important that informants are given proper guidance on how to present themselves. In the past, informants, who are often keen to associate themselves with UWA, have revealed their role to the wider community.

Working with the judiciary

The penalties given to individuals arrested for wildlife crimes largely determine how well law enforcement deters would-be offenders (Keane *et al.* 2008). Individuals prosecuted for serious wildlife crimes, such as the illegal hunting and trade of endangered, high value species, must receive appropriate sentences. In the past, however, this process has been hindered by magistrates treating wildlife crimes as minor offences and handing down minimum sentences, such as community service. Logistical constraints have also led to poor record keeping, so that repeat and first time offenders often receive similar sentences. Working with magistrates and police can help to improve how the criminal justice system processes offenders (Lindsey *et al.* 2013) and wider reporting of successful prosecutions can help to create a perception of heightened risk. Although UWA has made some progress, reassignment of magistrates means that this work needs to continue.

As part of this project, an international NGO the Wildlife Conservation Society supported the development and deployment of a UWA wildlife crime database to hold records of each offence and the personal details, including fingerprints, of each offender. The database aims to ensure that successfully prosecuted repeat offenders receive appropriate sentencing.

Priority actions

Table 4 summarises the priority actions UWA identified to combat illegal hunting and trade of high value species.

Table 4: Priority actions for UWA to combat illegal hunting and trade of high value species.

Intervention	Priority actions	Existing activity	Requires expansion
Ranger patrols	Increase deployment of ranger patrols to the high crime areas identified by Critchlow *et al.* (2015a; 2016b)	Yes	Yes
	Work with other security agencies to control firearms in priority areas	Yes	No
Intelligence gathering	Recruit community informants	Yes	Yes
	Improve community relations through community engagement	Yes	Yes
	Ensure all informants receive training	No	–
	Work with authorised resource users and wildlife scouts to increase provision of intelligence	Yes	Yes
	Undertake feasibility study into an anonymous informant reward system that uses money transferred by mobile phones	No	–
Working with judiciary	Raise awareness among magistrates	Yes	Yes
	Maintain offender database and use data to support prosecutions	Yes	Yes
	Improve reporting of successful prosecutions	Yes	Yes

7

Actions to combat commercial bushmeat hunting

Commercial hunting and trading of bushmeat

Commercial hunting for bushmeat is the most common wildlife crime amongst households living in villages near MFPA and QEPA. We estimate over 40 per cent of households hunted for commercial purposes at least once in 2015, increasing to over 50 per cent in some areas around MFPA. The vast majority of hunters are men who become involved at a young age (15–20 years old), often through friends or family members. When people take up hunting at a later age it is largely because they have lost other sources of income, for example, a business has failed. This pattern suggests that efforts to stop people taking up hunting may best be focused on young men.

Hunters use various strategies including dogs, nets and traps. The most common is wire snares and, in areas populated by the Acholi, wheel traps. These are placed in feeding areas, near watering points or along game trails. Such traps are cheap and easy to produce (particularly wire snares) and difficult for rangers to detect, making them appealing to hunters. However, although effective at killing large numbers of animals, traps are highly inefficient because they 'waste' animals when they are not checked regularly and fatally wounded animals may also escape (Lindsey *et al.* 2013). Traps are often combined with fire setting as this promotes regrowth that lures animals.

Firearms are very rarely used to hunt bushmeat because access to guns is difficult and hunters are scared to be caught possessing a gun.

Hunting effort is strongly seasonal, with peaks during the dry season (when there are few other income generating opportunities) and close to celebrations, such as Christmas and Easter. Several of the hunters we interviewed said hunting during the dry season lets hunters see rangers from further away, leave fewer tracks and concentrate effort in areas where animals congregate. There is, however, significant variation in the times hunters choose to enter protected areas, the length of time they spend there and how far they penetrate into the park. Focusing hunting effort close to protected area boundaries limits the time spent travelling to check traps, carry back meat and hence the risk of detection (Hofer *et al.* 2000), but carries a greater risk of rangers finding traps as boundary areas tend to be more heavily patrolled.

Most meat is reportedly sold locally to satisfy demand in villages near the protected areas. Meat is also sold in trading centres (small market towns) to small 'chop shops', which serve local and visiting customers and are largely run by women. Prices vary throughout the year depending on supply, but bushmeat is often cheaper and better quality than domestically produced meat. Many communities strongly prefer bushmeat over domestic livestock, to the extent that UWA staff say people are known to try to disguise domestic meat as bushmeat. Bushmeat is also sold fresh or smoked to traders from urban centres, where it yields a higher price. Evidence from elsewhere suggests that demand in urban areas is driven by a complex mix of price, availability, culture, ethnicity and status (Van Vliet and Mbazza 2011). Even if efforts to make alternative sources of animal protein more available successfully reduce local demand, they may do little to affect demand from urban centres.

Proposed Interventions

Combating commercial bushmeat hunting and trade must balance interventions that increase the direct costs (for example, the risk of being caught and fined) and those that address the underlying drivers, such as efforts to mitigate human-wildlife conflict or to ensure that communities near parks benefit directly from wildlife. The approach in the action plans focuses on detecting and prosecuting offenders, in combination with activities aimed at building effective working relationships with communities in hotspot areas. Community-focused interventions will work with *all* community members, particularly those that suffer from human-wildlife conflict (who are more likely both to be involved in hunting and to respond to incentives), rather than only targeting households involved in commercial bushmeat hunting. The aim is for a broad improvement in attitudes towards conservation as well as reduced dependence on commercial hunting

of bushmeat. At the same time, UWA aims to avoid creating the perception that illegal behaviour 'pays' since you then benefit from a conservation incentive scheme.

Figure 16 shows how the interventions identified in the action plans are expected to address both the direct and indirect threats commercial hunting and the bushmeat trade pose to wildlife.

Law enforcement patrols and intelligence gathering

As with efforts to counter commercial trade in high value species, law enforcement patrols are a vital line of defence against commercial bushmeat hunting. However, the scale of the problem is a major challenge. Our research findings show that over 40 per cent of households in 'frontline' villages had probably been involved in commercial hunting at some point in the preceding year and that only a small proportion had ever been arrested. Despite UWA's considerable investment in ranger patrols, the deterrent effect has clearly been limited (although it is impossible to know how many more households would be involved if there were no patrols).

As with hunting and trade in high value species, the action plans propose a greater use of law enforcement monitoring data to make patrols more effective. This could increase not only the number of arrests, but also the number of snares and wheel traps detected and removed, lowering wildlife deaths. There is strong evidence from different types of wildlife crime that people are much more sensitive to a rising chance of capture than they are to increased penalties once caught (Leader-Williams and Milner-Gulland 1993; T Sas Rolfes 2012; St John *et al.* 2013). This supports a focus on increased detection.

An effective network of community informants is also important to combat commercial hunting and can make law enforcement activities significantly more effective (Linkie *et al.* 2015). However, informants are less likely to provide information about community members hunting bushmeat than they are about those hunting and trading higher value species. This is because they are likely to sympathise with hunters' reasons or to know them personally. Consequently, the action plans emphasise using informants to identify individuals involved in distributing bushmeat to urban centres. This is intended to disrupt trade and limit hunters' opportunities to find buyers. As with efforts to combat illegal hunting and trade of high value species, recruiting more community informants will require significantly more investment in community engagement activities than UWA currently provides.

Figure 16: Conceptual model showing how proposed interventions are expected to address the direct and indirect threats illegal hunting and trade poses to bushmeat species.
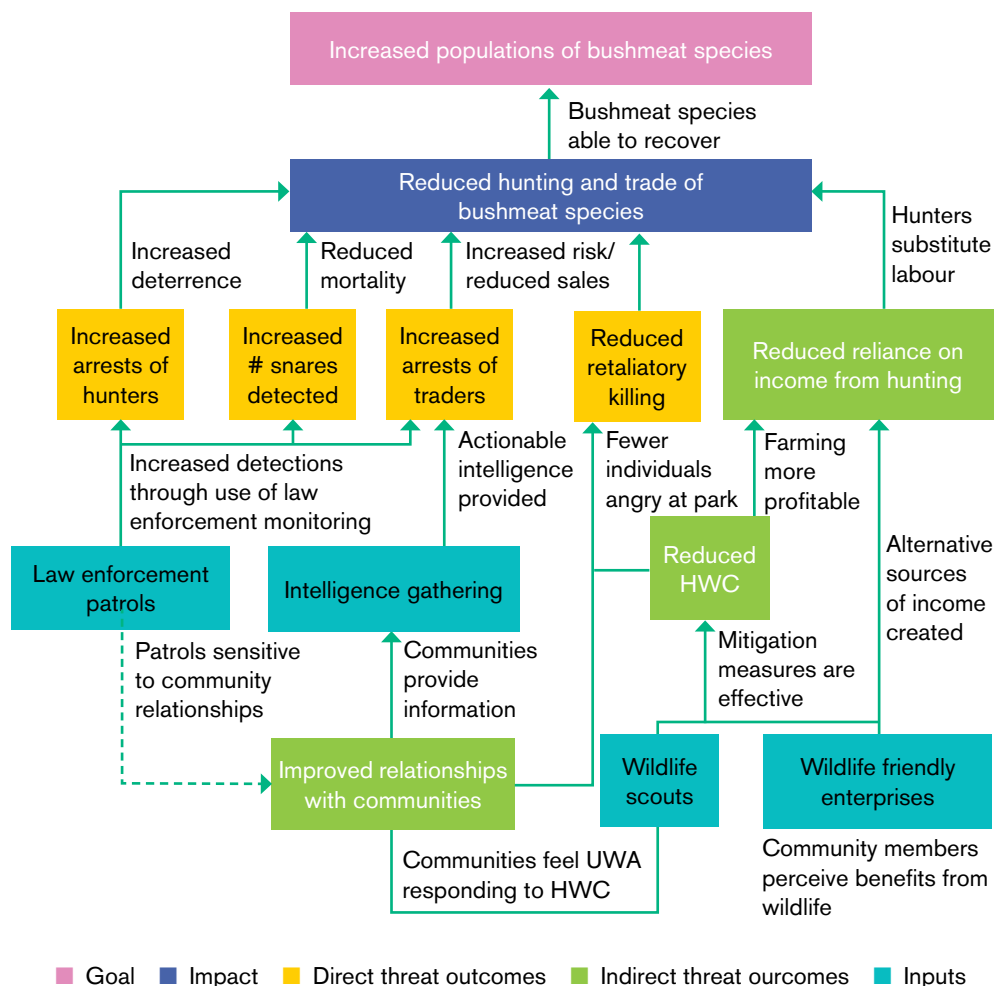
It is also important to note that despite law enforcement's important role in combating commercial trade in bushmeat, poorly-managed law enforcement can undermine relationships between park authorities and neighbouring communities. Our research revealed some suspicions amongst local people of UWA involvement when some local people disappeared inside the park. Equally, there is a perception within UWA that some rangers have been falsely accused of crimes or corruption by local people. Such perceptions, whether justified or not, can have serious, long-term effects on efforts to build trust. Local people also feel that conservation authorities do not take their

complaints seriously. It is essential to address such matters as they arise. This will require greater co-ordination between law enforcement and community conservation units to ensure activities planned by both units have consistent objectives and that instances that might cause conflict are seen to be responded to quickly and action is communicated back to communities.

Human-wildlife conflict mitigation and wildlife scouts

Resentment about human-wildlife conflict is a primary driver of wildlife crime. Our research suggests households that suffered from human-wildlife conflict were over 65 per cent more likely to hunt illegally than those that did not. Human-wildlife conflict is also the most common reason local people give for their negative attitudes towards the two parks, particularly in areas where elephants raid crops. This is compounded by the commonly-held perception that UWA does not take human-wildlife conflict seriously. **Efforts to develop stronger working relationships between UWA and communities must reduce the costs that local people experience through human-wildlife conflict and ensure that people believe their concerns are taken seriously and responded to.**

UWA is starting to move towards a model of community-based management using community volunteers (known as wildlife scouts) to be the first line of response to human-wildlife conflict. This approach aims to reduce the conflicts and to improve relationships with local communities. A wildlife scout programme has been started at MFPA with support from the African Wildlife Foundation (AWF) and Uganda Conservation Foundation (UCF). One of the major challenges, however, is incentivising and retaining wildlife scouts since they are volunteers. In MFPA, the programme has been linked with chilli farming: the scouts are linked with buyers and given seeds and training in cultivation methods in return for their involvement.

The scouts programme at MFPA does not cover the whole of the park boundary — there are still areas experiencing high levels of human-wildlife conflict that have no scouts. And at QEPA, there are currently no wildlife scouts, although some support has been secured from UCF to set up a pilot programme in one district adjoining the park. **The action plans thus propose a roll out of the wildlife scouts programme to all priority areas** identified by the planning teams.

A review of best practice for wildlife scouts to support the action plan process (Mwedde *et al.* 2017). The report covers all operational aspects of the wildlife scout programme and recommends how wildlife scout programmes in Uganda can be improved. The recruitment process is crucial, and the report recommends that participants are selected through a transparent process that is independent of local leaders in order to avoid suspicions of

corruption or nepotism. Focusing recruitment on young men will bring additional benefits, as it will occupy their time, help them to access new sources of income and reduce their chances of taking up hunting.

As wildlife scouts are not employed by UWA and do not receive salaries, it is important that they benefit from the programme through other means. Without this, participation will quickly decline after volunteers' initial enthusiasm recedes. UWA sees the chilli enterprise schemes, and other such schemes, as a good way to maintain participation whilst also physically deterring elephants. Similarly, village savings and loan associations, which enable members to build up capital and invest in enterprises through small loans, could be made more available to wildlife scouts as an incentive for participation in the programme.

However, it is the wider community, not the wildlife scouts that benefit most from the programme, as there is less conflict and a faster response when incidents occur. In the past, people have tended to exaggerate their claims of damage. Other community members, who do not see the damage themselves, may believe the claims, greatly amplifying communities' perception of the problem and also hampering efforts to understand the scale of the issue. **The action plans therefore propose that wildlife scouts' duties should include monitoring human-wildlife conflict incidents and the amount of damage caused**. Scouts should be issued smartphones to document and report damage. Although the Wildlife Act does not provide for compensating affected households, responding to individual incidents will demonstrate that UWA takes the issue seriously. The phones themselves would also incentivise scouts' participation.

Wildlife-friendly enterprise schemes

Wildlife-friendly enterprises offer local people an alternative way to generate incomes that are either directly or indirectly tied to conservation. For example, tourism enterprises, such as selling handicrafts or supplying tourist lodges with fresh produce, have direct links. Indirect links might simply be participants in the scheme agreeing not to engage in wildlife crime. Enterprises can cover a broad range of activities, and this is likely to meet local needs better than focusing on a single enterprise (Wright *et al.* 2016).

Creating income streams through these enterprises is intended to reduce reliance on income from bushmeat hunting and trade. When well designed, enterprise schemes can also bring many secondary benefits, such as promoting communities' institutional development (Clements *et al.* 2010), providing facilities for micro-lending, producing the raw materials used to deter wildlife from crop raiding (such as chilli oil), improving community attitudes towards conservation and reducing reliance on bushmeat as a source of protein.

However, wildlife-friendly enterprises do not have a good track-record of evidenced success, and are often built on assumptions that may not hold (Wright *et al.* 2016). In particular, they may fail if:

1. The enterprises promoted are not genuine substitutes for commercial bushmeat hunting but instead become additional sources of income

2. Benefits are not targeted at those households who hunt the most or who are the most vulnerable to restrictions on using natural resources

3. Household labour is not limited, such that households are able to allocate the time to both hunting and the enterprise being promoted.

Such failings can be avoided with careful design but it is important to note that wildlife-friendly enterprises often require substantial ongoing external investment (of time, capacity and funding), and successes will not be immediate.

Under the action plans, wildlife-friendly enterprises focus on producing chilli and honey, as well as supporting home gardens, in which participating households produce fresh vegetables for tourist lodges. All of these activities are already supported to some extent at the two sites, but investment is either very weak or restricted to a small area. **There is a need to expand support to other priority areas around each park and to increase investment in areas already receiving notional support**. The products identified for initial development (chilli and honey) have the advantage that they are directly linked to human-wildlife conflict mitigation. In the future, this linkage can be strengthened by marketing processed wildlife-friendly products to tourist lodges, urban centres or international markets.

Initially, recruiting participants would not explicitly focus on specific groups (except wildlife scouts, as noted above). This is to increase broader community acceptance and support of the activities, rather than to specifically target those households engaged in commercial bushmeat hunting. This approach also avoids creating perverse incentives, for example encouraging households to take up commercial hunting or trade in order to meet participation criteria.

In the first instance, these interventions would emphasise demonstrating the benefits of participation, developing community acceptance of activities, creating market linkages and building the local institutional capacity necessary for long-term success. In the longer term, there would be an increasing emphasis on demonstrating the sustainability of the enterprises, diversification of products (into agro-forestry or non-palatable crops) and building stricter compliance structures (ie ensuring participating households are not involved in wildlife crime) as acceptance and capacity increases.

Priority actions

Table 5 summaries the priority actions UWA identified in action plans to combat commercial bushmeat hunting and trade.

Table 5: Priority actions for UWA to combat commercial bushmeat hunting and trade.

Intervention	Priority activities	Existing Activity	Requires Expansion
Ranger patrols and intelligence gathering	Target ranger patrols to areas identified by Critchlow *et al.* (2015a; 2015b)	Yes	Yes
	Ensure greater co-ordination between law enforcement and community rangers	Yes	Yes
	Focus intelligence gathering on commercial bushmeat traders	Yes	Yes
Wildlife scouts	Increase support for existing wildlife scouts and expand to new areas	Yes	Yes
	Implement recommendations of the wildlife scout best practice review	No	–
	Integrate wildlife scout households into wildlife-friendly enterprises and village saving and loan associations	Yes	Yes
Wildlife-friendly enterprises	Initiate wildlife-friendly enterprise initiatives in priority areas	Yes	Yes
	Develop monitoring and compliance structures in collaboration with local communities	No	–
	Identify opportunities for diversifying products	No	–

8

Actions to combat subsistence hunting

Subsistence hunting of bushmeat

Although hunters often retain some portion of meat from their catch, domestic consumption is rarely the sole driver of hunting. Although people often talk about subsistence hunters, the term is confusing as it confounds individuals who hunt purely for domestic consumption and those who hunt to generate income to pay for basic subsistence items and services. In reality, there is little distinction between these two different types of hunters as both hunt to meet their basic needs.

Subsistence hunters do not hunt differently from those who hunt commercially, except in the number of hunting trips and the number of snares and traps they set. It is common for subsistence hunters to join friends or relatives who hunt more often. From the perspective of law enforcement, it is very difficult to distinguish between those driven to hunt through need and those who hunt for commercial purposes. Furthermore, increasing fines and custodial sentences may do little to change individuals' behaviour if they hunt to meet their basic subsistence needs, because they may feel they have no alternative to hunting. Providing alternative livelihood options may be more effective in changing subsistence hunting behaviour than commercial hunting.

Studies from other countries provide mixed experience on efforts to reduce bushmeat consumption. In Tanzania bushmeat was found to be substitutable with other domestic protein, such as beef, goat and chicken, and fish (Rentsch and Damon 2013). This seems to suggest that efforts to reduce bushmeat consumption could focus on increasing the price (by limiting the supply) and/or making alternative sources of protein cheaper. However, this strategy's effectiveness has not been verified and may vary geographically.

For example, a study from Congo-Brazzaville showed that even raising bushmeat prices and making other protein available did not reduce the amount of bushmeat consumed (Poulsen *et al.* 2009). So a preference for bushmeat can go over and beyond price. This is borne out by a study in Gabon that found rural people consistently preferred bushmeat over domestic meat (Schenck *et al.* 2006). It is important to ensure that any intervention aiming to reduce bushmeat consumption addresses local preferences.

Studies in MFPA and QEPA have highlighted some substitutability between bushmeat and fish. Increases in bushmeat consumption when fish availability falls is a common finding (Brashares *et al.* 2004) and suggests fish stocks in and around the parks need to be well managed if bushmeat consumption is to be controlled. Another common finding from elsewhere is that people eat more protein (bushmeat and other sources) as household income rises (Wilkie *et al.* 2005; Brashares *et al.* 2011; Rentsch and Damon 2013). This has important implications for activities that aim to reduce hunting by providing alternative livelihoods, as it suggests that, without appropriate controls on behaviour, local bushmeat consumption could actually be increased as incomes increase.

Proposed interventions

Subsistence hunting is predominantly driven by households' need for meat. Care has to be taken in addressing subsistence hunting through harsh law enforcement since that can disproportionately affect poor and otherwise vulnerable households. Reducing people's access to bushmeat without making alternative sources of protein more available will damage household food security and nutrition. Hence, the action plans combine activities to reduce household consumption of bushmeat and activities to boost supplies of alternatives.

Figure 17 presents a conceptual model showing how action plan interventions are expected to address subsistence bushmeat hunting's direct and indirect threats to wildlife.

Animal husbandry and wildlife ranching as alternative protein sources

UWA has previously supported local communities in livestock husbandry programmes funded through the revenue-sharing scheme. However, this has often been limited to distributing small numbers of animals to individuals and has not succeeded in increasing uptake of commercial animal husbandry. **The action plans recommend that livestock programmes should include training on husbandry techniques, intensification of production, disease management and book keeping, and focus on communal projects rather than supporting individuals.** The aims here are twofold: i) to provide the impetus for creating new small businesses and ii) to increase domestic meat supplies. Although increasing the supply of alternative protein does

not guarantee less hunting, this intervention complements activities aimed at reducing hunting by simultaneously reducing demand and providing a 'safety net' for those who might otherwise lose out.

Figure 17: Conceptual model showing how proposed interventions are expected to address the direct and indirect threats to high value species from illegal hunting and trade.
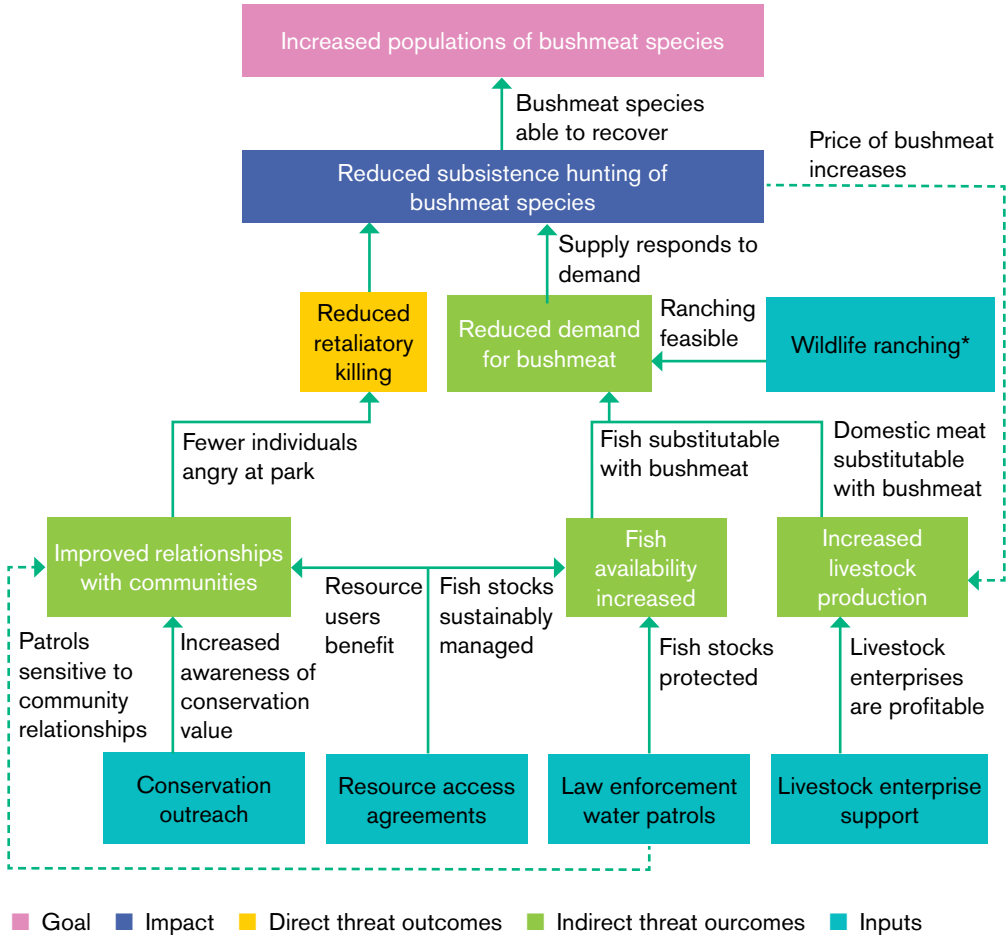
* indicates an intervention requiring a feasibility study.

The Uganda Wildlife Act offers provisions for managing wildlife species on communal land. In priority areas, where bushmeat hunting is high, wildlife ranching could replace some of the meat harvested from the protected areas. This may be particularly relevant for communal land north of MFPA, where livestock numbers remain depressed after losses during the Lord's Resistance Army insurgency and there are limited alternative income-earning opportunities. Producing game meat from wildlife ranching could help to reduce illegal hunting where demand for bushmeat is partly driven by preferences for

meat from wild rather than domestic animals. There are, however, many practical barriers to wildlife ranching, especially at the community level. These include high initial costs, elite capture (where a few individuals reap most of the benefits), restrictions on trading meat and other animal products, variable supplies of meat, laundering of illegally caught bushmeat and financial viability concerns (Lindsey *et al.* 2013). **Before taking this approach, a thorough feasibility assessment will be needed, potentially in partnership with an NGO experienced in starting up community projects based on managing natural resources.**

Inland water law enforcement patrols

A primary source of animal protein in communities adjacent to MFPA and QEPA is fish harvested from the River Nile, Lake Albert, Lake Edward and Lake George. There are already doubts about the long-term sustainability of current fishing effort in important water bodies such as Lake Albert (Mbabazi *et al.* 2012) and any efforts to reduce bushmeat hunting could push these fisheries beyond their tipping point. **It is important that UWA works with district fisheries officers to protect inland fish resources** and support sustainable management. As with other offences, patrols can be made more effective by using more monitoring data to identify hotspots of illegal fishing. UWA have yet to implement this approach to combating illegal fishing.

Extending resource access agreements to fisheries

'Authorised resource user groups' are granted restricted access to certain resources within each of the two protected areas. Currently, there are 18 groups around QEPA and 16 groups around MFPA, which are variously allowed to harvest grass, firewood, snail shells, fish and elephant dung from inside the protected areas, or to keep bees. Of these groups, only five (three around QEPA and two around MFPA) are permitted to fish inside the park. The action plans propose a **greater emphasis on expanding sustainable access to fish stocks**, with the aim of reducing reliance on bushmeat by providing a substitutable alternative source of protein.

Community outreach

UWA undertakes a range of community outreach activities, including awareness-raising meetings, radio talk shows and a school conservation education programme, in which local schools run wildlife clubs associated with the Wildlife Club of Uganda. These activities aim to make communities more aware of the value of conservation and wildlife and to complement other activities designed to improve community perceptions of wildlife. **The action plans propose continuing these activities but with a particular focus on reaching teenage boys before they become involved in wildlife crime.**

Priority actions

Table 6 summaries the priority actions identified in the action plans to combat subsistence bushmeat hunting.

Table 6: Priority actions for combating subsistence bushmeat hunting.

Intervention	Priority activities	Existing activity	Requires expansion
Support for animal husbandry	Support for small livestock enterprises	Yes	Yes
	Feasibility study into creating community wildlife ranching	No	–
Inland water patrols	Target ranger patrols to areas identified by Critchlow *et al.* (2015a; 2015b)	No	–
Resource access	Develop agreements for sustainable fishing	Yes	Yes
Conservation outreach	Focus outreach activities towards young men	Yes	No, but refocus

9

Co-ordination and implementation

In addition to setting out a strategic approach for combating priority wildlife crime at both QEPA and MFPA, the action plans highlight linkages between these interventions, as well as identifying potential implementation barriers to be addressed.

Intervention linkages

The action plans seek to help UWA better co-ordinate interventions and identify measures to maximise synergies and reduce conflicts between these. This is particularly important for activities implemented by the community conservation and the law enforcement units, where there is currently very little operational co-ordination. The action plans' success depends on these units working synergistically to tackle wildlife crime. An example of this is how community conservation activities can provide more actionable intelligence, which in turn can result in more arrests and prosecutions for wildlife crime. In this way, community-focused activities can strengthen law enforcement efforts, making them more effective and a stronger deterrent for illegal activities. Similarly, enforcing rules also forms an important component of the community-level activities. For instance, although some degree of self-monitoring is good within activities such as wildlife-friendly enterprises, possible legal sanctions be a deterrent to breaking participation conditions, creating a 'push and pull' effect for avoiding wildlife crime.

However, law enforcement activities can also work against pro-conservation behaviour. Local people's perceptions of the two protected areas are strongly affected by incidents connected with law enforcement. This is particularly true if members of a community are believed to have been injured or killed by rangers, but may also be caused by rangers'

attitudes towards local people more generally. Rangers are expected to use appropriate force in performing their duties, but must be aware of their actions' implications and ensure they treat local people fairly and respectfully.

There are also opportunities for synergies between different community-level interventions:

- Including wildlife scouts, or members of their household, in wildlife-friendly enterprises ensures that scouts have an incentive to participate in the programme. If the enterprise grows crops to deter wildlife incursions, this can also give scouts raw materials for their work.

- Enterprises linked to bee-keeping, or those producing non-palatable crops, reduce vulnerability to crop raiding, whilst providing a source of income.

- Combating hunting can stimulate the market for domestic meat, thereby potentially reducing reliance on bushmeat as a source of income even further.

Enabling conditions and implementation barriers

While developing the action plans, UWA staff identified several institutional barriers that must be addressed for the plans to be implemented successfully. These include the scarcity of funds and institutional mindsets within UWA headquarters (which see community-focused activities as a poor relation to law enforcement). Successful implementation also needs several 'enabling conditions' including sufficient political will to combat wildlife crime, action to avoid creating perverse incentives, and adequate training for staff charged with implementing the action plans.

Availability and allocation of funds

Funding remains one of the greatest constraints on UWA's operational capacity, particularly with regard to community-level activities. In the past, lack of funds has meant community engagement activities aimed at reducing wildlife crime have been discontinued. One example is the strategy of setting up a "reformed poacher association" with the idea that poachers would be supported with alternative livelihood opportunities. UWA has largely abandoned these because of limited funds and queries over cost effectiveness. UWA's budget comes from income generated by the parks. In years when tourist revenues are lower than expected, annual budgets have to be revised down. Such budgetary adjustments typically fall hardest on community engagement activities, and this can have knock-on consequences, undermining community trust and making activities less effective because they lack long-term support.

It is particularly important to continue community-based activities over the long term in order to build trust. These types of approaches are not quick fixes, and mutual learning in the early stages about how they work best in a particular context will mean that patience is required on both sides. Funding needs to be continued while this process plays out. For this reason, one recommendation from the action plans is that **resources should not be spread too thinly, but targeted towards communities where the need for this approach is greatest, and the most difference can be made using this approach (particularly areas where wildlife crime is at high levels, and there is a will to engage).** UWA recognises the contribution external donor support and collaboration with NGOs makes to combating wildlife crime, but such support has not always been targeted at the areas of greatest need.

The action plans set out priority activities for reducing wildlife crime so that UWA can focus resources where these will have the greatest effect. Activities include both law enforcement and community engagement interventions, both of which are necessary to combat wildlife crime and address its underlying causes. **It is important that UWA allocate more operational budget to community engagement activities, and that any budget readjustments fall equally on different activities**.

The action plans also identify priority activities that, while not currently funded, would increase UWA's capacity to combat wildlife crime. These priority activities either support existing initiatives or create new ones, and may be suitable for external support or greater internal support should funds be made available. The intention of highlighting these priorities in the action plan was to demonstrate how individual activities fit within a wider plan to tackle wildlife crime and to clearly identify priority areas suitable for donor funding or for collaboration with NGOs seeking to partner with UWA.

Cultural mindsets and community engagement

One of the greatest challenges to successfully implementing the action plans is the poor relationship between UWA staff and communities, particularly where wildlife crime is most prevalent. Many interventions in the action plans aim directly at building a positive relationship based on mutual respect and trust. Success will require a change in mindset that recognises that local people and conservation agencies can work together towards common goals. One way to help bridge this gap is to employ more people locally. Another way is to avoid relocating staff from one park to another as this constrains individual official's ability to build trusted relationships with local communities.

How UWA handles compliance with the rules for participating in interventions such as wildlife-friendly enterprises is also particularly important. Long-term effectiveness will rely on developing compliance structures, including self-monitoring, community-agreed and enforced sanctions and rewards, transparent reporting and conflict resolution procedures. Yet such structures take time to be developed and, perhaps more importantly,

to be accepted. Over-zealous enforcement of rules at an early stage may jeopardise acceptance, particularly if people don't feel the benefits of participation immediately.

UWA staff, particularly at HQ level, also need to change their mindset and start seeing community engagement interventions as a crucial complement to law enforcement if wildlife crime is to be successfully tackled.

Avoiding perverse incentives

Providing positive incentives to change behaviour is one of three principles guiding the action plans. However, it is equally important to avoid creating perverse incentives that may encourage counterproductive behaviour. The primary challenge here is ensuring that households not currently engaged in wildlife crime are not incentivised to become involved simply to increase their chances of participating in planned community engagement interventions.

If benefits are directed at households engaged in wildlife crime, there is a risk that law-abiding households are encouraged into crime, or that resentment at the perceived unfairness develops. Such effects would undermine the action plans. Consequently, all community members should be allowed to participate in each of the interventions planned. Where participation is constrained, either through limited resources or for practical reasons (for example, not everyone can become a wildlife scout), recruitment can be targeted at groups most likely to become engaged in wildlife crime. For example, young unemployed men are a particular priority. Alternatively, the community may agree that specific groups are particularly worthy of support (for example those who are particularly affected by crop damage, or particularly vulnerable). It is very important, however, that participation is not based upon whether or not a household is believed to be engaged in wildlife crime. This approach focuses on increasing wider acceptance and support for conservation within each community and addressing the underlying drivers of wildlife crime so that wildlife crime decreases over time.

Beyond the priority communities identified in the action plans, there is a risk that households from neighbouring communities or further afield may be incentivised to migrate to villages receiving support. Such a honeypot effect has been observed at protected areas around the world (Wittemyer *et al.* 2008) and can be a problem for interventions trying to encourage pro-conservation behaviour (Ferraro and Kramer 1997). In such cases, setting clear eligibility rules for participation in an activity is important (Balmford and Whitten 2003). There is also a risk that neighbouring communities might decide to increase their wildlife crime so that their village is included in an intervention. Although this risk is considered low, it will be necessary to qualitatively monitor behaviour in neighbouring villages and to expand support where appropriate. For example, successful wildlife-friendly enterprises may be suitable for expansion to other villages given sufficient demand for products.

Political will

Lack of political support represents a potentially critical obstacle to the action plans' long-term success. In the past, local politicians have undermined public opinions of wildlife and promised to allow access to park resources as a means of securing votes. The effects of such interference can be difficult to undo. Consequently, co-ordination to ensure that local leaders understand the proposed interventions and the benefits that these will bring to communities is essential. It is also expected that once local communities see the benefits of conservation interventions, there will be less backing for politicians that threaten their continuation.

Training needs

Insufficient training, especially for community conservation wardens and rangers, is impeding UWA's capacity to address wildlife crime. **UWA's Community Conservation Directorate has identified developing a training programme for community conservation staff as a priority activity. Similar training in how to engage with local people respectfully and fairly is required for all staff at park level, including law enforcement rangers**. Currently, rangers receive no formal training in community engagement (in contrast to the focus given to training on law enforcement). Such a training programme would address key skills gaps identified by UWA community conservation staff — particularly intervention planning, co-ordination with law enforcement, conflict resolution, gender sensitisation, monitoring and reporting (Mwedde 2016).

As well as needing appropriate training, staff responsibile for implementing the action plans need adequate logistical support. Finally, even with training, some of the proposed interventions need skills not currently found within UWA or partner organisations. We recommend that all plans for specific interventions include a skills assessment to identify any requirements for external expertise.

Community Conservation Policy

UWA's Community Conservation Policy was first published in 2004 and does not reflect the Community Conservation Directorate's current priorities or activities, particularly the role that community conservation activities can play in combating wildlife crime. Consequently, **we strongly recommend that the Community Conservation Policy is updated to set a clear direction for UWA's Community Conservation Unit as a strategic and necessary complement to law enforcement.**

10
Conclusion

A main conclusion from our research was that community-based interventions could help to combat wildlife crime in Ugandan protected areas. In some ways, this is an unremarkable result. Putting aside other potential benefits, such as poverty alleviation, community engagement has long been heralded by many as an important tool to protect wildlife (Murphree 2000; Adams and Hulme 2001; Adams 2004). Yet, while community-based interventions have a long history in Uganda, their conservation impact remains unclear (Infield and Adams 1999; Infield and Namara 2001; Lamprey and Mugisha 2009; Blomley *et al.* 2010).

Conversely, despite our research raising questions about the effectiveness of law enforcement patrols, and our finding that many households near the protected areas are involved in wildlife crime, the largely protectionist policies pursued by UWA at both QEPA and MFPA appear to be having some effect. The latest aerial censuses of wildlife in both parks show increasing or stable populations of nearly all of the species surveyed (Wanyama *et al.* 2014a; Wanyama *et al.* 2014b). As with protected areas elsewhere (for an example, see Brockington 2004), this apparent success of protectionist policies reduces the incentive for UWA to implement community-based interventions.

So why invest in community-based interventions, particularly as they challenge the status quo, potentially cost more, and require both institutional change within UWA and long-term commitment to neighbouring communities. The risk of shifting focus and resources from a tried and tested approach (law enforcement patrols) to a greater emphasis on combining community engagement and law enforcement interventions may appear high, especially for unproven and relatively intangible rewards. It is understandable why UWA has been most interested in law enforcement as their primary strategy.

However, a strong argument for community-based interventions is that a more balanced approach between community-based and law enforcement interventions can help to cut wildlife crime by helping to win local support for conservation. At present, people

living around the two study sites largely see conservation policies as unfair and wildlife as a threat to crops, livestock and themselves. This attitude represents an on-going and looming threat to wildlife inside both QEPA and MFPA. While the national population growth rate in Uganda was 3.0 per cent per year between 2002 and 2014 (UBOS 2014b), population growth rates in rural areas bordering QEPA and MFPA are significantly higher. For instance, in Nwoya district immediately north of MFPA, population growth rates for 2002–2014 were the highest in the country at 9.6 per cent (UBOS 2014c). If the high proportion of households involved in wildlife crime is not addressed, the number of offenders and the volume of offtake will increase dramatically, threatening to upset the recent positive trends in wildlife numbers at both sites. As well as the risk posed by rising human populations, there are rising risks posed by organised, systematic poaching of high value wildlife. So far, Uganda has largely avoided this but it is prevalent in neighbouring countries such as Tanzania (Chase *et al.* 2016). Such poaching operations are a significant threat to the slow recovery of Uganda's elephant population. The active co-operation from local communities is vital because intelligence is the most effective way to reduce high value wildlife crime.

Hence, while it is important to recognise recent conservation successes, the current positive trends in wildlife numbers are not assured. Our research suggests that greater investment in community engagement, in combination with law enforcement, could make protected areas more resilient by directly addressing the factors that push people into wildlife crime. This approach is also likely to make conservation activities more sustainable in the long term. While interventions such as wildlife-friendly enterprises can require significant initial investment in training and materials, the intention is that they become self-financing in the longer-term, maintaining the link to conservation because being wildlife-friendly adds value to the products. The investment needed in community engagement activities should reduce as interventions progress successfully. Hence, although community engagement interventions may cost more than law enforcement activities initially, this added investment may be recouped in the longer-term.

Finally, there is also the issue of equity. One of the problems commonly raised during this research was the lack of wildlife on community land. Community-based natural resource management, such as trialled at Lake Mburo (Lamprey and Mugisha 2009), was therefore not seen as a viable option. In many ways, this is emblematic of Uganda's approach to wildlife conservation, which revolves around protected areas. Unlike in many African countries, where there are large areas of communal land that are rich in wildlife and have been voluntarily set aside by communities for conservation, in Uganda the vast majority of wildlife is inside protected areas to which few local people have access. Because there is no tradition of a wildlife economy on communal land, local people convert their land to agriculture and farm right up to the boundaries of the protected areas. Where wildlife does venture out of protected areas, it poses a risk to crops and people alike. To rub salt in the wound, in such cases, local people are legally prevented from killing the wildlife

that threatens their livelihoods, but instead have to rely on sporadic assistance from UWA rangers or support from NGO projects. Consequently, local people are largely unable to benefit from wildlife but bear significant costs because they live near protected areas. The interventions considered in this project aim to create a more equitable situation by mitigating human-wildlife conflict and by increasing opportunities for local people to benefit from living close to wildlife.

There is a perception that some within UWA see community engagement initiatives as 'working with the enemy' and not as activities central to reducing wildlife crime. UWA staff say there is very little co-ordination of activities between law enforcement and community conservation units, and that they can sometimes undermine each other, or miss opportunities for synergies. This is particularly true where people perceived brutality or unfair arrest by law enforcement rangers. This can jeopardise community engagement activities aimed at improving the relationship between local people and the park. Our research shows that if certain community engagement interventions were implemented, local people would be more likely to provide information about illegal activities to UWA staff, thereby supporting law enforcement. The action plans described here provide a better, more co-ordinated strategy to combat wildlife crime at each park, incorporating all activities aimed at tackling wildlife crime and working to avoid clashes and to capitalise on synergies.

The Ugandan government needs to take vital steps to broaden its approach to combating wildlife crime. Uganda is developing a national strategy to combat poaching, illegal wildlife trade and trafficking. Staff involved in developing the QEPA and MFPA wildlife crime action plans are also involved in drafting the national strategy, and will be able to feed the findings presented here into the thinking for that strategy; particularly the guiding principles of developing long-term partnerships with local people and providing incentives change behaviour change by addressing underlying drivers of wildlife crime.

For long lasting success, the role community engagement activities can play in addressing wildlife crime must be recognised, and community conservation units within UWA must be given the support, training and resources they need. This will allow community conservation and law enforcement units to work on equal footings to develop programmes to combat wildlife crime at national and park level.

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Research Report
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Wildlife crime has come under increasing international scrutiny in recent years, with ever more money being spent on activities to combat it. However, little is known about what drives local people to become involved in wildlife crime, or about which interventions are likely to be most effective in tackling it. This report outlines the findings of research conducted within the villages bordering two of Uganda's largest protected areas (Queen Elizabeth and Murchison Falls), and presents policy recommendations for addressing wildlife crime at the national and park level.

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