Evaluating the success of 'Warrior Watch':

A Community-Based Conservation Initiative in Samburu, northern Kenya

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"*Enlisting the support of local people is, and will continue to be, critical to management and conservation efforts*".

Browne-Nunez & Jonker (2008)

"We were brought fresh from cattle, who only herded cattle… Samburu people were good conservationists and now we [morans] have been included to add to that effort. We are called to report on many things, even security… The wildlife are not to be carried on your back but we are to observe and conserve them… I used to be so ignorant and I had no idea what was happening in the conservancy, now I am totally convinced that it is vital and we should all embrace it".

Reria Lolkidenye,Warrior Watch *moran*, Lorora; 2010-present.

[Translated from Samburu, Warrior Watch training session; January 24th 2011]

Cover Image: Warrior Watch *morans* complete the Venn Diagram exercise in the lugga, Ngutuk Ongiron. **Right:** Reria listens during a Warrior Watch meeting, July 2010.

DECLARATION OF OWN WORK

I declare that this thesis (insert full title)

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Is entirely my own work and that where material could be construed as the work of others, it is fully cited and referenced, and/or with appropriate acknowledgement given.

Signature……

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ACRONYMNS & ABREVIATIONS

BSNR	Buffalo Springs National Reserve
EJMG	Prof. E.J. Milner-Gulland (Primary Supervisor; ICL)
EL	Ewaso Lions
FG	Focus group
HCC	Human-carnivore conflict
HG	Heather Gurd (self)
HWC	Human-wildlife conflict
JL	Jeneria Lekilele (Research Assistant; Meibae)
KWS	Kenya Wildlife Service
M&E	Monitoring and evaluation
Ngutuk	Ngutuk Ongiron
NL	Ngila Ltenesi (Research Assistant; Westgate)
NRT	Northern Rangelands Trust
RA	Research Assistant
SB	Shivani Bhalla (Secondary Supervisor; Ewaso Lions)
Shoats	Sheep and goats
SNR	Samburu National Reserve
TPB	Theory of Planned Behaviour
VD	Venn diagram
WW	Warrior Watch

ABSTRACT

Human-wildlife conflict poses a significant and growing threat to conservation efforts, and to human lives and livelihoods, worldwide. Large carnivores have been amongst the worst affected; human persecution the greatest threat to their survival. Engagement of local communities is now regarded as integral to effective resolution of human-wildlife conflict, and a wealth of community-based interventions have been implemented accordingly. However, few such interventions have been subject to rigorous evaluation; fundamental to ensuring maximum return on investment from limited resources.

This study examines the effectiveness of *Warrior Watch*; a novel community-based initiative in Samburu, northern Kenya. *Warrior Watch*, essentially a participatory monitoring and awareness raising programme, engages the *moran* demographic (warrior-aged males); traditionally a marginalised group and those frequently implicated in wildlife conflict. In the absence of baseline data, this study utilises a four-pronged mixed methods approach, incorporating Venn diagrams, focus groups, questionnaires and community quizzes. Application of these tools indicates that *Warrior Watch* has contributed significantly: (i) to improving attitudes and behavioural intentions towards wildlife, and particularly predator, conservation; (ii) to socially and politically empowering the *moran* demographic; and (iii) to increasing community awareness of the importance of wildlife conservation and potential methods for mitigating human-carnivore conflict . However, it has not significantly improved levels of ecological and behavioural wildlife knowledge within the wider community. Comparisons with neighbouring Meibae Conservancy, where *Warrior Watch* is not in operation, revealed poor predator tolerance, minimal support for conservation initiatives and substantially lower levels of empowerment of the *moran* demographic. At a micro-scale, findings justify expansion of *Warrior Watch* to neighbouring Conservancies, provided recommendations of this study are adhered to. At a macro-scale, this evaluation provides evidence that community-based initiatives targeting problem groups can successfully engender a positive conservation ethic amongst the wider community, without heavy reliance upon financial incentives.

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1. INTRODUCTION

1.1 PROBLEM STATEMENT

Despite implementation of a wealth of international conservation measures, global biodiversity continues to decline at an unprecedented rate; predominantly fuelled by anthropogenic activities (Butchart et al., 2010). Human-wildlife conflict (HWC)[1] features amongst the primary drivers of this decline and presents a serious obstacle to conservation efforts worldwide (Woodroffe et al., 2005a).

Human population growth and encroachment into, and fragmentation of, suitable habitat has increased the interface between people and wildlife (Woodroffe, 2000); exacerbating conflict. Hostilities towards wildlife are ubiquitous wherever substantial actual, or perceived, threats to human lives and livelihoods exist; resulting from: (i) competition for forage and water (Campbell et al., 2003; Young et al., 2005); (ii) disease transmission (Roelke-Parker et al., 1996; Cleaveland et al., 2001); (iii) crop raiding (Hill, 2000; Webber et al., 2011) (iv) livestock depredation (Romanach et al., 2007; Holmern et al., 2007) and (v) wildlife-induced injuries/fatalities (Löe & Röskaft, 2004). Local communities may also incur indirect costs from investment in mitigating measures (Thirgood et al., 2005).

Whilst HWC is neither confined to particular regions or species, the sensitivity of large carnivores is especially acute; human persecution the greatest threat to their survival (Woodroffe & Ginsberg, 1998). Such vulnerability may be attributed to a host of factors; their extensive home ranges, which often exceed protected area boundaries, cause increased contact with people generating a powerful edge effect (Woodroffe & Ginsberg, 1998). Their tendency to predate upon livestock and invoke fear has further contributed to the negative attitudes held against them (Woodroffe, 2000). Conflict over livestock depredation was responsible for the extinction of the Thylacine (*Thylacinus cynocephalus*) and Falkland Island Wolf (*Dusicyon australis*; Woodroffe et al., 2005a; Macdonald & Sillero-Zubiri, 2004), and continues to contribute to extensive

[1] "*Any interaction between humans and wildlife that results in negative impacts on human social, economic or cultural life, on the conservation of wildlife populations, or on the environment*" (WWF 2005)

range contractions experienced by species; including the African wild dog (*Lycaon pictus*), lion (*Panthera leo*) and cheetah (*Acinonyx jubatus)*[2].

Despite people, livestock and wildlife having coexisted in Africa for several thousand years (McCabe et al., 1992), rapid population growth and increased access to armaments and poisons, has since lead to widespread conflict (Campbell et al., 2009;Woodroffe et al., 2005a). In Kenya, effective conservation of large carnivores[3] necessitates resolution of such conflict, given: (i) >50% of suitable wildlife habitat – and >70% of wildlife - exists on communal grazing and community lands (Mizutani et al., 2005; Okech, 2010); (ii) human encroachment affects 72% of designated reserves, with HWC the third greatest threat to biodiversity in Kenya's protected areas (Kiringe & Okello, 2007; Okech, 2010) and (iii) in spite of a ban on all hunting in 1977 (Koch, 1995), retaliatory attacks in response to livestock depredation are common (Frank et al., 2005; KWS, 2010a). Most recently, in June 2012, six lions were killed following livestock depredation outside Nairobi National Park; a species declining by over one hundred individuals a year in Kenya, with <2,000 remaining today (KWS, 2012).

Unsurprisingly, HWC resolution has attracted substantial research effort (Woodroffe et al., 2005a), resulting in the implementation of a host of measures from compensation schemes (e.g. Nyhus et al., 2005; Maclennan et al., 2009) to predator-proof bomas (e.g. Born Free Foundation, 2012) and community outreach (e.g. Marker, 2009). Most are based on the premise that, by reducing costs of coexistence, they will better align local communities' interests with those of society at large. Few such initiatives have been evaluated (section 2.3) and fewer still consider social impacts (Dickman, 2010), despite success often being contingent upon changing human behaviours. A paucity of evaluations is common throughout the field (Ferraro & Pattanayak, 2006); a likely result of the current conservation culture, and one which must be addressed if current biodiversity declines are to be reversed through effective allocation of limited resources.

This study aims to evaluate just one of the myriad of interventions designed to address HWC; '*Warrior Watch'* (WW). WW is a novel community-based initiative in Samburu,

[2] All three now listed as endangered or threatened on the IUCN redlist (IUCN, 2012).

[3] African lion; wild dog; cheetah; leopard (*Panthera pardus*); and spotted (*Crocuta crocuta*) and striped (*Hyaena hyaena*) hyena

Kenya; a region home to globally important carnivore (wild dog, cheetah and lion; KWS, 2010a; KWS, 2010b) and herbivore (including endangered Grevy's Zebra (*Equus grevyi*)) populations. In a District with widespread poverty, where livestock represent wealth and status, high levels of predation on domestic animals present a major socio-economic constraint (Esilaba et al., 2007; Ogara et al., 2010). Romanach et al. (2007)[4] found low tolerance for all predators; concluding their future on communally-owned land remained "*highly uncertain*". Indeed, the community attributed the historic disappearance of wild dogs[5] to the combined effects of persecution and disease (Woodroffe et al., 2005b), whilst Esilaba et al. (2007) found higher levels of HWC in communities living in closer proximity to Samburu National Reserve (SNR).

In response, Ewaso Lions launched WW in early 2010, in partnership with Westgate Community Conservancy; a Northern Rangelands Trust Conservancy bordering SNR (section 2.4.2). This participatory monitoring and awareness-raising programme, was designed to encourage Samburu *morans*[6] - a traditionally neglected group typically implicated in wildlife conflict - to act as wildlife ambassadors by engaging them in conservation efforts, with an emphasis on predators. Ewaso Lions has trained fifteen *morans* in two Conservancies[7] and plans to expand further. An assessment of the programme's effectiveness is recommended.

1.2 IMPORTANCE OF PROGRAMME EVALUATION

Evaluation is important to determine a project's fulfilment of intended objectives, but equally enables identification of unintended impacts (Ferraro & Pattanayak, 2006). Consistent with this, evaluations allow less effective interventions to be identified and abandoned, or modified through a process of continuous learning and adaptive management (Bottrill et al., 2011); improving decision-making by reducing uncertainties (Cundill & Fabricius, 2009), and enabling more efficient resource allocation.

Evaluations can further increase public and internal accountability and transparency (Cundill & Fabricius, 2009); particularly pertinent as attempts are made to document

[4] Romanach et al. (2007) study was conducted in Samburu and neighbouring Laikipia.
[5] Wild dogs have recently returned to Samburu following their disappearance in the 1980s.
[6] Males of the warrior age-set (typically 15-30 years old; reference section 2.4.4).
[7] Nine in Westgate and six in neighbouring Mpus Kutuk ('Kipsing') Conservancy.

progress towards curbing biodiversity declines (Stem et al., 2005). They may further help mobilise support to expand/alter a programme (Pattanayak, 2009) e.g. through leveraging funding or increasing advocacy amongst stakeholders.

1.2.1 Why evaluate Warrior Watch?

Evaluations can be complex and costly (Clark 1996), therefore, the first step is to determine whether an evaluation should be conducted at all; Ferraro & Pattanayak (2006) and Pattanayak (2009) document criteria under which it is deemed useful. Regarding WW specifically, several factors signify the potential worth of evaluation:

WW is a novel project, representing the first attempt to engage *morans* in predator conservation within the region, thus represents an invaluable opportunity for learning and to contribute to knowledge of HCC mitigation.
Replication potential is high as demonstrated via prior expansion into Mpus Kutuk.
There is a need to justify further expansion/ alterations.
There is potential for leverage of further funding; particularly important considering Ewaso Lion's sole reliance upon receipt of grants and donations.

1.3 STUDY AIM

To critically evaluate the social impacts of, and perceptions towards, Warrior Watch within Westgate, so as to generate recommendations to improve programme efficacy in the pre-existing locations and to determine whether, and in what capacity, expansion is justified (particularly in reference to the planned expansion into neighbouring Meibae Conservancy). It is not within the remit of this study to evaluate the ecological value of the participatory monitoring data collected by *WW-morans* or to quantify the impact WW has had on wildlife populations through changes in human behaviour towards predators.

1.4 OBJECTIVES AND HYPOTHESES

Table 1.1 Research objectives and hypotheses

Research Objectives:	Hypotheses:
I. To determine if and how WW has influenced conservation attitudes and behavioural intentions in Westgate, and how results compare with Meibae where the programme does not operate.	**H1:** WW has had a positive influence on attitudes and behavioural intentions towards wildlife, and specifically predator, conservation within Westgate; this being most evident in the *moran* demographic.
II. To determine if and how WW has empowered the *moran* demographic in Westgate, and how empowerment of *morans* compares with Meibae.	**H2:** WW activities have resulted in increased political empowerment of *morans*; particularly involvement in conservation decision-making processes.
III. To determine if and how WW has influenced the conservation and ecological knowledge of people living in Westgate and how their knowledge compares to residents of Meibae.	**H3:** WW has a positive influence on the conservation and ecological knowledge of conservancy members with scores higher in Westgate than Meibae.
IV. To understand people's knowledge of, and perceptions towards, WW including personal and/or conservancy-wide benefits and concerns, and how WW compares to other initiatives operating in the region.	**H4:** Positive perceptions towards WW relative to other initiatives are greatest amongst participating *morans*; with limited benefits outside the *moran* demographic.
V. To establish whether patterns emerging in I-IV are consistent across the Conservancy or operate along a gradient of exposure to the WW programme.	**H5:** Communities living in closer proximity to the base of WW will exhibit greater knowledge of and more positive attitudes towards wildlife conservation, and WW.
VI. To make recommendations to improve the efficacy of WW	

2. BACKGROUND

2.1 EVALUATING CONSERVATION INTERVENTIONS

Effective management necessitates incorporating well-constructed monitoring and evaluation systems (M&E) into programme design (Stem et al., 2005). Monitoring is concerned with garnering information about changes in state variables over time (Yoccoz et al., 2001), whereas evaluation involves systematically assessing whether a pre-defined set of goals have been met (Weiss, 1998).

2.1.1 Evaluation within the conservation field

Box 2.1: "[There are] *few well-designed empirical analyses to assess even the most common biodiversity conservation measures*". (MEA, 2005)

Even accounting for the fact conservation is a relatively new discipline, rigorous evaluations are rare and the field lags behind others, in terms of quantity and quality (Ferraro & Pattanayak, 2006; Howe & Milner-Gulland, 2012; Box.2.1). This is partially attributable to the current culture of self-censorship; practitioners – aware that renewal of funding may be contingent upon prior achievements – tend to report success not failure, limiting potential for social learning and effective resource allocation (Redford & Taber, 2000). Further barriers include:

- Failure to explicitly incorporate M&E into programme design; itself driven more by '*urgency*' than '*evidence of success*' (Margoluis et al., 2009a);
- Difficulties addressing biological problems within anthropogenic settings, where measurement units (e.g. humans) may differ from target units (e.g. ecosystem or species) and practitioners lack adequate social science training (Margoluis et al., 2009a);
- Difficulties establishing casual relationships where multiple interventions are operating simultaneously and/or changes are slow to manifest or effects are indirect (Howe & Milner-Gulland 2012).

Nevertheless, since the mid-1990s the importance of evaluation has become increasingly apparent to conservationists. Stem et al. (2005) reviewed >100 publications from the field concerned with programme evaluation; classifying four main

purposes for conducting evaluations (Table2.1), focus here is restricted to "*effectiveness measurement*".

Table 2.1: The four purposes for conducting evaluations as defined by [1]Stem et al. (2005) and [2]Salzer & Salafsky (2003).

	Description:
Basic research	*"the gathering or generation of knowledge about a subject to better understand the topic"*[1]
Accounting and certification	*"considers whether an organisation or programme is fulfilling its obligations to donors, the public, the government, or some other enforcement entity"*[1]
Status assessment	*"Assessing the condition or status of a particular conservation entity (such as species, population, and ecosystem), generally irrespective of a particular intervention designed to affect the variable"*[1]
Effectiveness measurement	*"Answers the question: are the actions we are taking having their intended impact"*[2]

2.1.2 When is a programme considered '*effective*'?

Clark and Brunner (1996) specify that evaluation "*should assess success and failure in terms of goal achievement and accountability for outcomes".* Defining success, however, can be relatively complex; being largely subjective (Feuerstein, 1986). Firstly, divergent objectives – humanitarian, environmental, scientific or otherwise – can result from the range of (inter)national donors and practitioners who characterise the field (Ferraro & Pattanayak, 2006; Botterill et al., 2011). Secondly, local communities may hold conflicting views; Feuerstein (1986) documents an example where locals deemed a development intervention successful not because it had improved sanitation but because villagers used the lockable outhouses built to store their valuables. Finally, what constitutes '*success*' remains entirely project-specific.

Defining clear goals - ideally during the planning phase -upon which all stakeholders agree, sets a benchmark against which to measure effectiveness (Kleiman et al., 2000). Making this a participatory process fosters support by increasing local peoples' sense of ownership.

2.1.3 Evaluation design

Traditionally, evaluations focused on measuring the extent to which planned activities were carried out, in the form of inputs and outputs. However, Ferraro & Pattanayak (2006) called for a shift towards analysing achievement at more fundamental levels: outcomes and impacts (Fig.2.1).

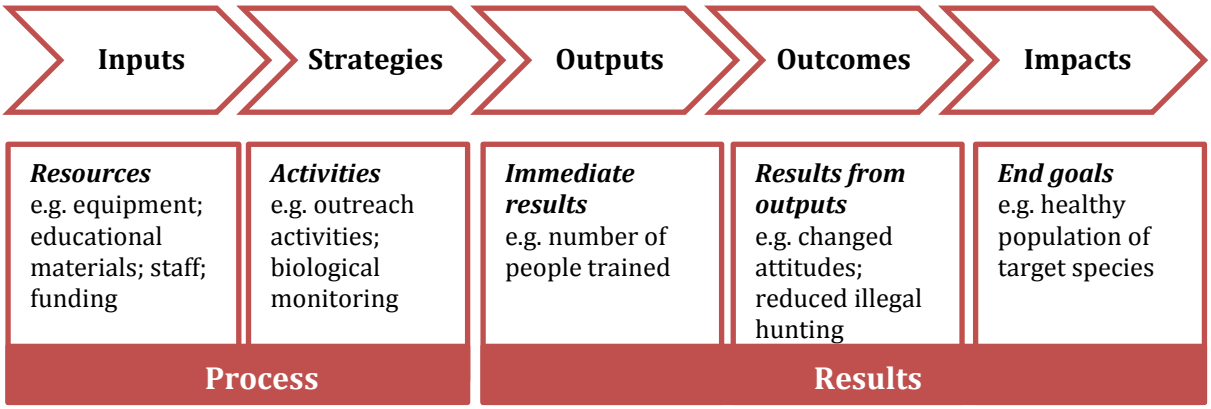


Fig. 2.1 Components of an evaluation framework; adapted from Margoluis et al. (2009b)

Assessment at this level necessitates consideration of the counterfactual outcome; what would have happened in the absence of the intervention? (Ferraro & Pattanayak, 2006). Given this is unobservable, requiring quantification of the difference in outcomes for the same unit of analysis, various methodological approaches can be employed to reconstruct an approximation of it; a 'before-after' comparison alone cannot achieve this due to potentially confounding influences (Ferraro & Pattanayak, 2006).

Whilst randomised experimental designs confer the highest internal validity, and may be appropriate for measuring the effectiveness of educational campaigns[8], they are often deemed ethically or logistically inappropriate (Margoluis et al., 2009a). Whilst quasi-experimental designs[9] provide a robust alternative, Margoluis et al. (2009a) argue that the complex and dynamic context conservation interventions operate in, and the limited resources available, mean interventions rarely lend themselves to this type of design. They argue evaluations are "*not a one size fits all endeavour*" and need not always "*establish absolute causality, maximise external validity, and rule out all other explanations*", but should be shaped by "*trade-offs on issues such as precision, cost and*

[8] For examples of randomised experimental design applied to educational campaigns see section 2.3

[9] Quasi-experimental designs are similar to experimental designs but lack random assignment; a common example is to use matched controls (e.g. Andam et al., 2010)

buy-in". Regarding multi-faceted interventions Bettinger et al. (2010) argue that all components must be assessed to determine what ultimately contributed to success or failure.

2.2 MEASURING ANTHROPOGENIC IMPACTS; LEARNING FROM OTHER DISCIPLINES

It is often assumed that by reducing wildlife-induced damages HWC will concurrently diminish, however, evidence suggests underlying social factors play an equally important role in shaping conflict (Dickman, 2010); in Namibia cheetah persecution continued despite successful implementation of mitigating measures (Marker, 2002), whilst Goldman et al. (2010) document complex cultural relations between Maasai and lions. Despite this, the "human" side of HWC interventions often goes unevaluated due to a lack of training and collaboration between biologists and social scientists (Bettinger et al., 2010).

2.2.1 Measuring attitudes and behaviours

Attitudes[10] may be measured in a variety of ways; all have their limitations. One widely employed survey instrument is the Likert-scale, where individuals are asked to define their level of agreement with a statement along a symmetrical scale; typically 'strongly disagree' to 'strongly agree'. Under this construct, several indicators are often used and combined into a score to reduce risk of measurement error (Heberlein, 1981). One criticism, however, is that Likert-scales limit people to answering in a pre-defined manner. Also, westernised techniques may not be appropriate when applied in an African setting (Browne-Nunez & Jonker, 2008); Kangwana (1993), for example, found Likert statements were not understood by Kenyan Maasai. Conversely, open-ended questions – whilst potentially providing a more in-depth understanding – make attitude comparisons hard since they lack standardisation.

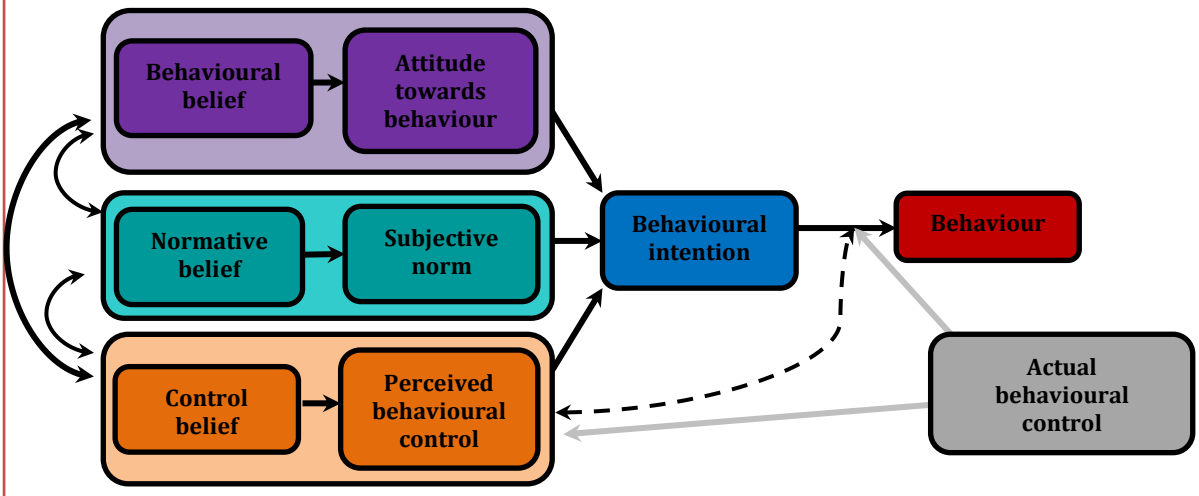
Despite advances in attitude research, Browne-Nunez and Jonker (2008) found most African attitude surveys pertaining to conservation were not grounded in theory nor did they refer to behavioural implications. One cannot assume that changing attitudes concomitantly changes behaviour; Waylen et al. (2009) show that ecotourism had a positive impact on attitudes but failed to change conservation behaviours, with hunting

[10] Defined by Ajzen (2005) as "*a disposition to respond favourably or unfavourably to an object, person, institution or event*"

still perceived as the greatest threat to wildlife. In measuring intervention effectiveness it is therefore prudent to measure behavioural components too.

The Theory of Planned Behaviour[11] (TPB; Ajzen, 1991) seeks to explain this complex relationship between attitudes and behaviours; with recent application in the human-carnivore conflict (HCC) arena (Marchini & Macdonald, 2012). It proposes that the intention to conduct a particular behaviour is the most proximate determinant of actual behaviour, with intention governed by personal attitudes, social pressures and perceived behavioural controls (Fig.2.2).

Fig. 2.2 Theory of Planned Behaviour (Ajzen, 1991)



- **Personal attitudes** refer to the subject's own evaluation of performing the behaviour, which itself must be explicitly target-, action-, context- and time-specific.
- **Subjective norm** equates to perceived social pressures to perform in a way of which those important to the subject would approve.
- **Perceived behavioural controls** reflect whether the subject believes executing the desired behaviour is under their volitional control.
- The **beliefs** which underlie these constructs are termed behavioural, normative and control beliefs, respectively.

Given the feasibility and reliability issues with measuring behavioural change via direct observation or self-reporting (Baruch-Mordo et al., 2009; Merkle et al., 2011; Baruch-Mordo et al., 2011) the next best alternative is to measure reported intentions.

[11] An extension of the Theory of Reasoned Action (Ajzen & Fishbein, 1980)

"Willingness to pay" in support of conservation is one widely utilised method for gauging intentions, but is wealth dependent (Howe et al., 2011). Therefore, "willingness to help" can provide a less biased alternative, particularly where economic resources are limited (Diekman & Franzen, 1999).

2.2.2 Measuring empowerment from community-based initiatives

Before community-based conservation, a top-down 'fences and fines' approach to conservation radiated, disenfranchising local communities (Adams & Hulme, 2001). Today, local stakeholders' support is perceived as crucial to conservation success and, with participation deemed essential for development, conservation initiatives which engage such groups may actually contribute towards empowerment.

Whilst there is no universal definition, empowerment has been described as "*the process by which people acquire the ability to act in ways to control their lives*" (Gauthier, 1993). Scheyvens (1999) proposed a framework to assess the effectiveness of community-based ecotourism initiatives in terms of impacts on local communities; the four dimensions utilised under this framework are defined in Table.2.2.

Table 2.2 Dimensions of empowerment as described in Scheyvens (1999) framework for assessing the effectiveness of community-based ecotourism initiatives (continued overleaf). Signs also summarised from Scheyvens (1999).

	Description	Signs of empowerment	Signs of disempowerment
Political	"*if a community is to be politically empowered…their voices and their concerns should guide the development of any ecotourism project*"	Opinions of community (including marginalised groups) considered; with opportunities to be represented in decision-making processes.	Failure to involve groups in decision-making; community perceive they have little control over issues pertaining to operation of the initiative.
Social	"*refers to a situation in which a community's sense of cohesion and integrity has been confirmed or strengthened by an activity such as ecotourism*"	Community cohesion improved as demonstrated by members working together to ensure success.	Disharmony; competition; loss of respect and culture; inequitable distribution of costs and benefits

Economic	"*when considering whether or not a community has been economically empowered…it is necessary to consider opportunities which have arisen in terms of both formal and informal sector employment and business opportunities*"	Sustainable, equitably distributed economic gains. Visible signs of improvement from injection of cash.	Leakage of economic gains or monopolisation by local elites. Limited employment opportunities to local families.
Psycho-logical	*"A local community who is optimistic about the future, has faith in the abilities of its residents, is relatively self-reliant and demonstrates pride in traditions and culture can be said to be psychologically powerful."*	Enhanced self-esteem; increased confidence leading them to seek further education/training.	Those receiving inequitable distribution of costs and benefits become disillusioned with initiative.

Whilst sceptics contest whether empowerment can be effectively quantified through qualitative participatory analyses, others argue perceptions of the community themselves are indispensable (Bith, 2011). Aggregated focus groups present an obvious methodology for exploring cross-sectional views of society, but participatory tools such as 'Venn diagrams' (VD) can also be employed. VDs are used within the development field to analyse power relations and changes resulting from an intervention (World Bank, 2007). Being a visual tool, they are appropriate for use with non-literate groups; often required when considering empowerment of marginalised people.

2.3 EVALUATIONS OF HUMAN-CARNIVORE CONFLICT INTERVENTIONS

Of the few studies documenting effectiveness of interventions designed to address HCC, several target educational, enforcement and management campaigns for human-bear conflict in North America (Beckmann et al., 2004; Gore et al., 2008; Baruch-Mordo et al., 2011; Merkle et al., 2011). They examine behavioural changes– observational or self-reported – under a (quasi-)experimental design; employing 'pre-post' testing in conjunction with controls.

Focusing specifically on African HCC exposes a greater hole in the evaluation literature. Woodroffe et al. (2007) evaluated the effectiveness of livestock husbandry practices, adopting a treatment-control design and working under the assumption that reducing livestock depredation reduces carnivore off-take. Dickman (2010), however, argues that altering human behaviour is more successful long-term than reducing wildlife damage.

Accordingly, Hazzah et al. (2009, 2011) examined the effect of a compensation scheme on individuals' reported inclination to retaliate and compared lion mortality under various compensation and/or participatory monitoring treatments; concluding that participatory monitoring, by exploiting underlying components of Maasai culture in conjunction with conflict mitigation, was more effective under scenarios of extreme conflict. However, caution is warranted in 'before-after' comparisons of mortality since confounding factors may explain observed trends.

2.4 CHARACTERISATION OF THE STUDY SITE & WARRIOR WATCH

2.4.1 Samburu District

Samburu occupies 21,000km^2 within the Rift Valley Province of north-central Kenya, 400km north of Nairobi (Fig.2.3).

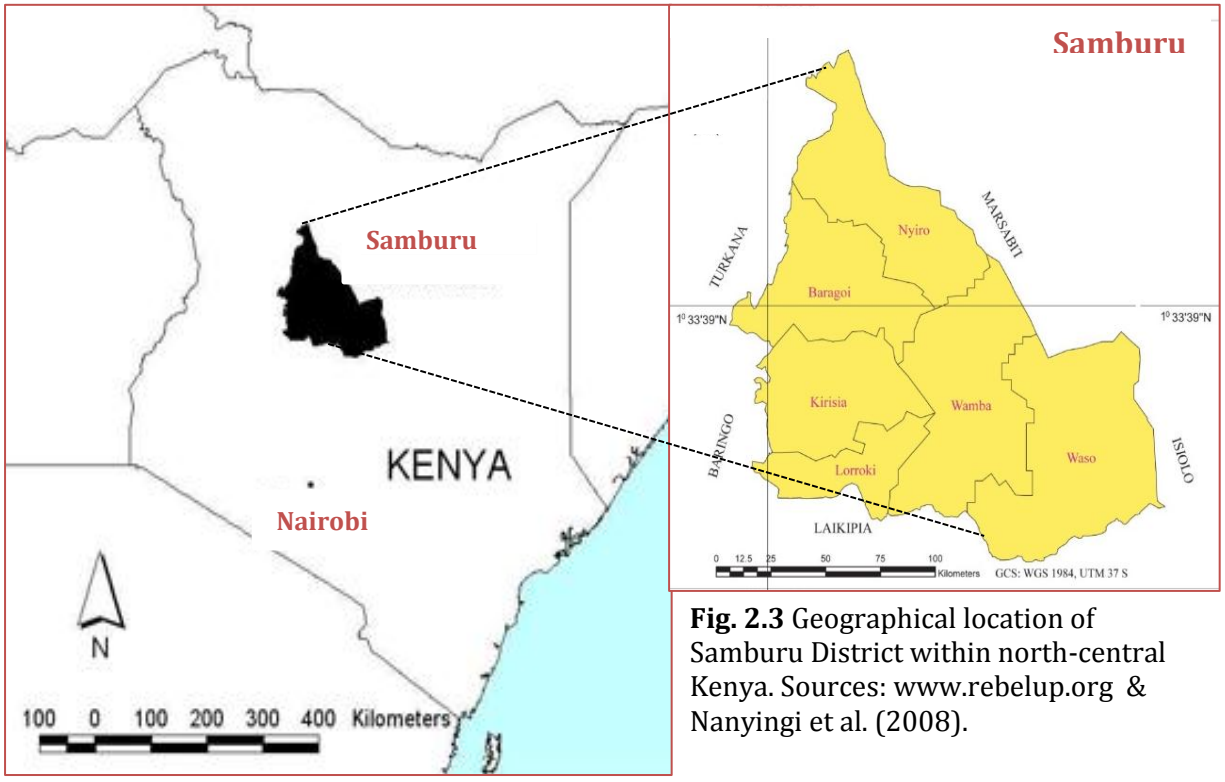


Fig. 2.3 Geographical location of Samburu District within north-central Kenya. Sources: www.rebelup.org & Nanyingi et al. (2008).

Samburu is characterised by semi-arid/arid lands[12]; with semi-nomadic pastoralism proving the most viable livelihood strategy (Campbell et al., 2009). The population, more than doubling between 1979 and 2008 (Arid Lands, 2007), stands at 224,000

[12] Average annual temperature ranges 24-33◦C (Esilaba et al., 2007); and rainfall (250-500mm) is concentrated bimodally, but can be erratic (Campbell et al., 2009)

(CRA, 2011); 73% living below the poverty line and >80% lacking basic education in some regions (Esilaba et al., 2007).

Marginalised from political and economic resources, Samburu is plagued by the type of chronic insecurity typically associated with natural resource scarcity and tribal antagonism (Campbell et al., 2009). A number of Community Conservancies have, however, recently established, under the umbrella of NRT, offering an opportunity for economic diversification and enhancing security and conservation efforts on community land. A network of such Conservancies now spans >3million acres (Fig.2.4); each comprising one or more Group Ranches who have agreed to manage their land collectively for livestock and wildlife (NRT, 2010a).

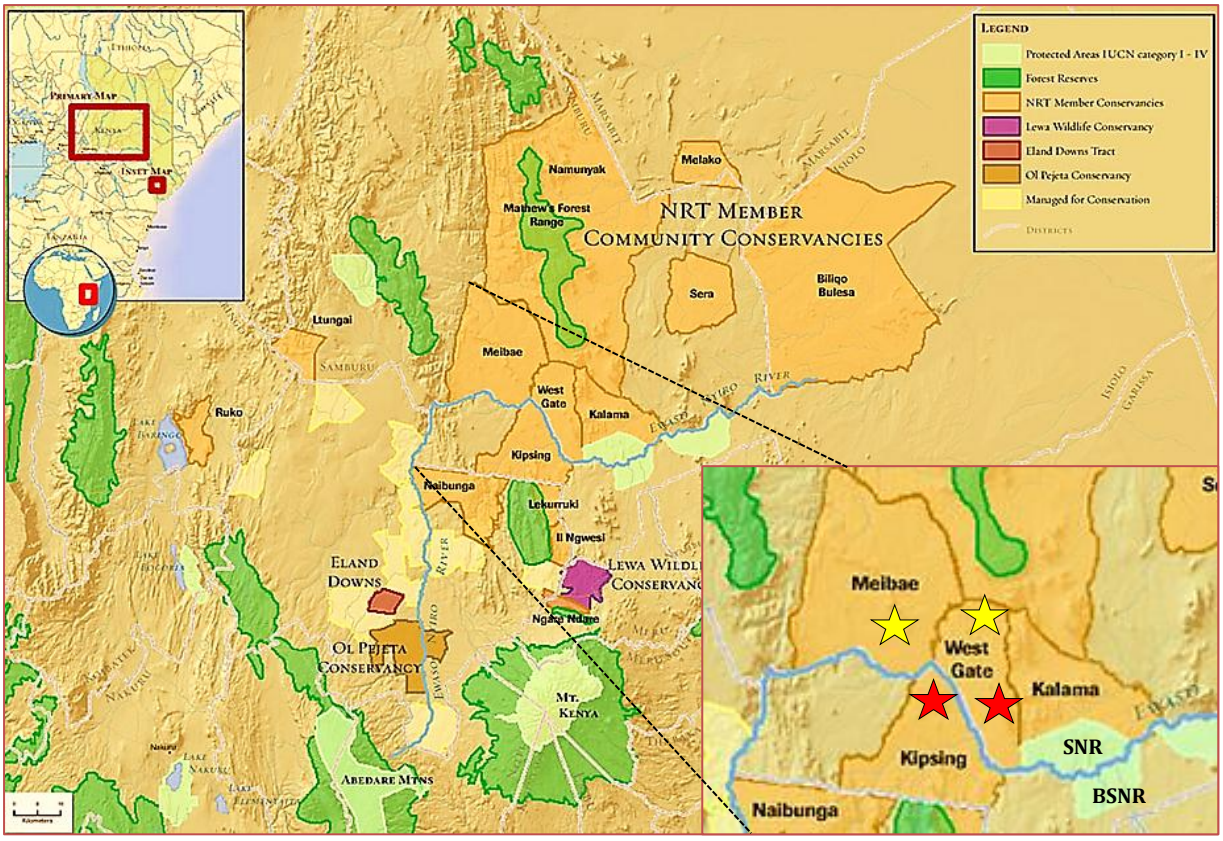


Fig. 2.4 Northern Rangelands Trust Community Conservancies, highlighting those where 'Warrior Watch' operates (red stars) and where current study is taking place (yellow stars). SNR = Samburu National Reserve; BSNR = Buffalo Springs National Reserve. Adapted from: http://www.nrt-kenya.org/pix/maps/NRTConservancies_July2010.jpg

2.4.2 Westgate & Meibae Community Conservancies

Westgate registered with NRT in 2004. It borders Samburu National Reserve (Fig.2.4) and land ownership is associated with Ngutuk Ongiron Group Ranch.

Box. 2.2 "[To] *develop a platform for the Samburu pastoralist community living within the Group Ranch to reduce poverty levels through integrated eco-friendly tourist activities and conservation*" (NRT, 2010b)

Consistent with their mission (Box.2.2), a tourist lodge ('Sasaab') was established in 2007; 60% of the revenue going towards community projects and 40% to Conservancy operating costs (NRT 2010b). The Conservancy Board acts as the entry point for extending other programmes to the community, whilst Ewaso Lions represents the other conservation group with a permanent base. Grevy's Zebra Trust, Earthwatch, Action for Cheetahs in Kenya, Save the Elephants and the African Wildlife Foundation also work in Westgate.

Meibae, which borders Westgate, registered with NRT in 2006. It is owned by a number of Group Ranches; for whom pastoralism is the predominant livelihood activity and where tourism has yet to establish. With the exception of Ewaso Lions and Save the Elephants, conservation groups active here are similar to Westgate.

2.4.3 Samburu fauna

Additional to species characteristic of East African rangelands, a number of rare species and regional endemics inhabit Samburu; it is the last remaining stronghold for Grevy's Zebra, and other endemics include: reticulated giraffe (*Giraffa camelopardalis reticulata*), gerenuk (*Litocranius walleri*), Somali ostrich (*Struthio camelus molybdophanes*) and beisa oryx (*Oryx gazella beisa*). Samburu is also famed for its concentrations of elephants (*Loxodonta africana*) and nationally and globally important populations of carnivores; most notably, the largest population of wild dogs in Kenya live in Samburu and neighbouring Districts and the Samburu-Laikipia cheetah population is one of four in East Africa to number >200 adults (KWS, 2010b).

2.4.4 Samburu tribe

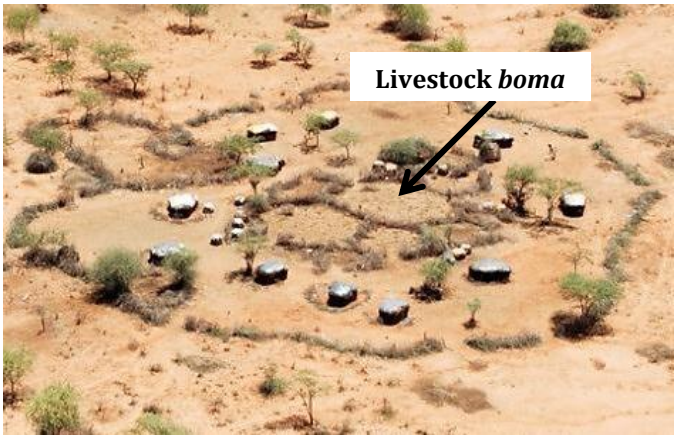


Fig.2.5 Aerial view of a Samburu *manyatta*. Source: http://www.samburutrust.org/wc-2-what-is-a-manyatta/

- Samburu are Maa-speaking pastoralists, occupying an area stretching north from Mount Kenya (Kuriyan, 2004). They inhabit impermanent dwellings (*manyattas;* Fig.2.5) arising through the need to migrate to new pasture.
- Society is structured by a hierarchical age-system pertaining to males; the most pertinent division between warriors (*morans*) and elders (*wazee)*. *Moranhood*, a period of prolonged adolescence beginning with mass circumcision and ending in marriage, traditionally spans fifteen years[13] but is dependent upon the rule of Clan elders and completion of a series of ceremonies (Spencer, 2004). Following inauguration, *morans* are segregated from the rest of society; forming *Clubs* with others from their age-set (Spencer, 2004).
- Few studies have explored Samburu perceptions towards wildlife or protected areas. Those that have identified: (i) the importance of customs underlying attitudes towards species (Kuriyan, 2004 (*elephants*)); (ii) poor predator tolerance (Romanach et al., 2007); (iii) limited ecological understanding (Kuriyan, 2004; Bruyere et al., 2011).

2.4.5 Ewaso Lions[14]

Ewaso Lions is a grassroots project, with a base in Sasaab and a mission to "*promote the conservation of lions through research and community-based outreach*". With a study area spanning over 900km^2 covering Samburu, Buffalo Springs and Shaba National Reserves and adjacent community lands, it seeks to facilitate long-term lion conservation efforts by investigating factors influencing population dynamics, including

[13] ~15 to ~30 years of age

[14] Initiated by Oxford PhD Candidate Shivani Bhalla in 2007, and directed by Bhalla and colleague Paul Thomson (www.ewasolions.org)

HCC. Community engagement is central to their work, as demonstrated by many outreach programmes, of which WW is the flagship.

2.4.6 Warrior Watch

Despite spending most of their time in the bush alongside wildlife, and those typically implicated in wildlife conflict, Samburu *morans* represent a neglected group in conservation management within northern Kenya[15]. Ewaso Lions sought to address this by engaging *morans* as wildlife ambassadors - promoting human-predator co-existence, building capacity, and increasing awareness of wildlife's importance - the intention to engender a positive conservation ethic within these *morans* and the wider community via dissemination.

WW commenced in January 2010, when Ewaso Lions selected six *morans* from different locations within Westgate; who were trained on data collection, basic wildlife ecology and conservation, security issues, and the importance of wildlife. Following expansion in 2011, the first cohort facilitated the training of nine new recruits.

Whilst WW targets all wildlife, particular emphasis is placed upon predators and HCC mitigation; specific aims are outlined in Fig.2.6 and *morans'* responsibilities in Fig.2.7.

Fig. 2.6 Warrior Watch Aims

- Encouraging *morans* to be active within their communities as wildlife ambassadors and to improve community awareness about predators, especially other *morans*;
- To enable open discussions on conflict throughout the community;
- Leverage *morans'* wide-ranging presence in wildlife areas to receive reports on wildlife from across the region;
- To provide education to *morans* who might not otherwise have the opportunity to receive basic education.

WW activities were designed to be wholly compatible traditional pastoralist lifestyle. Keen to avoid reliance upon financial incentives, Ewaso Lions – upon the request of

[15] This view was expressed by the Head of Westgate Security during a WW meeting in January 2011.

participants – provides weekly educational lessons in return for their work[16], plus a small food stipend.

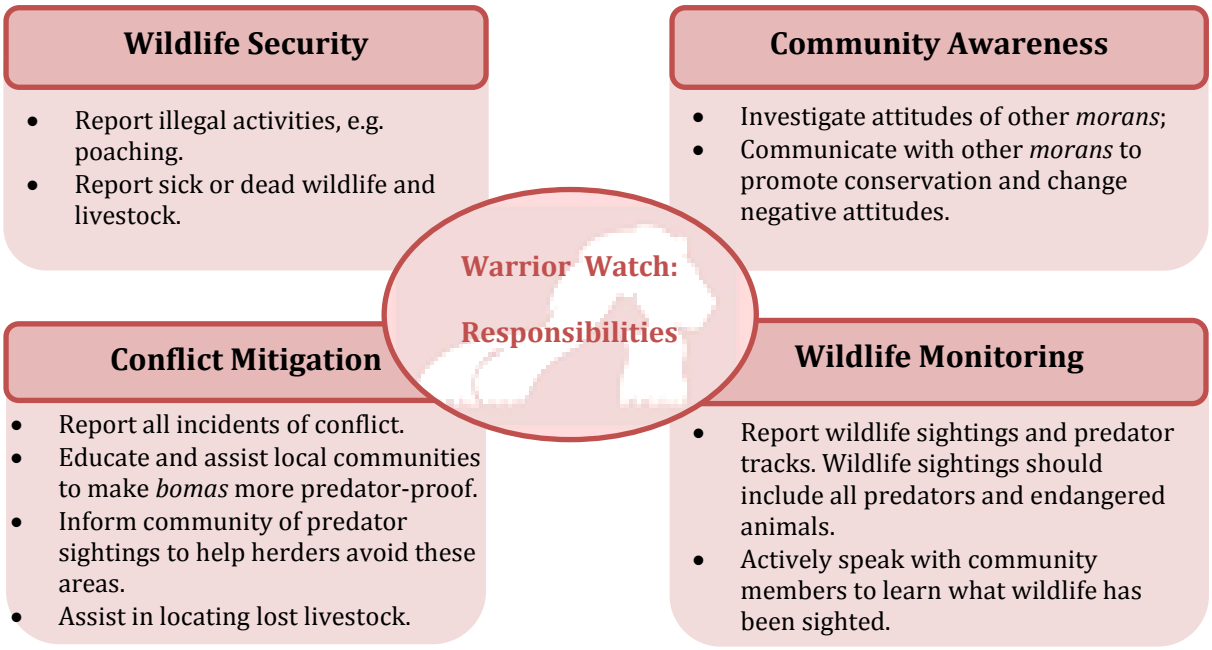


Fig. 2.7 Responsibilities of WW-*morans*

Whilst sporadic examinations have been conducted to gauge knowledge levels and effectiveness of training sessions, no formal evaluation of the project's efficacy has been conducted to-date nor has any attention been paid to impacts on the wider community. With plans to expand to neighbouring Conservancies in 2013, such an evaluation is timely.

[16] Educational lessons are held on Sundays when weekly wildlife reports (oral or written) are collected from participants.

3. METHODOLOGY

3.1 FRAMEWORK

The study was shaped by constraints imposed through a failure to incorporate M&E into WW design; most notably it lacks baseline data. Therefore, a 4-pronged mixed-methods approach (Fig.3.1; overleaf) was used to elucidate what might have happened in the absence of, and any changes attributable to, WW. Meibae Conservancy was selected to provide some comparison[17].

3.1.1 Location selection

It was not possible to obtain robust sample sizes from all eight Westgate locations where *WW-morans* are based (Fig.3.2). Four locations were selected between which exposure to WW was expected to differ significantly, enabling empirical comparisons and conclusions to be drawn about WW's impact across Westgate. **Sasaab** and **Ngutuk Ongiron** were expected to have highest exposure being where Ewaso Lions is based and weekly WW meetings held, respectively. **Sukuroi** and **Naisunyai** represent the furthest locations from either base and were presumed to have lowest exposure. Selection further accounted for the two enrolment periods (Jan. '10 and Jan. '11); each exposure category represented by one 'new' and one 'old' recruit.

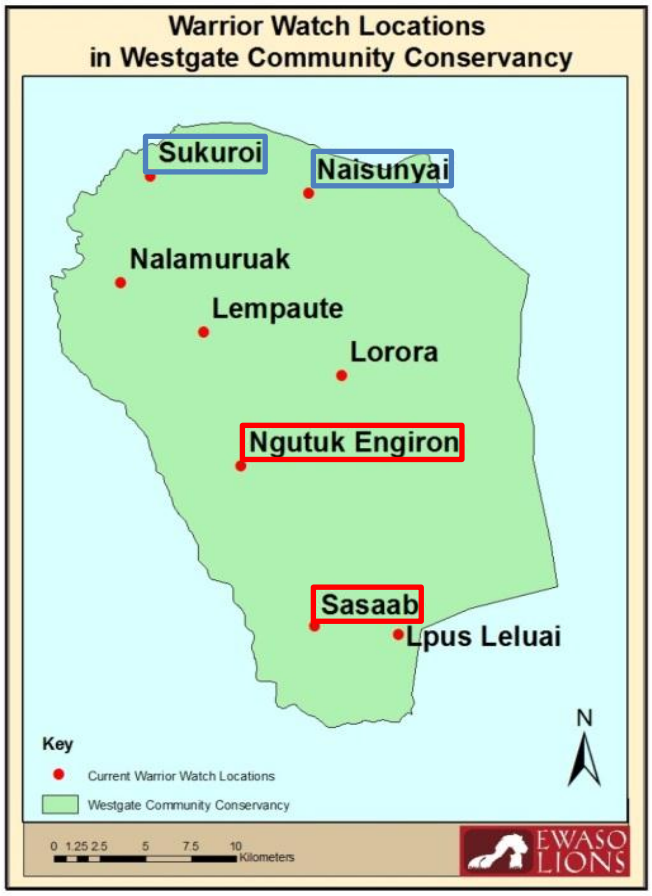


Fig. 3.2 Locations where current WW-*morans* are based (Westgate). Red='presumed high exposure' and blue= 'presumed low exposure'; both were selected for survey. Sasaab= base of Ewaso Lions; Ngutuk Ongiron= base of WW school.
Map by S.Bhalla.

[17] Meibae provided the best and most logistically feasible match. WW is also looking to expand there in 2013. However, the potential for cofounding influences is high so it cannot be considered a true control.

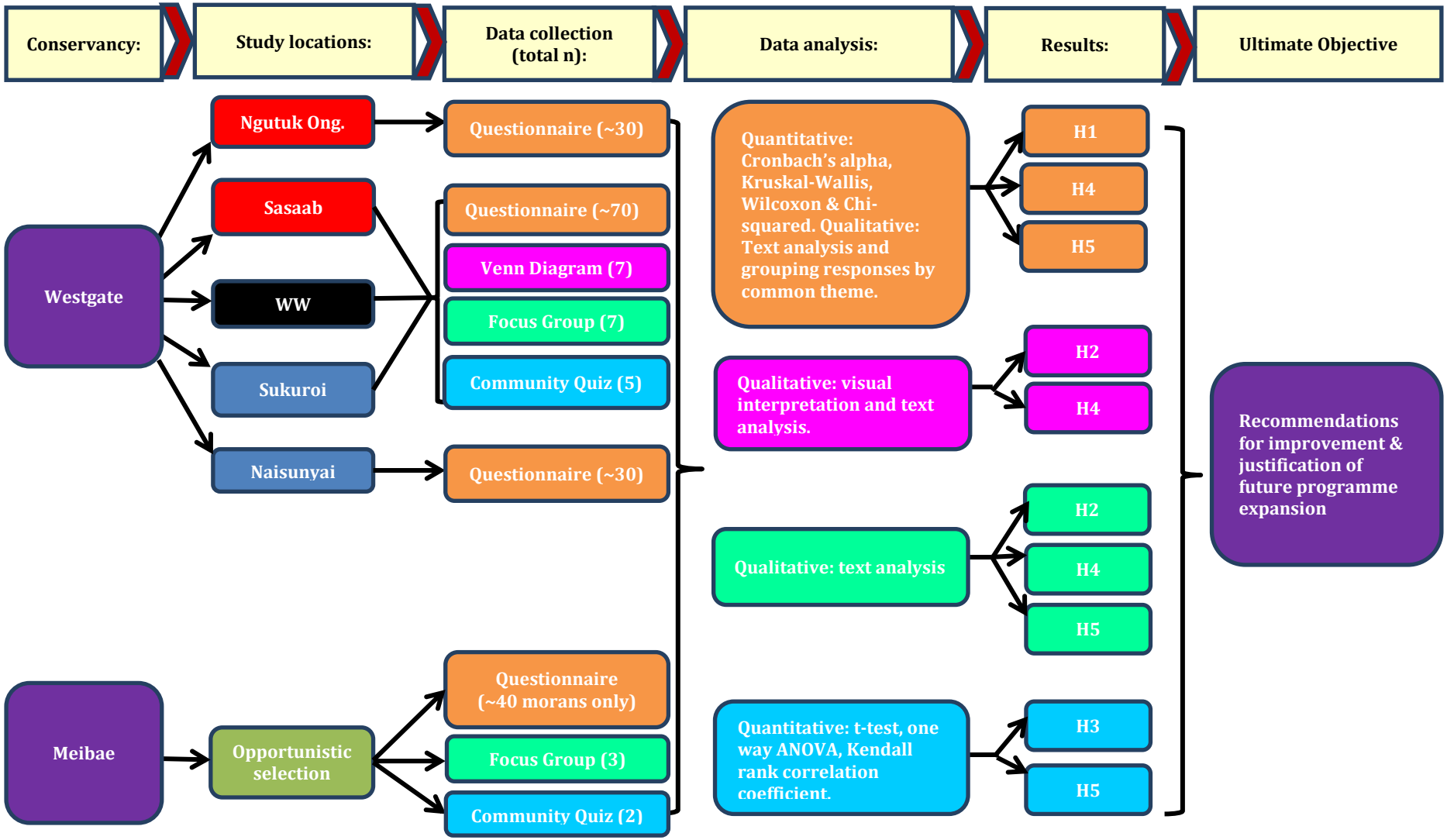


Fig. 3.1 Flow chart summarising methodological framework for this study.

Within Meibae, location selection was opportunistic; confined to the south of the Conservancy.

3.2 DATA COLLECTION

Data were gathered 29th April-21st July 2012, using two Research Assistants (RAs).

3.2.1 Research Assistants

RAs were required because Samburu is the native language and ethnic group can introduce interviewer bias (Word et al., 1974). Precautions were therefore taken to ensure no non-Samburu presence during surveys[18]. Ewaso Lions director Shivani Bhalla was not present when surveys were being conducted to minimise the potential for social desirability bias.

RAs were trained in research methodologies and informed to only translate what was written, and provide no additional comments, unless otherwise instructed (e.g. during FGs). Ngila Ltenesi (NL; Ewaso Lions Community Officer) conducted work in Westgate; whilst Jeneria Lekilele (JL; Ewaso Lions Field Officer) worked in Meibae; with precautions taken to ensure both worked uniformly. Unfortunately, employment of independent RAs was impossible due to insufficient time to identify and train a Samburu. Despite his connection with Ewaso Lions, NL has no direct involvement in WW and did not reveal his association until surveys were completed. Whilst JL, who helps co-ordinate WW, could introduce interviewer bias within Westgate; his anonymity in Meibae made it acceptable for him to work there.

3.2.2 Venn Diagrams

The aim was to identify how different demographics from each location view:

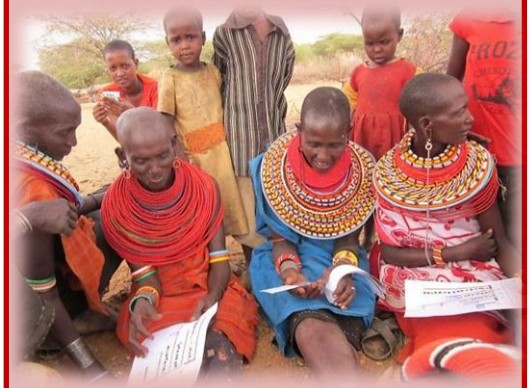
- Wildlife conservation projects relative to institutions dealing with other issues.
- The relative importance and impact of WW.
- Involvement of *morans* in conservation issues.
- Any changes which have occurred over the past two years and attribution of these changes.

[18] HG was present during WW-*morans*' surveys but previous experience with the group in 2010 and 2011 suggested this would not impact results.

Venn Diagram Mapping – WW-*morans*

Focus Group – Elders, Meibae

Questionnaire – *Moran*, Meibae



Community Quiz - Sasaab

Fig. 3.3 Photographs of methods employed. Photo credits (top-bottom): Heather Gurd; Reit Lentiyoo x2; Jeneria Lekilele.

VD/FGs (World Bank ,2007; Appendix 1) were piloted in Sasaab[19]; with amendments made to condense the activity when it took longer than anticipated. NL subsequently canvassed Sasaab and Sukuroi to form three groups of ≥5 individuals from the same demographic in each location. An additional VD/FG was held with WW-*morans*[20] .

Each group was informed of the objectives and assured anonymity. The facilitator's full identity was not disclosed until the end, nor did he make explicit reference to Ewaso Lions/WW to minimise bias; though it is possible some, and all *WW-morans*, were aware of his association.

Participants were asked to name who deals with (a) environmental; (b) economic; (c) social or (d) other issues within Westgate and to rate each groups' relative importance to them through selection of circle size and subsequent ranking. Relationships between actors were illustrated through the proximity and positioning of circles on a sheet where another circle had been drawn to represent the Conservancy (Fig. 3.4; full details given in Appendix 1). Focus then switched to those groups involved in conservation, with triangles of three different sizes added to illustrate relative conservation impact.

[19] This took place away from the main *manyatta.*

[20] WW-*morans* VD and FG were held on two non-consecutive days due to time constraints and the wealth of information provided.

The facilitator recorded discussions on pre-prepared forms, and concluded by asking:

- Would there be changes had the group been asked to complete the exercise two years ago;
- Whether any changes could be attributed to WW.

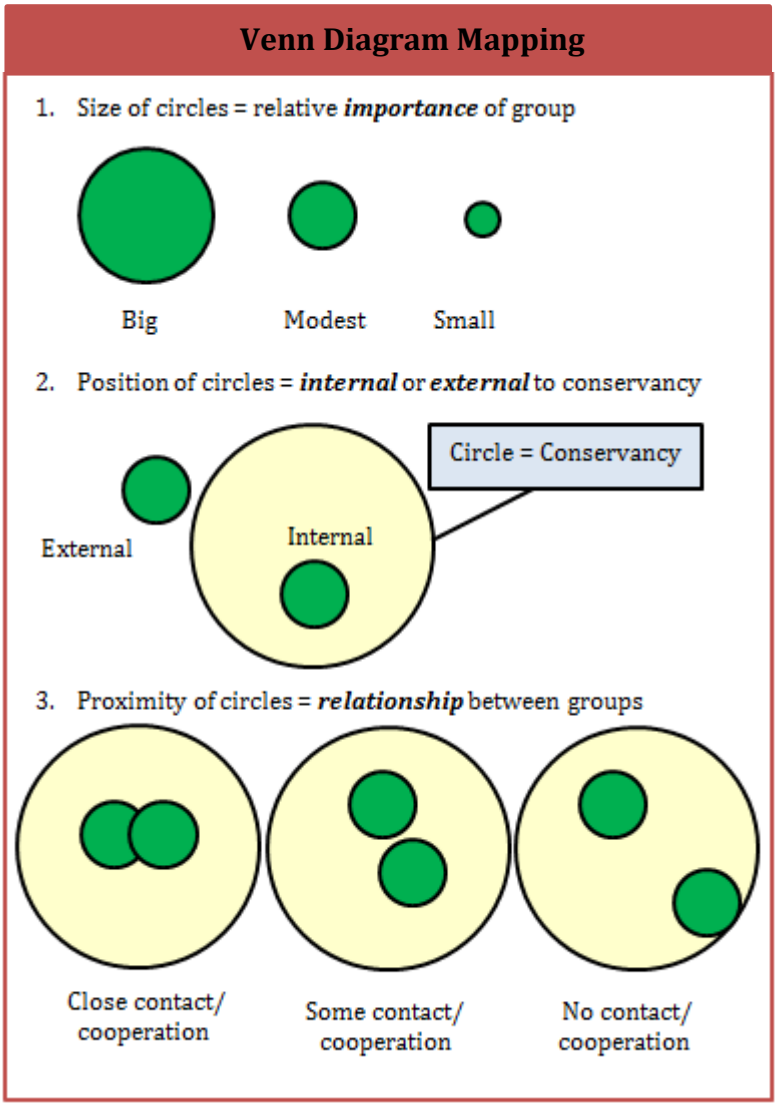


Fig. 3.4 Schematic to illustrate Venn diagram exercise; based on descriptions in World Bank (2007) and Richards (2011).

3.2.3 Focus Groups

FGs, used to gather in-depth qualitative information, are regularly employed in social sciences (Hennink, 2007). In Westgate, they followed VDs and involved the same participants; with discussion structured around open-ended questions relating to four themes (see Appendix 2 for further details). Following an introductory section to gauge

the groups' attitude towards conservation, discussion centred on WW. Specifically: knowledge of its aims, whether these matched community interests and had been achieved; costs and benefits to different groups and potential improvements (N.B. questionnaires raised similar issues to provide triangulation and opportunities for quantitative analysis). FGs subsequently focused on the role of *morans*; specifically, the degree to which WW has empowered this traditionally neglected demographic, following Scheyvens' (1999) framework.

In Meibae, FGs were aimed at identifying perceptions towards existing programmes, current involvement of *morans* and interest in WW expansion.

Facilitators were instructed to encourage discussion amongst all group members, whilst refraining from offering directive prompts. A debriefing session was held between HG and NL/JL following each exercise to verify interpretation of notes.

3.2.4 Questionnaires

Orally administered questionnaires concerned with addressing objectives I, III and IV (Appendices 3 & 4) were central to this study; principal benefits being they are easily replicated and administered by multiple individuals whilst retaining standardisation. Incorporation of closed and open-ended questions enabled quantitative and qualitative analyses, strengthening resultant understanding by drawing on the merits of each.

Questionnaires employed in Westgate and Meibae were identical, expect for section (iv) (Table 3.1).

Table 3.1 Components of the questionnaire surveys (continued overleaf)

Section		Description
i)	**Interview data**	Information on the location and timing of surveys.
ii)	**Interviewee data**	Socio-demographic information to ascertain representation and influence of characteristics, specifically age-set and location, on (iii) and (iv). Livestock assets, as an indicator of wealth and a potential source of conflict, were also recorded.

iii)	**Attitudes and behavioural intentions**	To ascertain any impact of WW on attitudes and/or behavioural intentions of community members towards (a) wildlife conservation and (b) predator conservation, following the TPB (section 3.2.4.1).
iv)	**Perceptions towards conservation programmes**	Within Westgate this refers to WW and includes an assessment of the costs and benefits to different groups, as well as suggestions for improvement. Within Meibae, this refers to any conservation programmes operating in the region and, specifically, towards expansion of WW.

Questions relating to attitudes and intentions came before explicit reference was made to WW; with care taken to ensure phrasing of questions was not leading, ambiguous or sensitive (Iarossi, 2006). On average, surveys lasted 1hr 46 (Westgate) or 58 minutes (Meibae; shorter questionnaire).

3.2.4.1 Theoretical framework

The TPB was used to design section (iii) of the questionnaire; concerned with quantifying attitudes and behavioural intentions (Fig. 3.5).

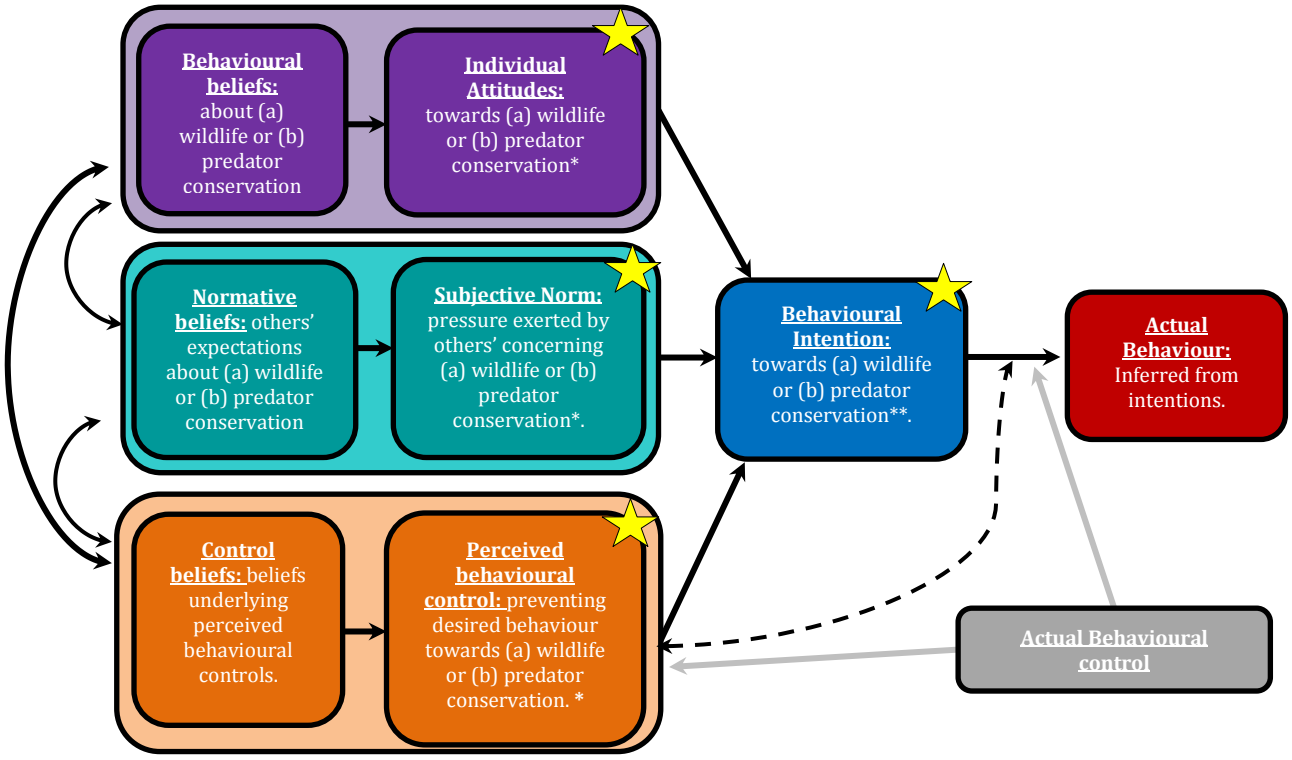


Fig. 3.5 Theory of Planned Behaviour (Ajzen, 1991), adapted for current study. Stars indicate components explicitly measured in this study; * = via Likert-scale statements; **= via willingness to spend time on conservation activities/to lose livestock to a predator before retaliated

Statements, varying in stance, were compiled to quantify attitudes towards wildlife (n=6) and predator (n=6) conservation, and to elucidate subjective norms (n= 4) and perceived behavioural controls (n=4) which might influence ultimate behaviours. Attitude statements were structured to be target, action, context and time-specific (St. John et al., 2011). RAs translated statements into Samburu before administering questionnaires to ensure consistency; with back-translations used to verify accuracy.

Participants were asked to indicate their level of agreement with each statement along a 3-point Likert Scale (agree, neutral, disagree); with options to refuse or answer 'I do not know'. Answers were then coded; those indicative of a positive conservation stance assigned a score of +1, neutral answers 0 and negative answers -1. An opportunity was provided at the end of each sub-section to justify responses.

Unable to measure actual behaviours, intentions were quantified using (a) willingness to spend time on conservation and (b) an adapted proxy for tolerance (Romanach et al., 2007); where individuals were asked to indicate the number of livestock, if any, they would be willing to lose to a predator in one month before they retaliated/condoned retaliation by a relative. Questions regarding the application of conflict mitigation methods and willingness to report particular incidents provided further insight into the likelihood of proactive conservation behaviours.

To ascertain any impacts attributable to WW, in the absence of a baseline, participants were asked following attitudinal and intentions-based questions:

- Whether they would have answered the same way two years ago;
- If not, to specify the reason for change and whether any group had influenced them.

3.2.4.2 Pilot

Questionnaires, designed by HG, were reviewed by EJMG and Ewaso Lions, with changes made; including, reducing the attitudinal questions from a five to three-point Likert-Scale due to incomprehension of the difference between 'strongly agree' and 'agree' during a previous Ewaso Lions' survey.

The pilot (8th – 12th May 2012) involved three representatives of each demographic from Westgate village, who were asked to complete the survey and provide comments on its design. This raised the issues in Table 3.2.

Table 3.2 Issues and solutions resulting from piloting of the questionnaire.

Issue	Solution
Repetition of questions pertaining to changing attitudes towards wildlife and then predators	Sections combined.
Confusion over the categories for behavioural intentions towards retaliatory killing where certain species did not kill cattle.	Cattle-based questions restricted to lions and spotted hyenas.

Following the pilot no further revisions were made.

3.2.4.3 Interviewee selection

Houses are not numbered and access to official census records not available; this combined with a culture of semi-nomadism limited potential for a robust random sampling framework. In Meibae opportunistic sampling was required, however, in Westgate unofficial population surveys were conducted by Ewaso Lions (February-May 2012). For each location a list of forty family names was randomly selected. The fluid nature of settlement and associated difficulties with locating specific family members precluded random assignment of family names by demographic; a reserve list was therefore compiled, as justified by Kangwana (1993).

3.2.5 Community Quiz

Environmental quizzes have previously been used to evaluate local knowledge, whilst also providing an opportunity to raise awareness (Andrianandrasana et al., 2005). This approach was selected here since it provided the most relaxed and time-efficient methodology.

Fifty questions targeting six themes were compiled using WW training materials and prior knowledge (Appendix 5.1); and finalised following feedback from Ewaso Lions. Questions ranged in difficulty; easier questions ensured less knowledgeable participants did not feel despondent, whilst harder questions set-apart those with

greater knowledge. Answer-sheets were designed with specific consideration of the low levels of literacy in the area (Appendix 5.2)

Selected villages[21] were canvassed to form teams containing 2-4 individuals from the same demographic. Participants were opportunistically assigned to groups; with separate quizzes held for women and *morans* due to cultural sensitivities, and for WW-*morans* for logistical reasons[22]. Prior to the start of the quiz, socio-demographic data were recorded for each team.

3.3 ETHICS

- Confidentiality was guaranteed and participants' names were not recorded (except *WW-morans)*.
- Study objectives were made explicit to prevent inflated expectations.
- Due to the potentially sensitive nature of retaliatory attacks, no individuals were asked whether they had participated in this act.

3.4 DATA ANALYSIS

Quantitative: analyses were conducted in R statistics package[23] or MS Excel. To assess attitudes towards conservation, scores for individual items were aggregated by sub-section, with Cronbach's alpha {ltm} coefficient calculated to verify internal consistency; where deemed questionable (<0.70; George & Mallery, 2003) analyses were performed on aggregated and individual items. Due to non-normally distributed data, non-parametric tests (Fig.3.1) were used to measure differences in attitudes between locations and demographics; whilst parametric analyses could be used to determine whether knowledge differed between groups (Fig.3.1). Appropriate post-hoc comparisons were conducted where necessary.

Qualitative: open-ended questionnaire questions were coded, with responses grouped by common themes. Visual interpretation and text analysis were used for VD/FGs.

[21] Sasaab and Sukuroi in Westgate and an unnamed location in Meibae (Fig.3.1).
[22] WW morans were randomly, as opposed to opportunistically, assigned to three separate groups.
[23] Version 2.13.1

4. RESULTS

Results are structured around the study objectives, drawing on quantitative and qualitative data to address hypotheses. Under objectives, results are firstly presented for Westgate; where *WW-morans* are considered a sub-section of the population but excluded from intra-community analyses unless otherwise stated[24]. Due to the non-significant effect of sub-location for most variables of interest, Westgate locations were combined unless reported otherwise. Finally, to help elucidate changes potentially attributable to WW and explore the potential for expansion, demographic-specific comparisons are made between WW-*morans* and other *morans* in Westgate and Meibae.

4.1 SAMPLE CHARACTERISTICS

Table.4.1 shows the number of individuals/groups from each location participating under the different methods; where appropriate broken down to indicate representation of demographic groups.

Table 4.1 Number of individuals or groups participating in each exercise.

	WW	Westgate Community					Meibae
		Sasaab	Ngutuk	Sukuroi	Naisunyai	Total	
Approx. adult population:	**9**	**98**	**154**	**251**	**216**		UNKNOWN
A. QUESTIONNAIRE							
Total number of Participants:	**9**	**30**	**30**	**31**	**30**	**121**	**32**
Number of morans:	9	11	10	10	10	41	32
Number of elders:		9	10	10	11	40	
Number of women:		10	10	11	9	40	
Proportion of total population surveyed:	100 %	30.6%	19.5%	12.4%	13.9%		UNKNOWN
Proportion of morans:		50%	16.4%	43.5%	14.1%		UNKNOWN
Proportion of elders:		34.6%	34.5%	14.9%	22.9%		
Proportion of women:		20%	15.6%	6.2%	9.3%		
B. VENN DIAGRAM/FOCUS GROUPS							
Total number of groups:	**1**	**3**		**3**		**6**	**3** (FG only)
C. COMMUNITY QUIZ							
Total number of teams:	**3**	**6**		**5**		**11**	**5**
Number of moran's teams:	3	2		2		4	2
Number of elder's teams:		1		2		3	2
Number of women's teams:		3		1		4	1

[24] They represent Westgate *morans* from various locations who have received specialised training.

The primary livelihood strategy was pastoralism (Westgate:>90%; Meibae:>97%); with household income derived largely from livestock (W:>70%; M:>97%). In Westgate, particularly Sasaab (<19%), there was some diversification of household income derived from wildlife- and/or tourism-related activities.

Participant age ranged from *moranhood* to fifty in Westgate questionnaires, with older individuals in VD/FGs. Regardless of age or gender, most participants (W:>80%; M:>94%) had received no formal education.

Appendix 6 provides a full breakdown of socio-demographic characteristics.

4.2 ATTITUDES AND BEHAVIOURAL INTENTIONS

4.2.1 General feelings concerning wildlife presence

Free-listed benefits and costs associated with having wildlife in the Conservancy were similar across Westgate (Table.4.2), and for Meibae *morans*. However, WW-*morans* and Sasaab residents did not rank the ecological and/or cultural importance of wildlife as highly as other Westgate groups[25]; whilst 32% (n=31) of Meibae *morans* did not acknowledge wildlife benefits.

Table 4.2 Top four ranked themes for each Westgate location and WW-*morans* who acknowledged positive and negative things about having wildlife in the Conservancy. Rankings based on the frequency of people rating each theme as the 1st -6th most important reason; only the top four are presented.

		WW-*morans*	Sasaab	Ngutuk Ongiron	Sukuroi	Naisunyai
Are there good things about having wildlife in Conservancy?	1	Tourism	Tourism	Tourism	Cultural importance	Tourism
	2	Unrelated support	Unrelated support	Cultural importance	Tourism	Cultural importance
	3	Conservancy/ conservation projects arrived	Employment opportunities	Employment opportunities & Ecosystem importance	Unrelated support	Ecosystem importance
	4	Employment opportunities	Cultural importance		Ecosystem importance	Conservancy/ conservation projects arrived
Are there bad things about having wildlife in Conservancy?	1	Kills injures livestock/people	Kills injures livestock/people	Kills injures livestock/people	Kills injures livestock/people	Kills injures livestock/people
	2	Environmental damage	Environmental damage	Environmental damage	Environmental damage	Disease & Environmental damage
	3	Competition	Competition	Disease	Land occupation	
	4	Disease & Land occupation	Land occupation	Competition	Competition	Land occupation

[25] Sasaab being the location closest to the tourist lodge

The trade-off associated with having wildlife in the Conservancy is likely to vary by species. 74% Westgate's wider community named at least one animal they preferred not to be there; spotted hyena, then wild dog and leopard being most frequently cited (Fig. 4.1a).

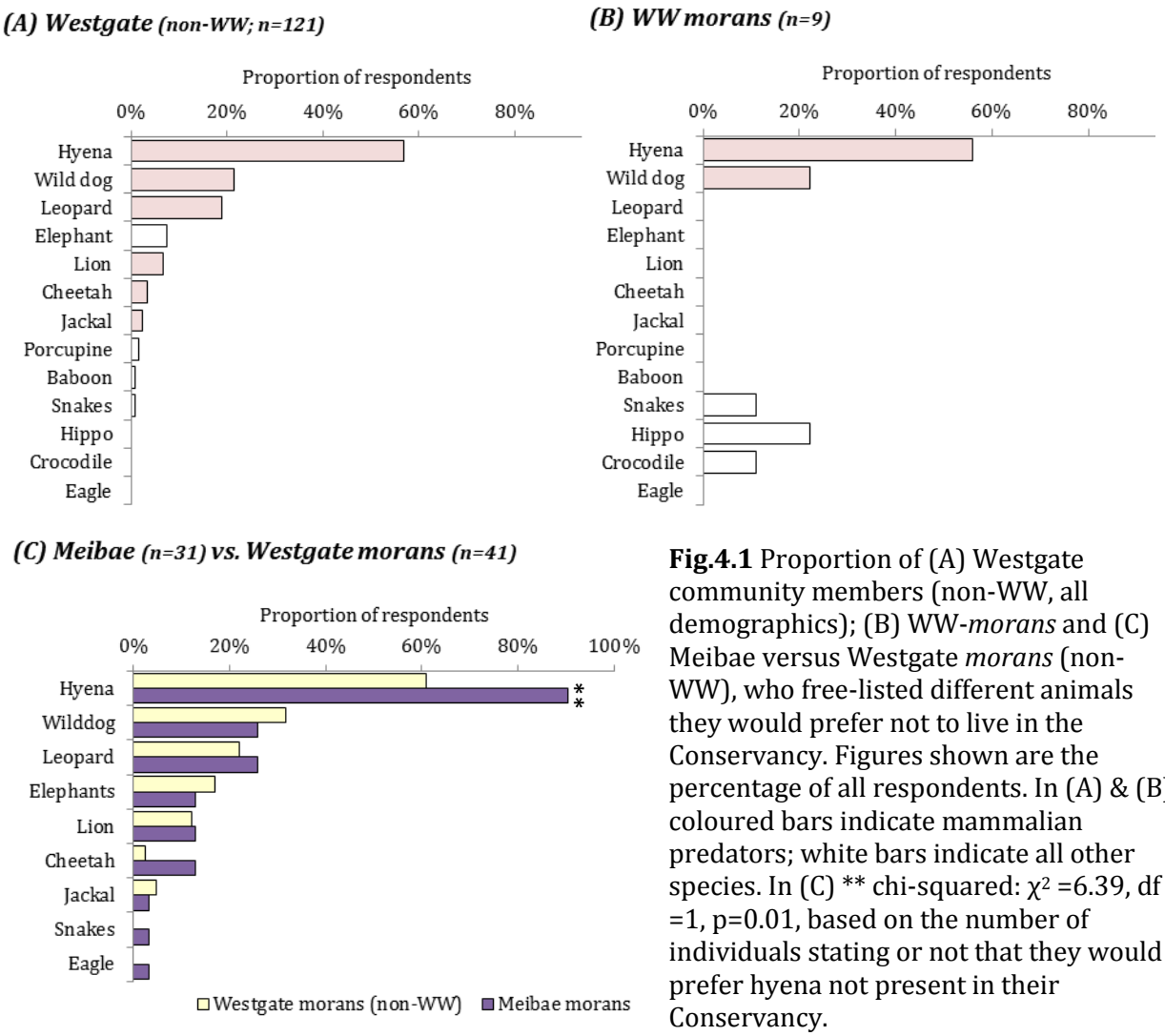


Fig.4.1 Proportion of (A) Westgate community members (non-WW, all demographics); (B) WW-*morans* and (C) Meibae versus Westgate *morans* (non-WW), who free-listed different animals they would prefer not to live in the Conservancy. Figures shown are the percentage of all respondents. In (A) & (B) coloured bars indicate mammalian predators; white bars indicate all other species. In (C) ** chi-squared: χ^2 =6.39, df =1, p=0.01, based on the number of individuals stating or not that they would prefer hyena not present in their Conservancy.

Despite WW's emphasis on predators, five *WW-morans* listed hyena, and two wild dogs, as animals they would prefer were not in Westgate (Fig. 4.1b). However, there was high within-group variation as one *moran* cited additional animals he wanted in Westgate[26], whilst another acknowledged benefits from all species.

A similar carnivore bias was evident amongst Meibae *morans* (Fig. 4.1c); with no significant difference in the number free-listing (or not) any species, except hyena (Chi-

[26] hippopotamus, buffalo and rhinoceros

squared for hyena: $\chi^2 = 6.39$, df= 1, p=0.01), when compared to non-WW Westgate *morans*. Justification for listing predators was exclusively related to their propensity to kill/injure humans and livestock. Behavioural traits increasing dislike included: '*killing and not eating*', '*killing day and night*' and '*killing many at once*'.

4.2.2 Personal attitudes

Internal consistency of items used to assess personal attitudes towards both wildlife and predator conservation was high (Cronbach's alpha: +0.76 and +0.95, respectively); indicating those answering in a pro-conservation manner to one question were likely to do so for another.

Contrary to H5, location - as a proxy for exposure to WW– had no significant effect on the general public's attitudes towards wildlife (Kruskal-Wallis: $\chi^2 = 5.00$, df =3 p=0.17) or predator (Kruskal-Wallis: $\chi^2 = 2.36$, df = 3, p= 0.50) conservation; with largely positive attitudes expressed across Westgate, except for a few individuals in Naisunyai and Sukuroi who held negative aggregated scores for wildlife conservation (Fig. 4.2).

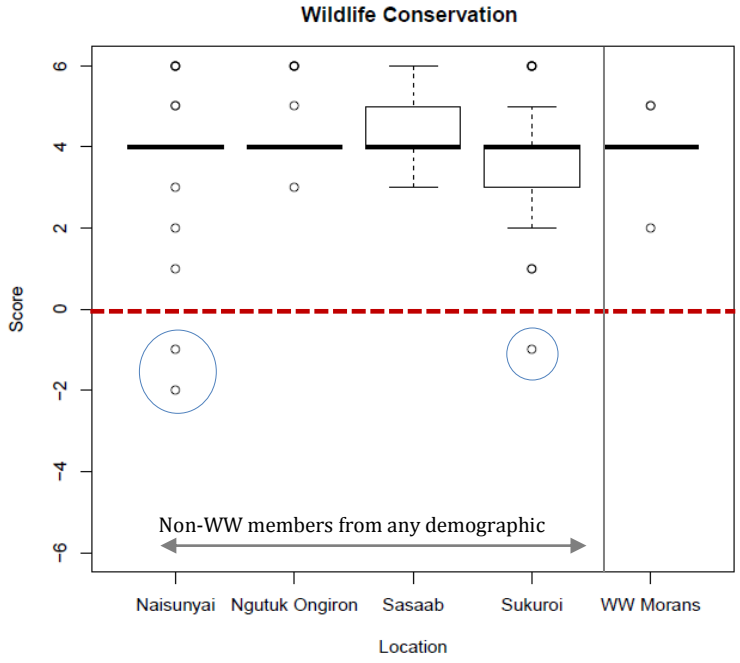


Fig. 4.2 Aggregated score (max: 6, min:-6) for personal attitudes towards wildlife conservation across different locations in Westgate, and for WW-*morans*. Blue circles highlight negative aggregated scores. No significant difference was observed between Westgate locations (Kruskal-Wallis: $\chi^2 = 5.00$, df =3 p=0.17) or between Westgate locations and WW-*morans* (Kruskal-Wallis: $\chi^2 = 5.20$, df= 4, p= 0.27)

WW-morans personal attitudes were not significantly different to the wider community for wildlife (Kruskal-Wallis: $\chi^2 = 5.20$, df= 4, p= 0.27) or predator ($\chi^2 = 4.13$, df= 4, p= 0.39) conservation. Nor was any difference evident between *morans*, elders and women

- combining scores for all Westgate community members – for wildlife (χ^2 =0.94, df=2 p=0.62) or predator (χ^2 =0.01, df=2, p=0.99) attitudes.

Regarding wildlife conservation, justification for personal attitudes within Westgate was largely associated with acknowledgement of benefits derived from wildlife (68%, n=130). 23% noted both costs and benefits, with 15% stating that benefits were greater, and 15% also thought wildlife and livestock were equally important. Less favourable attitudes were justified by acknowledging the dangers of coexistence (10%) or potential for competition and disease transmission (2%).

Similar reasoning was applied to predator attitudes; 85% (n=130) acknowledged benefits; with 21% stating these outweighed costs. 15% referred to the fact killing was bad since it resulted in further loss; 8% stated that killing did not solve the problem of attacks and 15% argued peaceful mitigation methods were favourable to lethal control. Justification for less positive attitudes implied tolerance of some but not all predators (2%), the belief that costs outweighed benefits (2%) or that conservation would exacerbate conflict (<1%).

Box 4.1: Attitude item two - *"Today I would be happier if wild animals were kept in separate areas away from where people are living because they can be a danger to humans and livestock".*

Despite similar justifications regarding personal attitudes towards wildlife and specifically predators, Westgate individuals mostly held higher aggregated scores for predators (Wilcoxon (paired):V = 208, p= <0.0001); despite the carnivore-bias observed in Fig.4.1. This can probably be traced back to item two (Box.4.1). 57-83% of individuals within each location agreed to this lowering their aggregated score for wildlife; nineteen explaining that separation would reduce HWC.

Focusing on *morans*, personal attitudes to wildlife (KW: χ^2=51.74, df = 2, p<0.0001) and predator (KW: χ^2=59.33, df = 2, p<0.0001) conservation were significantly higher for Westgate non-WW and *WW-morans* than Meibae *morans* (Fig.4.3).

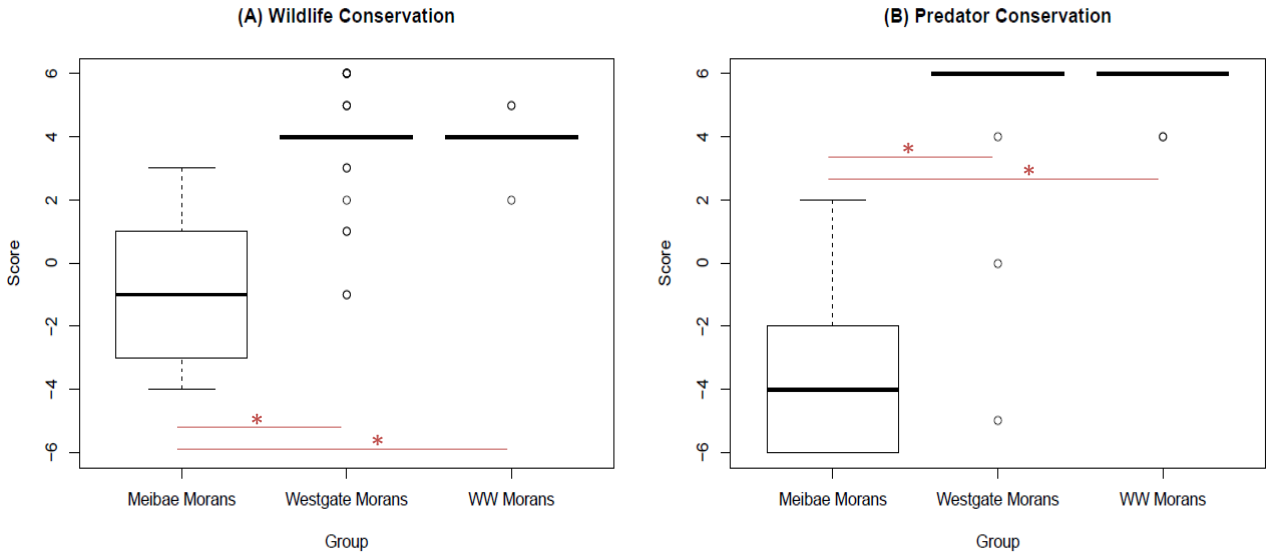


Fig. 4.3 Aggregated attitude score (max: 6, min:-6) for personal attitudes towards (A) wildlife and (B) predator conservation for Meibae *morans* and Westgate non-WW *morans* and WW *morans*. ** = p<0.05 (multiple comparison test after Kruskal Wallis)

Whilst 24% of Meibae *morans* (n=29) acknowledged benefits resulting from wildlife, in contrast to Westgate, 17% said benefits did not reach them and 7% felt wildlife was only important during ceremonies. Disease and competition were most commonly stated to justify personal attitudes (31%). 17% also referred to human fatalities.

Regarding predator conservation, 20% of Meibae *morans* (n=30) thought conservation would increase conflict and/or that predators were only detrimental. Some, however, acknowledged that benefits accrued to other Conservancies (17%) or said they tolerated "*some*" predators (10%).

4.2.3 Subjective norm

Under George & Mallery's (2003) rule of thumb[27], the internal consistency of items used to assess the subjective norm[28] towards both wildlife and predators, might be considered questionable (Cronbach's alpha=+0.61 and +0.58, respectively). Caution is, therefore, warranted in analysis and interpretation of results; Table.4.3 summarises comparisons for aggregated and individual items for non-WW Westgate individuals.

[27] Acceptability = >0.70
[28] The beliefs of others in the Conservancy

Table 4.3 Kruskal-Wallis (χ^2) results comparing aggregated and individual attitude items for assessment of the subjective norm by non-WW individuals within different Westgate locations and different demographic groups (*morans*, elders, women), relating to (A) wildlife and (B) predator conservation. Bold denotes significant effect.

(A) Wildlife Conservation			
	Location	**Demographic**	**Direction of effect**
Aggregated score (Items 1 & 2)	χ^2 = 18.90 **p = 0.0003**	χ^2 =7.62 p =0.05	Location: Sasaab and Sukuroi higher aggregated scores than Ngutuk or Naisunyai. Demographic: NA
Item 1: *"Most people living here today would think that wildlife conservation was at least as important as other issues"*	χ^2 = 3.59 p=0.31	χ^2 = 2.30 p=0.51	Location: NA Demographic: NA
Item 2: **"***Most people living here today would approve of me grazing my livestock inside the core area during a bad drought even though this area is reserved for wildlife"*	χ^2 = 17.06 **p<0.001**	χ^2 =7.94 p =0.05	Location: Ngutuk and Naisunyai agree more than Sasaab or Sukuroi, giving them a lower score. Demographic: NA
(B) Predator Conservation			
	Location	**Demographic**	**Direction of effect**
Aggregated score (Items 1 & 2)	χ^2 = 14.92 **p<0.002**	χ^2 = 5.75 p=0.12	Location: Sasaab has higher aggregated score than other locations. Demographic: NA
Item 1: *"Most people living here today would think that killing or injuring any predator is a bad thing to do even if that predator had attacked livestock"*	χ^2 = 3.41 p= 0.33	χ^2 =2.63 p=0.45	Location: NA Demographic: NA
Item 2: *"Most people living here today would agree that predators have a damaging effect on their livelihoods and therefore numbers should be limited"*	χ^2 = 13.83 **p=0.003**	χ^2 =4.61 p=0.20	Location: Sasaab disagrees more than other locations. Demographic: NA

Whilst there was no effect of demographic (Table.4.3), results indicate that the difference between locations in aggregated scores is likely to have been largely influenced by item two for both sections. Fig.4.4, therefore, shows the proportion of respondents agreeing (or not) with individual items; suggesting that - regardless of location - most believe others consider conservation at least as important as alternative issues (Fig.4.4a) and view retaliatory attacks negatively (Fig.4.4b). However, results for

Sasaab[29] (and *WW-morans*) imply a more positive evaluation of the subjective norm compared to other locations when one considers approval of grazing within the Core area (Fig. 4.4c) or the necessity to limit predators due to damaging effects inflicted upon livelihoods (Fig. 4.4d).

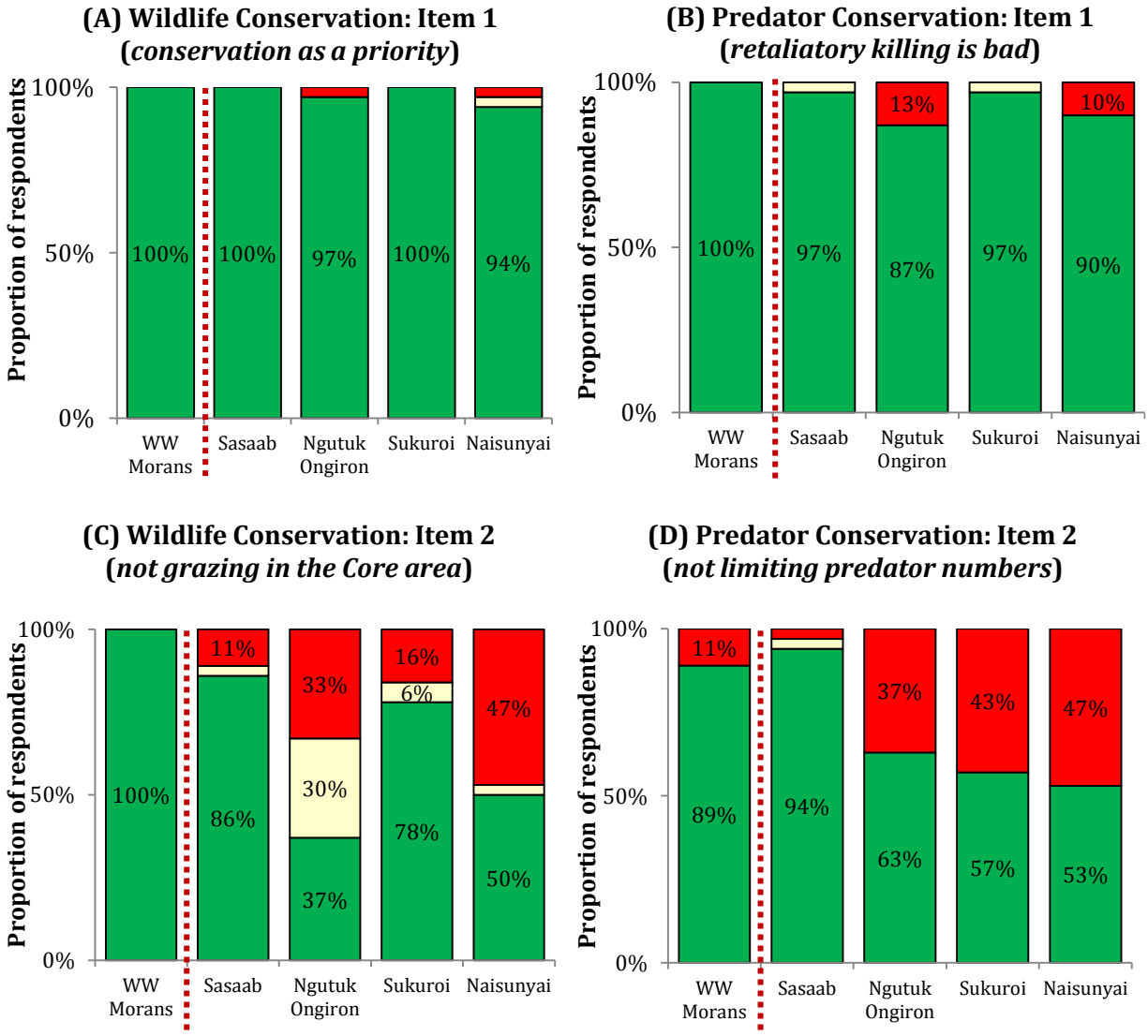


Fig. 4.4 Proportion of individuals in each location answering in a pro-conservation (green bars), anti-conservation (red bars) or neutral manner (yellow bars) in response to individual attitude items used to assess subjective norms for (A) wildlife and (B) predator conservation. Text in italics denotes general theme of each item. WW morans are separated with a dashed line since they represent a sub-section of the Westgate population and individuals are from a range of geographical locations.

[29] Sasaab is where Ewaso Lions research camp is based

To further elucidate subjective norms towards predators, individuals were asked whether others in their area still killed following livestock depredation. Whilst no difference was observed between demographics (Chi-squared: $\chi^2 = 1.58$, df=4, p= 0.81), location had a significant effect upon perceptions ($\chi^2 = 36.74$, df=6, p= <0.0001); this becoming non-significant after removing Ngutuk, where 100% answered 'No' ($\chi^2 = 1.99$, df = 4, p= 0.74).

Focusing on *morans*; consistent with lower personal attitudes, Meibae *morans* held more negative perceptions of the subjective norm towards wildlife and predator conservation than Westgate non-WW or *WW-morans,* regardless of whether items were aggregated or isolated (Table 4.4).

Table 4.4 Kruskal-Wallis (χ^2) results comparing aggregated and individual attitude items for assessment of subjective norms by Meibae and non-WW and WW Westgate *morans,* relating to (A) wildlife and (B) predator conservation. Bold denotes significant effect.

(A) Wildlife Conservation		
	Moran group	**Direction of effect**
Aggregated score (Items 1 & 2)	$\chi^2 = 52.28$ **p<0.0001**	Summated scores reflecting perceptions of the subjective norm toward general wildlife conservation were lower for Meibae *morans* than either WW or non-WW Westgate *morans*.
Item 1: *"Most people living here today would think that wildlife conservation was at least as important as other issues"*	$\chi^2 = 54.07$ **p<0.0001**	Meibae *morans* disagreed significantly more than either WW or non-WW Westgate *morans*.
Item 2: **"***Most people living here today would approve of me grazing my livestock inside the core area during a bad drought even though this area is reserved for wildlife"*	$\chi^2 = 35.47$ **p<0.0001**	Meibae *morans* agreed significantly more than either WW or non-WW Westgate *morans*.
(B) Predator Conservation		
	Moran group	**Direction of effect**
Aggregated score (Items 1 & 2)	$\chi^2 = 44.48$ **p<0.0001**	Summated scores reflecting perceptions of the subjective norm toward predator conservation were lower for Meibae than either WW or non-WW Westgate morans.

(continued overleaf)

Item 1: *"Most people living here today would think that killing or injuring any predator is a bad thing to do even if that predator had attacked livestock"*	**χ^2 = 40.42** p<0.0001	Meibae *morans* agreed significantly less than either WW or non-WW Westgate *morans*.
Item 2: *"Most people living here today would agree that predators have a damaging effect on their livelihoods and therefore numbers should be limited"*	χ^2 = 26.29 **p<0.0001**	Meibae *morans* agreed significantly more than either WW or non-WW Westgate *morans.*

When justifying responses, many Meibae *morans* felt they did not benefit from wildlife and/or considered livestock their priority (44%, n=27; Box 4.2).

Box 4.2 *"Livestock is our priority; why should wildlife be the priority when it brings us no benefits"* (*Moran*, Meibae)

Alarmingly, 86% of Meibae *morans* (n=29) thought others in Meibae still killed predators following livestock depredation; agreement being significantly higher than for non-WW Westgate *morans* (Chi-squared:χ^2 = 23.97, p= <0.0001). Importantly, in both Meibae and Westgate, an individual's own intentions regarding retaliatory attacks upon different species (section 4.2.7) closely matched whether they thought others still engaged in this act; 81-86% of Meibae *morans*, and 63-77% of Westgate residents – species dependent and excluding those who answered 'don't know' - either stating both that they would kill the predator and that they perceived others still kill predators or both that they would not kill it and that they perceive others no longer kill predators. Table 4.5 illustrates this point for leopards.

Table 4.5 Response of non-WW Westgate residents and Meibae *morans* to the questions: (i) Do you think people living here today kill predators to stop them taking livestock? (perceived norm; excludes option for don't know) and (ii) indicate the number of livestock you would be willing to lose to a leopard in a month before you would attempt to kill a predator or would think it acceptable for a relative to kill a predator (own tolerance; categories for 'no tolerance' and 'after a threshold number of shoats killed in one month' are combined). Highlighted cells indicate the proportion of individuals whose own tolerance matches their perception of whether others in the Conservancy still kill predators.

Example: leopard		**Westgate (all non-WW)**		**Meibae (*morans*)**	
↓ own tolerance	**→ perceived norm**	Others kill predators	Others don't kill predators	Others kill predators	Others don't kill predators
I would never kill leopard		15%	64%	6%	0%
I would kill leopard		13%	8%	77%	17%

4.2.4 Perceived behavioural control

Given the Cronbach's alpha score of only +0.64, analyses of perceived behavioural controls pertaining to wildlife conservation consider both aggregated and individual items. With a coefficient of -0.97 suggesting complete disagreement between items, analyses for predator conservation are confined to individual items.

Whilst scores relating to perceived behavioural controls[30] did not differ by location, non-WW Westgate *morans* were significantly more likely than elders or women to answer neutrally to statements concerning control over decision-making and knowledge HWC-mitigation methods; however, all groups were equally likely to agree with predator conservation items (Table 4.6).

Table 4.6 Kruskal-Wallis (χ^2) results comparing aggregated and individual attitude items for assessment of behavioural controls across Westgate locations and demographic groups (both excluding WW *morans*), relating to (A) wildlife and (B) predator conservation.

(A) Wildlife Conservation			
	Location	**Demographic**	**Direction of effect**
Aggregated score (Items 1 & 2)	χ^2 =6.31 p =0.10	χ^2 = 15.09 **p= 0.001**	Location: NA Demographic: lower aggregated scores for *morans* compared to women and elders.
Item 1: *"Personally I have little control over wildlife conservation issues in the conservancy. The important decisions are currently made by other people and not me"*	χ^2 = 6.40 p=0.09	χ^2 =12.45 **p=0.002**	Location: NA Demographic: *morans* disagreed less (66%) than women (90%) and elders (93%). Those *morans* that did not disagree were mostly neutral (29%).
Item 2: **"***I now know many ways people can reduce conflict and competition with wildlife so neither must suffer because of the other"*	χ^2 =1.44 p =0.70	χ^2 = 9.23 **p=0.01**	Location: NA Demographic: *morans* agreed less (85%) than women (100%) and elders (97%).Those *morans* that did not agree were mostly neutral.
B) Predator Conservation			
	Location	**Demographic**	**Direction of effect**
Item 1: *"I could kill a predator if I wanted to. There is nothing stopping me e.g. law, equipment, skill"*	χ^2 =3.07 p=0.38	χ^2 =1.88 p=0.39	Location: NA Demographic: NA
Item 2: *"I would like to help protect predators by reducing conflict with livestock but there are factors which prevent me from doing this"*	χ^2 = 4.19 p = 0.24	χ^2 =2.03 p=0.36	Location: NA Demographic: NA (but see text)

[30] External factors which might prevent an individual behaving in a manner they desire

Importantly, in Westgate, in response to item 1, killing of wildlife was widely acknowledged as illegal; with a strong belief if caught you would be shot or arrested (86%; free-listed); indicating rigorous law enforcement.

Whilst 85% of community members agreed with item two for predator-related statements (Table.4.6); implying factors preventing them from assisting in HWC mitigation efforts, just 10% (n=120) explicitly supported this idea when asked to justify responses. It is possible the item was unclear, with people agreeing they wanted to help rather than agreeing factors prevented them from doing so; hence the internal consistency coefficient of -0.97.

> ***Box 4.3*** *"...I have tried many ways but I have no other experience to reduce conflict and a lack of money to put wire* [boma]" (*Moran*, Meibae).

Focusing on *morans*, differences were evident between perceptions of Meibae *morans*' and either WW or non-WW Westgate *morans*' (Table.4.7). Meibae *morans* were more likely to agree they (i) had little control over wildlife conservation issues and (ii) did not know sufficient methods to reduce HWC (Box.4.3).

Table 4.7 Kruskal-Wallis (χ^2) results comparing aggregated and individual attitude items for assessment of behavioural controls for non-WW and WW Westgate *morans* and Meibae *morans*, relating to (A) wildlife and (B) predator conservation.

(A) Wildlife Conservation		
	Moran groups	**Direction of effect**
Aggregated score (Items 1 & 2)	$\chi^2 = 50.04$ **p<0.0001**	Meibae *morans* hold lower aggregated scores than either WW or non-WW Westgate *morans*.
Item 1: *"Personally I have little control over wildlife conservation issues in the conservancy. The important decisions are currently made by other people and not me"*	$\chi^2 = 54.72$ **p<0.0001**	Meibae *morans* agreed more often than either WW or non-WW Westgate *morans*.
Item 2: **"***I now know many ways people can reduce conflict and competition with wildlife so neither must suffer because of the other"*	$\chi^2 = 15.70$ **p<0.001**	Meibae *morans* disagreed more often than either WW or non-WW Westgate *morans*.

(continued overleaf)

B) Predator Conservation		
	Moran groups	**Direction of effect**
Item 1: *"I could kill a predator if I wanted to. There is nothing stopping me e.g. law, equipment, skill"*	$\chi^2 = 47.30$ **p<0.0001**	Meibae *morans* agreed more often than either WW or non-WW Westgate *morans*.
Item 2: *"I would like to help protect predators by reducing conflict with livestock but there are factors which prevent me from doing this"*	$\chi^2 = 11.70$ **p= 0.003**	Westgate *morans* agreed more often than Meibae *morans*, however there is concern that the question may have been misunderstood – see text

Consistent with perceptions that people still kill predators in Meibae, 71% (n=28) of *morans* – compared to 2% (n=41) of Westgate *morans* - felt nothing was stopping them killing predators if they wished; however, 28% still acknowledged consequences (e.g.shot or arrested) if they did.

4.2.5 Attitude change and attribution

Whilst these results indicate positive attitudes towards conservation within Westgate (and negative attitudes within Meibae), they do not reveal WW's specific contribution; however, several factors suggest it has had a positive impact.

Firstly, >90% of community members in each Westgate location, and all *WW-morans*, stated their attitude "*towards wildlife, and particularly predators*" had changed in the last two years. This is suggestive both of a rapid change and one consistent with WW's time of operation. Secondly, when asked if any group had influenced their opinions 47% -97% of community members, and all *WW-morans*, free-listed WW. Contrary to H5, Sasaab and Ngutuk[31] did not cite WW more than other locations.

The Conservancy (10-47%) and Ewaso Lions (6-46%) appear to have also contributed to changing attitudes; however, results imply a distance gradient may be in operation, with Sasaab and Ngutuk more readily listing the Conservancy, and Sasaab more readily listing Ewaso Lions, compared with less proximate locations. Frequencies relating to other groups, for example Grevy's Zebra Trust, ranged from 0% to 16%; dependent upon location.

In contrast to Westgate, just 20% of Meibae *morans* (n=30) stated their attitudes had changed; all attributing this to the Conservancy.

[31] locations with the highest perceived exposure to WW

4.2.6 Behavioural intentions: wildlife conservation[32]

Willingness to spend time on conservation activities implied that, whilst most of Westgate community (96%, n=121) currently devote no time to conservation, all except two were willing to contribute further. Suggested activities were mostly restricted to reporting injured/dead wildlife (35%) and poachers (23%), however, 17% expressed interest in formal monitoring.

Those already engaged in conservation, including *WW-morans*, were happy with the time they currently devote to conservation; stating that it enabled coverage of a large area during their patrols.

93% of community members said their answer would have differed two years ago; justifications suggest a recent increase in knowledge (65%) and opportunities to get involved (>12%), with 13% explicitly referring to WW; this proportion rising to 63-93% when asked if anyone had influenced them. Again, Sasaab cited WW less frequently and the Conservancy more frequently relative to other locations.

4.2.7 Behavioural intentions: predator conservation

In Westgate, location did not significantly influence predator tolerance; except for spotted hyena (Chi-squared: χ^2 =18.19, df =6, p=0.01; Sasaab demonstrating higher tolerance).

Consistent with positive predator attitudes, the majority of non-WW Westgate residents, and *WW-morans*, said they would never kill a predator regardless of the number of livestock consumed; with the exception of spotted hyena (Fig. 4.5). However, a substantial number (including *WW-morans*) would still retaliate if the predator killed above a threshold number of livestock within one month or, in extreme cases, before it had a chance to attack livestock.

[32] No comparison to Meibae was possible due to misunderstanding of the question. Time spent on current activities was interpreted as time willing to spend on conservation activities.

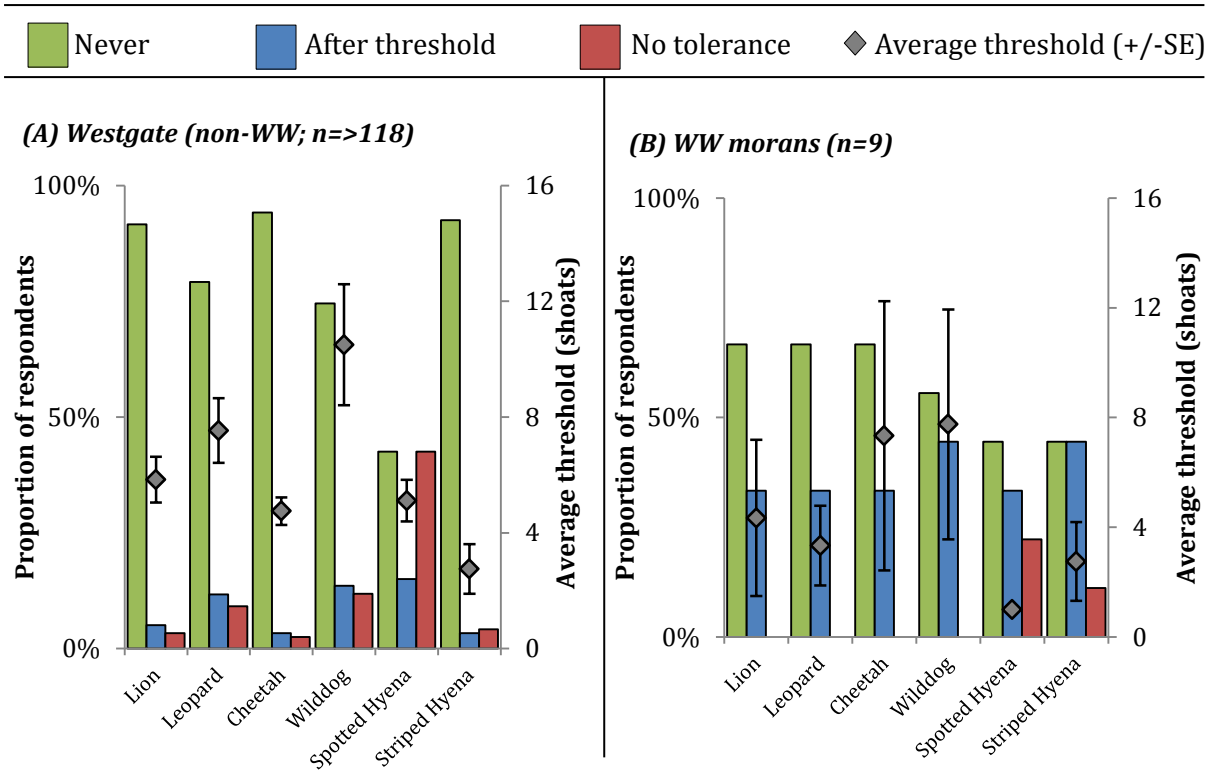


Fig. 4.5 Proportion of (A) non-WW Westgate residents and (B) WW-*morans* who would: (i) never kill a predator regardless of livestock consumption (green); (ii) kill only after a threshold number of livestock had been consumed (blue) or (iii) would kill a predator before it had the chance to kill livestock (red). Diamonds indicate average threshold (+/-SE) of shoats individuals stating option (ii) would be willing to lose before retaliating.

When justifying tolerance for particular species, reference was made to its conservation status, the level of conflict experienced and/or its ability to attract tourist revenue. Cultural reasons were also cited for lion[33] and wild dog[34]. Personal likes and dislikes were rarely used, except spotted hyena which 22% of community members "*hated*". More philosophical 'blanket' arguments (e.g. "*killing doesn't solve the problem*", "*I would lose two important animals*[35]", "*there is one shoat for predators and the rest for herders*") were uncommon amongst community members, though cited by several *WW-morans*. Although this is encouraging, given *WW-morans* role as ambassadors it remains concerning that over half stated they would kill at least one species after it consumed (at most) a threshold number of livestock.

[33] Lion skins are used in marriage ceremonies but are now often provided by Kenya Wildlife Service and shared amongst families (S.Bhalla, pers. comm.)

[34] There is a Samburu belief that denotes anyone killing a wild dog will not be blessed with a son.

[35] Referring to the loss of both a domestic animal and the predator if they retaliated

Nevertheless, eight out of nine *WW-morans* and >93% of community members in each location stated a change in tolerance over the last two years. Again, this was mostly attributed to increased awareness of the benefits and importance of predators; 57-93% of individuals in each location listing WW as an influence. Contrary to expectations the location where WW was cited least frequently (57%) was Sasaab; where, again, more (37%) people cited the Conservancy's influence compared with other locations (<13%).

Focusing on *morans*, Meibae expressed low tolerance for all species, with a "kill-on-sight" policy stated by 45-94%, dependent upon species. The distribution of answers to each category of tolerance for Meibae versus Westgate *morans* was deemed highly significant, with Westgate displaying greater tolerance in each case (Table 4.8).

Table 4.8 Chi-squared (χ^2) test statistics for comparisons between the distribution of answers to each category of tolerance (never kill; kill after threshold; no tolerance) for Meibae *morans* and Westgate non-WW *morans*.

Species	Chi-squared	Direction of effect
Lion	χ^2 =46.74, df=2, **p<0.0001**	Westgate non-WW *morans* more tolerant than Meibae *morans*
Leopard	χ^2 =37.46, df=2, **p<0.0001**	
Cheetah	χ^2 = 59.89, df=2, **p<0.0001**	
Wild dog	χ^2 =22.14, df=2, **p<0.0001**	
Spotted hyena	χ^2=16.71, df=2, **p=0.0002**	
Striped hyena	χ^2=60.07, df=2, **p<0.0001**	

In Meibae, justification was largely related to the need to prevent further attacks or due to predators killing multiple livestock. The importance of cultural beliefs cannot be undermined, however; 24% (n=29) stating they would not kill wild dogs due to underlying cultural beliefs.

Compared with Westgate, 87% of Meibae *morans* felt their tolerance remained unchanged; those few stating positive changes listed the Conservancy or Wachira as an influence.[36].

[36] The late Wachira was an influential man involved in raising awareness about wildlife and providing loans to the community in Meibae. Evidence suggests this was a relatively long time ago.

4.2.8 Additional indicators of pro-conservation behaviour

i) Methods employed to reduce conflict

Use of guard dogs (>57%) and tightly fencing livestock *bomas* (>60%) were the methods most frequently cited to reduce HCC across Westgate. Recognition of the importance of utilising multiple, experienced herders, avoiding bushy areas and changing husbandry practices following attacks was widespread. Other deterrents included use of fires/lights at night (23-40%), scarecrows (17-33%) and sound-making devices (10-17%); many adopting these practices following *WW-morans'* advice (Box 4.4).

Box. 4.4 "*Whenever we lose our goats to hyenas 'Yesalai'* [WW-*moran*, Sasaab] *gives us advice to use deterrents like scarecrows, fire, dogs and objects producing sound*" (Women's FG, Sasaab)

The greatest inter-Conservancy difference was that 32% of Meibae *morans* (n=28) said they would kill a predator to limit conflict; often referring to poisoning - particularly concerning given its indiscriminate application:

"*I poisoned hyenas and eight of them died and three jackals*" (*Moran*, Meibae)

"*I started to poison predators two months ago when I realised predators were many*" (*Moran*, Meibae)

ii) Reporting incidents

In Westgate most individuals would report if a predator killed their livestock (>97%; WW the most cited group to whom they would report), if they came across lost livestock (>97%; elders and *morans* most cited) or if they found a dead/injured wild animal (>90%; a diversity of groups cited including WW, EL, Conservancy and KWS).

Whilst 87% (n=30) of Meibae *morans* would report lost livestock (mostly to other *morans*) just 63% would report if a predator killed their livestock (mostly to other *morans*) and 67% would report if they found a dead/injured wild animal (mostly to the Conservancy). Lack of response was indicated as a reason not to report incidents, whilst three said reporting predation to another *moran* was for assistance killing that predator.

4.3 EMPOWERMENT OF THE MORAN DEMOGRAPHIC

4.3.1 Political empowerment

When asked to indicate their level of agreement with the statement: "*Personally, I have little control over wildlife conservation issues in the Conservancy. The important decisions are currently made by other people not me*", 66% (n=41) of Westgate *morans* and eight out of nine *WW-morans* disagreed (Box 4.5).

Box 4.5. "*We know that whatever issue is discussed all community members are actually involved*" (*Moran*, Ngutuk Ongiron).

Just 5% of non-WW Westgate *morans* and one WW *moran* felt they had little control, in contrast to 93% of Meibae *morans* (n=30). Justification for agreement in Westgate was attributed to the Conservancy making "*important*" decisions; whilst Meibae *morans* expressed complete exclusion[37]:

"*These projects and Scouts are not involving anyone in conservation, it is like all the wildlife are belonging to them…we are not involved with any of wildlife stuff except one moran who has gone to a grazing management seminar*" (*Moran's* FG, Meibae)

Although results cannot confirm WW's role in empowering *morans*, evidence from FG/VDs emphases WW's contribution to giving *morans* a voice in conservation and general decision-making in Westgate:

"*Due to the starting of* ***Warrior Watch*** *we are involved in conservation, given a chance to participate in meetings and address our views to community members*" (*Moran's* FG, Sasaab).

"***Warrior Watch*** *has played a big role; before morans were neglected in society and left behind in many issues"* (*Moran's* FG, Sukuroi).

Further support for political empowerment comes from the VDs; community *morans* were considered, in 5 of 7 VDs, to have at least some conservation impact. However, their role was apparently limited to reporting injured/dead wildlife and poachers. Whereas, *WW-morans* were regularly cited as having the 3rd or 4th highest impact of all

[37] The Chief verified these claims during the Elder's FG in Meibae.

actors; falling behind the Conservancy, Ewaso Lions and – in two out of three VDs in Sukuroi - behind Grevy's Zebra Trust.

Box 4.6 "*Morans from the community are more respected due to* ***Warrior Watch*** *...[it] has changed morans; people used to think they were criminal subjects in society"* (Elder's FG, Sasaab).

4.3.2 Social empowerment

It was widely acknowledged in FGs that WW has contributed significantly towards social cohesion in Westgate. Firstly, *WW-morans* appear instrumental in changing perceptions towards the demographic as a whole (Box.4.6). Secondly, as purported in all FGs, WW has united various groups:

- ***Morans*** **and Conservancy employees**:

"Before ***Warrior Watch*** *there was a misunderstanding between Scouts and morans, but nowadays there is a close relationship and cooperation."* (Elder's FG, Sasaab).

- **Conservationists and community members:**

"[Talking about WW] *Education to demographic groups improved the relationship of conservationists and community members because now many people know the importance of wildlife and the benefits it brings to them"* (Women's FG, Sasaab).

- ***Morans*** **and elders:**

"Morans are now helping elders identify raiders and recover stolen livestock from neighbouring Districts; this never happened two years ago. Due to the hardwork of morans from ***Warrior Watch*** *is why we elders are successful in maintaining peace"* (Elder's FG, Sasaab)

Such comments indicate a cohesive society where members are working together to achieve common goals with positives for both biodiversity conservation - through increased wildlife awareness and cooperation - and for maintenance of security, as *morans* are entrusted to assist in resolving issues they had previously been accused of (e.g. raiding). Further evidence of WW's role in uniting demographics– both with each other and with Ewaso Lions – comes from VDs, where WW is the common denominator

linking elders, *morans* and women together and linking these groups with Ewaso Lions (Appendix 8). Such cohesiveness does not appear to be echoed in Meibae, where FGs suggested a volatile relationship between Scouts and *morans*:

"*Morans are taken as thieves and killers. Scouts don't like them.*" (Elder's FG, Meibae)

"*We don't want to create any relationship with Scouts because they have started shooting us in the bushes*" *(Moran's* FG, Meibae)

4.3.3 Economic empowerment

Although WW was not designed to provide monetary incentives evidence suggests financial benefits accrued through provision of the food stipend and that this was not limited to participants; 6 of 7 FGs stating monetary benefits to relatives and/or friends of *WW-morans*. Moreover, 8-31% of community members in each location free-listed some form of financial support as a personal benefit of WW.

There was no support for economic empowerment resulting from conservation efforts with respect to Meibae *morans*.

Box 4.7: *"Surely education changed my life because before I never knew the importance of wildlife but now I have known"* (WW *moran's* FG).

4.3.4 Psychological empowerment

Psychological empowerment of community members was restricted to skills gained in predator control from *WW-morans*, and increased respect for the *moran* demographic. *WW-morans* themselves described further benefits of education and technological skills[38] (Box 4.7); also likely to have positively influenced individual confidence levels. Though explicit reference to this was never made, *WW-morans* ranked themselves 2nd to the Conservancy – above Ewaso Lions - in terms of their conservation impact; indicating they feel their efforts are indeed worthwhile. However, they suggest a divide in social standing has developed between community and *WW-morans* which might invoke resentment in future:

"they see ***Warrior Watch*** *morans to be special and empowered from them"* (WW-*moran*'s FG)

[38] WW-*morans* are trained and then provided with GPS, radios, mobile phones, binoculars and cameras when they have reached the required standard

Conversely, Meibae *morans* believe wildlife belongs to Scouts (*moran*'s FG) and perceive land management initiatives as taking away community land (women's FG). Under Scheyvens' (1999) framework this could signify psychological disempowerment; a scenario which can result when groups do not receive benefits from initiatives but face hardships due to restrictions imposed upon them. Moreover, three *morans* stated that they would not report a dead wild animal and/or an incident of livestock depredation because there had been no response to such reports on previous occasions; highlighting some disillusionment with current institutions.

4.4 ECOLOGICAL AND CONSERVATION KNOWLEDGE[39]

In Westgate, all *WW-morans*, and 26 of 33 non-WW participants, listed Ewaso Lions or WW as their greatest source of wildlife knowledge; the remainder cited the Conservancy, Lodge or Grevy's Zebra Trust. In Meibae, 11 of 17 participants were self-taught; the rest citing 'Wachira'[40], the Conservancy or Earthwatch.

Focusing on Westgate, there was no significant effect of location on overall scores (t=-0.31, p=0.77); results for Sasaab and Sukuroi were therefore aggregated. Whilst *WW-morans* held high overall scores, and appeared to perform consistently better than elders (Fig. 4.6), no significant difference was found across demographic groups (ANOVA: F=3.30, p=0.07).

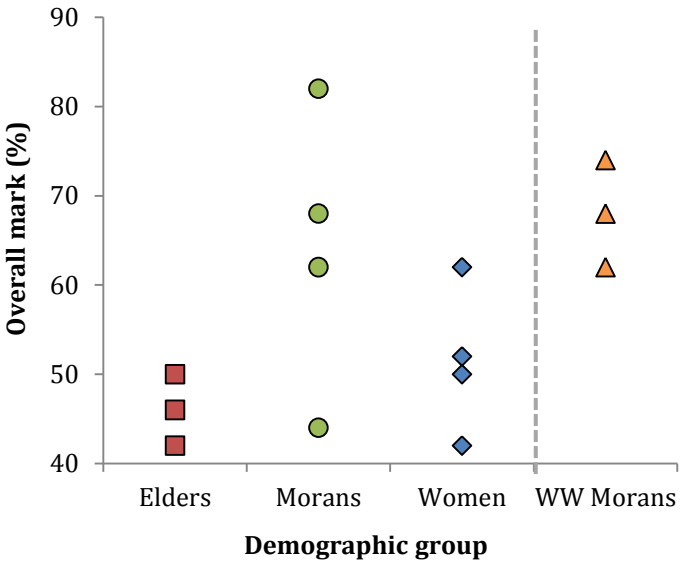


Fig. 4.6 Overall marks for groups participating in the quiz, each symbol representing one team. *WW-morans* separated by a dotted line since they represent a sub-section of the population who have received specialised training.

[39] Team size was not correlated with overall scores (Kendall's rank-correlation: Westgate: z: -1.19, p = 0.23; Meibae: z: -0.58, p = 0.56).
[40] The late Wachira was an influential man involved in raising awareness about wildlife and providing loans to the community in Meibae. Evidence suggests this was a relatively long time ago.

However, when scores are broken down by round *WW-morans* performed significiantly better during the identification round than elders (Tukey HSD test: p=0.02) and women (p=0.02), and in the scenarios[41] round compared with elders (p=0.04) (Fig. 4.7).

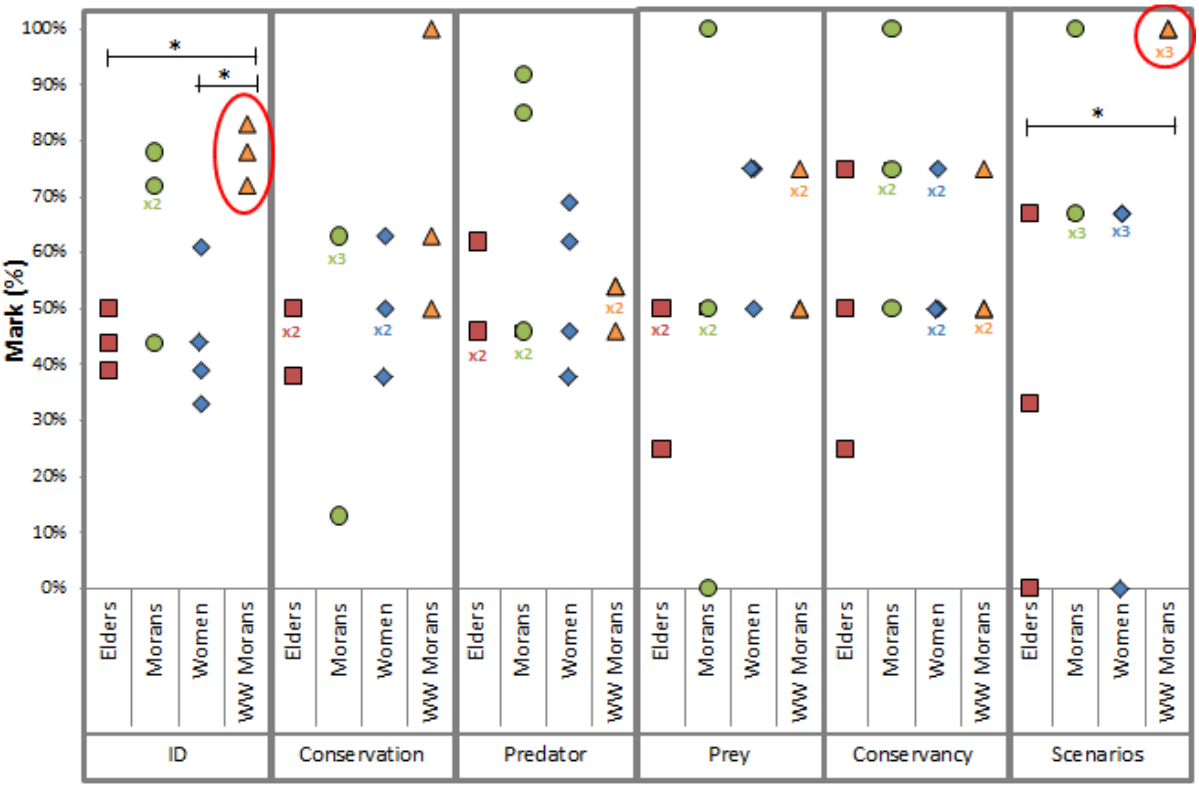


Fig. 4.7 Westgate quiz scores broken down by round and demographic. Question number varied - identification (ID): 18; conservation: 8; Predator: 13; Prey: 4; Conservancy: 4; Scenarios: 3. Each symbol represents a group; where scores overlap adjacent numbers indicate frequencies. * denotes significant at p<0.05; Tukey HSD test.

Contary to H4, scores for Westgate, excluding *WW-morans*, were not significantly higher than Meibae (t=-0.88, p= 0.39). Fig.4.8, however, implies that the pattern of knowledge for elders, *morans* and women may not be the same in Meibae as Westgate, with elders performing better in the former. Yet, small sample size meant it was not possible to explore this further.

[41] questions requiring participants to know what actions to take in certain situations e.g. if they discover an injured cheetah.

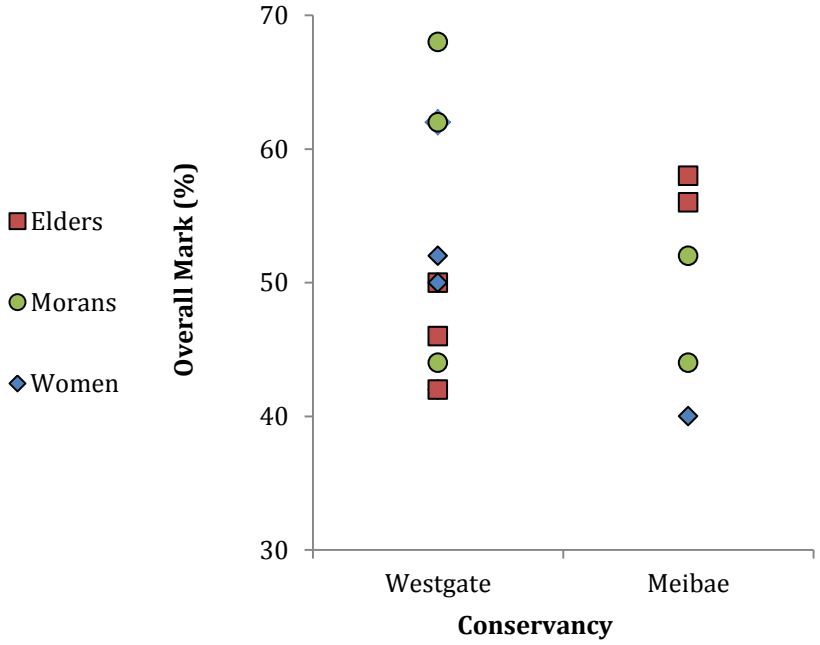


Fig. 4.8 Overall marks (%) for Westgate (all non-WW demographics; 11 groups) and Meibae (all demographics; 5 groups). Some overlapping scores.

There remained no significant difference between the Conservancies when scores were broken down by round; except for the conservation round where Westgate performed better (conservation: t=-2.41, p = 0.04).

Conclusions drawn in this section are, however, limited in that they reflect the knowledge of a small and geographically restricted sample.

4.5 KNOWLEDGE OF, AND PERCEPTIONS TOWARDS, WARRIOR WATCH

4.5.1 Background

All Westgate interviewees (n=120) had heard of Ewaso Lions and free-listed at least one good thing about it (Fig. 4.9). A number related to WW; the three highest listed items:

- Employment of *morans* (39%),
- Education of *morans* (35%)
- Creation of WW (31%; equal with "community education")

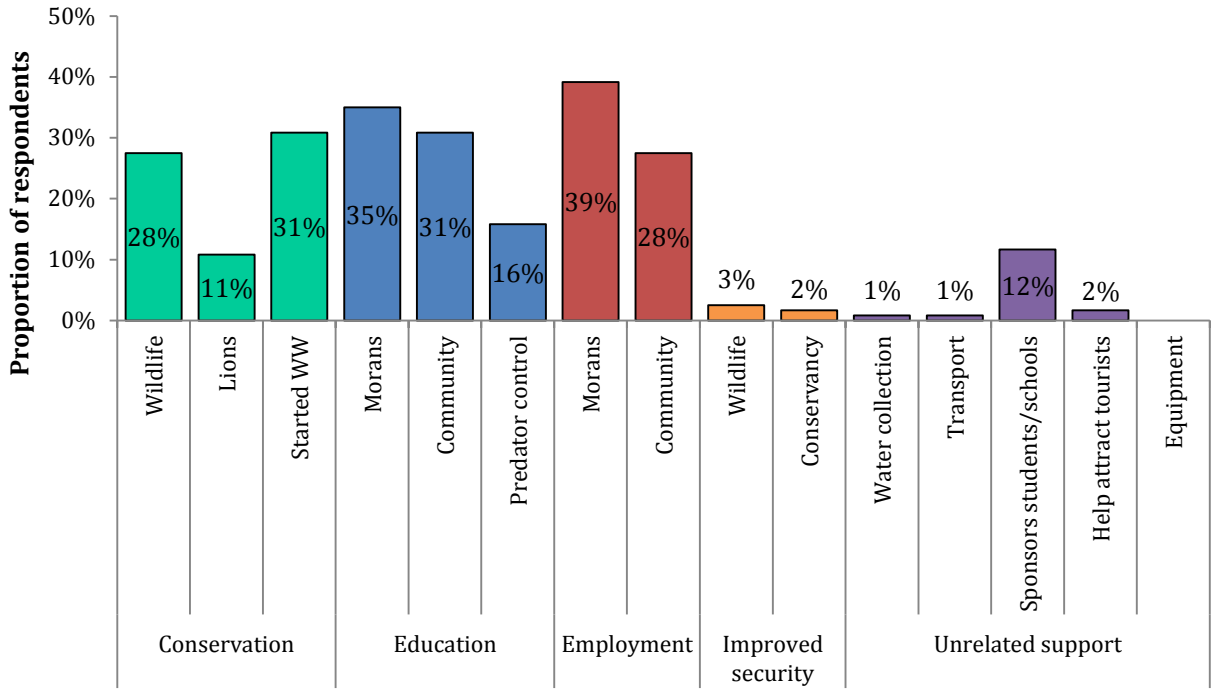


Fig. 4.9 responses to the open ended question: "Are there any good things about Ewaso Lions? If yes, what?" Proportions describe the number of people free-listing each theme for all Westgate locations combined. Proportions total over 100% since multiple answers accepted.

Six individuals (n=120), three residents of Naisunyai, listed negative aspect(s) of EL; including: male-bias (n=4), a lack of compensation following livestock depredation (n=2), being instructed against killing predators (n=2) and not visiting my area enough (n=1).

Regarding WW, all participants were aware of the programme and able to name – at least - the representative from their location[42]. Reasonable understanding of aims was also demonstrated; as illustrated in Fig. 4.10, the most frequently stated perceived aims most closely matched actual aims cited in the concept note.

[42] With the exception of one woman who listed the WW-*moran* based in the next closest location to her own.

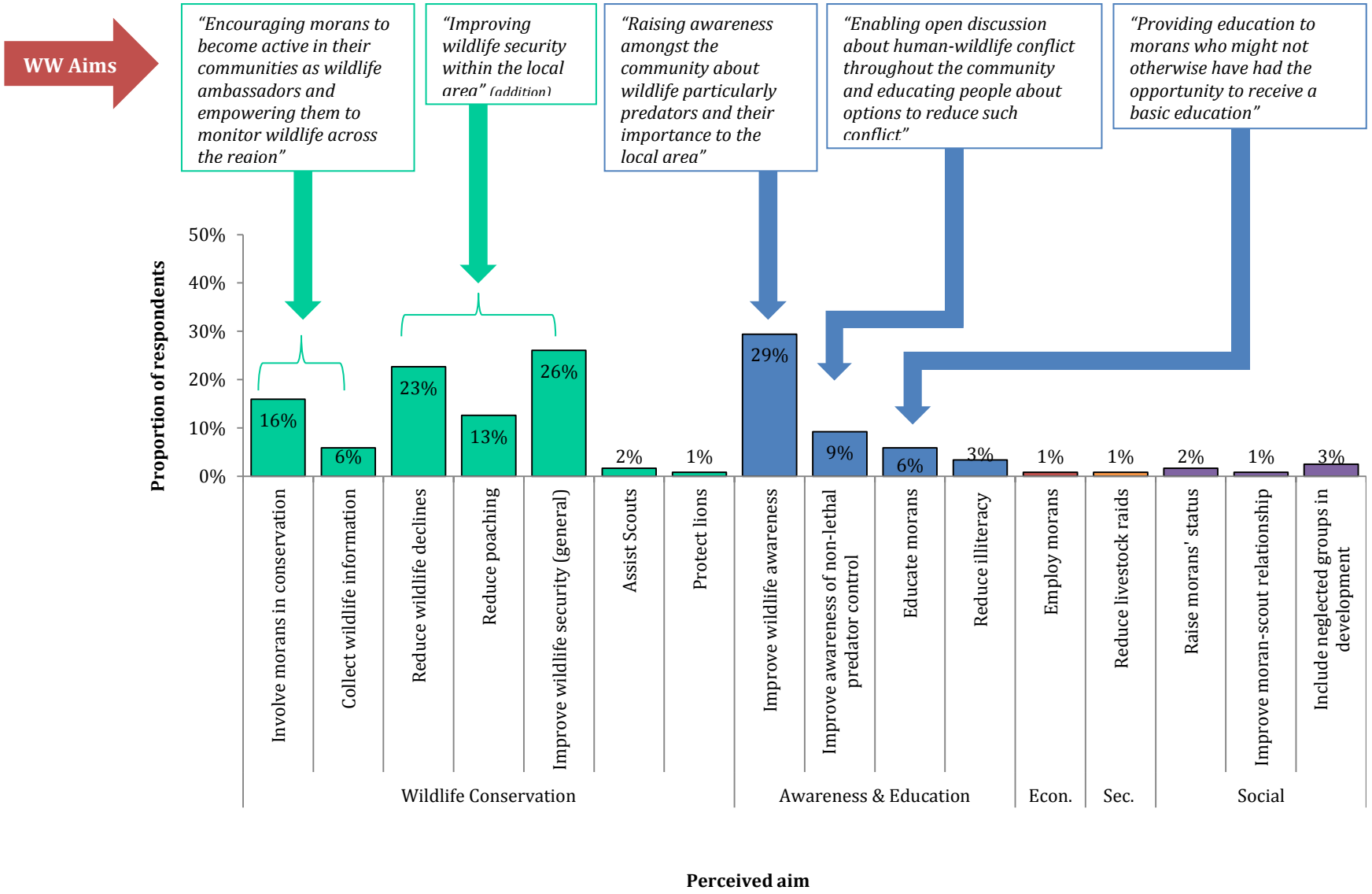


Fig. 4.10 Responses given to the question: "What are the main aims of WW? Proportions shown are the number of individuals free-listing each theme within all Westgate locations. Proportions total over 100% as multiple answers were accepted. Actual aims shown in boxes above the graph; (addition) refers to an aim added at a later stage. Econ.=economic and Sec. = security.

Compared to those stating education of *morans* as a benefit of EL (35%) (and WW: 82%), relatively few saw this as one of the main aims of WW (6%). The same true of collecting wildlife information (6%) and improving awareness of predator control methods (9%). Nevertheless, it was widely agreed during FGs that aims met the interests of the community and that WW has so far been successful in achieving them: "*Before the school of warriors started, morans were never involved in conservation. Now morans from Warrior Watch deal with wildlife conservation daily by recording wildlife that they have seen in a given period of time. They are able to use stationeries like writing on paper to record conflict, use binoculars and radios for communication; things that they never did before*" (Women's FG, Sasaab).

"*Many people in our area nowadays have known many ways of controlling predators and poaching cases have also reduced due to the presence of morans from Warrior Watch. Us community members are interested in conserving wildlife by copying Warrior Watch representative*" (Elder's FG, Sukuroi).

Focusing on *WW-morans*, five of six[43] identified the importance of involving *morans* in conservation and improving wildlife security. Just two, however, explicitly referred to raising awareness about wildlife or options to reduce conflict; despite identifying these as benefits to the community during FGs. It was not clear whether they just did not view these "main" aims. They also did not mention education as an aim of WW, despite this being the most frequently cited self-benefit (7) and the factor half ranked as the main reason they attend weekly meetings.

4.5.2 Costs and benefits: *WW-morans*

99.2% of Westgate residents cited benefits to *WW-morans* (n=118); education (82%) and employment (78%) were the most widely listed, as they were by *WW-morans* themselves. Other benefits included:

- Opportunity to acquire new skills in conservation (21%);
- Skills in equipment use (9%);
- Improved social status (7%);
- Privilege to be involved in conservation (6%)
- Opportunity to visit new areas (3%)

[43] Three non-responses

Five individuals also listed costs; these were all related to a lack of time to devote to personal commitments (e.g. attending ceremonies). During FGs, *WW-morans* further expressed discontent over the lack of a binding agreement.

4.5.3 Costs and benefits: non-WW individuals

When asked if they themselves accrued any benefits from WW, 80-97% agreed depending on location; however, benefits were largely confined to increased awareness about wildlife and predator control (Fig. 4.11). Yet a larger number than expected, 17% of those acknowledging self-benefits, reported financial support.

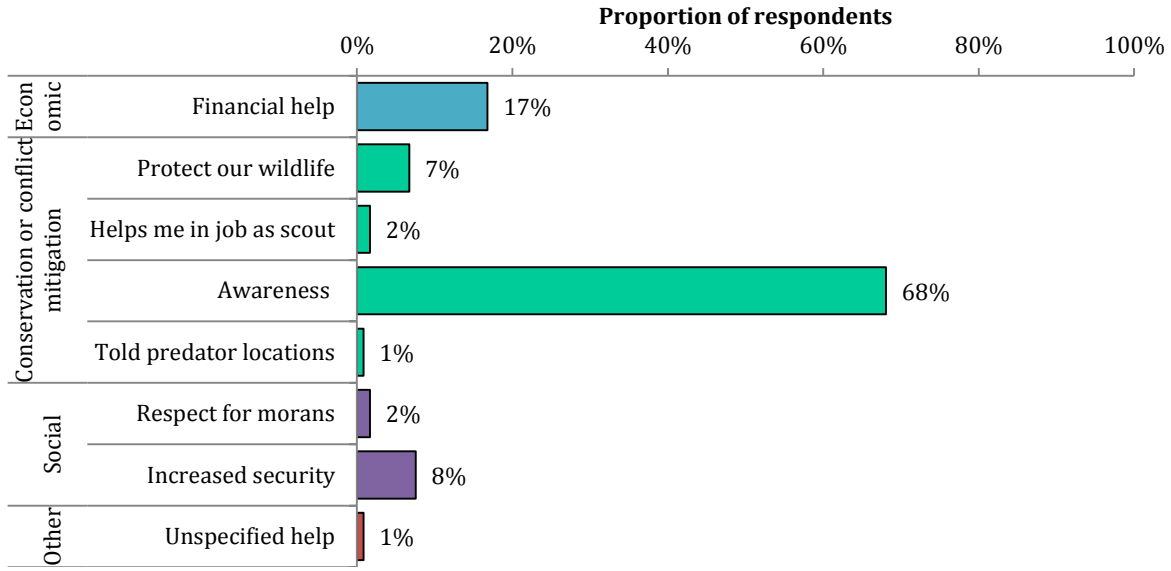


Fig. 4.11 Proportion of community members free-listing different types of benefit they derive from WW (n=119). Proportions total more than 100% since multiple answers accepted.

Whilst no self-costs were acknowledged by the wider community, *WW-morans* listed two 'negatives' of WW to the community; firstly, that community *morans* thought participants were benefiting more from wildlife due to involvement in WW. Whilst, regarding elders they said:

"*Elders hate it when conflicts are reported by WW as they say we just record it and no payment is given*" (WW-*moran's* FG)

However, this is not so much a negative imposed upon elders as a negative view of the way WW operates. Indeed, the issue of compensation was raised on a couple of occasions.

4.5.4 Costs and benefits: Conservancy

No costs were acknowledged, but 83% -100% of individuals, depending on location, reported benefits to the Conservancy from WW. These mostly related to:

- Cooperation on conservation issues (46%)
- Collection of wildlife information from peripheral locations (43%)
- Enhanced security (31%).

Perceived benefits cited by *WW-morans* themselves echoed these themes.

4.5.5 Improvements

63% (n=120) of Westgate residents felt WW could be improved with suggestions largely falling into two categories: 'increased equipment and personnel' and 'improved education' (Fig. 4.12).

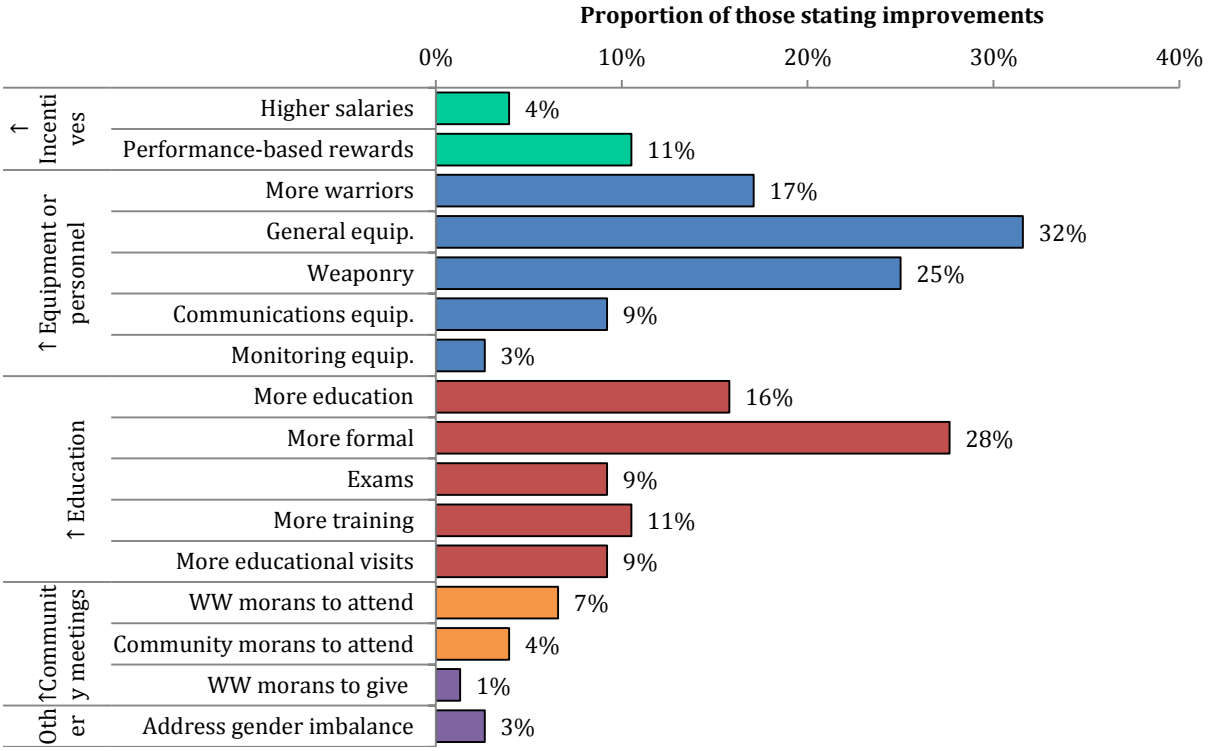


Fig. 4.12 Proportion of those free-listing each type of improvement. Percentages given are out of the total number of Westgate residents (n= 76) specifying that improvements could be made to WW. Proportions total over 100% as multiple answers accepted.

A general feeling amongst the community was that *WW-morans* did not have sufficient equipment to fulfil their role effectively; whether or not they specified the type of equipment currently lacking. Justification for increased weaponry was exclusively

associated with the need to kill poachers, implying a strong sense of disapproval for this activity. Moreover, 9% of those providing suggestions for improvement thought the current communication problems between *WW-morans* (and with Scouts) could be alleviated through provision of more radios.

Whilst the issue of equipment could be resolved with directed funding[44], the issues pertaining to education and addressing gender-bias may requires more radical alterations; whilst education is the main incentive to *WW-morans*, gender-bias could invoke community resentment. Sasaab elders suggested a possible mechanism by which the gender-bias issue could be addressed:

> "*There should be a school for girls in Sasaab where [WW morans] go at night; the competition will encourage morans in the programme to be serious and feel like they are doing something good*" (Elder's FG, Sasaab)

When *WW-morans* were also asked about improvements suggestions provided mostly related to a lack of equipment/personnel or a desire for higher 'salaries' (Fig. 4.13).

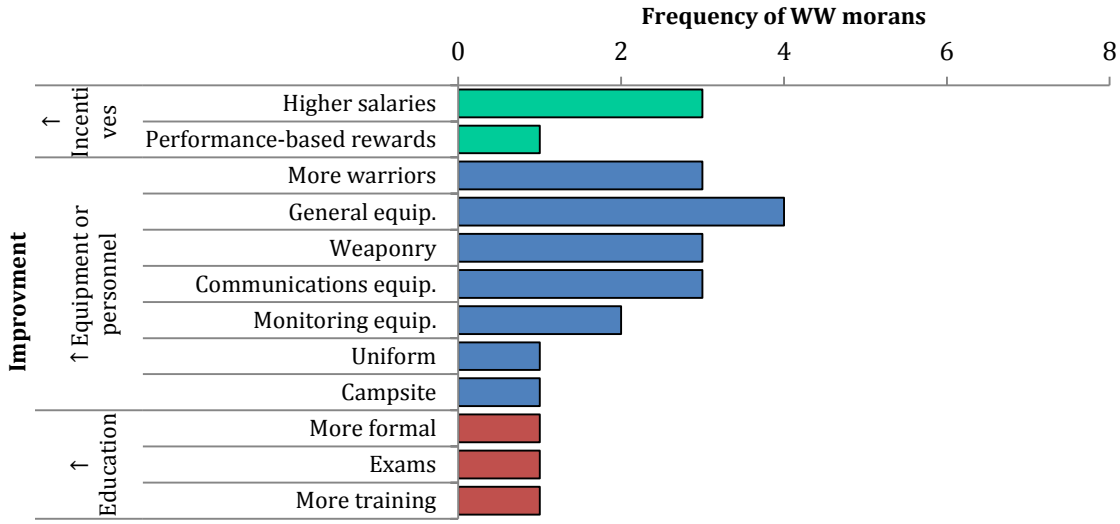


Fig. 4.13 Improvements as suggested by WW-*morans* and grouped according to common themes

Whilst education featured heavily in the community's suggested improvements, just one WW *moran* listed a desire for more formal education. That said, FGs implied a strong

[44] For example, funds have recently been allocated to provision of more radios

passion for learning, with *morans* requesting more comprehensive training and education about wildlife. Particular reference was made to the divide between those who are able to use GPSs and those who are not, as well as common difficulties surrounding identification of particular species[45] .

Despite the selection process not featuring in the free-listed improvements of *WW-morans* or community members , when explicitly asked if improvements could be made, 53% (n=120) of community members and eight *WW-morans* agreed. However, 20% of community members suggested consulting the Conservancy Board; implying they were unfamiliar with the original method and would actually be satisfied had they known this was how *morans* were chosen. Instead, the majority of community members thought they either had sought employment (35%) or knew/were a relative of EL staff (28%). Most felt selection should instead follow examinations (38%) or interviews (16%); though consultation of elders was also deemed appropriate (17%). Whilst *WW-morans* agreed consultation of elders (and themselves) could improve selection in future, they believed their selection regarded their good conduct (4) or recommendations (4).

4.5.6 Relative perceptions of WW

Whilst aforementioned results indicate very positive views of WW, VDs (Appendix 8) and associated discussions revealed a complex picture; with community members often ranking other actors above WW in terms of relative importance to them. However, the pattern was not consistent across demographics or locations and even within groups there was often substantial debate, indicative of strong personal views on the subject. In general, however, it was umbrella-type organisations who dealt with a number of issues (especially social or economic) which were more favourably ranked; with reasons including the provision of healthcare, education and security services or access to livestock markets.

Since WW targets *morans* and appears instrumental in empowering them, one might predict that community *morans* would think WW more important, relative to other projects, than elders or women. Whilst this appears to hold true in Sasaab with *morans* ranking WW more favourably (3rd of 8 actors) in terms of importance than either

[45] For example, lesser and greater kudu; cheetah and leopard; Grevy's and plain's zebra; striped hyena and aardwolf

women (5th of 9) or elders (8th of 11); the same cannot be said for Sukuroi where *morans* ranked WW lower (10th of 11) than either women (5th of 8) and elders (6th of 9) in terms of importance to them.

Nevertheless, WW was consistently perceived as having a high conservation impact across demographic groups and locations. Whilst the Conservancy Board was ranked 1st in all cases because it is "*the founder of all projects*", WW was consistently ranked 3rd or 4th behind it, Ewaso Lions and –in two Sukuroi VDs – behind Grevy's Zebra Trust. The high proportions of people indicating that WW influenced their attitudes and tolerance towards wildlife and/or their adoption of conflict mitigation techniques (sections 4.25-8) provide support for this.

Focusing on *WW-morans*; participants ranked WW 2nd to Ewaso Lions; arguing that their own branch of the project would not exist otherwise, so they would never have succeeded in securing 'employment' or an education. Regarding conservation impact, however, they ranked WW 2nd to the Conservancy, with Ewaso Lions featuring 4th behind NRT.

4.5.7 Meibae

4.5.7.1 Perceptions of current projects

Just 56% (n=32) of Meibae *morans* were able to identify any conservation project working in their area; of these Action for Cheetahs was most widely cited (72%), this was followed by Grevy's Zebra Trust (50%) and the Conservancy (17%). Whilst grazing management (22%, n=18) and conservation of Cheetahs and/or Grevy's (11%) were cited alongside employment (61%) as positives of these projects, negatives and suggested improvements imply cause for concern:

"*They are not involving us in what they are doing unless they want to take away our land*"

"*Tell them to find an orphanage for all Cheetahs, so they don't eat our goats*"

"*Advise them to take away Grevy's from our grazing areas because they finish all the grass*"

4.5.7.2 Perceptions towards WW expansion

Following questionnaires *morans* were asked, after a description of WW, whether they would like the programme in Meibae. Despite overtly negative attitudes towards wildlife, and particular predators (section 4.22), and poor perceptions of current conservation initiatives, 97% welcomed the prospect:

"All the projects working here are not involving us in conservation. They want all the wildlife to live here but by a project showing up and involving morans I think the chances of success are higher than for other projects. I would also like to see how the project changes me with predators" (Moran, Meibae)

"I was surprised I could not believe that morans can conserve lions and be involved in wildlife decisions….I really like that programme to come here to bring people to the board of conservation" (Moran, Meibae)

A central theme in 71% of arguments in favour of WW was the opportunity to be taught different methods of predator control. Importantly, FG showed interest was not confined to *morans*; indeed, both the women's and elder's FGs were already aware of WW and expressed interest in its expansion:

"I heard [about WW] from Chief and I really like it. I even spoke to him looking if there will be a way also to bring it here…I really like anything which can bring morans into conservation so they can stop killing all these animals" (Elder's FG)

5. DISCUSSION

5.1 ATTITUDES AND BEHAVIOURAL INTENTIONS

HWC can erode local support for conservation, provoking negative attitudes and poor tolerance for target species (Gadd et al., 2005); especially where pastoralists (subsistence or commercial) coexist with large carnivores (Romanach et al., 2007; Schumann et al., 2008; Hemson et al., 2009). Whilst personal attitudes held by Meibae *morans* were consistent with this trend, those in Westgate held very positive attitudes regarding both wildlife and, specifically, predator conservation. Some studies have found wildlife conservation attitudes correlated with age (Zimmerman et al., 2005; Røskaft et al., 2007) and/or gender (Kaltenborn et al., 2006), however, no effect of demographic was evident here.

Although attitudes have been shown, in some cases, not to reflect intentions (Holmes, 2003; Waylen et al., 2009), positive attitudes were well supported by an almost unanimous desire to devote more time to conservation in Westgate. Whilst increased awareness and opportunities for participation were key factors, seeing previously non-literate *morans* now monitoring wildlife may also have contributed:

"*many times I see moran's patrolling daily in the bush or visiting bomas with some machines in their hands; their activity motivated me very much*" (Elder, Sukuroi)

Such desire to get involved may also be associated with an increased sense of ownership;

"*Before I thought that wildlife belonged to scouts and KWS but now I know it belongs to me*" (*Moran*, Sasaab)

However, given finite employment opportunities directly related to conservation, and a male-bias for those that do exist, finding alternative mechanisms to harness this interest could prove fruitful. The sooner this is done the more effective it is likely to be since positive intentions can dissipate over time if not continually reinforced (Hughes, 2012).

Despite positive intentions towards wildlife, and attitudes towards predators, one might predict that poor predator tolerance would persist, given: (i) Romanach et al. (2007)

found 77-88% of community members in parts of Samburu District held a "kill-on-sight" policy for different predators and (ii) large carnivores were cited most frequently as species people preferred not to have in the Conservancy. However, with the exception of spotted hyena for which tolerance was low (consistent with the findings of other studies; Romanach et al., 2007; Gadd, 2005), Westgate residents held comparatively high tolerance for predators compared to other pastoralist communities (Romanach et al., 2007; Holmern et al., 2007; Hemson et al., 2009).

Intentions under TPB, however, are not just a product of personal attitudes but also social pressures and perceived behavioural controls (Ajzen, 1991). Marchini and Macdonald (2012) applied this theory to explain rancher's intentions to kill jaguars in the Pantanal, Brazil; concluding that ranchers had stronger intentions to kill jaguars when they perceived (i) others approval of killing and (ii) other ranchers' engagement in this behaviour. Similarly, in Westgate and Meibae self-reported intentions towards all species mostly matched whether individuals thought others in their Conservancy still retaliated in response to livestock depredation; the difference being the direction of social pressure. Efforts in Meibae should, therefore, focus on addressing the perception that removing predators in response to livestock depredation is acceptable. Moreover, comments such as "*there is no law in the bush to stop me killing if I want*" suggest a need for enhanced legal enforcement. Whilst *WW-morans* do not possess legal powers their presence could be sufficient to illicit compliance (Box 5.1). The presence of Durrell Wildlife Conservation Trust in Menabe, Madagascar increased perceived costs of non-compliance despite the organisation not implementing any additional sanctions (Sommerville et al., 2010).

> ***Box 5.1:*** *"WW reduced rate of poaching because other people think that morans involved in that programme will lead them to be arrested by KWS"* (Elder's FG, Sukuroi)

Species-specific beliefs inherent to Samburu culture, though not acknowledged by all, did transcend Conservancy boundaries; with numerous individuals from both Conservancies stating they would not kill wild dogs because: "*the community think it is bad to kill*" and "*if you kill a dog you will never get a baby boy*". This supports the findings of Romanach et al., (2007), where the community held higher tolerance for wild dogs believing they were "*sacred*".

In Madagascar cultural taboos have been shown to proffer real protection to threatened species (Jones et al., 2008a), however, beliefs can be detrimental. In Tanzania, certain ethnicities believe hyenas are bewitched and trained to kill other people's livestock, exacerbating conflict (Dickman, 2010). Whilst tolerance for spotted hyenas was uncharacteristically low in Westgate, there was no evidence to suggest similar beliefs here; nevertheless much of the community were united in their dislike, calling it "*greedy*" and *"disastrous*". Whilst education can lessen hostilities deep-rooted beliefs are difficult to reverse. Greater emphasis on spotted hyenas' ecological importance could be beneficial; reference to their role as scavengers made by just five interviewees across both Conservancies (n=162). Other studies in Samburu also highlighted a poor understanding of the ecological importance of wildlife (Kuriyan, 2004) and protected areas (Bruyere et al., 2011).

So what does all this mean with regards to the effectiveness of WW? Firstly, it is extremely encouraging that for the 90% of Westgate community members who stated a change in their attitude, WW was perceived to have had the greatest impact in all locations (joint with Conservancy in Sasaab); a pattern replicated for improved tolerance (Box 5.2).

***Box 5.2**: "I have never had time to think to conserve wildlife until Warrior Watch came to help us understand more about wildlife; before two years ago I never valued the existence of any predator and I thought sparing predators was a bad thing but now I am changed"* (Elder, Sukuroi).

Thus, initial observations suggest WW has not only been effective at rapidly changing opinions but that it has achieved this across the Conservancy, irrespective of 'presumed' exposure; indicating that the use of *morans* as vectors for information dissemination has been effective in a region with little/no access to media. Less compelling, however, is that a few *WW-morans* have retained low tolerance for particular species. Whilst this warrants attention, a time-lag between changes in attitude and concomitant changes in behaviour is to be expected; nevertheless, even in light of the short timeframe, one would expect changes to manifest first in *WW-morans.*

Ultimately, concerns over the future of predators in Westgate and surrounding areas persist, given: (i) conservation efforts can be undermined by the minority who claim they would retaliate; (ii) large home ranges mean detrimental impacts could result from

the actions of neighbouring communities; and (iii) species-specific reasons given for not killing were often associated with (a) attraction of tourist revenue, which is concerning given the volatility of the industry (Walpole & Leader-Williams, 2002) and (b) rarity of, or conflicts associated with, species. Given conservation efforts seek to increase carnivore populations, the latter justifies the need for interventions designed to reduce conflict, such that a concomitant increase in retaliation is not observed.

5.2 EMPOWERMENT OF THE MORAN DEMOGRAPHIC

Berkes (2004) states that, "*equity and empowerment are often more important than monetary incentives for community-based conservation*"; arguing that social and political benefits can have demonstrable impacts and increased attention should be paid to such factors. Campbell and Vanio-Matilla (2003) argue that there is a greater likelihood for this under participatory involvement. Evidence here contributes to the existing literature on the topic for a project with minimal monetary incentives.

Consistent with H2, there was strong evidence for political empowerment regarding *morans* involvement in conservation decision-making. With some evidence to suggest this has been a recent development (Box 5.3). However, perceived control over conservation remained higher for elders and women; indicating participation of community *morans* still lags behind others.

Box 5.3: "*…it is just a few months ago that we were participating in conservancy meetings, yet our conservancy is very old*" (*Moran*, Naisunyai).

Contrary to H2, however, WW appears to have contributed most significantly towards social, as opposed to political, empowerment. This supports other studies demonstrating enhanced social capital derived through participation in community conservation projects; for example, monitoring fog capture and bird communities in Ecuador encouraged communities to conserve tropical forests by promoting cooperation across various levels (Becker et al., 2005).

Regarding economic empowerment, though provision of a small food stipend to a fraction of the population is insufficient to constitute economic empowerment; the

inherent culture of sharing within Samburu society meant the effect of this was wider than anticipated (Holtzman, 2007).

Unfortunately neither the role of other bodies (e.g. Conservancy) nor the extent to which *morans* views are actually considered (Khwaja, 2003) can be quantified; however, community perceptions suggest WW has contributed substantially to two of the four dimensions outlined in Scheyvens' (1999) framework: political and social empowerment.

5.3 ECOLOGICAL AND CONSERVATION KNOWLEDGE

Environmental education is often used to promote pro-conservation attitudes and behaviours; the effects of which may be felt beyond the target audience due to intergenerational (Damerell, 2009) and intercommunity (Vaughan et al., 2003) knowledge transfer. WW is based on this premise; using *WW-morans* to disseminate information to the wider community, with evidence of effective dissemination regarding conflict mitigation (Box 4.4;pg.45). The quiz provided an opportunity to gauge the extent to which other knowledge, such as training on wildlife biology and behaviour, is being absorbed and disseminated.

Importantly, the influence of other factors on the knowledge of community members is limited by a lack of: (i) of formal education; (ii) access to external media sources and (iii) internal sources of information. The expectations under the assumption of minimal confounding influences are outlined in Table 5.1.

Table 5.1 Expected pattern of results for different scenarios based on the assumption of minimal confounding influences

Scenario	Expected observations*
WW-*morans* are absorbing but not disseminating information	WW-*morans* score higher than non-WW Westgate community but non-WW Westgate community perform to a similar standard as Meibae community.
WW-*morans* are absorbing and disseminating information	WW-*morans* scores are similar to non-WW Westgate community but non-WW Westgate community perform to a higher standard than Meibae community.
WW-*morans* are neither absorbing or disseminating information	Scores for WW-*morans*, non-WW Westgate community and Meibae community are similar.

** Under the assumption that there are minimal confounding influences (i.e. alternative sources of conservation and ecological knowledge are low)*

Since overall scores were similar for *WW-morans* and the wider Westgate community, who in turn performed to a similar level as Meibae residents, this implies ineffective absorption and dissemination by *WW-morans*. Yet, isolated rounds revealed a more complex pattern.

Firstly, *WW-morans* outperformed other Westgate demographics on the identification and scenarios rounds; implying they have retained, but not passed on, information provided during training sessions regarding animal differentiation by species, gender and age, and the course of action to take under different scenarios (e.g. encountering an injured cheetah). This is not unexpected given their role involves recording wildlife and patrolling for injured animals. However, similar scores observed for rounds which required knowledge of species' ecology, biology and behaviour, suggests ineffective absorption of this information. Although training workshops are held several times a year, personal observation suggests greater reinforcement during the interim period would be beneficial. There is evidence to show practical activities can greatly enhance learning (e.g.Kusmawan et al., 2006), and might be especially relevant to a group who have never been formally educated.

Secondly, Westgate and Meibae communities performed similarly, with the exception of the conservation round. This raises some questions: how much knowledge could be

considered traditional ecological knowledge? How much is the difference for the conservation round due to WW? Could a lower knowledge of conservation in Meibae be linked to the negative attitudes and tolerance exhibited by Meibae *morans*? Answers to these questions would be tentative at best, given: (i) the potential for confounding influences and (ii) this mechanism for assessing knowledge did not enable the relationship between knowledge and attitudes to be formally assessed. Indeed, this relationship is not always straightforward; Aipanjiguly et al., (2003) found greater knowledge correlated with greater support for manatee conservation, whilst in Kenya Romanach et al. (2011), found that educated people were less likely to want predators on their land but they held higher tolerance.

Although conclusions drawn are tentative given the geographically and numerically restricted sample, indications suggest that increased attention to ensuring retainment of biological/behavioural information is warranted; as is facilitation of information transfer to non-target audiences. Noteworthy is the fact Sasaab women questioned how they were supposed to know the answers when they have not been taught about wildlife. Given *WW-morans'* ability to act as a vector for transmitting other information (e.g. conflict mitigation methods), results suggest this capacity could be harnessed to greater effect, particularly in reference to raising awareness about species' identification and actions to take under different scenarios.

5.4 KNOWLEDGE OF AND PERCEPTIONS TOWARDS WARRIOR WATCH

Local communities' support is integral to the success of community-based conservation interventions. Such support typically necessitates that aims and activities are accepted and benefits are equitably disbursed (Sommerville et al., 2010). Moreover, to maximise an intervention's impact it must reach as wide an audience as is possible.

WW aims and activities were relatively well understood, deemed to be successful and aligned with community interests. Additionally, universal awareness of WW was documented amongst interviewees; with evidence to suggest the programme had been well received across the Conservancy. Where programmes target a particular sector of society, inequitable distribution of benefits is to be expected; personal benefits to non-WW participants were largely restricted to advice about predator control. Nevertheless, support remained universally high; possible explanations include:

- Political and social benefits (section 4.31-2) are sufficient to illicit community support in the absence of personal gain. For example, Bajracharya et al. (2006) found, despite limited direct financial reward, support for a community-based initiative in Nepal was high due to improved infrastructure and services.
- Personal benefits to participants are deemed insufficient to warrant resentment amongst the wider community.

Concerning the former, the challenge is to maintain community support once such benefits have been realised; this may depend upon whether you classify empowerment as a "*means to an end*" or as an "*end*" itself (Khwaja, 2003). Concerning the latter, the challenge is to maintain the motivation of *WW-morans*; given Ewaso Lions' desire to avoid reliance upon financial incentives, this is likely best achieved through the educational component.

5.5 JUSTIFYING EXPANSION: MEIBAE

To justify expansion it is not only necessary to show that WW has been effective in pre-existing locations, but to consider whether the right conditions prevail in regions where expansion is planned. Regarding Meibae, it is encouraging that initial observations suggest widespread support for expansion. However, caution is warranted not to inflate expectations; other studies have shown how failure to meet expectations has eroded local support for both initiatives and conservation (Songowa, 1999; Ite & Adams, 2000; Box 5.4).

Box 5.4 Examining local perceptions of human-wildlife conflict interventions in Uganda, Shiel & Akampulira (date unknown) stated: *"In many cases communities have become sceptical; they welcome new interventions not as a means to address problem animals, but as a means to gain other opportunities such as cash payments for their labour"*

A number of factors signify the need for scoping activities to determine the community's preconceptions. Firstly, several reasons for wanting WW referred to provision of employment and development opportunities e.g.:

"*Yes it will benefit us because we used to go to Nairobi to find jobs and it will be great to work from home*" (*Moran*, Meibae)

This is worrying given the limited support for current interventions, where increased employment was seen as a mechanism for improvement, and the fact WW would not employ many people.

Secondly, it was widely acknowledged that "*only if wildlife brings us benefits will we make it a priority*". In Laikipia, tourism-derived benefits have been shown to improve attitudes and tolerance towards wildlife in the absence of formal education (Gadd, 2005). Additionally, recognition of the economic importance of wildlife was frequently cited in Westgate as a reason for improved attitudes. With no tourism in Meibae, will WW stand the same chance of success? The most reliable answer, in the absence of a trial, would come from an assessment of attitudes in Mpus Kutuk, where WW has been in operation since January 2011 and where tourism is absent[46].

Finally, the effectiveness of WW has been facilitated by a strong Conservancy foundation; Westgate is widely regarded as a model for other Conservancies both by its residents and outsiders (J.Lekilele, pers. comm.). That same support was not echoed in Meibae.

At a broader scale, given Ewaso Lions' long-term goal to have a network of *WW-morans* across the region, one must consider how factors such as culture will impact effectiveness, given the diversity of ethnicities inhabiting the District.

5.6 STUDY STRENGTHS & LIMITATIONS

This study provided an invaluable opportunity to examine the effectiveness of engaging *morans* in conservation in northern Kenya and to determine whether, and in what capacity, WW expansion could be justified. Whilst Westgate results are encouraging with evidence to suggest WW has had a substantial impact, the future of predators in neighbouring Meibae is a significant cause for concern and demands greater attention.

Regarding evaluation design, the study ensured opinions of the wider community were accounted for and provided an opportunity to train local RAs in social research tools; both should help generate a strong(er) sense of community ownership. Moreover, in

[46] Logistical and security issues meant it was not possible to conduct surveys in Mpus Kutuk during this study.

contrast to many African attitude surveys (Browne-Nunez & Jonker, 2008), this study was grounded in theory.

However, a number of limitations remain; not least the lack of a baseline against which to measure changes. Reliance upon community perceptions within a limited area could - despite precautions - have engendered bias through the means outlined in Table 5.2. Moreover, whilst Meibae proffered the best comparison under the circumstances, it was insufficient to isolate WW's contribution to the observed differences between the Conservancies; the potential for confounding factors high.

Table 5.2 Potential sources of bias from reliance upon community perceptions of change. Continued overleaf.

Bias	Relevance to study
Social desirability bias	In interviewer administered surveys there is potential for answers to be skewed in a direction consistent with societal norms. Ensuring no non-Samburu presence will have increased validity of results and the frank nature of responses, which included discussion of predator poisoning, suggests minimal effect.
Acquiescence bias	Occurs when participants have a tendency to agree with statements regardless of connotations (Cronbach 1946). Medium to high internal consistencies were reported for Likert statements relating to personal attitudes and subjective norms, however, poor consistency for the predator behavioural control statements could indicate acquiescence bias; where individuals unsure of meaning opt to agree.
Recall bias	Relying on community members to recall information after a significant length of time has elapsed can induce recall bias (Jones et al., 2008b); in this case, the largely non-literate population may struggle to identify changes which occurred before or after the two year mark used in the study, despite use of a reference point in the form of the devastating flash-flood which occurred two months after WW's launch.
Sample coverage bias	Due to time and logistical constraints surveys were restricted to four locations in Westgate; therefore, bias might have been introduced through inadequate sample coverage. Whilst the lack of variation exhibited within Westgate is encouraging, it would have been beneficial to examine effectiveness within Mpus Kutuk; especially since Ewaso Lions presence here is restricted to WW-*morans.*

Regarding survey instruments, reduction of Likert-scales to ensure cultural appropriateness limited data resolution by restricting quantification to the direction but not strength of agreement; compromising the ability to perform multivariate analyses.

5.7 FUTURE RESEARCH: WARRIOR WATCH

Research should focus on collating baseline data from Conservancies where expansion is proposed; including, exploration of community expectations and the contribution of different variables, including tourism-derived benefits, to changing attitudes. Comprehension of the relationship between a WW *moran*'s tolerance and that others in his location could shed further light of the role WW has played in changing attitudes[47].

Whilst the current study has considered the human side of this HWC intervention, evaluation of effectiveness should be a two-pronged approach. It would be beneficial to consider (i) the effect on species persistence after an appropriate time interval and (ii) the utility of ecological data collected under the participatory monitoring scheme and its subsequent ability to inform management decisions; personal observation suggests current utility is confined to presence/absence analyses.

5.8 LESSONS LEARNT: WARRIOR WATCH AND BEYOND

A number of case-specific recommendations have been outlined throughout the course of this discussion concerned with improving the efficacy of pre-existing and planned WW operations; for example: (i) improved coordination of educational component as the key incentive to *WW-morans*; (ii) reinforced practical training of *WW-morans,* with a greater emphasis on the ecological importance of wildlife and incorporating a mechanism for improved dissemination to the wider community. Two additional recommendations specific to WW and the broader study system, respectively, involve targeting pre-*moran* age-sets:

- Development of a contingency plan to ensure long-term sustainability when current WW participants complete the transition from *moranhood* to junior elders[48]. A system akin to a 'buddy' scheme, where the next generation are mentored by a current WW *moran,* could facilitate this transition and aid effectiveness of

[47] This would require larger sample sizes than were available under this study.
[48] This phase has already begun for their age-set.

information exchange. The role of current *WW-morans,* following inauguration to the next age-set, also requires clarification.

- This study did not explore attitudes of pre-*moran* males or equivalent-aged females, however, increased focus on this age-group could be beneficial since attitudes can develop at an early age (Bryant & Hungerford, 1977). Thus, by *moranhood* it may be much harder to change negative attitudes.

Although WW represents a culturally specific scenario, limiting potential for widespread replication, a number of lessons can be learnt from this study regarding HWC resolution, efficacy of community-based initiatives and, more broadly, execution of evaluations.

A key finding was that WW succeeded in gaining widespread community support and contributed to changing attitudes and intentions towards wildlife in the absence of substantial monetary incentives. A commonly employed approach to resolving HCC is to compensate pastoralists for livestock loss; yet the long-term sustainability of this approach has been widely criticised, alongside its potential for generating perverse incentives[49] and moral hazard[50] (Nyhus et al., 2005). The effectiveness of adopting a pro-active, as opposed to reactive, approach to HWC resolution is further supported by the apparent success of 'Lion Guardians'[51]; a programme which engages Maasai to monitor and protect lions in the Amboseli-Tsavo ecosystem, Kenya (Hazzah et al., 2011).

Secondly, the study demonstrated the effectiveness of purposefully engaging a demographic traditionally (i) implicated in wildlife conflict and (ii) marginalised within society. Contrary to the notion of the "ecological noble savage"[52] (Redford, 1990), successful conservation of carnivores, in this case, necessitates that *morans* acknowledge the cause and effect between retaliatory attacks, wildlife declines and the associated socio-economic and ecological implications. Such an approach is applicable to a variety of contexts; from employing former poachers of turtle eggs as rangers in

[49] Perverse incentives can result when compensation makes pastoralism more profitable and results in increased environmental pressure.

[50] Moral hazard might result if compensating for livestock losses means people are less likely to invest in measures that seek to mitigate conflict occurring in the first place.

[51] For information on Lion Guardians visit: http://www.lionconservation.org/lion-guardians.html

[52] "Ecological noble savage" is a term used to refer to the view of local people as natural conservationists.

Nicaragua (Smith & Otterstrom, 2009) to using hunters to enumerate wildlife populations in Zambia (Marks, 1994). The benefits are of course multiplied where the target group also represent marginalised peoples since community-based conservation interventions can act as a platform for empowering such groups, as evidenced here.

Raising awareness of the importance of wildlife amongst a predominantly non-literate population, where local institutions represent the only source of information, presents many challenges. This study, however, demonstrates how selected members of the community can act as wildlife ambassadors; spreading the conservation message to a wide audience and engendering a sense of ownership over natural resources. Ancrenaz et al. (2007) state that establishing "*a strong physical presence on the ground*" is a prerequisite to the success of community-based initiatives. By having *WW-morans* posted in their own villages creates a permanent presence which could not be achieved by one central body; reinforcing the message, generating grassroots support and, ultimately maximising return on investment.

With respect to measuring programme effectiveness, a lot can still be learnt retrospectively when constraints on design preclude the ability to establish absolute causality (Margoluis et al., 2009a) and/or where contextual barriers limit adoption of standard sampling procedures (Browne-Nunez & Jonker, 2008) . That said, the conservation community must heed the messages of Ferraro & Pattanayak (2006) and Margoluis et al., (2009a) and, at the very least, incorporate M&E into programme design; specifically, recording baseline data for treatment and comparison groups would be significant and achievable improvement. Focusing on HWC interventions, the findings of this study support the call of Baruch-Mordo and colleagues' (2009) for, "*more human dimensions studies that focus on change in human behaviour to measure management success*". In order to achieve this in a developing world context, however, greater attention must be paid to the appropriateness of western techniques for measuring attitudes and behaviours. A shift in focus from direct financial benefits to also consider less tangible indicators of success (e.g. empowerment) is further recommended in light of evidence presented here.

5.9 CONCLUDING REMARKS

Taking into account the lack of baseline data and the potential for confounding influences, particularly the efforts of other conservation bodies in the Conservancy, the evidence collated suggests WW has been instrumental in (i) changing attitudes and behavioural intentions towards wildlife conservation and (ii) empowering a marginalised group within Samburu society across an entire Conservancy. Expansion of the programme to neighbouring Conservancies can thus be justified under the proviso that comprehensive baseline data are obtained, expectations of the community examined and a small-scale trial executed, prior to implementing the scheme on a broader scale.

Whilst this study can in no way claim to provide a solution to HWC on a global-scale; it represents a rare attempt to document the effectiveness of an intervention designed to promote human-carnivore coexistence. Indeed, many more interventions will need to be evaluated to ensure the long-term persistence of the world's large carnivores through effective allocation of limited resources.

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APPENDIX 1: Basic outline for Venn Diagram Mapping

1. Introduction

   Introduce yourself (refrain from mentioning Ewaso Lions/WW) and explain that we are interested to learn their thoughts on the organisations and groups who work in this area using both a practical exercise and a discussion. Assure anonymity and check all participants are willing to continue.

2. Record characteristics of the group on prepared datasheet:

   Age; (ii) Occupation; (iii) how long each person has lived in this location (Sasaab/Sukuroi); (iv) education level and (v) any relevant roles? E.g. Board member, womens group member, grazing board member

3. Ask the group to name as many organisations/individuals/ groups which are working in or with the community of Westgate. They do not need to be physically present in the Conservancy. They may have big impacts or small impacts. They can target any number of issues in the Conservancy.
   - Who deals with environmental issues here? (e.g.water/livestock grazing/wildlife conservation)
   - Who deals with economic issues here? (e.g credit/ livestock/tourism)
   - Who deals with social issues here? (e.g. health/literacy/education/training)
   - Any others? (if they haven't mentioned important groups you can suggest these now but record this information)

   Complete sheet.

4. Ask them to rank the groups in order of importance to them as representatives of the morans/ elders/women of their location.

   Firstly, do this based on selection of circle size – big circle equates to big importance, medium is medium importance, small is small importance. Make sure whole group is involved and not dominated by one or two individuals. Draw/write organisation on relevant circle as you go through each in turn.

   Once they have selected circle size, group the circles of the same size and get the group to rank from most to least important (tied ranks acceptable).

   Complete sheet with ranks and associated discussions of importance.

5. Explain that we are interested to know how they feel these groups interact. Do any groups work together closely? Do any groups not work together at all? Explain that the circle on the paper represents the Conservancy so any groups which are part of the Conservancy go inside the circle and any groups which work here but are not part of the Conservancy go outside the circle. The degree the circles which represent each group overlap shows how closely those groups are thought to work together.

6. Explain how we now just want to focus on those groups involved in wildlife conservation. They can be involved a lot or not very much at all.

Ask the participants to identify those groups involved in wildlife conservation.

Ask them to select triangles of different sizes to show how much impact they think each group has had in conservation. Big impact = big triangle. Medium impact = medium triangle. Small impact = small triangle. Place triangles on top of the relevant circles. Rank these the same way you ranked importance (circles).

Complete sheet with ranks and associated discussions of importance.

7. Take a photograph of the VD and stick down the circles/triangles once the whole group is in agreement.

8. Ask the group:
   - If you were to do these excerise two years ago would anything be different? For example, are some groups new? Have some disappeared? Have any gained/lost importance? Have any gained/lost impact? Do some work together now that didn't before or vice versa?
   - Has Warrior Watch resulted in any of these changes?
   - If they have anything else they want to say.

9. Move on to the focus group discussion with the same participants (Westgate version).

APPENDIX 2: Basic themes for Focus Group Discussion

Remember: This is just an outline of the general topics of interest. Feel free to explore other issues of interest further if they arise.

A) WESTGATE

1. Attitudes

- What are the main challenges you face living in this area? Rank them.
- Do you think any of these challenges could be addressed or made worse by initiatives targeting wildlife conservation?

2. Perceptions of Warrior Watch

In early 2010 Ewaso Lions and Westgate Community Conservancy started the Warrior Watch program. Is this a project you have all heard of? …We are really interested to know what you think about this program and how you think it compares with other projects in the area because this will help us make improvements to the program and identify what is and is not working.

- What do you think are the aims of Warrior Watch?
- Do these aims match community interests i.e. is conservation a priority here?
- Do you think it has been successful so far in meeting these aims? How/Why/Why not?
- Do you think there are <u>benefits</u> of the Warrior programme to:
    - Participants
    - Your demographic group e.g. morans, elders, women
    - The conservancy as a whole?
- Do you think there are <u>negatives</u> of the Warrior programme to:
    - Participants
    - Your demographic group e.g. morans, elders, women
    - The conservancy as a whole?
- How do you think it compares with other projects working here that deal with wildlife conservation?
- Do you think Warrior Watch could be improved in any way?
- Are there any projects here or in neighbouring conservancies dealing with wildlife conservation which you think are better/worse than Warrior Watch**?**

3. Empowerment of the *moran* demographic as a result of WW?

- ***Political empowerment:*** explore involvement of morans in conservation and general decision-making and whether or not this has changed (and why)
- ***Social empowerment:*** explore how morans are viewed by others in the Conservancy and whether has changed or not (and why).
- ***Economic empowerment:*** explore financial benefits/income to morans
- ***Pyschological empowerment:*** noticed/experienced any changes in morans? (e.g. as a result of skills development)

4. Security of wildlife

- Who is involved in security of wildlife and people in the Conservancy? what role to *morans* play (if any)?

B) MEIBAE

1. Attitudes

- What are the main challenges you face living in this area? Rank them.
- Do you think any of these challenges could be addressed or made worse by initiatives targeting wildlife conservation?

2. Perceptions of current conservation projects

- Of the groups dealing with conservation of wildlife/predators here who has the biggest impact (take from VD) → for this group(s) follow the same questions outlined for WW
- Do these aims match community interests i.e. is conservation a priority here? Should it be made a priority or not?
- Do you think it has been successful so far in meeting these aims? How/Why/Why not?
- Do you think there are benefits to:
    - Participants
    - Your demographic group e.g. morans, elders, women
    - The conservancy as a whole?
- Do you think there are negatives to:
    - Participants
    - Your demographic group e.g. morans, elders, women
    - The conservancy as a whole?
- How do you think it compares with other projects working here that deal with wildlife conservation? Any improvements?
- Any there any projects in neighbouring Conservancies dealing with wildlife conservation which you think are better/worse?

3. Empowerment of the *moran* demographic as a result of WW?

- ***Political empowerment:*** explore involvement of morans in conservation and general decision-making and whether or not this has changed (and why)
- ***Social empowerment:*** explore how morans are viewed by others in the Conservancy and whether has changed or not (and why).
- ***Economic empowerment:*** explore financial benefits/income to morans
- ***Pyschological empowerment:*** noticed/experienced any changes in morans? (e.g. as a result of skills development)

4. Security of wildlife

- Who is involved in security of wildlife and people in the Conservancy? what role to *morans* play (if any)?

5. Perceptions of Warrior Watch

- Explore perceptions towards expansion of WW after giving an outline of the programme.

APPENDIX 3: Westgate Questionnaire (rescaled for thesis presentation)

Good morning/afternoon. My name is Ngila Ltenesi. I am conducting a survey on behalf of a student called Heather. She is from England and currently studying a Masters degree in Conservation Science. We are interested to find out about how people, livestock and wildlife interact in this conservancy and would be really interested to hear your views on this and on some of the projects attempting to address these issues. The survey is strictly confidential; all answers provided will be kept anonymous, with the general findings of the study made freely available. The survey will take approximately 1 hour to complete. If you don't want to answer or do not understand any specific question tell me. Take your time to think about the answers. Thank-you.

A. INTERVIEW DETAILS

i) Interviewer:	Ngila Ltenesi	**ii) Quest. ID no.:**	
iii) Date:	_ _/_ _/ 2 0 1 2	**iv) GPS location:**	0 3 _ _ _ _ _ / 0 0 _ _ _ _ _
v) Start Time: (hh:mm AM/PM)	_ _: _ _ AM / PM	**vi) End Time:** (hh:mm AM/PM)	_ _: _ _ AM / PM
vii) Community area:	Sasaab □ Ngutuk Ongiron □ Sukuroi □ Naisunyai □ WW meeting □	**viii) Locality:**	In Boma □ / Watering hole □ In field with livestock – herding □ In field without livestock □ School – student or teacher □ Other (please specify) □ _____

B. INTERVIEWEE DETAILS

i) Sex:	Male □ Female □	**ii) Age group:**	<20 □ 21-30 □ 31-40 □ 41-50 □ 51-60 □ 61+ □ If male: *Moran* □ **or** *Mzee* □
iii) Highest education:	WW only □ None □ Some primary □ Finished primary □ Some secondary □ Finished secondary □ Tertiary □	**iv) (a) Main occupation:** **(b) HH income:**	_____ Does most of **your family's** income come from (chose **max. 2**): Tourism □ / Livestock □ / Wildlife-related □ / other □ - specify: _____
v) (a) Tribe: **(b) Clan:**		**vi) Religion:**	
vii) Which boma do you come from? _____How long have you lived in this *manyatta*? _____			

C. INTERVIEWEE LIVESTOCK ASSETS

Livestock type:	Number owned now:	vi) Main causes of livestock loss:	vii) Have these causes changed in the last two years?
i) Cattle:		**(biggest cause)** 1)_____ 2) _____	Y □ N □ 1) ↑ or ↓ _____ _____ 2) ↑ or ↓ _____
ii) Shoats:	_ _ _ Goats _ _ _ Sheep Total: _____		

iii) Donkeys:		3) _____	_____
iv) Camels:		4)_____	3) ↑ or ↓ _____ _____
v) Other (specify: _____)		**(smallest cause)**	4) ↑ or ↓ _____ _____

D. PERCEIVED COSTS AND BENEFITS OF LIVING WITH WILDLIFE

i) Are there any GOOD things about having wildlife in the conservancy? Y □ N □. **If yes, rank.**

1) _____2) _____3) _____
4) _____5) _____6) _____

ii) Are there any BAD things about having wildlife in the conservancy? Y □ N □. **If yes, rank.**

1) _____2) _____3) _____
4) _____5) _____6) _____

iii) Are there any animals you wish did not live here? Y □ N □. **If yes, name up to 3.**

1) _____2) _____3) _____
Why?_____

E. ATTITUDES TOWARDS WILDLIFE CONSERVATION

I will ask you to indicate your level of agreement with a series of statements. You may answer 'I do not know' but try to answer as many as you can as this will be more useful to us. Answer honestly, any information given is anonymous.

	i) GENERAL WILDLIFE CONSERVATION ATTITUDE STATEMENTS:	**Agreement:** Agree 1	Neutral 2	Disagree 3	Don't know	Refusal
1	**All** wildlife species living here today deserve to be **protected.**					
2	Today, I would be happier if wild animals were kept in separate areas away from where people are living because they can be a **danger** to humans and livestock.					
3	Wildlife and livestock **compete** for water and grazing, but the needs of livestock remain more important than the needs of wildlife and should always be prioritised.					
4	Having wildlife here is important to our **culture,** so we must look after it for future generations.					
5	We must protect wildlife because we now depend on the money, jobs and development **tourism** has brought to our area.					
6	Wild animals remain a big problem here today because they spread **diseases** which harm our livestock; protecting them will only make this problem worse.					
	Why have you answered this way?					
7	**Most people** living here today think that wildlife conservation is **at least as important as other issues** e.g. education/ healthcare/ development/ security.					
8	**Most people** living here today would approve of me grazing my livestock inside the **core area** during a bad drought, even though this area is reserved for wildlife.					
	Why have you answered this way?					
9	Personally, I have **little control** over wildlife conservation issues in the conservancy. The important decisions are currently made by other people not me.					

10	I now know **many ways people can reduce conflict and competition** with wildlife so that neither must suffer because of the other.					
Why have you answered this way?						

		Agreement:				
	ii) PREDATOR CONSERVATION ATTITUDES	**Agree**	**Neutral**	**Disagree**	**Don't know**	**Refusal**
		1	**2**	**3**		
1	Predators should be protected because they now bring **more benefits** to this community than they do problems.					
2	If a predator kills a few of my goats in my family's boma at night it is acceptable for me or a family member to **kill that predator** so it does not take any more livestock from us or other people.					
3	Conserving predators is a **waste of resources** as it leads to more conflict within the community. Today, time and money would be better spent on more urgent issues e.g. education/ healthcare/ development/ security.					
4	Tourists are attracted here by predators; sometimes losing a shoat to a predator is **a fact of life** we must accept if we want **tourism** to continue.					
5	Today, only scouts and conservationists have a **duty to conserve** predators; not other people.					
6	Predators are important to maintaining a **healthy environment** so we must make sure their numbers do not decrease further.					
Why have you answered this way?						
7	**Most people** living here today would think that **killing or injuring any predator is a bad** thing to do even if that predator had attacked livestock.					
8	**Most people** living here today would agree that **predators have a damaging effect** on their livelihoods (e.g. income or way of life) and therefore their numbers should be limited.					
Why have you answered this way?						
9	I could **kill** a predator if I wanted to. There is **nothing stopping me** e.g. law, skill, equipment.					
10	I would like to help **protect predators** by reducing conflict with livestock but there are **factors which prevent me** from doing this e.g. money/skills/knowledge/resources to reinforce boma or invest in predator deterrents.					
Why have you answered this way?						

Has your attitude towards the conservation of wildlife, and particularly predators, changed over the past two years ago?
Y □ N □. **Discuss.**

Has any particular organisation or group influenced your opinions?

F. BEHAVIOURAL INTENTIONS TOWARDS WILDLIFE CONSERVATION

i) GENERAL WILDLIFE CONSERVATION

a) How much time, if any, do you currently spend doing wildlife conservation activities e.g. monitoring wildlife/ awareness raising/reducing conflict/locating lost livestock etc.?

None □	1-3 hr/wk □	4-6 hr/wk □	7-9hr/wk □	10+hr/wk □

With whom?: _____

b) How much time, if any, would you like to spend doing wildlife conservation activities?

Less than now: □	Same as now: □	More than now: □

Why did you answer less / same / more time?

If more, what would you like to do?

Would you have answered in the same way two years ago? Y □ N □. Discuss.

Has any particular organisation or group influenced your opinions?

ii) PREDATOR – RETALIATORY KILLING

Indicate the number of livestock you would be willing to lose to a predator in a month before you would attempt to kill a predator or would think it acceptable for someone else in your family to kill a predator. If you would:

- **Never kill or accept the killing of a predator regardless of the number of livestock attacked answer 'never'.**
- **Kill or accept the killing of a predator before it had a chance to kill any livestock answer 'no tolerance'.**
- **Explain ALL reasons.**

	Shoats			Cattle			
	Never kill	**After killed [_] in one month:**	**No tolerance**	**Never kill**	**After killed [_] in one month:**	**No tolerance**	**Reason** [include cultural reasons]
Lion		_____			_____		
Leopard		_____					
Cheetah		_____					
Wild dog		_____					
Spotted Hyena		_____			_____		
Striped Hyena		_____					

Has your tolerance of any or all predators changed since two years ago? Y □ N □. Discuss.

Has any particular organisation or group influenced your opinions?

Please list what action(s), if any, you take to reduce the chance of predator attacking your livestock?

Has this been successful? Y □ N □**/ Have you always done this?** Y □ N □**…. if no <u>why</u> and <u>when</u> did you make this change?**

Has any particular organisation or group influenced your decision?

iii) Do you think people living here <u>today</u> kill predators to stop them taking livestock? Y □ N □ DK □

<u>G. REPORTING INFORMATION</u> (multiple answers ok)

i) If a predator were to kill one of your livestock would you report this to someone? Y □ N □ DK □. **If yes, who?**

Family member	Conservancy HQ	Ewaso Lions	KWS	Other:
Wazee/Elder	Conservancy Scout	Warrior Watch representative	Moran	Other:

ii) If you came across some lost livestock with no herder would you report this to someone? Y □ N □ DK □. **If yes, who?**

Family member	Conservancy HQ	Ewaso Lions	KWS	Other:
Wazee/Elder	Conservancy Scout	Warrior Watch representative	Moran	Other:

iii) If you discovered an injured or dead wild animal would you report this to someone? Y □ N □ DK □. **If yes, who?**

Family member	Conservancy HQ	Ewaso Lions	KWS	Other:
Wazee/Elder	Conservancy Scout	Warrior Watch representative	Moran	Other:

<u>Any comments:</u>

_____

_____

<u>H. PERCEPTIONS OF EWASO LIONS & THEIR WARRIOR WATCH PROGRAMME</u>

i) Have you heard of Ewaso Lions? Y □ N □. **If yes, what do they do?** _____

ii) Are there any GOOD things about Ewaso Lions? Y □ N □ . **If yes, what?**

_____

_____

iii) Are there any BAD things about Ewaso Lions? Y □ N □ . **If yes, what?**

_____

_____

iv) Have you heard of Ewaso Lion's Warrior programme? Y □ N □; **how?**

_____

v) Do you personally know anyone involved in <u>Warrior programme</u>? Y □ N □; **If yes, who and how?**

_____

vi) What do you think are the main aim(s) of the Warrior programme?

[*Explain if don't know or wrong*]

_____

_____

vii) Do you think <u>participants</u> experience any <u>benefits</u> from the Warrior programme? Y □ N □

If yes, what?

_____

_____

viii) Do you think <u>participants</u> experience any <u>negatives</u> from the Warrior programme? Y □ N □
If yes, what?

_____

_____

ix) Do <u>you personally</u> experience any <u>benefits</u> from the presence of the Warrior programme?
Y □ N □ . **If yes, what?** [ignore if participant].

_____

x) Do <u>you personally</u> experience any <u>negatives</u> from the presence of the Warrior programme?
Y □ N □ . **If yes, what?** [ignore if participant].

_____

xi) Do you think the <u>conservancy</u> experiences any <u>benefits</u> from the presence of the WW programme? Y □ N □ . **If yes, what?**

_____

xii) Do you think the <u>conservancy</u> experiences any <u>negatives</u> from the presence of the WW programme? Y □ N □ . **If yes, what?**

_____

xiii) Do you think the Warrior programme could be improved in any way? Y □ N □ . **If yes, how?**

_____

_____

xiv) Do you think <u>your</u> attitudes towards wildlife conservation and/or predators in particular have been influenced by the work of the Warrior programme? Y □ N □
how_____

xv) Overall how would you rate the Warrior programme in terms of:

AIMS:	**Excellent**	**Good**	**Average**	**Poor**	**Very Poor**	**Don't know**
Raising awareness amongst the community about wildlife, particularly predators and their importance to the local area.						
Encouraging *morans* to become active within their communities as wildlife ambassadors and empowering them to monitor wildlife across the region.						
Enabling open discussion of human-wildlife conflict throughout the community and educating people about actions to reduce such conflict.						
Providing an education to *morans* who might not otherwise have the opportunity to receive a basic education.						
Improving wildlife security in the area						

xvi) Can you please name the <u>ONE</u> WW representative from your region_____
[ignore if participant]

xvii) Why do you think this person - or yourself if you are a WW *moran* - was chosen to participate in the WW programme?

_____

xviii) Do you think the method of selecting WW morans could be improved in any way? Y □ N □ . **If yes, how?**

_____

xix) What form of contact, if any, have you had with [*insert name of WW representative***]? <u>OR</u> If you are a WW *moran* please state the ways in which you share information with the community.**

_____

Ashe Oleng!! [<u>Remember:</u> complete Survey end time]

Any additional comments

<u>WW Morans only – use additional paper and attach:</u>

a) What makes you turn up to meetings every Sunday?

b) Briefly (i.e. a few sentences) summarise your experiences, good and/or bad, of WW so far.

APPENDIX 4: Meibae Questionnaire (rescaled for thesis presentation)

Good morning/afternoon. My name is Jeneria Lekileli. I am conducting a survey on behalf of a student called Heather. She is from England and currently studying a Masters degree in Conservation Science. We are interested to find out about how people, livestock and wildlife interact in this conservancy and would be really interested to hear your views on this and on some of the projects attempting to address these issues. The survey is strictly confidential; all answers provided will be kept anonymous, with the general findings of the study made freely available. The survey will take approximately 1 hour to complete. If you don't want to answer or do not understand any specific question tell me. Take your time to think about the answers. Thank you.

A) INTERVIEW DETAILS

i) Interviewer:	Jeneria Lekileli	**ii) Quest. ID no.:**	
iii) Date:	_ _/_ _/ 2 0 1 2	**iv) GPS location:**	_ _ _ _ _ _ _ / _ _ _ _ _ _ _
v) Start Time: (hh:mm AM/PM)	_ _: _ _ AM / PM	**vi) End Time:** (hh:mm AM/PM)	_ _: _ _ AM / PM
vii) Community area:		**viii) Locality:**	In Boma □ / Watering hole □ In field with livestock – herding □ In field without livestock □ School – student or teacher □ Other (please specify) □ _____

B) INTERVIEWEE DETAILS

i) Sex:	Male □	**ii) Age group:**	<20 □ 21-30 □ 31-40 □
iii) Highest education:	None □ Some primary □ Finished primary □ Some secondary □ Finished secondary □ Tertiary □	**iv) (a) Main occupation:** **(b) HH income:**	_____ Does most of **your family's** income come from (chose **max. 2**): Tourism □ / Livestock □ / Wildlife-related □ / other □ - specify: _____
v) (a) Tribe: **(b) Clan:**		**vi) Religion:**	
vii) Which boma do you come from? _____How long have you lived in this manyatta?____			

C) INTERVIEWEE LIVESTOCK ASSETS

Livestock type:	Number owned now:	vi) Main causes of livestock loss:	vii) Have these causes changed in the last two years?
i) Cattle:		**(biggest cause)** 1)_____ 2) _____ 3) _____	Y □ N □ 1) ↑ or ↓ _____ _____ 2) ↑ or ↓ _____ _____
ii) Shoats:	_ _ _ Goats _ _ _ Sheep Total:		
iii) Donkeys:			

			3) ↑ or ↓ _____ _____
iv) Camels:		4)_____ **(smallest cause)**	4) ↑ or ↓ _____ _____
v) Other (specify: _____)			

D) PERCEIVED COSTS AND BENEFITS OF LIVING WITH WILDLIFE

i) Are there any GOOD things about having wildlife in the conservancy? Y □ N □. **If yes, name in order of importance.**

1) _____2) _____3) _____
4) _____5) _____6) _____

ii) Are there any BAD things about having wildlife in the conservancy? Y □ N □. **If yes, name in order of importance.**

1) _____2) _____3) _____
4) _____5) _____6) _____

iii) Are there any animals you wish did not live here? Y □ N □. **If yes, name up to 3.**

1) _____2) _____3) _____
Why?_____

E) ATTITUDES TOWARDS WILDLIFE CONSERVATION

I will ask you to indicate your level of agreement with a series of statements. You may answer 'I do not know' but try to answer as many as you can as this will be more useful to us. Answer honestly – any information given is anonymous.

		Agreement:				
	i) GENERAL WILDLIFE CONSERVATION ATTITUDE STATEMENTS:	**Agree**	**Neutral**	**Disagree**	**Don't know**	**Refusal**
		1	**2**	**3**		
1	**All** wildlife species living here today deserve to be **protected.**					
2	Today, I would be happier if wild animals were kept in separate areas away from where people are living because they can be a **danger** to humans and livestock.					
3	Wildlife and livestock **compete** for water and grazing, but the needs of livestock remain more important than the needs of wildlife and should always be prioritised.					
4	Having wildlife here is important to our **culture,** so we must look after it for future generations.					
5	We must protect wildlife because we now depend on the money, jobs and development **tourism** has brought to our area.					
6	Wild animals remain a big problem here today because they spread **diseases** which harm our livestock; protecting them will only make this problem worse.					
Why have you answered this way?						
7	**Most people** living here today think that wildlife conservation is **at least as important as other issues** e.g. education/ healthcare/ development/ security.					
8	**Most people** living here today would approve of me grazing my livestock inside the **core area** during a bad drought, even though this area is reserved for wildlife.					
Why have you answered this way?						

9	Personally, I have **little control** over wildlife conservation issues in the conservancy. The important decisions are currently made by other people not me.					
10	I now know **many ways people can reduce conflict and competition** with wildlife so that neither must suffer because of the other.					
Why have you answered this way?						

		Agreement:				
	ii) PREDATOR CONSERVATION ATTITUDES	**Agree**	**Neutral**	**Disagree**	**Don't know**	**Refusal**
		1	**2**	**3**		
1	Predators should be protected because they now bring **more benefits** to this community than they do problems.					
2	If a predator kills a few of my goats in my family's boma at night it is acceptable for me or a family member to **kill that predator** so it does not take any more livestock from us or other people.					
3	Conserving predators is a **waste of resources** as it leads to more conflict within the community. Today, time and money would be better spent on more urgent issues e.g. education/ healthcare/ development/ security.					
4	Tourists are attracted here by predators; sometimes losing a shoat to a predator is **a fact of life** we must accept if we want **tourism** to continue.					
5	Today, only scouts and conservationists have a **duty to conserve** predators; not other people.					
6	Predators are important to maintaining a **healthy environment** so we must make sure their numbers do not decrease further.					
Why have you answered this way?						
7	**Most people** living here today would think that **killing or injuring any predator is a bad** thing to do even if that predator had attacked livestock.					
8	**Most people** living here today would agree that **predators have a damaging effect** on their livelihoods (e.g. income or way of life) and therefore their numbers should be limited.					
Why have you answered this way?						
9	I could **kill** a predator if I wanted to. There is **nothing stopping me** e.g. law, skill, equipment.					
10	I would like to help **protect predators** by reducing conflict with livestock but there are **factors which prevent me** from doing this e.g. money/skills/knowledge/resources to reinforce boma or invest in predator deterrents.					
Why have you answered this way?						

Has your attitude towards the conservation of wildlife, and particularly predators, changed over the past two years?
Y □ N □. **Discuss.**

Has any particular <u>organisation or group</u> influenced your opinions?

F) <u>BEHAVIOURAL INTENTIONS TOWARDS WILDLIFE CONSERVATION</u>

i) GENERAL WILDLIFE CONSERVATION

a) How much time, if any, <u>do you</u> currently spend doing wildlife conservation activities e.g. monitoring wildlife/ awareness raising/reducing conflict/locating lost livestock etc.?

None □	**1-3 hr/wk** □	**4-6 hr/wk** □	**7-9hr/wk** □	**10+hr/wk** □

With whom?: _____

b) How much time, if any, <u>would you like to</u> spend doing wildlife conservation activities?

Less than now: □	**Same as now:** □	**More than now:** □

Why did you answer less / same / more time?

If more, what would you like to do?

Would you have answered in the same way two years ago? Y □ N □. **Discuss.**

Has any particular <u>organisation or group</u> influenced your opinions?

ii) PREDATOR – RETALIATORY KILLING

Indicate the number of livestock <u>you</u> would be willing to lose to a predator <u>in a month</u> before you would attempt to kill a predator or would think it acceptable for someone else in your family to kill a predator. If you would:

- **<u>Never kill</u> or accept the killing of a predator regardless of the number of livestock attacked answer 'never'.**
- **<u>Kill</u> or accept the killing of a predator <u>before</u> it had a chance to kill any livestock answer 'no tolerance'.**
- **Explain ALL reasons.**

	Shoats			**Cattle**			
	Never kill predator	**After killed [_] in one month:**	**No tolerance**	**Never kill predator**	**After killed [_] in one month:**	**No tolerance**	**Reason** [include cultural reasons]
Lion		_____			_____		
Leopard		_____					
Cheetah		_____					
Wild dog		_____					
Spotted Hyena		_____			_____		
Striped Hyena		_____					

Has your tolerance of any or all predators changed since two years ago? Y □ N □**. Discuss.** **Has any particular <u>organisation or group</u> influenced your opinions?**
Please list what action(s), if any, you take to reduce the chance of predator attacking your livestock? **Has this been successful?** Y □ N □**/ Have you always done this?** Y □ N □**…. if no <u>why</u> and <u>when</u> did you make this change?** **<u>Has any particular organisation or group influenced your decision?</u>**

iii) Do you think people living here <u>today</u> kill predators to stop them taking livestock? Y □ N □ DK □

<u>G. REPORTING INFORMATION</u> (multiple answers ok)

i) If a predator were to kill one of your livestock would you report this to someone? Y □ N □ DK □. **If yes, who? (circle)**

Family member	Conservancy HQ	Ewaso Lions	KWS	Other:
Wazee/Elder	Conservancy Scout	Warrior Watch representative	Moran	Other:

ii) If you came across some lost livestock with no herder would you report this to someone? Y □ N □ DK □**. If yes, who?**

Family member	Conservancy HQ	KWS	Other:
Wazee/Elder	Conservancy Scout	Moran	Other:

iii) If you discovered an injured or dead wild animal would you report this to someone? Y □ N □ DK □**. If yes, who?**

Family member	Conservancy HQ	KWS	Other:
Wazee/Elder	Conservancy Scout	Moran	Other:

<u>Any comments:</u>

_____

<u>H. PERCEPTIONS OF CONSERVATION PROGRAMS</u>

i) Name any wildlife conservation projects that you know of working in Meibae.

1. _____2. _____3. _____4. _____5. _____

ii) What do you think about the work of these projects? (e.g. Anything good? Anything bad?)

Good:_____

_____

Bad:_____

_____

iii) Do you think these projects could be improved in any way? Y □ N □**. If yes, how?**

_____

_____

iv) Is everyone who wants to be involved in making decisions about wildlife conservation in this conservancy able to do so or are certain groups neglected or unable to participate? Specify.

_____

v) Are morans here involved in wildlife conservation? Y □ N □**. If yes, how?**

_____

vi) Have you heard of Ewaso Lions, a grassroots lion conservation project based in West Gate? Y □ N □. **If yes, how?**

_____

vii) Have you heard of Ewaso Lion's Warrior programme? Y □ N □; **how?**

_____

Now explain the objectives of the WW programme to the interviewee regardless of whether they have heard of WW or not. Ensure you mention how it was designed to empower the moran demographic who have traditionally been neglected in wildlife conservation.

viii) Having heard about the aims of the WW programme, do you think this is something which would benefit your area or do you think the projects here already are sufficient? Why?

Ashe Oleng!! [Remember: complete Survey end time]
Any additional comments

APPENDIX 5.1: Community Quiz Questions and Photographs

Round One: Animal Identities (species, age and gender)			
	Question:	**Options:**	
1	What animal is this?	**PHOTO 1** Yellow – Cheetah Red – Leopard Blue – Serval Green – Wild cat	
2	Which of these animals is a **Gerenuk**?	**PHOTO 2**	
3	Which of these animals is a **Grant's Gazelle**?	**PHOTO 2**	
4	Which of these animals is an **Eland**?	**PHOTO 3**	
5	Which of these animals is a **Striped Hyena**?	**PHOTO 4**	
6	Which of these pictures shows the spot pattern on the coat of a **Cheetah**?	**PHOTO 5**	
7	Which of these pictures of a Zebra is a **Common Zebra**?	**PHOTO 6**	
8	Which of these tracks is **NOT** from **a species of cat**?	**PHOTO 7**	
9	Name the animal from the track you identified in question 16.	**PHOTO 7** Yellow - Domestic dog Red - Spotted Hyena Blue - Wild dog Green - Striped Hyena	
10	Which animals are these two lion feeding on?	**PHOTO 8** Yellow – Waterbuck & Eland Red - Greater Kudu & Eland Blue – Eland & Oryx Green – Waterbuck & Oryx	
11	What is this animal facing away from the camera?	**PHOTO 9** Yellow – Wild cat Red - Caracal Blue – Serval Green – Civet cat	
12	How many of these pictures show a **Greater Kudu**?	**PHOTO 10** Yellow - 1 Red -2 Blue -3 Green – 4	
13	What is this animal?	**PHOTO 11** Yellow – Aardwolf Red – Striped hyena Blue – Caracal Green – Golden Jackal	
14	Which of these pictures shows a **Bat-eared Fox**?	**PHOTO 12**	
15	Which of these footprints is that of a **Leopard**?	**PHOTO 13**	
16	In some species both sexes have horns, in other species only males have horns. How many of these animals could be **female**?	**PHOTO 14** Yellow – 1 Red – 2 Blue – 3 Green - 4	
17	How many of these lions are **male**?	**PHOTO 15** Yellow – 1 Red – 2 Blue – 3 Green - 4	
18	The pictures show a number of lions not from this region – they live in the Mara. The lions are	**PHOTO 16**	

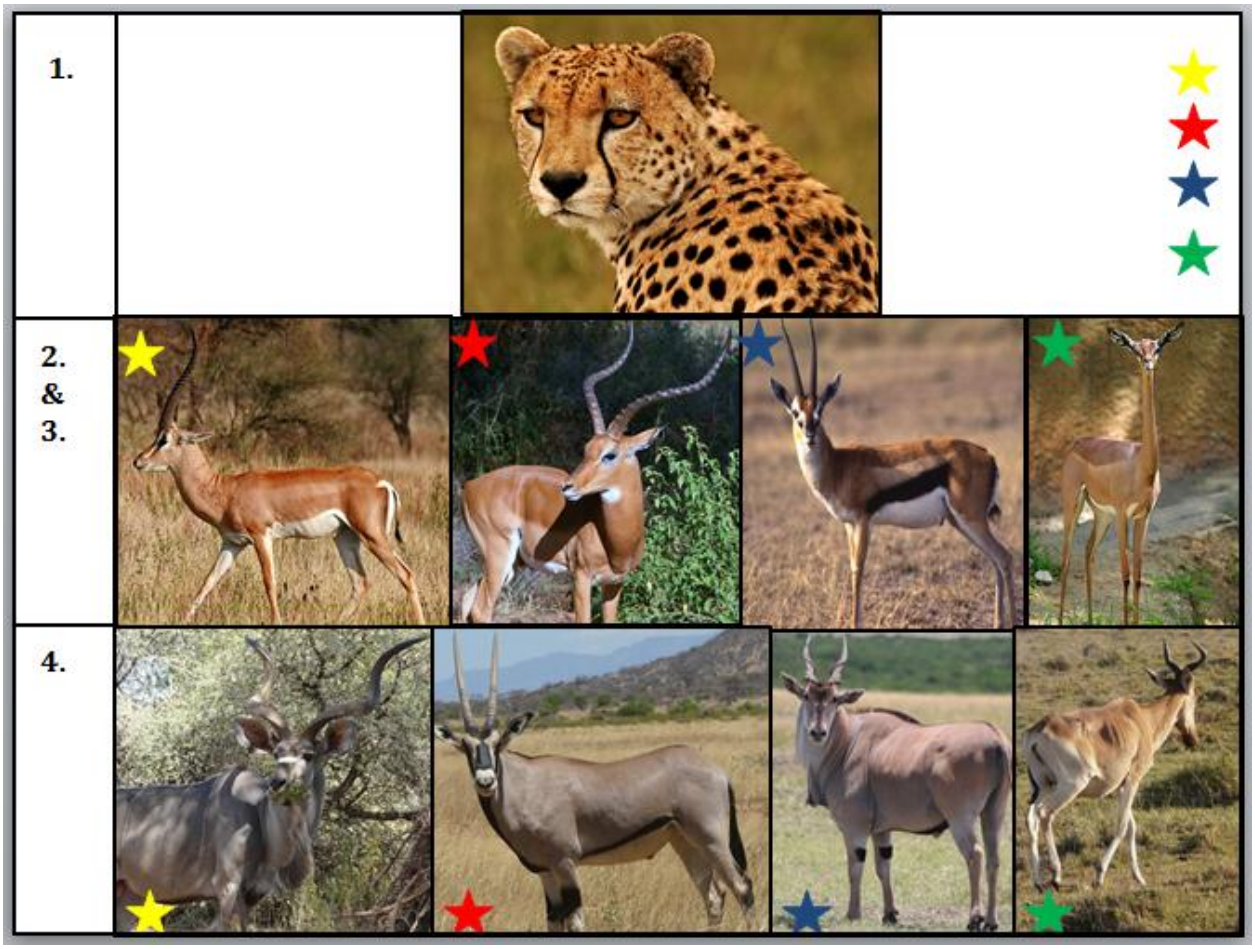
	different ages. Which do you think is the **oldest**?		
Round Two: Wildlife Conservation (status and threats)			
	Question:	**Options:**	
1	Predators, like cheetahs and lions, are declining in number everywhere. But which of the following is the **greatest** cause for this decline?	Yellow – lack of wild prey Red – conflict with people e.g. over livestock depredation Blue - disease Green –competition between predators	
2	Lions have declined significantly. In Kenya, we are losing ~100 lions every year. How many **lions** do you think there are left in Kenya today?	Yellow – less than 2000 Red - Between 2000 and 5000 Blue – Between 5000 and 8000 Green – over 8,000	
3	Which of the following predators is **most endangered**? i.e. fewest left.	Yellow – lion Red – wild dog Blue – Spotted hyena Green – Leopard	
4	Which of the following prey species is **most endangered**? i.e. fewest left.	Yellow – Impala Red – Eland Blue – Grevys Zebra Green – Greater Kudu	
5	Protected areas, like Samburu and Buffalo Springs NRs are designed to provide safe areas for wildlife to live but these areas are often not big enough to ensure the long-term protection of wildlife. How much of Kenya's wildlife do you think is found **outside** protected areas, for example on community or private lands?	Yellow – less in community areas Red – same in community areas Blue - more in community areas Green – much more in community areas	
6	There are few Grevys zebra left.The Samburu/Laikipia area is the place where they are most abundant and most easily seen. How many GZ are there left today?	Yellow - 100 Red - 100-500 Blue – Between 1500 and 2500 Green –over 3000	
7	Conservationists sometimes attach a collar to animals called a GPS collar – often worn around the neck of the animal like a necklace. You may have seen this on some of the elephants here. GPS collars provide a lot of information to researchers about wildlife but which of the following information **CANNOT** be provided by a GPS collar?	Yellow – data on the movement of the animal Red - data on the type of habitat the animal uses Blue – data on the exact location of the animal at a point in time Green – data on the other animals in the area.	
8	West Gate conservancy has a buffer zone adjacent to the conservation area, but which of the following is the best description of what the buffer zone is designed to do? Rank in order.	Yellow – to improve grazing management and restore grasses on bare and degraded land for use by wildlife and livestock. Red – An extension to the core conservation area Blue - An area for livestock only Green – to remove trees for firewood	
Round Three: Predators (e.g. Biology, Behaviour & Benefits)			
	Question:	**Options:**	
1	Which is the largest cat?	Yellow – Lion Red – Leopard Blue – Caracal Green - Cheetah	
2	In which species of predator is the female **larger** than the male?	Yellow – Striped hyena Red – Spotted hyena Blue – Cheetah Green - Leopard	
3	Which of these predators **only** eats prey killed by	Yellow – black-backed jackal	

	other predators and **NEVER** hunts for itself?	Red – spotted hyena Blue – striped hyena Green – none of the above. All three are also capable of hunting themselves.	
4	Which of these predators rarely scavenges - they like to eat things they have killed themselves not things killed by others.	Yellow – Leopard Red – Cheetah Blue – Wild dog Green – Both cheetah and wild dog	
5	Predators often behave differently in community areas compared to protected areas, but which of the following reasons is **incorrect**.	Yellow – predators are less vocal in community areas Red – They will often hide in the bushes during the day in community areas Blue –They move quickly when they see people Green – They climb trees more often in community areas.	
6	Which of the following predators can climb trees?	Yellow – leopards Red – leopards and cheetahs Blue – leopards, cheetahs and lions Green – leopard, cheetah, lion or a wild dog.	
7	A predator is high in a tree feeding on an impala. What **MUST** the predator be?	Yellow – leopard or cheetah Red – leopard Blue – leopard or lion Green – lion	
8	Male lions usually have a large mane. Some of the lions in Samburu do not have a big mane which makes it hard to tell male from female. Why do you think males here have little or no mane?	Yellow – In a bushy environment like this a large mane would catch on things restricting movement of the animal. Red – It is too hot for a big mane Blue – A big mane makes them more easy to see which is not good living in community areas. Green – females prefer males with a small mane	
9	Which individuals in a pack of Wild dogs will breed and have young?	Yellow – all females but just the dominant (alpha) male Red – all mature individuals Blue – Just the dominant (alpha) male and female Green – a few males and a few females	
10	Who attacked the donkey in this picture?	**PHOTO 17** Yellow– spotted hyena Red - leopard Blue – wild dog Green - lion	
11	A camel has been attacked by a predator. There are claw marks on its belly and bite marks around its mouth. The predator was scared away before it finished eating. What might have killed this camel?	Yellow– spotted hyena Red - lion Blue – leopard Green - cheetah	
12	A goat which was left in the bush without a herder has been attacked by a predator. The head is broken and the neck has been dismantled. The intestines remain uneaten. What might have killed the goat?	Yellow– spotted hyena Red - lion Blue – leopard Green - cheetah	
13	Which predator eats **mostly** termites?	Yellow– spotted hyena Red – striped hyena Blue – bat eared fox Green - aardvark	

Round Four: Prey (e.g. Ecology, Behaviour)			
	Question:	**Options:**	
1	Many prey species, like impala, gazelles and oryx, live in big groups called herds. There are advantages and disadvantages to living in groups. Which of these statements about living in a herd is **TRUE**?	Yellow– Living in groups reduces detection by predators Red – Living in groups reduces competition for food Blue – Living in groups reduces disease Green – Living in groups reduces the chance of an individual being attacked by a predator once the group has been sighted.	
2	The animals here are adapted to living in this arid environment. Some get water from vegetation others have to drink water to survive. Which of the following is most **DEPENDENT** on water?	Yellow– gerenuk Red - oryx Blue – buffalo Green – grant's gazelle	
3	**Elephants** are the largest land mammals, but how long are they pregnant for?	Yellow– 6 months (half a year) Red - 12 months (1 year) Blue – 22 Months (just under 2 years) Green – 33 months (just under 3 years)	
4	Which type of **giraffe** is found in this area?	Yellow– Reticulated giraffe Red - Maasai giraffe Blue – Rothschild giraffe Green – All three	
Round Five: Conservancies			
	Question:	**Options:**	
1	When are you allowed to graze livestock inside a conservation area?	Yellow– Never Red – In the dry season Blue – In the wet season Green – During a drought	
2	What is the conservancy?	Yellow– the car Red – the area people, livestock and wildlife are living together Blue – an area just for wildlife Green – only the people living in the area	
3	What is the community?	Yellow– the car Red – the local people Blue – the women only Green – the area that people, livestock and wildlife are living together.	
4	What is the role of conservancy scout?	Yellow– dealing with social problems only Red – controlling wildlife criminals only Blue – patrolling the area for security of wildlife and people Green – They drink chai and discuss issues with the community	
Round Six: Scenarios			
	Question:	**Options:**	**A**
1	You are out in the bush and you come across a dead giraffe. What **should** you do?	Yellow– Nothing. It is dead. Red - Identify what killed the animal and report this information. Blue – Report the death and take the meat. Green –Check there are no predators around, then leave the Giraffe as it is not endangered so I don't need to report.	
2	You are out in the bush and you see a cheetah in the distance. You notice it is limping badly. What	Yellow– Leave the cheetah it will be frightened.	

	<u>should</u> you do?	Red – Run away. It is injured and may be aggressive. Blue – Leave the area immediately to report the information. Green – Follow quietly and at a safe distance, keeping others away. Report the information.	
3	Which of the following animals are you supposed to report if you find an individual dead?	Yellow– Only predators Red – Only prey Blue – Any animal Green – Only those prey or predators which are endangered like grevys or wild dog	

Source: Some images are authors own; some are ©Ewaso Lions; others obtained from a variety of sources including google image search.



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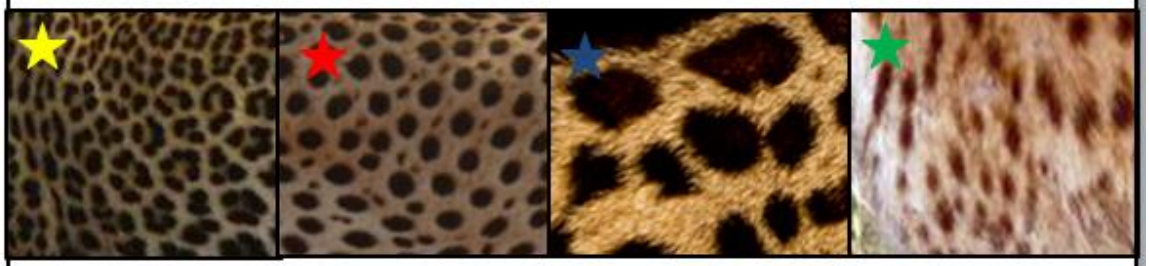

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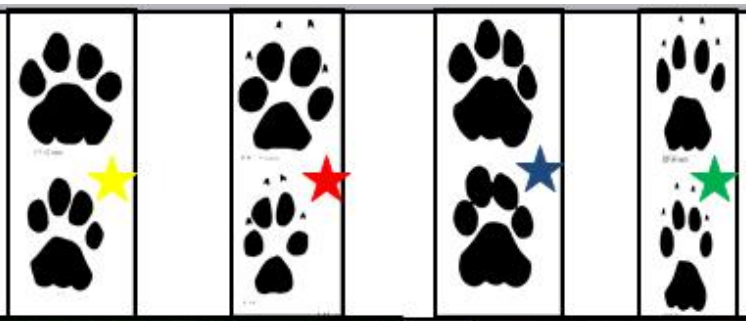

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14.

15.

16.

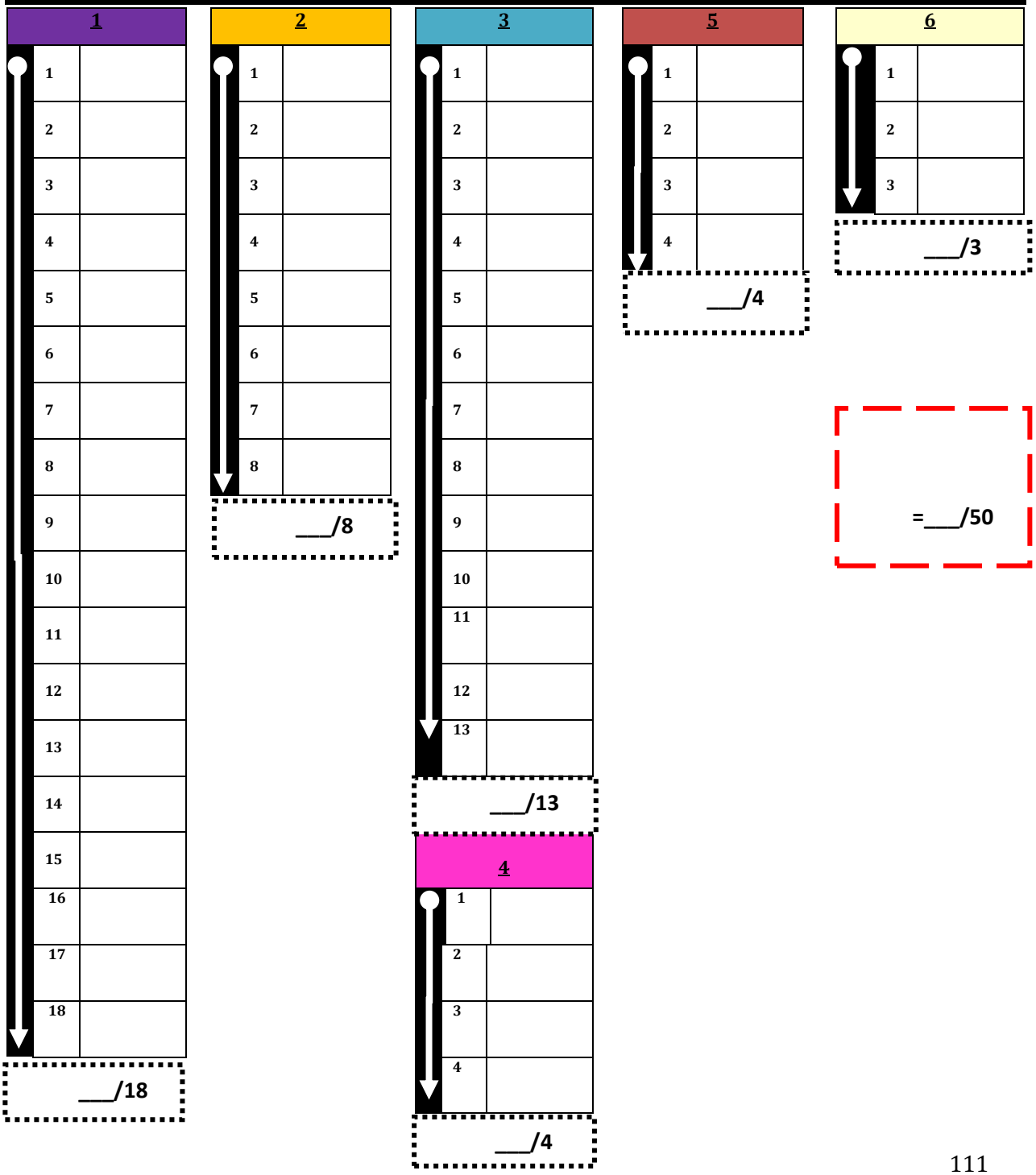
17.

18.				
19.				

APPENDIX 5.2: Community Quiz Participant Answer-sheet

All questions were multiple-choice with four options; participants selected a coloured star they thought corresponded with the correct answer and stuck this on the pre-prepared sheet below (rescaled for thesis presentation).

Location of quiz:	Westgate ☐ Meibae ☐			
Team:	WW Morans ☐ Non-WW Morans ☐ Elders ☐ Women ☐			
Education level (no. at each level):	None (___); WW only (___); Some primary (___); Finished primary; (___); Some secondary; (___); Finished secondary (___);			
Occupation(s) of team members:	1.	2.	3.	4.
Which groups (organisations/demographic groups etc.) do you learn most about wildlife/conservation/ecology/conservancy from?	1.	2.	3.	4.



APPENDIX 6: Sample Characteristics for Questionnaire Surveys

	WW	WGCC community					Meibae
		Sasaab	Ngutuk Ongiron	Sukuroi	Naisunyai	Total	
Total Participants:	**9**	**30**	**30**	**31**	**30**	**121**	**32**
A) Interviewee attributes (figures equal proportion of respondents, except*):							
1. Demographics:							
(a) Demographic group							
Morans	1.00	0.37	0.33	0.32	0.33	0.34	1.00
Elders	0.00	0.30	0.33	0.32	0.37	0.33	0.00
Women	0.00	0.33	0.33	0.35	0.30	0.33	0.00
(b) Age group							
<20	0.11	0.00	0.13	0.00	0.00	0.03	0.59
21-30	0.89	0.43	0.17	0.32	0.33	0.31	0.34
31-40	0.00	0.43	0.27	0.39	0.27	0.34	0.06
41-50	0.00	0.13	0.43	0.29	0.40	0.31	0.00
51-60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60+	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2. Economics:							
(a) Primary Occupation							
Pastoralism	1.00	0.90	0.97	1.00	0.93	0.95	0.97
Conservancy Scout	0.00	0.03	0.03	0.00	0.00	0.02	0.00
Buisness person	0.00	0.03	0.00	0.00	0.00	0.01	0.03
Teacher	0.00	0.00	0.00	0.00	0.93	0.02	0.00
"Working class"	0.00	0.03	0.00	0.00	0.00	0.01	0.00
WW moran	9.00	0.00	0.00	0.00	0.00	0.00	0.00
(b) HH income							
Livestock	0.00	0.70	0.80	0.81	0.97	0.82	0.97
Wildlife	0.11	0.00	0.03	0.03	0.03	0.02	0.00
Tourism	0.00	0.00	0.03	0.03	0.00	0.02	0.00
Own buisness	0.00	0.03	0.00	0.03	0.00	0.02	0.03
Livestock & Wildlife	0.67	0.03	0.07	0.00	0.00	0.02	0.00
Livestock & Tourism	0.11	0.13	0.03	0.00	0.00	0.04	0.00
Wildlife & Tourism	0.00	0.03	0.00	0.00	0.00	0.01	0.00
Unspecified	0.11	0.07	0.03	0.10	0.00	0.05	0.00
(c) *Livestock assets (average head of livestock)							
Cattle	10.78	5.33	5.03	9.33	9.10	7.14	10.56
Shoats	75.33	77.73	80.83	123.63	175.20	113.88	89.72
Donkeys	2.56	5.50	5.10	5.93	6.60	5.76	3.94
Camels	0.44	1.40	2.93	0.13	6.17	2.64	5.41
Chickens	5.22	0.20	0.93	0.33	0.73	0.55	0.00
3. Cultural:							
(a) Clan							
Longeli	0.22	0.13	0.03	0.94	0.00	0.28	0.16
Loimisi	0.22	0.00	0.27	0.00	0.00	0.07	0.50

Lorokushu	0.22	0.53	0.07	0.00	0.03	0.16	0.06
Lmasu	0.00	0.03	0.00	0.00	0.00	0.01	0.00
Lanat	0.22	0.00	0.20	0.00	0.00	0.05	0.00
Lpusi ngishu/kishu	0.11	0.07	0.40	0.06	0.93	0.36	0.09
Lukumae	0.00	0.03	0.00	0.00	0.00	0.01	0.06
Lngwesi	0.00	0.07	0.00	0.00	0.00	0.02	0.03
Lamasula	0.00	0.10	0.00	0.00	0.00	0.02	0.00
Lpusi	0.00	0.00	0.03	0.00	0.00	0.01	0.03
Unspecified	0.00	0.03	0.00	0.00	0.03	0.02	0.06
4. Social:							
(a) Education level							
WW only	0.78	0.00	0.00	0.00	0.00	0.00	0.00
None	0.00	0.83	0.80	0.97	0.00	0.65	0.94
Primary	0.22	0.07	0.20	0.03	0.00	0.07	0.00
Secondary	0.00	0.00	0.00	0.00	0.00	0.00	0.06
Tertiary	0.00	0.07	0.00	0.00	0.00	0.02	0.00
(b) Time in Manyatta	9.57	6.88	6.78	9.33	19.13	10.52	10.6
B) Interview attributes:							
1. Average duration:	01:36:27	01:47:32	01:41:12	01:55:25	01:43:26	01:46:57	00:58:39
2. Locality:							
In boma	0.00	0.43	0.43	0.35	0.47	0.42	0.47
At watering hole	0.00	0.07	0.10	0.10	0.23	0.12	0.09
In bush - herding livestock	0.00	0.10	0.07	0.13	0.10	0.10	0.13
In bush - without livestock	0.00	0.30	0.33	0.39	0.17	0.30	0.31
In bush - resting	0.00	0.10	0.00	0.00	0.00	0.02	0
Travelling on road	0.00	0.00	0.00	0.03	0.00	0.01	0
"Shopping centre"	0.00	0.00	0.03	0.00	0.00	0.01	0
School	0.78	0.00	0.03	0.00	0.03	0.02	0
Ewaso Lions camp	0.22	0.00	0.00	0.00	0.00	0.00	0

APPENDIX 7: Livestock Loss

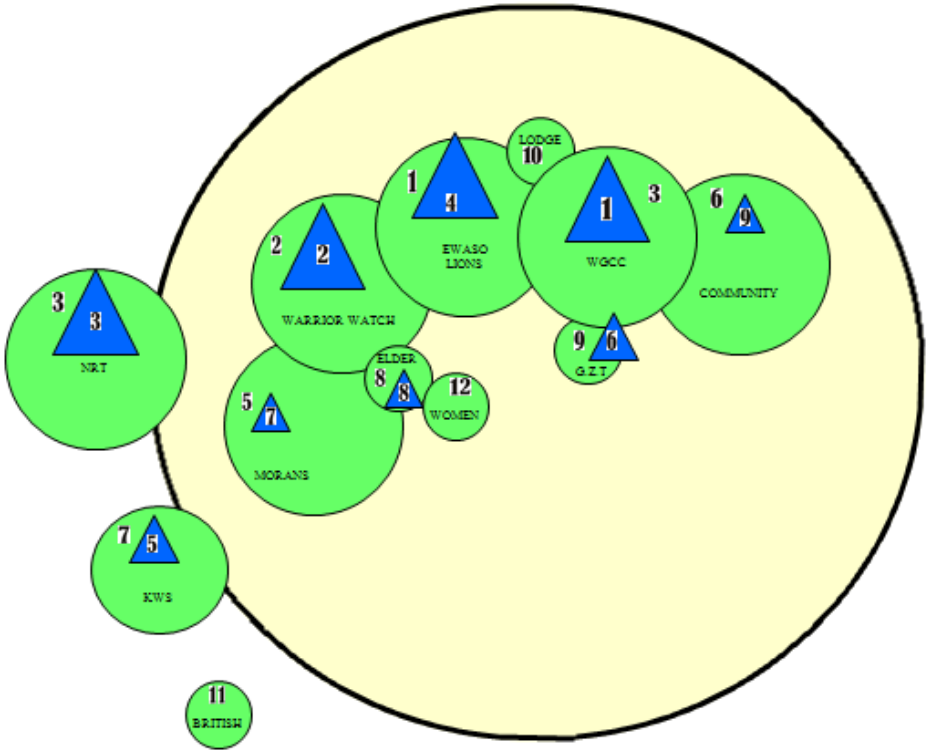
Predation was widely perceived as the third greatest cause of livestock loss; but within Westgate the majority of people thought there had been a reduction in predation over the last two years. They mostly attributed this to the efforts of Ewaso Lions (including WW). In Meibae predation was not considered to have reduced.

Location	Main causes	Most frequent direction of change stated (proportion)*	Most frequent reason stated for change (proportion)*	Number of reasons
WW	1. Drought	↓ (1.00)	Heavy rains came (1.00)	8
	2. Disease	↓ (0.63)	Vets treated livestock (0.63)	8
	3. Predation	↓ (0.86)	**Ewaso Lions** helped us reduce predation rate (0.71)	7
	4. Sold	↓ (1.00)	Heavy rains meant livestock produced milk, so selling stopped (0.67)	3
Sasaab	5. Drought	↓ (0.84)	Heavy rains came (0.60)	25
	6. Disease	↓ (0.97)	Vets treated livestock (0.90)	29
	7. Predation	↓ (0.85)	**Ewaso Lions** helped us reduce predation rate (0.70)	20
	8. Lost	↓ (0.67)	**Ewaso Lions** taught us how to improve livestock husbandry (0.67)	6
Ngutuk Ongiron	1. Drought	↓ (1.00)	Heavy rains came (0.93)	28
	2. Disease	↓ (0.79)	Vets treated livestock (0.93)	28
	3. Predation	↓ (1.00)	**Ewaso Lions** helped us reduce predation rate (0.90)	10
	4. Sold	↑ (0.57)	Relief meant stopped selling (0.57)	7
Sukuroi	1. Drought	↓ (0.81)	Heavy rains came (0.67)	27
	2. Disease	↓ (1.00)	Vets treated livestock (0.71)	28
	3. Predation	↓ (0.84)	**Ewaso Lions** helped us reduce predation rate (0.68)	18
	4. Sold	↓ (0.88)	Relief meant stopped selling (0.75)	8
Naisunyai	1. Drought	↓ (0.81)	Government relief helped (0.37)	27
	2. Disease	↓ (1.00)	Vets treated livestock (0.)	28
	3. Predation	↓ (0.84)	**Ewaso Lions** helped us reduce predation rate (0.91)	23
	4. Lost	↓ / →(0.50)	**Ewaso Lions** taught us how to improve livestock husbandry (0.50)	4
Meibae	1. Drought	↓(0.78)	Heavy rains came (0.52)	29
	2. Disease	↓(0.93)	Vets treated livestock (0.85)	26
	3. Predation	→ (0.68)	Nothing changed (0.64)	22
	4. Sold	→ (0.56)	Continues (0.50)	16

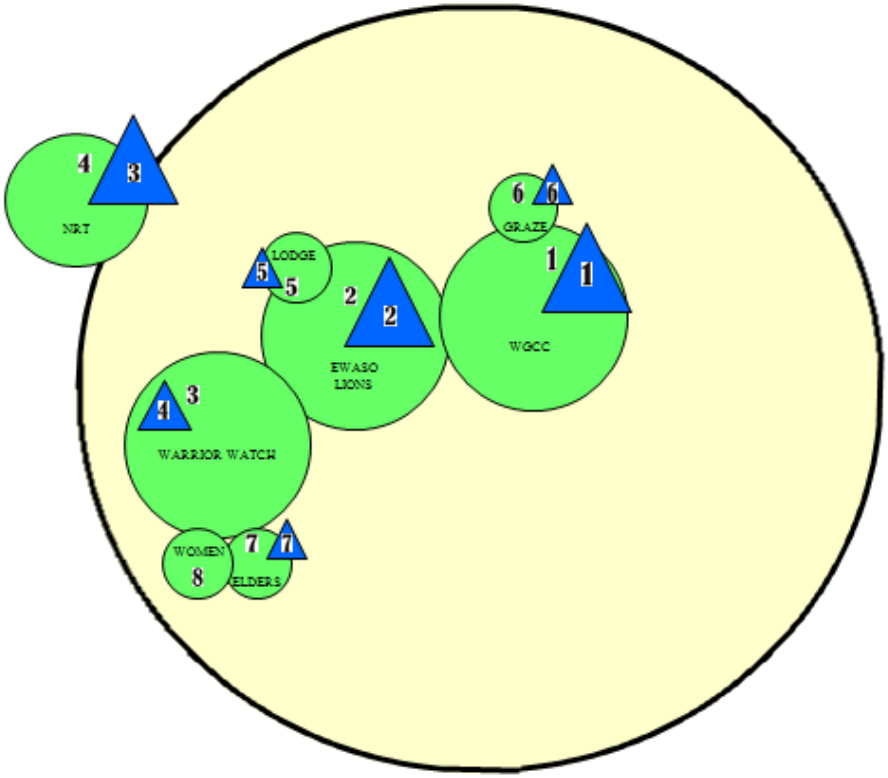
***proportions based on most frequent response of those providing an answer (free-listed). Period of change specified was 2 years.**

APPENDIX EIGHT: Venn Diagram Maps

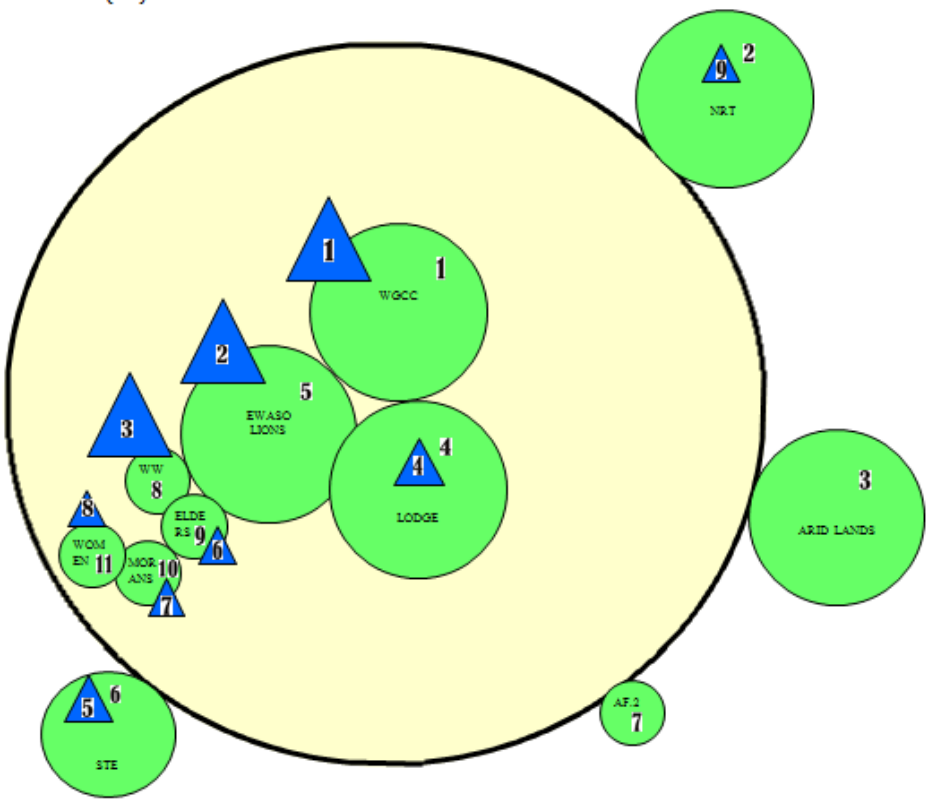
WARRIOR WATCH MORANS (X10), NGUTUK ONGIRON, 29.04.12



MORANS (X5), SASAAB, 15.05.2012



SASAAB ELDERS (X5) 18.05.12



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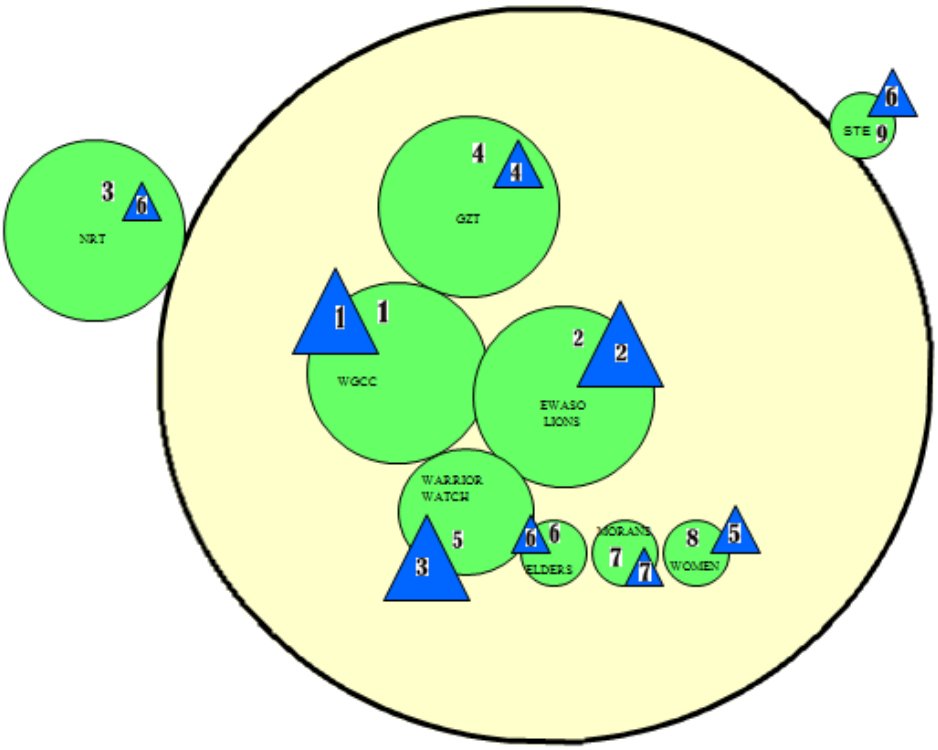
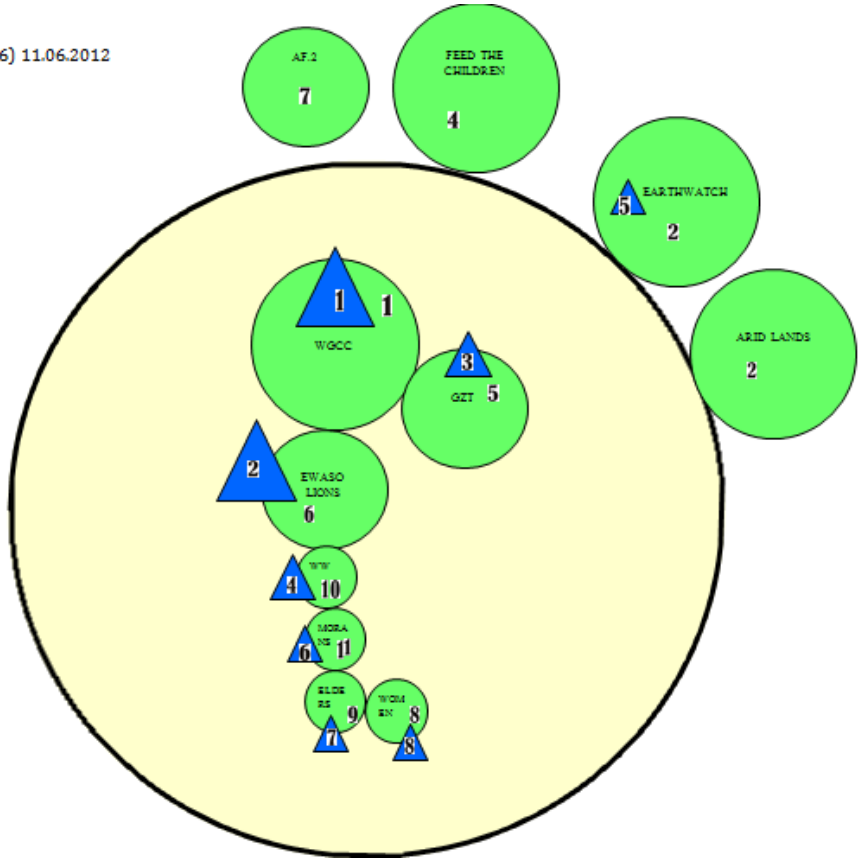
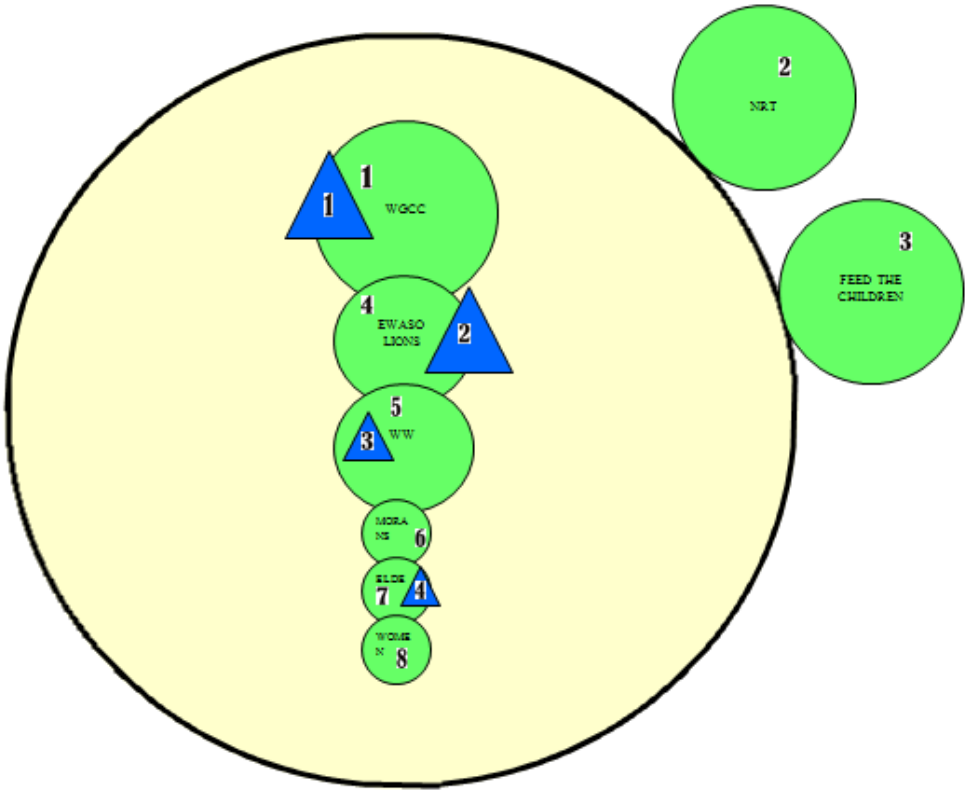


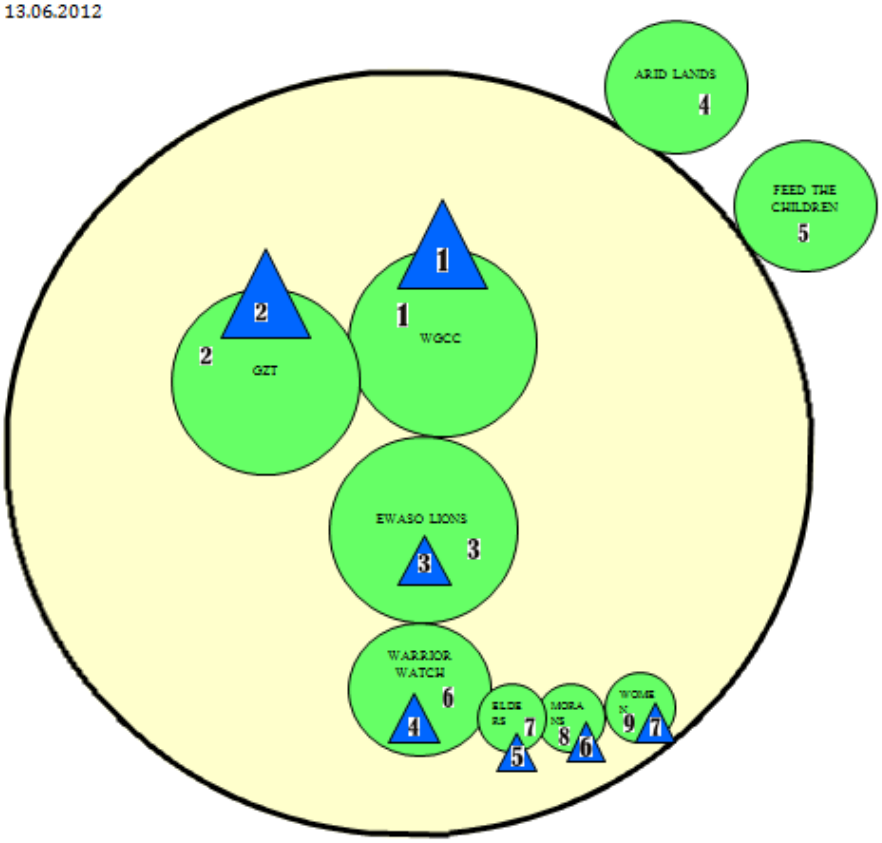
SUKUROI MORANS (X6) 11.06.2012



SUKUROI WOMEN (X6) 08.06.2012



SUKUROI ELDERS (X6) 13.06.2012



Abbreviations for Venn diagrams:

AF.2	Afya Two
BRITISH	British Army
GRAZE	Grazing management board
GZT	Grevy's Zebra Trust
KWS	Kenya Wildlife Service
LODGE	Sasaab Lodge
NRT	Northern Rangelands Trust
STE	Save the Elephants
WGCC	Westgate Community Conservancy Board
WW	Warrior Watch