Perceptions and attitudes of a Maasai community in southern Kenya regarding predator-damage compensation, wildlife conservation and the predators that prey on their livestock

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Abstract

World-wide, carnivore numbers are declining, largely, due to conflict with humans. Wildlife-damage compensation schemes are one potential way to increase tolerance for carnivores while minimizing the financial losses people incur when carnivores prey on their livestock. The Predator Compensation Fund is one such scheme. Operating on Mbirikani Group Ranch, a communally owned area in southern Kenya's Maasailand, the Predator Compensation Fund compensates owners for livestock attacked/killed by lion (*Panthera leo*), cheetah (*Acinonyx jubatus*), leopard (*Panthera pardus*) and spotted hyena (*Crocuta crocuta*), as well as 5 other mammalian species, in hopes of conserving the remaining local populations of these carnivores. This study examines the Predator Compensation Fund and the attitudes, perceptions and opinions of the Mbirikani Group Ranch community regarding the Predator Compensation Fund and carnivores. Selected using stratified random selection, 101 subjects (men and women) were interviewed between April and July, 2005, using a semi-structured interview format with open-ended questions. The results show that although the Predator Compensation Fund has increased tolerance levels for carnivores and the subjects indicated a desire for the project to continue, they also felt the project was unfair and inequitable. Many subjects also lacked an adequate understanding of the project, which lead to misperceptions and further negative attitudes towards the Predator Compensation Fund, carnivores and project administrators. Successful resolution of these issues will depend on frequent and extensive education efforts by the project for all community members, as well timely project information dissemination, which will serve to increase the project's transparency. Additionally, adjustments to some rules and procedures are recommended to increase perceptions of fairness in the project, for both the community and the project, and to help shift the responsibility back to the community for properly protecting their livestock against carnivore attacks. Alternatives to compensation and the community's willingness to accept alternatives to compensation are also investigated here. Implementing effective, resolution-minded changes should have significant positive effects for the Predator Compensation Fund, Mbirikani Group Ranch and, ultimately, carnivores.

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Acronyms

CBC	Community-Based Conservation
ITK	Indigenous Technical Knowledge
IUCN	The World Conservation Union
KLCP	Kilimanjaro Lion Conservation Project
km	kilometer
Ksh	Kenyan Shillings
KWS	Kenya Wildlife Service
LPP	Laikipia Predator Project
MGR	Mbirikani Group Ranch
mi^2	square miles
ODWPT	Ol Donyo Wuas Preservation Trust
SLT	Snow Leopard Trust
PCF	Predator Compensation Fund
PP	Performance Payments
USD	United States dollar
VO	Verification Officer

Glossary

Age Set: a group of young males who are initiated into adulthood together through circumcision. Once circumcised, these males are known as *Morans* for the next 10 to 15 years, until the next group is initiated into adulthood and the old *Moran* group becomes Elders. The age set is thus a permanent grouping and lasts throughout the lifetime of its members. The current age sets on Mbirikani Group Ranch are: *Ilkiponi* (18-29 yrs old), *Ilkedotu* (28-42 yrs old), *Ilkeshimu* (40-54 yrs old), *Iseuri* (55-65 yrs old), *Ilnyanusi* (66-79 yrs old) and *Ilterito* (80-93 yrs old).

Boma: the typical Maasai compound/homestead consisting, at minimum, of a thorn bush enclosure with inner thorn enclosures for livestock. Bomas generally accommodate one to 15 households, or *olmarei*, which line the outermost enclosure; each household usually has a separate entrance.

Clans: ancestral divisions which are inherited paternally and do not change throughout one's lifetime. The three clans on Mbirikani Group Ranch are *Laiser, Ilmolelia* and *Ilaitayiok.*

Moral Hazard: the risk that a party to transaction has not entered into the contract in good faith, has provided misleading information about its assets, liabilities or credit capacity or has an incentive to take unusual risks in a desperate attempt to earn a profit before the contract settles (answers.com).

Moran(s): an individual (or individuals) who is part of the warrior age set.

Mzee*:* the Swahili word for a male who is past the age of *Moranhood*; an elder.

Olmarei: the Maasai household, which is defined by the group of people who eat meals together.

Performance Payments*:* an economic incentive wherein an organization pays residents living in a pre-set boundary for the presence of species targeted for conservation, and thus for their conservation performance. The method gives incentive not to harm or kill the target species since the more of the species there are in the pre-set boundary, the more money the community will receive.

Wazungu: the Swahili word for white people.

Chapter 1: Introduction/Research Question

1.1 Study and Predator Compensation Fund Background

Carnivore numbers are on the decline worldwide, and the area of Mbirikani Group Ranch (MGR), in southern Kenya's Maasailand, is no exception. Richard Bonham, a white Kenyan living on MGR since 1986, noticed, in his first 5 years of operating Ol Donyo Wuas Safari Lodge, that lions (*Panthera leo*) seemed to be disappearing, despite a Kenyan law protecting wildlife and a limited presence of the Kenya Wildlife Service (KWS) in the area. As lions disappeared, the number of sheep and goats (collectively known and used in this paper as "shoats") and cattle kept by the local Maasai, a tribe native to Kenya and Tanzania, rose steadily. It was suspected that the decline of lions was largely due to killings by the Maasai in retaliation for lions preying on livestock. This decline was one of the factors which lead Richard to create the Ol Donyo Wuas Preservation Trust (ODWPT; formerly the Maasailand Preservation Trust) in 1991, for the purposes of preventing the killing of lions and other wildlife, and stopping the illegal bush meat trade on and around the ranch.

Five years after the creation of ODWPT, Richard partnered with Tom Hill, an American entrepreneur, who raised money to start a game scout program. Game scouts would patrol the areas of the ranch to investigate and report any wildlife killings to the local KWS unit. Once started, the scout project was deemed successful, and the trust branched out to fund a rhinoceros preservation unit, school scholarships and child sponsorships.

Despite their best efforts to control lion killings, in the 18 months between September, 2001, and March, 2003, 22 lion killings were reported and verified on MGR. The killings sent a clear message to Richard and Tom that their efforts were not enough; more drastic measures were needed in order to prevent the extinction of the African lion in the area.

Richard and Tom next sought help from predator biologist Laurence Frank of the Laikipia Predator Project (LPP), to see what might be done. After much discussion, it was decided that ODWPT would implement an experimental project that would financially compensate the MGR community for damage to or loss of livestock (cattle, shoats and donkeys) to predators in exchange for their tolerance of predators. Tom Hill secured funding from individual international donors, and, on April 1, 2003, the Predator Compensation Fund (PCF) was launched on MGR. Based on financial projections by the ODWPT administrators, funding was secured to maintain the project for a period of three years. The PCF is the only carnivore damage compensation project run in the area and one of the relative few existing in the world.

In March, 2004, Laurence's LPP, with financial backing from the National Geographic Society and the Wildlife Conservation Society, created a project on MGR called Kilimanjaro Lion Conservation Project (KLCP). KLCP's focus was to collect data on lion populations, territorial ranges and prey, and to better understand predators' impact on the local community, and vice versa. Seamus Maclennan, project biologist, was hired to run KLCP and perform the lion research. Seamus also became an integral part of the PCF, functioning in an administrative role and as a temporary verification officer (VO). At the conclusion of data collections for this study, 7 lions wore radio-telemetry collars for the KLCP research; these 7 lions represented an estimated 35-50% of the lion population on and around MGR (KLCP, 2005).

After the 3-year PCF experimental period comes to an end in 2006, an evaluation of the project is planned to determine the project's success. If the project is deemed successful, additional funding will be solicited from current and new donors, and the project expanded to group ranches neighboring MGR. Measurement of success for the PCF 3rd year evaluation will be based on criteria stated in Hill and Bonham (2005):

- A cessation of lion killings on Mbirikani Group Ranch

- An increase in the population of lions on Mbirikani Group Ranch to more "normal" levels
- The sustainability of "normal" lion populations on Mbirikani Group Ranch over time

1.2 Study Site

This study was conducted on MGR, a communally-owned Maasai group ranch found approximately 60 km northeast of Mt. Kilimanjaro, within the Tsavo-Amboseli ecosystem, an area world renowned for its biodiversity and vast populations of endemic species. The group ranch is approximately 1,139 mi^2 (square miles) in size (125,893 hectares) and is home to approximately 11,000 members[1] and their families. Chyulu Hills National Park is found to the north and east of MGR, while Amboseli National Park is west of MGR, though the two are separated by Olgulului group ranch. Three other Maasai group ranches also border MGR; Merrueshi group ranch is north of MGR, while Kuku and Kimana group ranches are to the south. Kimana Sanctuary also borders the southern boundary of MGR.

The study area is characterized by semiarid climate. The area experiences two rainy seasons, one from March to May and another from October to December, with an average annual rainfall between 500 and 600 millimeters, though this measurement fluctuates from year to year and drought is a recurrent problem (Campbell, 1999). Much of the southern portion of the ranch benefits from the well-watered slopes of Mt. Kilimanjaro; many swamp and riparian lands can be found there. These areas function as the ranch's agricultural centers (Campbell, 1999).

[1] According to the Constitution and Rules of Mbirikani Group Ranch (Solonka, 2005) a member is an individual who meets the following requirements: 1) the person is Maasai; 2) the person resides or occupies or is entitled to occupy or own a parcel of land on the group ranch; 3) the person has inherited an interest from a deceased member whose name appears in the register of members of the group ranch; 4) all group ranch representatives agree that the person is a member and the decision is confirmed at an annual general meeting of the group ranch or a court of law orders that membership be granted to the individual. A woman may be a member only if she has inherited membership from a deceased husband, child, sibling or parent with no remaining male relatives.

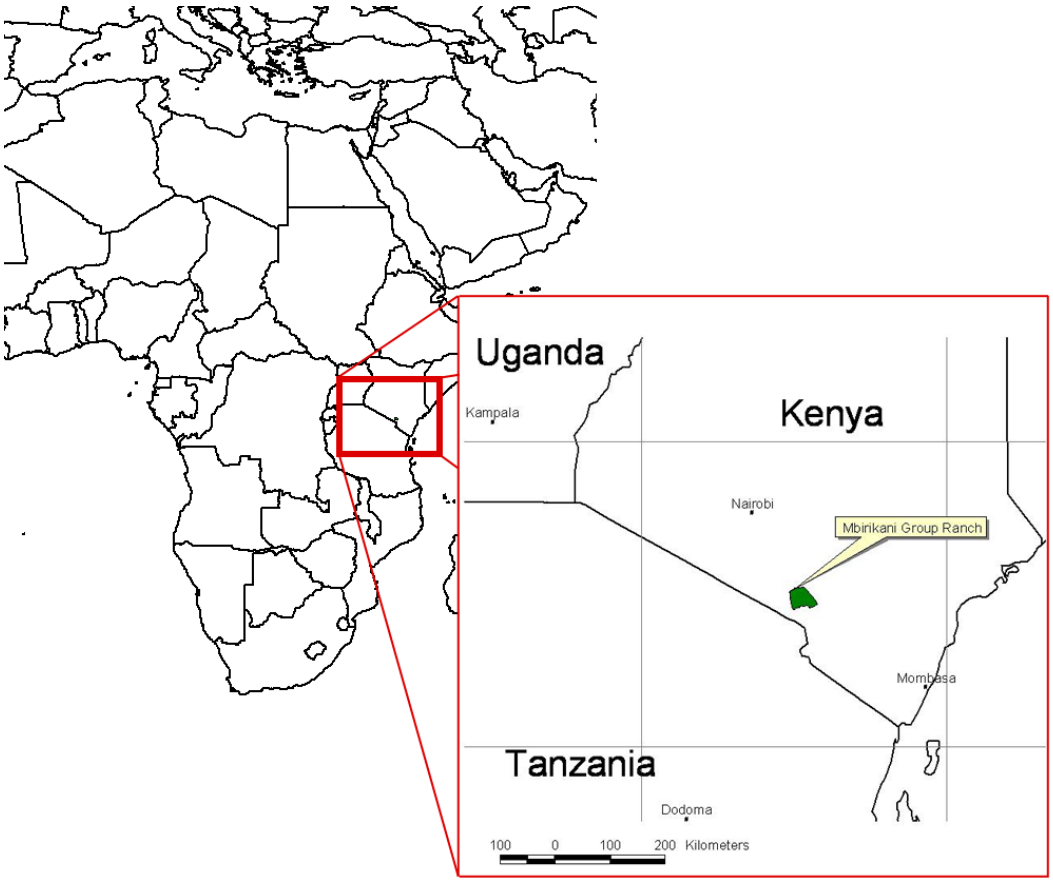

Figure 1: Location of the Mbirikani Group Ranch Study site (maps created by KLCP)

The Maasai culture has been historically and traditionally based on subsistence pastoralism. Today, livestock continues to form a major part of the Maasai social and economic systems; a primary goal of the Maasai is to maintain sufficient livestock in order to survive drought and livestock epidemics. While livestock herding continues to be widespread on MGR, extending over much of the savanna, there has been a cultural shift from pastoralism to agro-pastoralism over the past 20 years in reaction to the desire for more extensive household benefits and alternatives to the unpredictable and declining pastoral lifestyle (Okello, 2005).

British colonizers, who ruled East Africa until the early 1960's, attempted to modernize the Maasai economy by transforming land tenure arrangements and encouraging the education of Maasai children and a reduction of livestock numbers. Colonizers also worked to control the

nomadic movements of the Maasai. More recent national, social and economic changes have succeeded in bringing further change to Maasai traditional social norms (Campbell, 1999). The post-colony Kenyan government has been particularly successful in implementing change in Maasai land tenure. The government created the group ranch concept as a way to provide a framework for dismantling communal ownership of land throughout Maasailand and the Maasai's traditional nomadic pastoralism (Graham, 1989; Galaty, 1992). Maasai land tenure was formalized in 1969 through the introduction of the Land Act of Parliament. Land was denoted to every cattle owner within clan territories. An elected group of representatives, known as the group ranch committee, was appointed as the local governing body for matters pertaining to the individual group ranch. However, it seems the purpose for which Maasai group ranches were created has not been totally successful since most Maasai remain, to some degree, nomadic.

1.3 Research Question

I met Laurence Frank while on safari in Kenya in early February, 2005. I expressed to him my interest in taking on a research project concerning human-wildlife conflicts which would fulfill the practicum and Capstone requirements for my Masters degree from the School for International Training. Later at a KLCP site visit, Laurence and Seamus suggested an evaluation of the opinions of the participating community concerning the PCF would enhance the planned 3rd year evaluation. With continued lion killings on MGR and many complaints being issued from the MGR community about PCF (i.e. payment prices too low, time limits too strict, and so on), my time would be well spent conducting a study of the PCF project from the community's point of view.

I spent several months on MGR completing my practicum with KLCP prior to starting this study. In that time, I familiarized myself with the PCF and spent time in the MGR community and attended meetings with community members concerning the PCF. I heard the

history of the project from their point of view, and listened to many opinions, praises and criticisms. Hearing these views lead me to ask many questions about the attitudes and perceptions of the MGR community regarding the PCF, and the data collected in this study has allowed me to answer these questions. One question in particular sums up the basis of this evaluation and functions as my main research question:

- What are the attitudes and perceptions of the participating Maasai community regarding the Predator Compensation Fund on Mbirikani Group Ranch?

The following sub-questions have helped to further answer the main question:

- Does the community understand how the project operates, and is it perceived as being egalitarian?
- Has the Predator Compensation Fund altered community perceptions toward predators (i.e. perceived carnivore population changes, rates of predator retaliatory killings, and tolerance levels)?
- What are the perceived benefits to the ranch and to the individuals of the Mbirikani Group Ranch community of conserving carnivores?
- Has the project engendered changes in the way community members manage their livestock (i.e. husbandry methods) since the start of the Predator Compensation Fund?
- Are the benefits of the development projects administered by Predator Compensation Fund and Ol Donyo Wuas Preservation Trust reaching the majority of the members in the participating community?
- Would community members participate in other types of payment-based conservation methods such as insurance or performance payments (see *Glossary*)?

Okello (2005) states that local opinions can influence conservation efforts and thus monitoring locals' concerns related to conservation can provide a foundation for effective decision making to help mitigate negative wildlife impacts. Upon completion, this paper will be presented to ODWPT administrators so the views of the community may be considered if/when subsequent changes to the project need to be made.

This study has not only provided the MGR community with a formal outlet for their praise and/or grievances, but it also included an element of education. Through the interview

process, subjects had the opportunity to ask questions and learn more about the PCF. Given the highly social nature of the Maasai culture, these community members likely shared what they learned with their family, friends and fellow group ranch members.

1.4 Predator Compensation Fund Rules and Procedures

As per the PCF agreement (PCF, 2005) and my personal knowledge of the PCF, the project works in the following way: MGR has been divided into seven zones for the purposes of this project (zones A-G, see figure 1 below). The PCF agreement states that only an MGR member can file a compensation claim for livestock attacked or killed by a predator.

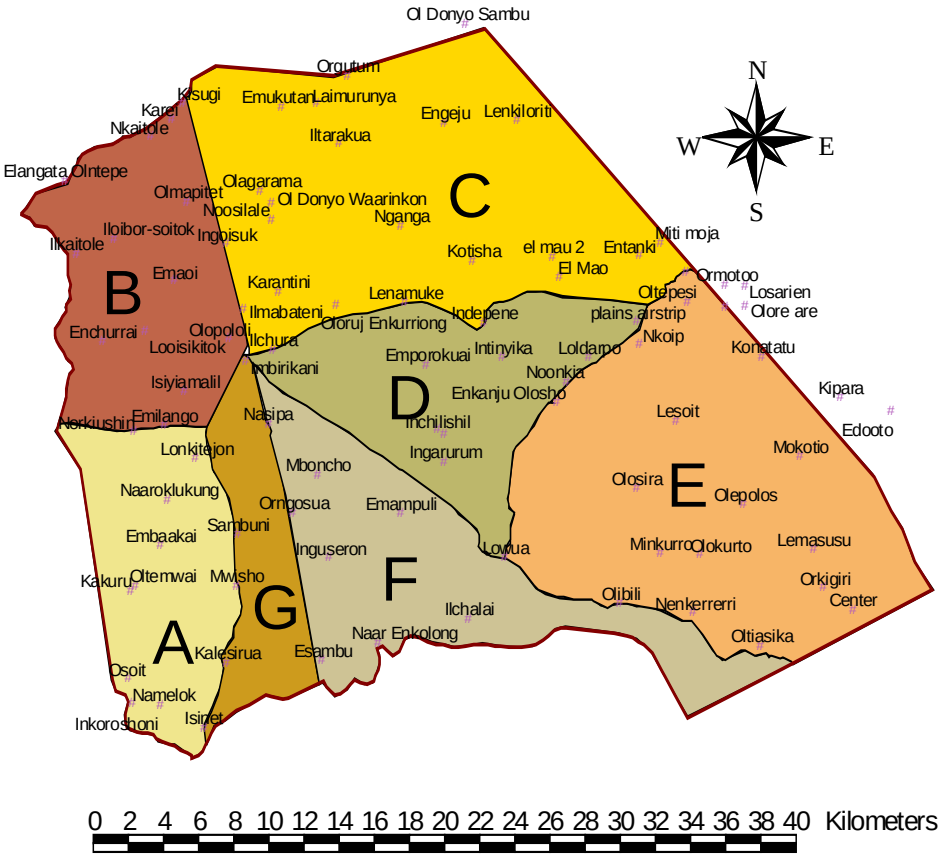

Figure 2: Predator Compensation Fund administrative boundaries (zones) for Mbirikani Group Ranch (map created by KLCP)

If a member's livestock is injured or killed by a predator, the claimant has 4 options for reporting the attack/killing: 1) go directly to the ODWPT headquarters (HQ) office in Mbirikani (town), 2)

go to the ODW Safari Lodge (where a permanent radio is available and where the VO is stationed), 3) locate his zone's assigned PCF reporter (who is equipped with a hand held radio and randomly patrols the zone daily) or 4) send word to the reporter through a third party. Whichever option is used to report the incident, the attack/killing must be reported within 24 hours of the incident so that it can be investigated while carnivore tracks and other evidence are still clear. If the zone reporter is used, the zone reporter then radios the ODWPT HQ, giving details of the incident, including the name of the livestock owner and the location of the owner's boma[2]. Only reports made between 8 am and 6 pm are considered valid.

A trained verification officer (VO), an MGR member employed by the PCF, receives the information from the ODWPT HQ and visits the site, ideally, within a few hours after receiving the report. The PCF agreement states that the carcass of any livestock believed to have been attacked/killed by a predator, as well as any potential predator tracks, must be protected from further damage prior to inspection by the VO. Any carcass that has been butchered for its meat or has been left unprotected to scavenger damage (i.e. without covering it with thorn bushes or hanging it in a tree) will be ineligible for payment. Similarly, any injured livestock must also be protected from further attacks. Upon arrival, the VO listens to the owner's account of the attack/killing and asks for other details regarding eyewitnesses to the attack, if any, the type of predator witnessed, the time of the attack and so on. The VO then examines the livestock/carcass for evidence of which predator was responsible for the attack and whether the attack occurred pre- or post-mortem (thus attempting to rule out payment for false claims). The surrounding ground is also examined for signs that will help identify the species responsible for the attack. Attacks by lion (*Panthera leo*), cheetah (*Acinonyx jubatus*), leopard (*Panthera pardus*), spotted

[2] A boma is the typical Maasai homestead/compound. It consists of a thorn bush enclosure with inner thorn enclosures for livestock. Bomas generally accommodate one to 15 households (defined as family members who eat meals together) with each household having a separate entrance.

hyena (*Crocuta crocuta*) and striped hyena (*Hyaena hyaena*) are covered under the terms of the PCF agreement. Attacks by elephant (*Loxidonta africana*), cape buffalo (*Syncerus caffer*), side-striped jackal (*Canis adustus*) and black-backed jackal (*Canis mesomelas*) are also covered by the agreement, though these animals attack with less frequency on MGR and are, therefore, less problematic. Appendix I shows photographs of each species covered by the PCF.

Additionally, the VO determines if the livestock was lost in the bush/without a herder at the time of the attack or within a boma that does not meet the PCF rules/standards constituting a "good" boma (minimum 4 feet high and 4 feet thick). If either of these situations applies, the compensation payment is subject to a penalty/reduction (30% or 50% of full payment; see Tables 1a-c). Schumann *et al* (2004) and Lukarvsky (2003), as well as the editors of *Carnivore Damage Prevention News* (2003), suggest that unless a community participating in a compensation scheme modifies their herding practices, incidence and severity of predator attacks on livestock will generally remain unchanged. Thus, the penalties given for inadequate herding practices are intended to bring about change. For all verified and approved claims not falling into the two previously mentioned penalty situations, full compensation is given.

Prices are based on average values for livestock sales in Kajiado District (timeframe and results unknown). Thirty percent of the funds paid out in the form of compensation come from the group ranch finances (increased from 25% in July, 2005), while 70% is paid by ODWPT. Table 1a-c lists the compensation prices (as of June, 2005).

Table 1a: Killed by Leopard, Cheetah or other (in Ksh)			
	Full	Bad Boma (50%)	Lost (30%)
Cow	13,500	6,750	4,050
Sheep/Goat	2,000	1,000	600
Donkey	6,000	3,000	1,800

Table 1b: Killed by a Lion (in Ksh)			
	Full	Bad Boma (50%)	Lost (50%)
Cow	13,500	6,750	6,750
Sheep/Goat	2,000	1,000	1,000
Donkey	6,000	3,000	3,000

Table 1c: Killed by a Hyena (in Ksh)			
	Full	Bad Boma (50%)	Lost (30%)
Cow	6,750	3,375	2,025
Sheep/Goat	2,000	1,000	600
Donkey	3,000	1,500	900

Table 1a-c: PCF compensation prices for livestock attacked/killed by various predators (conversion as of June 15, 2006 is 1 USD = 73.6 Ksh)

The VO fills out a PCF credit note in duplicate, explaining to the livestock owner his findings, the amount of compensation they will receive and why, if any, there has been a penalty issued on the credit note. The owner is told the date of the next payout date (nominally on the first day of every other month starting with January) and that he/she can collect his money at the ODWPT HQ office on that date. Only claims made within the boundary of MGR or within 1 (kilometer) of any non-protected area can be considered for payment.

Zone penalties exist for cases in which false claims and predator killings are involved. In the event that a claim is determined to be false, the claim is invalidated and the claimant is fined 6,000 Ksh. If the claimant cannot or refuses to pay the fine prior to the following PCF payout date, the fine is deducted pro-rata from all valid claims from his/her zone during the 2-month pay period when the false claim is made.

If a predator is wounded or killed within the boundaries of MGR by a member or visitor not turning him/herself in and not apprehended by authorities, a 15,000 Ksh reward is given to the first person who comes forward with information about the person(s) involved in the incident, provided the culprit(s) is prosecuted. The identified culprit(s) is fined 13,500 Ksh (per

culprit) and arrested, and conviction is sought. If the culprit(s) is not identified, the PCF may be subject to suspension at the beginning of the following pay period. If the identified culprit(s) is a non-MGR member, claims made in the given zone during the given pay period are invalidated.

In the event of a disagreement between the livestock owner and the VO, PCF administrators have the option of reviewing the claim to make a final ruling. The ruling is absolute and not subject to further review.

Payment for compensation claims are made at the ODWPT HQ per the payout schedule (as described earlier). The owner can redeem his/her credit note for cash on the payout date immediately following the attack. Credit notes presented for redemption more than two months after the attack are not honored.

Only MGR members and specific families living on Kuku Group Ranch within 3 km of the town of Centre can qualify for PCF compensation. Additionally, only livestock attacks/kills occurring on MGR or in the boundary buffer zone (1 km outside the MGR boundary with the exception of the area of MGR which borders Kimana Sactuary) are considered for compensation.

The PCF agreement is reviewed by ODWPT and renegotiated between ODWPT and the MGR committee annually.

1.5 Predator Compensation Fund Challenges

Throughout the duration of PCF, several articles on compensation were consulted to learn what methods have succeeded and failed with other compensation projects. Nyhus (2003a) documents several core elements of successful compensation schemes, such as quick and accurate verification of damage, fair payment, a plan for sufficient and sustainable funds, shared project ownership, clear rules, guidelines and measures of success. The PCF was designed with some of these core elements in mind, however, the projects still faces many challenges.

1.5.1 Lion Killings

In the first 27 months of the PCF, 4 lion killings on MGR were confirmed (1 in May, 2003, resulting in a PCF suspension; 1 in March 2004; 2 in June, 2005 – see Photo 1). This was a marked decrease from the 22 lion killings reported during the previous 18 months. However, another KLCP researcher has collected data within zone E which suggests many unreported carnivore killings may take place in that zone.

Zone E is the largest of the 7 zones on MGR yet the human population encompasses only about 9% of the total MGR population. Much of the zone is dense with vegetation, providing more cover for carnivores. Thus, with relatively few humans and more camouflage, avoiding the persecution of humans and, thus, survival, may be easier for carnivores there. Since PCF data shows that attacks on livestock by carnivores and corresponding compensation claims in zone E occur with greater frequency than most other locations on the ranch, there may indeed be more carnivores in zone E than other parts of MGR. However, densely vegetated areas unoccupied by humans may also work against carnivores; retaliatory and/or traditional killings of carnivores might take place in such areas with little risk of the killer(s) being caught, making participation in such activities more attractive. If data from zone E is accurate, it may be impossible to determine the success of the PCF in that zone without knowing actual numbers of carnivores killed on MGR by humans while the project is going.

Photo 1: **Two young male lions kill by *Morans* on Mbirikani Group Ranch in June, 2005. (Photo credit: Amy Howard)**

1.5.2 Predator Compensation Fund Budget

In the first 24 months, the PCF paid out a total of $68,000 in compensation (presentation by T. Hill, September 26, 2006, The Wildlife Society 2006 Annual Meeting). However, due to a project suspension resulting from a lion kill by MGR residents, no payouts were made during the 6 months between July and December, 2003. Thus, in approximately 18 months, amount paid out in compensation consumed approximately 5/6 of the initial 3-year PCF budget (presentation by T. Hill, April 6, 2005, PCF meeting with MGR community in Mbrikani town). A second suspension began just after the start of year 3 (April, 2005) as a result of proposed reductions in compensation prices.

Though only 5 incidences of false claims were identified in the second year of the PCF, the possibility remains that others have made it through the system without PCF administrator's knowledge. With only 1 permanent VO performing verifications throughout the duration of this study (Seamus Maclennan acted only as a temporary VO between April, 2004, and April, 2005),

and little supervision or methods to check the validity of issued credit notes, the permanent VO seemed to have the power to decide who would and would not receive compensation. Had a claimant disagreed with the VO's verification ruling, PCF administrators had the option of reviewing the case, but in such a situation, it would have been the claimant's word against the VO's word.

Another form of cheating may have taken place through non-group ranch member claims. Compensation claims for livestock owned by non-group ranch members, who either live on the ranch without membership or graze their livestock on the ranch, may have been paid out by the PCF, since the MGR member list is rarely consulted to check for claimant membership. Non-group ranch members may have also used group ranch members to make compensation claims on their behalf, effectively cheating the system and further burdening the PCF budget.

Additionally, the PCF budget may not have been robust enough to address the severe overpopulation of livestock on MGR. The African Wildlife Foundation estimates the carrying capacity of MGR for livestock to be 2 head of livestock per resident, which is ~75% less than the average livestock numbers present on the ranch over the past several years. The number of livestock on MGR is also estimated to be at least twice the number of wild herbivores found in the area, making the chances of conflict with carnivores high (presentation by P. Ntiati of African Wildlife Foundation, April 7, 2005). In drought conditions, which were present on MGR in the first 24 months of the PCF, the overabundance of livestock may have exacerbated drought effects by out-competing the wild herbivores for grazing. It is conceivable that during drought conditions, wild herbivores likely migrate to areas with better grazing, leaving some carnivores with little option than to turn to livestock as prey.

Though requests were made of PCF administrators for access to original PCF budget information, the information has not been made available. Without such information, it is

difficult to say whether the budget failed to plan for a realistic number of livestock killings during the first 24 months, if the appropriate measures to prevent false claims or cheating were not in place or if such measures were simply ineffective.

1.5.3 Predator Compensation Fund Agreement

The PCF has also been faced with the challenge of yearly PCF agreement and compensation price negotiations with the MGR committee. The group ranch committee consists of a chairman, a vice chairman, a secretary and a treasurer, as well as 16 other male members of MGR. The committee is elected by the MGR members every 3 years and represents the members in all matters related to group ranch management. In late 2004, financial issues led PCF administrators to approach the MGR committee about reducing compensation prices in the 2005 agreement. The administrators explained that without these reductions, the PCF would run out of money and the project would be forced to end in mid-2005 unless and/or until more money could be secured.

During the first 3 months of 2005, additional meetings were held with the committee, though they refused to agree to a reduction in prices. The MGR committee, in fact, indicated that anything other than an increase in prices was unacceptable. Thus, the ODWPT was forced to suspend the PCF in early April, 2005 (2nd PCF suspension). It was not until late May, 2005, over 6 months after the initial negotiations began, that the committee agreed to bypass the proposed price reductions by adding an additional 5% to compensation payouts from group ranch funds. So, compensation prices remained the same, but the proportion of PCF and MGR contributions changed from 75/25 to 70/30, respectively.

Though this particular agreement negotiation was settled, MGR residents have threatened to continue to kill carnivores unless compensation payment prices are raised. Thus, the community's desire for higher compensation prices, and the ODWPT's unwillingness and/or

inability to increase them, could ultimately thwart PCF efforts. If future PCF efforts are unable to appease the MGR community, human-caused carnivore deaths on MGR will move the remaining local carnivore populations, particularly lion, that much closer to extinction.

Chapter 2: Literature Review

2.1 Community-Based Conservation

Pastoralists, livestock and wildlife have coexisted in Africa for the past 2,000 years (McCabe *et al*, 1992). Prior to the colonization of many parts of Africa, this coexistence was relatively peaceful, and the use of wildlife by local peoples was largely sustainable (Nsanjara, 1993; Murphree, 2000). Nsanjara (1993) describes a pre-colonial, traditional Africa where local people practiced "conservation" in a way that today's conservationists consider innovative and successful; only certain classes of people were allowed by the chief to hunt certain species of animals (now known as *controlled harvesting*), while other animals were considered sacred and could not be killed under normal circumstances. The killing of still other animals was considered taboo. The chief assigned scouts to verify that his rules were being followed and to deal with violators, and the benefits of the wildlife were shared in the form of meat and traditional healer services by all. Those who abused the chief's laws had very few friends.

The influx of European colonizers into Africa brought forth unsustainable hunting practices; the guns and rifles they brought were much more effective in making hunting an everyday event than the weapons used by tribal people and led to severe declines of many mammalian species (Nsanjara, 1993). Realizing that something needed to be done before all hunted species were eradicated, colonizers, eventually, implemented the "fences and fines" method of conservation, a method designed and implemented in and for Europe and North America (Songorwa, 1999; Nsanjara, 1993), which forcibly removed tribal people from their lands and systematically alienated them from newly established national parks and reserves. This

conservation strategy, also known as *protectionism* or *fortress conservation*, ignored the needs of the local people (Hackel, 1999), since the exclusion of local peoples from protected areas made their use of plants and wildlife and, thus, to an extent, the role of wildlife in the traditional cultures, illegal (Nsanjara, 1993).

The colonial conservation approach lead, not only, to the failure in conservation, but also to a drastic change in the way local people viewed wildlife. Once viewed as irreplaceable assets which were highly guarded, local communities began to view wildlife as worthless. Locals also began to believe the only ones who benefited from wildlife were the state, wildlife departments, tourists and poachers. They began to despise the wildlife departments, and the relationships between the two quickly fell apart (Nsanjara, 1993).

In 1980, the World Conservation Union (IUCN) released The World Conservation Strategy, which forcefully argued that successful environmental conservation is contingent upon the active involvement and participation of local communities in environmental conservation (McCabe *et al*, 1992). The result of this document was a new conservation paradigm now known as Community-Based Conservation (CBC). The main objective of CBC is to alter the relationship between people and the environment through participatory, bottom-up methods, so as to create conditions whereby a maximum number of community members receive benefits and revenue from sustainable management and/or utilization of wildlife (Western, 1994; Songorwa, 1999). For CBC to work, it must demonstrate that wildlife conservation is a better option for land use than for cattle and/or agriculture (Nsanjara, 1993) otherwise, local people will likely look for more profitable economic alternatives.

CBC, is now used globally in conjunction with the protectionism method, as more and more conservationists see that the solution to conservation in the third world countries lies with the local people themselves, particularly in areas outside of national parks and reserves

(Murphree, 2000; Strander, 1993). At the core of CBC is the rejection of the notion that rural Africans should be viewed as degraders of the environment (Hulme and Murphree, 1999), and recognizing the necessity of treating rural Africans as stakeholders who have rights and responsibilities to the land and the animals is crucial to the success of CBC efforts. Thus, CBC makes an effort to put "indigenous technical knowledge" (ITK) of rural Africans to use, acknowledging that they have a sophisticated understanding of the environmental processes that go on around them (Hulme and Murphree, 1999; Murphree, 2000; Ntiamoa-Baidu *et al*, 2000). The use of ITK is the first attempt to revisit the conservation methods of pre-colonial wildlife management (Nsanjara, 1993).

The use of CBC is neither uniform nor universal, yet it represents a hope of changing the way conservation has been practiced in developing countries and rural areas for far too long. CBC is seen by the international community as an obvious advance over past conservation practices that tended to ignore the needs of local people and their opinions (Murphree, 2000; Hackel, 1999), as it is designed to simultaneously empower local people and conserves wildlife (Barrett and Arcese, 1995). CBC has also been projected to be the most efficient and practical way to conserve thus far in the modern, developing world (Mehta *et al*, 1998),

Murphree (2000) refers to CBC as "conservation *with* the people" (based on his four-fold categorization of stages in African conservation, CBC being part of the third stage). Until stage four, "conservation *by* the people", can be reached, the stage where the locus of initiative and decision-making is shifted from the state to relatively autonomous localized jurisdictions while the state takes the role of facilitation through provision of coordination, infrastructure and arbitration, CBC seems to be the best option for conservation today. Moreover, it is agreed that unless we combine conservation and sustainable development and allow local communities into endeavors to conserve wildlife, conservation efforts are doomed to fail (Nsanjara, 1993).

I see potential in Murphree's "conservation *by* the people" model, yet at the same time, I feel that it is currently unrealistic for most developing countries in Africa. My experiences in southern and eastern Africa over the past 5 years with poor, rural people is that most do not have the education necessary to make Murphree's model a reality. Many of these people, if not most, still lack sufficient basic needs (food, water, health care, shelter and clothing). Thus, many developing countries in Africa continue to rely on the international community to implement their conservation efforts. If, or until, the time comes for "conservation *by* the people", conservation programs must make every effort to involve local communities from inception in planning to decision-making (Jackson *et al*, 2001)**.** To do anything less would be to disrespect the intimate and longstanding ties indigenous people have to the land and wildlife that surround them. The rapidly expanding literature on the role of local communities in conservation and environmental management demonstrates that community involvement is essential if effective measures, policies and strategies are to be created for the resolution of human-wildlife conflicts (Jackson *et al*, 2001).

The use of CBC management strategies is becoming popular in Kenya because of its role in helping to restore and maintain mutual relationships between governments, non-government organizations and local communities (Ogutu, 2002). It is a good start in the direction of integrating local people into the management of natural resources, but, it is just a start. For CBC programs to be truly successful, dissemination of benefits, monetary or otherwise, must be consistent and equitable throughout target communities. Currently, rural communities do not see the link between themselves, tourism and CBC programs because they do not have access to money generated by tourism (Kirby, 2003). KWS Director John Waithaka has indicated that less than 1% of revenue collected from national parks and reserves trickles down to local communities (Kwayera, 2006). Kiss (2003) suggests biodiversity loss is almost always driven by

economic forces and will only be stopped when protecting biodiversity is a viable economic alternative to destroying it, from the landholders' and resource users' perspective. Thus, communities will not stop converting land for agriculture or performing retaliatory killings of predators until benefits reach them directly.

2.2 Human-Carnivore Conflict

Wildlife is declining on a global scale. In Kenya alone, wildlife populations have been declining for the past 25 years (Campbell *et al*, 2003). Still, East Africa continues to be unrivaled in its concentration and diversity of large mammalian species (Mizutani *et al*, 1999). Yet it seems to be this abundance and variety of animals, as well as the huge increase in the human population, that causes increased potential for human-wildlife conflict (Mizutani *et al*, 1999). The large predators, lions, hyenas, cheetahs, leopards and wild dogs (*Lycaon pictus*) are especially vulnerable since they prey on livestock (Frank, 2003; Ogada *et al*, 2003; Roach, 2003; Swara, 2003; Treves and Karanth, 2003; Patterson *et al*, 2004).

Laurence Frank, director of Laikipia Predator Project and a carnivore expert and researcher, says that 20 years ago the lion populations seemed to be in good shape, somewhere in the range of 200,000 (New Scientist, 2003). Now the best estimate of the worldwide lion population is no more than 25,000-30,000 (personal communication, L. Frank, October, 2006) and most of those animals are in protected areas such as national parks and reserves (Swara, 2003). Cheetahs once ranged over most of Africa and central and western Asia. Today, fewer than 15,000 remain (New Scientist, 2003), and about 20% of the survivors live on commercial livestock and game farmland in north-central Namibia (MacDonald and Sillero-Zubiri, 2002; Schumann, 2004). Since large predators have slow reproductive rates, small litters and relatively delayed sexual maturity, their productivity is often far less than is necessary to offset unnatural mortality rates (Clark *et al*, 1996). Both the African lion and the cheetah are currently listed as

vulnerable in the IUCN Red List of Threatened Species (2004). No one knows how many hyenas exist today, but they too are being shot and poisoned into extinction (Swara, 2003).

Woodroffe and Ginsberg (1998) suggest drastic declines in populations of carnivores are almost entirely caused by deliberate or accidental human activity (i.e. shootings, poisonings, accidental snaring and road accidents), affecting both nominally protected populations and those outside protected areas (Ogada *et al*, 2003). Woodroffe, a wild dog researcher from the University of California, Davis, adds that people cause 74% of predator deaths in protected areas. Thus, national parks and reserves are not enough to ensure that predators will survive into the near future (New Scientist, 2003).

Large predators are small in numbers, yet have sizable home ranges and require large prey populations; therefore only vast, relatively intact ecosystems can support the remaining populations of the top-level carnivores (Schaller, 1992; Gittleman, 1993). Within their ecosystem, they regulate or limit the numbers herbivores, their natural prey, thereby changing or maintaining the structure and function of entire ecosystems (Schaller, 1972), which makes them essential to the health of ecosystems and of vital concern to conservation efforts.

In Kenya, approximately 50 national parks and reserves exist for the purposes of wildlife use, and these cover about 8% of the land (Mwangi, 1995; Nyeki, 1993). However, a significant portion of them provide little, if any, protection, from humans, and all are affected to varying degrees by human activities (personal communication, L. Frank, October, 2006). Moreover, 80% of wildlife is found outside of protected areas (by Mwangi, 1995), which are becoming increasingly hostile to large predators because populations of both humans and their livestock are growing at an unprecedented rates (New Scientist, 2003). In many places, livestock outnumber the predators' natural prey (Mishra, 1997), effectively increasing the risk of human–predator conflict. Such conflict develops from the opposing interests between human development and

wildlife conservation (Kimega, 2003). All too often, carnivores' protein-rich diets and need for resources, some of which are scarce, draw them into recurrent and ongoing competition with humans who have somewhat similar needs either for themselves or their livestock (Treves and Karanth, 2003; Campbell *et al*, 2003).

Conflict with humans in the form of livestock depredation, and the inevitable retaliation, is emerging as one of the single most important threats facing predators in East Africa today (Rainy and Worden, 2003). Laurence Frank (New Scientist, 2003) suggests the real cost of having a predator on your land comes down to what they actually kill. However, Fourli (1999) adds that the true numbers of livestock lost to predators may not be as important as how the livestock owners perceive the severity of damage; actual damage is often lower than the perceived damage, yet it is the perceived damage that influences public opinion most. More often than not, the solution to conflict with predators comes in the form of the retributive killing via guns, spears or poison.

2.3 Compensation for Wildlife Damage

In much of semi-arid Africa where tribal people are traditional pastoralists who raise livestock, the only convincing argument for allowing predators to live is if local people can earn money from the predators; predators must have a positive financial value for people to tolerate them or to induce people to make efforts to better protect their livestock (New Scientist, 2003). Local peoples' willingness to co-exist with predators hinges on reducing depredation to an acceptable level while also improving incomes to help offset unavoidable losses of livestock to predators (Jackson *et al*, 2001).

A chronic issue for local people that seems to influence attitudes towards wildlife conservation and management is the lack of compensation for wildlife damage to their crops and livestock (Campbell *et al*, 2003). Though some studies showed that livestock losses to predators

are negligible relative to total livestock holdings (New Scientist, 2003; Butler, 2000; Rudnai, 1979; Kruuk, 2002), and losses to natural mortality or disease are often more extensive than of that to predators (Mizutani *et al*, 1999), losses from depredation are still significant and costly, particularly at the household level (Oli, 1994; Butler, 2000; Bulte and Rondeau, 2005; Dawson, 2005). One cow in a hundred would be one too many if it happened to be your cow, and the loss of livestock can have severe emotional, political and financial costs (MacDonald and Sillero-Zubiri, 2002).

One way to potentially minimize or eliminate retributive killing of predators is through the implementation of compensation schemes. In their most common form, compensation schemes reimburse and/or reduce the financial loss of people who have experienced damage to crops or property, including livestock, or physical damage or death of a family member caused by wildlife (Nyhus *et al*, 2003b). Compensation projects generally target a single species or small groups of species, such as predators, and reimburse people for the damage caused by that species or group of species. Reimbursements can range anywhere from above market value to just a fraction of the value of the loss (Nyhus *et al*, 2003b), and payments can be made as cash or in the form of crop or livestock replacement.

Some of the major benefits attributed to compensation schemes are the ability to increase tolerance (Olsen, 1991) and promote more positive attitudes towards wildlife and conservation efforts in communities that live closest to vulnerable and/or dangerous animals. Also, when carried out effectively, compensation efforts can raise awareness about community concerns and shift economic responsibility to the participating community and contributing donors (Nyhus *et al*, 2003b). By spreading the economic burden and moderating the financial risk to people who co-exist with wildlife, conservationists hope to reduce the negative consequences of human-wildlife conflict (Nyhus *et al*, 2003b). Particularly in rural areas of poverty-stricken countries,

compensation can be relatively cheap and is readily acceptable to local communities who can be directly involved in the management of compensation funds (Rondeau and Bulte, 2004).

Few payment-based conservation alternatives, such as insurance, may be feasible in developing countries, giving compensation projects even more merit. Ray (1998) states that "the institutional context makes it highly unlikely that peasants in developing countries" could afford to purchase insurance against wildlife damage. Moreover, setting up an insurance network is difficult because of the high incidence of wildlife damage in many areas, and because certain types of wildlife damage may constitute a form of catastrophic risk, affecting a large portion of the local population simultaneously (Rondeau and Bulte, 2004).

The lack of alternatives does not imply that compensation of wildlife damage actually helps organizations achieve their intended objectives (Rondeau and Bulte, 2003). Some literature suggests there are inherent problems with using compensation for conservation. Rondeau and Bulte (2003 and 2004) indicate that despite good intentions, compensation schemes are ineffective and can backfire, achieving the opposite results of those intended; they may induce negative consequences for wildlife, such as extinction, and may also result in a net welfare loss for local people. Additionally, since compensation removes the incentive for defensive action (e.g. fencing and herding/guarding) by the participating community (Dorrance, 1983; Fritts *et al*, 1992; Wagner *et al*, 1997; Fourli, 1999; Yoder, 2000; Rondeau and Bulte, 2004), a reduction in defensive action should be expected (Rondeau and Bulte, 2004).

Compensation *does* provide incentive for ranchers to increase their stocking rate in order to protect against loss caused by predators, which with compensation, they agree not to retaliate against; more livestock implies intensified foraging competition, usually to the detriment of both wild ungulate and predator populations (Prins, 2000; Rondeau and Bulte, 2004). Bulte and Rondeau (2005) discuss this effect specifically with the PCF in mind: in an isolated area such as

MGR, the authors expect an unintended result of the project to be an increase in livestock and competition for grazing, followed by a decrease in herbivores and an increase in predator damage which will ultimately trigger revenge or nuisance control killings. Additionally, Rondeau and Bulte (2004) state that if compensation inflates incomes in a region, there may be an influx of people from other regions, increasing the pressure on remaining habitats and/or mitigating or reversing any potential positive effects that compensation may have.

Compensation schemes can also be problematic because recipient communities may perceive the establishment of a compensation scheme as an acceptance of responsibility for wildlife damage (Wagner *et al*, 1997), as a form of bribery, or as an imposition of western values on developing nations (Ferraro and Kiss, 2002), and thus expectations of payment by the community may exceed what the compensation project is willing or able to provide. In some cases, large amounts of fraudulent claims have lead to the demise of poorly funded compensation schemes (WWF, 2000). A recent effort by the Kenyan government to compensate for elephant damage was found to fuel false claims and led to a flood of claims that could not be substantiated. Ultimately, the project resulted in an acceleration of forest destruction as people cleared land to plant crops that were purposely left unattended in order to file for compensation (WWF, 2005).

Furthermore, compensation does not address the root cause of the conflict, and agencies carrying out a compensation scheme can become trapped in a payment system for an indefinite period of time in order to maintain the link between the investment and the conservation objectives (Wagner *et al*, 1997; Ferraro and Kiss, 2002; Karanth and Madhusudan, 2002).

Additional criticism of compensation schemes includes corruption, cheating, ineffective bureaucracies and moral hazard[3].

Many opponents of compensation suggest that paying individuals or communities for conservation performance (i.e. Performance Payments) may be a simpler and more effective approach and should be considered before implementing a compensation scheme (Ferraro, 2000; Rondeau and Bulte, 2004). Performance Payments (PP) pay residents living in a pre-set boundary for the presence of species targeted for conservation; thus, residents are rewarded for their conservation performance. The PP approach has been most frequently used for habitat protection, however it may be amenable to wildlife conservation in situations where wildlife populations can be monitored (Nyhus *et al*, 2003b). For example, a community living next to a national park might receive X amount of money for evidence of each live individual of a specific species that uses the community's land; evidence is based on monitoring efforts which might include sightings, spoor counts and photo-trapping, among other things.

Payment levels (individual, household, community) and payment schedules (monthly, bi-annually, annually) for a PP scheme can be adjusted to suit a project's and/or a participating community's needs. However, a potential difficulty with PP is that it may be more expensive to use than compensation; for PP to be effective at increasing tolerance, payments would likely need to be high enough to cover any potential loss incurred by the target species (personal communication, D. Rondeau, September, 2006).

In the carnivore context, the PP approach provides incentives for conservation that compensation can not. It does not decrease an owner's incentive for defensive action. Instead, the community would have an incentive to adopt whatever mechanisms (including doing

[3] The risk that a party to transaction has not entered into the contract in good faith, has provided misleading information about its assets, liabilities or credit capacity or has an incentive to take unusual risks in a desperate attempt to earn a profit before the contract settles (Answers.com, July 18, 2006).

nothing) are most cost-effective to reduce the amount of damage carnivores do to their livestock. Additionally, PP does not increase the profitability of owning livestock, so, unlike compensation, does not increase the incentives to expand livestock herds; it, in fact, may provide disincentives (Nyhus *et al*, 2003b). Because PP is not linked to wildlife damage, everyone in the participating community may benefit from PP, unlike with compensation where only those experiencing loss receive financial gain.

Regardless of what the literature says about compensation, compensation schemes have been implemented all over the world, from Nepal, Israel, Norway, Spain, Turkmenistan, Namibia, India, the United States, South Africa and Sweden to Mongolia. These efforts have had mixed success; some have been short-lived, while others are ongoing and successful. Yet, Nyhus *et al* (2003b and 2003a) state that although compensation programs are conceptually appealing and gaining in popularity worldwide, relatively few analyses exist for compensation projects run in remote areas such as Africa, Asia and Latin America, and their effectiveness in reducing local efforts to eradicate nuisance wildlife is largely unknown.

Chapter 3: Research Design and Methodology

3.1 Data Collections

Both the topic of this research and the nature of the research questions required data collections to be conducted in the field. My intention for this research was to draw from the case study tradition in order to explore the "bound system" which constitutes the PCF. Thus, an "in-depth data collection involving multiple sources of information" (Creswell, 1998) was conducted.

The interpretivism paradigm was applied for this study. Though I did my best to remain objective and keep my own biases out of the interviews, it was necessary to take into consideration the individual subjects and their motivations, intentions and values, and thus

incorporate some subjectivity into the research. Corbetta (2003) states that the interpretivism aim is to understand the meanings subjects attribute to their own actions and so research methods must be qualitative and subjective, and will vary to some degree from case to case depending on the interactions between the researcher and the subject. This method allows not only a collective conclusion of the research but also allows subjects' answers to be looked at on an individual basis.

Individual, semi-structured and open-ended question interviews were conducted with subjects over a 4 month period between April and July, 2005. Stratified random selection from a list of all MGR permanent bomas (compiled by R. Groom, PhD candidate, University of Bristol) was used to select the subject bomas. The household, or *olmarei*, was used as the sampling unit, since bomas often consist of more than one household. Stratified random selection was also used to select the household within multi-household bomas. Within one household, interviews were ideally performed with 3 subject types: the male-head of household (*Mzee* or elder), his adult wife and an adult *Moran* (warrior) child. It was expected that in many households, all 3 subject types might not exist or be available, thus interviews with one or two of the subject types per household was acceptable.

I approached subjects in person and with my translator, Antony Kasanga, a local Maasai man employed by KLCP and fluent in Maa (the language of the Maasai), Swahili and English. Subjects were read a letter which explained the purpose of the study and what would be asked of them as study subjects, and introduced me as the researcher. Subjects were then asked if they wished to participate in the study. If they chose not to participate, another boma/household was selected from the permanent boma list.

The main interview questions were pre-translated and back-translated prior to the start of the research to check for translation accuracy, though due to semi-structured methods, not all

questions could be anticipated and pre-translated. Additionally, some questions evolved from their original form in order to more effectively draw out a subject's response on a topic. For example, an original question of 'How do you feel about (topic)?" might have received a 'I feel nothing' response; thus, a question might have evolved to something more specific such as 'Is it fair that (topic)? Such changes generally improved data collections without compromising the objectivity of questions.

Interview answers were recorded on pre-formatted answer sheets in a qualitative format; however, it quickly became apparent that recording the subjects' translated answers by hand would not be sufficient to capture the scope of qualitative information desired. A digital recorder (Sony cassette-corder, model # TCM200DV) was used, thereafter, to record interviews. Permission to record the interview was sought from each subject prior to the start of the interview. If the subject chose not to have his/her interview recorded, the original procedure of hand recording answers was the sole method used to record answers; all other interviews were recorded on both on tape and by hand. Interviews recorded on audiotape were later translated and transcribed onto paper by a small team of local translators (each held a secondary-level education and was able to understand verbal and written English, Swahili and Maa). A condition of their employment was that each agreed not to divulge or discuss any information about subjects or interviews.

I personally administered all interviews, though since most subjects spoke only Maa, translation was usually necessary. All but 5 interviews were conducted in English-Maa. One interview was conducted in English-Swahili, and 4 more were conducted in English using the translator for assistance as needed.

Photo 2: Interview with study subject (photo credit: Amy Howard)

Interview duration was, on average, one hour. When possible, interviews were held privately with the subject in order to minimize influence and biases from onlookers. Questions focused on several topics including: 1) knowledge of, experience with and opinions of the PCF; 2) attitudes and behaviors towards predators; 3) past and present herding practices; and 4) alternatives to compensation for carnivore conservation and human-wildlife conflict mitigation. Socio-economic information was also collected to gain a better understanding of the participating PCF community and to aid in analysis. Appendix II shows the interview questions used in this study.

PCF administrators and employees were also interviewed to gain insight on administration viewpoints and project procedures. Additionally, informal discussions were held with community members not selected as subjects but still interested in expressing their opinions or asking questions about the PCF.

3.2 Data Analysis

Statistical analyses were done using the Statistical Package for Social Sciences (SPSS) Windows version 14.0 (SPSS Inc., Chicago, IL, USA). Cross-tabulated data was checked for significance using Pearson Chi-Square at the $P < 0.05$ level.

3.3 Limitations of Research

Language was one of several limitations I encountered during the course of this study. Though I learned some Swahili and Maa during my stay in Kenya, my skills in both remained rudimentary. I was, thus, limited to and entirely reliant on working with an interpreter, even for most casual exchanges. Working through a translator is time-consuming and risky; information can be translated inaccurately in both directions so that the meaning of information can be altered or misunderstood. Though I took precautions to avoid this issue, some (translated) interview responses were confusing and difficult to work with. Rather than compromise the study, I chose not to include questionable data in the analysis.

I also had to consider the risk of moral hazard in this study as a potential limitation; subjects might intentionally provide misleading or fabricated information. It was difficult, particularly with data on livestock holdings, unverified loss, claims made and payouts collected, to determine the validity and/or accuracy of some subjects' responses. For the most part, I had to rely on what the subjects told me and/or my assistant's familiarity with subjects, though there were a few circumstances were I was able to check the validity of responses; one subject in particular told me he was on the group ranch committee, but when I checked the list of names and asked known members of the committee about current membership, I learned that he had, indeed, given me false information.

Another limitation of this study is that statistics on claims assumes that all conflict and livestock loss on MGR has, at least, been reported to the PCF (with the exception of the periods

when the PCF has been suspended). Without accurate reporting data, however, it is impossible to know the accuracy of this assumption or the impact on the statistics if all conflict was not reported. Additionally, the lack of baseline data and pre-PCF statistics on livestock, herders, carnivores and depredation makes it difficult to determine what changes have taken place on MGR over time.

Constraints on this study, largely due to limited time, meant that the sample size was small in comparison to the size of the community. Additionally, the nomadic ways of the Maasai made locating subjects time-consuming and difficult. Time constraints also made it impossible to examine the MGR economics (incomes, livestock prices, etc.). Being able to conduct any future studies over a longer time period would help alleviate these difficulties

Lastly, as an outsider to the Maasai culture and the MGR community, I had to acknowledge my American biases and be mindful to limit their influence on my interactions with subjects and the community. The time I spent on MGR before beginning my study allowed me to build a mutually trusting and respectful relationship with the community. It was this bond that allowed information to be exchanged between the subjects and I, yet, some sensitive topics were difficult to address even with the established trust. It is my hope to maintain this mutual trust and respect by presenting my findings to the MGR community and further exploring the issues highlighted in this study.

I originally thought that being a woman would also make interacting with the MGR community and, thus, conducting this study, difficult since the Maasai culture is patriarchal. To my surprise, I found the opposite to be true; I received respect similar to what a white man would regarding group ranch issues, and was able to attend traditional ceremonies and celebrations that a white man might not be allowed to attend.

Chapter 4: Results

4.1 Socio-Economic Characteristics

A total of 101 subjects were interviewed from 60 households/bomas from the 7 zones on MGR. All subjects were Maasai. This sample population represented ~1% of the total human population living on MGR and follows the percentage of the human population in each zone of MGR, using a target of 60 household/bomas to determine the total sample size (Table 2). The average number of households per boma was 3.63.

Zone	% of Subject Populaton	Number of Subjects in Study	Number of Households/ Bomas in Study
Zone A	15.8	16	9
Zone B	7.9	8	5
Zone C	14.9	15	8
Zone D	5.9	6	3
Zone E	5.9	6	5
Zone F	20.8	21	13
Zone G	28.7	29	17
Totals	100	101	60

Table 2: Zone breakdown of subject population and subjects/households used in this study

Only 5 households produced all 3 desired subject types, while 31 households produced 2 subject types, with all but 1 pair being of the husband/wife relationship. An additional 24 household produced single subjects. The single subject type included widowed, elderly women, men or women whose spouses were unavailable and unmarried *Morans* living alone.

The subject ratio of men to women was almost even with 50 females and 51 males (Table 3). Ages ranged from 18 to 88 years old, though since Maasai often do not to keep accurate record of age, several age responses, particularly those from the upper limit, are suspected to be erroneous. The average age of subjects was 36 years old.

Subjects fell into 1 of 6 age sets[4], though the current *Moran* age set, *Ilkiponi*, was the most common (Table 3). Traditionally married women take the age set of her husband, however for the purposes of this study women have been assigned to their age-corresponding age set.

Age Set		Males	Females	%
Moran	*Ilkiponi* (18-29 yrs old)	21	16	36.6
Mzee	*Ilkedotu* (28-42 yrs old)	13	17	29.7
	Ilkeshimu (40-54 yrs old)	13	13	25.7
	Iseuri (55-65 yrs old)	2	4	5.9
	Ilnyanusi (66-79 yrs old)	1	0	1.0
	Ilterito (80-93 yrs old)	1	0	1.0
Total Subjects		51	50	99.9

Table 3: Age sets and sex of subjects

Three clans[5], or ancestral divisions, are represented on MGR (Table 4). Fifteen of the 20 sub-clans that exist among the 3 clans on MGR were represented in this study.

Clan	Frequency	%
Laiser	50	49.5
Ilmolelia	39	38.6
Ilaitayiok	9	8.9
From Tanzania	2	2.0
Clan unknown	1	1.0
Totals	101	100.0

Table 4: Clan divisions of subjects

Pastoralism was found to be the most common occupation (Table 5), though 38 subjects claimed more than one occupation.

[4] An age sets is established when a group of young males is initiated into adulthood together through circumcision. Once circumcised, these males are known as *Morans* for the next 10 to 15 years, until the next group is initiated into adulthood and the old *Moran* group becomes Elders. The age set is thus a permanent grouping and lasts throughout the lifetime of its members.

[5] Clans, and sub-clan memberships are inherited paternally and do not change throughout one's lifetime.

Occupation	Frequency	%
Pastoralist	82	56.2
Farmer/Cultivator	44	30.1
Student	4	2.7
Business-person	4	2.7
Politician	3	2.1
Teacher	3	2.1
Priest, Pastor	2	1.4
Game Scout	2	1.4
Cook	1	0.7
Driver	1	0.7
Totals	146	100.1

Table 5: Occupations of subjects

Maasai women, according to custom and group ranch law, are not allowed to own land unless it is inherited from a deceased husband, child, siblings, parent(s) or other such relative (Solonka, 2005). Thus, women are not typically considered group ranch members, since only land owners can be group ranch members. Additionally, only group ranch members can be elected to the group ranch committee. Thus, the 12.9% of subjects (n = 13) who indicated that they were serving on the group ranch committee or had served on the committee in the past, were all men.

The education levels of the subjects varied (Table 6), though the large majority claimed to have had no formal education. Of the 13 men who indicated they were serving on the group ranch committee or had served on the committee in the past, only 38.5% of this portion had a primary school level education or higher (P = 0.003).

Education Level	Frequency	%
No Formal Education	75	74.3
Completed Primary School	10	9.9
Some Primary School	5	5.0
Currently in Secondary School	3	3.0
Some Secondary School	3	3.0
Completed Secondary School	2	2.0
Currently in Primary School	1	1.0
Some University	1	1.0
Completed Diploma (AA equivalent)	1	1.0
Total Responses	101	100.2

Table 6: Education levels of subjects

Two religions are present on MGR, the traditional belief system and Christianity. Christians represented 63.3% of the subjects (n = 64), while the remaining 36.6% (n = 37) indicated that they practiced the traditional belief system.

A large portion of subjects (69.3%, n = 70) were born within the boundaries of MGR. Seven percent (n = 7) indicated that they had lived on the ranch between 3 and 8 years, 15.9% (n = 16) between 15 and 20 years, and 8% (n = 8) between 25 and 33 years. The average time subjects lived on MGR was 29.4 years.

Total numbers of livestock owned by individual subjects ranged between 0 and 900, though the average was 85.4. Table 7 shows the breakdown of frequencies of total livestock owned. The average holdings of cattle, shoats and donkey were 35.5, 48.6 and 1.1, respectively. Three subjects responded that they owned no livestock, however 11 sets of married subjects claimed ownership of identical amounts and types of livestock which accounted for 1,208 animals. The total number of livestock, as well as all livestock related statistics, has been corrected for duplicates among the 11 married couples*. Therefore, the total, corrected, number of livestock represented by subjects was 8,603.

Response	Frequency	%
none	14*	13.9
1-10	14	13.9
11-25	25	24.8
26-50	13	12.9
51-75	10	9.9
76-100	2	2.0
101-150	4	4.0
151-250	8	7.9
251-500	7	6.9
501-1000	3	3.0
No Response	1	1.0
Total Responses	101	100.0

Table 7: Total Livestock holdings of subjects

4.2 Herding Practices

A large portion of subjects indicated that children have in the past and continue to do a good deal of the herding duties (Table 8). Many subjects also responded that in the "old days" (i.e. when the subject was a child, thus responses are relative to the age of the subject) they personally had done much of the herding. Given the assumption that in the "old days" subjects were children, the old days/self category would actually increase the frequency of children herders used in the past. Additionally, more subjects claimed to use *Morans* for herding now than in the past. Twenty-one subjects gave multiple responses regarding herders in the "old days", while 45 gave multiple responses to present herders.

Response	Past	%	Present	%
Self	50	39.3	19	11.8
Adults (*Mzees* & women)	10	7.9	19	11.8
Morans (men only)	10	7.9	46	28.6
Teens (pre-*Moran* age boys & girls, ~13-18 years old)	6	4.7	1	0.6
Children (pre-teen boys & girls – age 12 & under)	49	38.6	75	46.6
No Herder	0	0	1	0.6
Unclear Response or Can't Remember	2	1.6	0	0
Total Responses	127	100.0	161	100.0

Table 8: Past and present herders: age and sex

Subjects indicated that most herders, both in the past and present, were relatives who did not get paid for herding duties (Table 9). Since many subjects gave multiple responses to who did the herding, it was necessary to add the "either employed or relative" and "neither employed or relatives" categories.

Response	"Old" days	%	Present	%
Employed	6	5.9	25	24.8
Relative	68	67.3	48	47.5
Either Employed or Relatives	0	0	3	3.0
Neither Employed or Relatives	4	4.0	1	1.0
No Response	1	1.0	1	1.0
Question Not Asked or Unclear Response	22	21.8	23	22.8
Total Response	101	100.0	101	100.1

Table 9: Past and present herders: employed or relatives?

4.3 Carnivores

4.3.1 Carnivores On and Around Mbirikani Group Ranch

Sixty-four subjects (63.4 %) indicated they felt carnivores were not difficult to find on MGR. “Since the first attack, it keeps coming to my boma. I see it often”**.** Only 28 subjects (27.7 %) felt carnivores were difficult to find. “They are hard to find because they go deep in to the bush”. Seven (6.9%) said they did not know if carnivores were difficult to find on MGR.

Most subjects perceived there to be more carnivores now than both before the PCF began and in the “old days” (Table 10). “I think there are more now because they are not killed any longer”. However, one subject indicated there were ‘more hyenas but less lions now”. With regards to the perception of carnivore numbers now versus in the past, subjects were asked to indicate whether the perceived carnivore numbers were good or bad. “More now…it is not good or bad because we are getting sponsors for our children but (carnivores) are also killing our livestock”.

Response		Now vs Past		%	Now vs Pre-PCF	%
More Now	-	4	56	55.5	74	73.3
	good	10				
	bad	38				
	both	4				
Same Amount	good	1	7	6.9	7	6.9
	bad	6				
More Then	-	1	34	33.7	13	12.9
	good	18				
	bad	13				
	both	2				
No Response		4		4.0	6	5.9
I Don’t Remember		0		0	1	1.0
Total Responses		101		100.1	101	100

Table 10: Subject perceptions of carnivore numbers now vs. “Old Days” and before the start of the Predator Compensation Fund

When asked how they would feel if all the carnivores were gone (extinct) from MGR, the majority of subjects (57.4%, $n = 58$) indicated that it would be good and/or they would feel happy. “If all carnivores are gone, it would be good because when a cow gets lost, someone is sure that it won’t be killed”. “It would be good because there would be no need of having

herders". Thirty-one (30.7%) subjects said it would be bad and/or they would feel sad if carnivores were gone. "There could be no project or tourists coming and no carnivores to beautify the nature". "It would be bad because there would be no jobs available". "These animals are beneficial when they eat our livestock, so it is better if they are here". "I would feel bad because they are good for the future". An additional 4 subjects indicated there would be good and bad aspects to the absence of carnivores on MGR. "It would be good because there would be no predators to prey on our livestock, but bad also because there could be no project". Eight subjects (7.9%) declined to answer the question or gave an unclear response.

4.3.2 Killing of Carnivores

The majority of subjects indicated they do not kill carnivores when the PCF is in effect specifically because of the PCF and/or compensation paid out for carnivore damage (Table 11). "The PCF rules stops us from killing because if we kill then there is no compensation". "I was being paid not to kill them". "I won't kill because we are told not to kill by the project and compensation stops us from killing". Nineteen subjects gave multiple responses to this question, thus, 69 (68.3%) subjects account for the 76 responses that indicate a PCF-related reason for not killing carnivores.

A small number of subjects (n = 4, 4.0% of subjects) indicated nothing would stop them from killing a carnivore which had attacked/killed their livestock. "I know there is a law in Kenya against killing carnivores, but if my livestock is killed I will have to kill (predators) even if I go to jail". No significant correlations were found for the 4 subjects who indicated the PCF would not stop them from killing a predator that attacked/killed their livestock. The only socio-economic similarity found among the 4 was that none had a formal education, though because of the small number, this similarity was not found to be statistically significant.

Response	Frequency	%
PCF/compensation	57	47.5
PCF agreement/rules	19	15.8
Fear of arrest	18	15.0
Personal beliefs	6	5.0
Kenyan Law	3	2.5
Not physically able to kill	2	1.7
Not easy to kill	1	0.8
Other	1	0.8
Nothing, will kill if I choose/get the opportunity	4	3.3
Unclear or No Response	9	7.5
Total Responses	120	99.9

Table 11: Influences that keep subjects from killing carnivores when the Predator Compensation Fund is in effect

When faced with a hypothetical question about carnivores attacking/killing their livestock during a PCF suspension (a period when no compensation is paid), most subjects indicated they would kill any carnivore they found present at an attack site (Table 12). “I will kill the carnivore with no compensation but I will not kill with compensation”. Another 2 subjects (1.8%) indicated only the specific animal responsible for an attack would be killed (via tracking, if necessary), while 1 subject indicated that only a hyena would be killed if it attacked their livestock. A total of 51 (46.4%) responses were given indicating the respondent would not, or could not, kill a carnivore if the PCF were suspended. “The committee said we should not kill even if there is no project”. “I won’t kill because I don’t know if the project will be back or not”. Nine subjects more than a single response to this hypothetical question.

Response	Frequency	%
Kill any carnivore present at attack	47	42.7
Kill only hyena	1	0.9
Kill only individual carnivores responsible for attack	2	1.8
Won’t kill	41	37.3
Not physically able to kill	3	2.7
Won’t kill and will report the attack	7	6.4
I Don’t Know	1	0.9
Unclear or No Response	8	7.3
Total Responses	110	100.0

Table 12: Responses to PCF on hold/animals attacked hypothetical situation

Seventy-six subjects (67.9%) indicated that if they wanted to kill a carnivore, they would kill it using a spear, 18 (16.1%) using poison and 2 (1.8%) using a machete. Eleven subjects

(9.8%) said they would not kill a carnivore and one more (0.8%) indicated she was not physically able to kill a carnivore.

The majority of subjects (46.5%, $n = 47$) indicated that they did not know if people on neighboring group ranches kill carnivores. “I have no idea if they kill because I think compensation is everywhere”. Thirty-nine (38.6%) responded they believed neighboring ranches do kill carnivores. “If (carnivores) kill their livestock, they will kill because they are not getting compensation”. Some subjects specifically indicated they thought it was ok that neighboring ranches kill carnivores; “Because they don’t have a compensation project, it is okay if they kill”. “It’s normal. It would also be happening here if there was no compensation”. Others did not like the idea of neighboring ranches killing carnivores. “It’s bad because these carnivores move from MGR to other ranches so (other ranches) may end up killing our carnivores”. “They are reducing the number of carnivores and it means the tourist potential is less”. Another 14 (13.9%) responded that they believed neighboring ranches do not kill carnivores. “I think there is a law over killing animals, so they don’t kill any animals…because they fear to be arrested”. “Nobody nowadays kills the carnivores”.

4.3.3 Benefits of Carnivores

The most frequent response given regarding the perceived benefits of carnivores to MGR was the PCF/compensation, though tourism and school bursaries were also common (Table 13). “I’ve grown to know that the carnivores are potential and for tourism purposes, but if (PCF) was not there I would say (carnivores) are bad because they feed on our animals. But now we are getting returns from the carnivores. They feed on our animals and we also get something”. Many others perceived no benefit to tolerating carnivores on MGR. “There is no benefit of carnivores; it was only a benefit when *Morans* killed them and then became famous”. “They have no

benefits but because they are God's creation, they have the right to survive". Forty subjects gave multiple responses this question.

Response	Frequency	%
PCF/compensation	41	22.8
Tourism	26	14.4
School bursaries	22	12.2
Sponsorships	17	9.4
Employment	10	5.6
Benefits to the ecosystem	8	4.4
ODW Lodge	8	4.4
Development projects	6	3.3
Medical Clinic	5	2.8
Benefits for future generations	3	1.7
Research	3	1.7
Able to see the carnivores	2	1.1
Cultural Benefits	1	0.6
No Benefits	22	12.2
I Don't Know	4	2.2
Unclear or No Response	2	1.1
Total Responses	180	99.9

Table 13: Perceived benefits of carnivores to MGR

Table 14 shows a list of the perceived benefits of carnivores to individuals living on MGR. The most frequent response was that carnivores offer no benefits. "I get no benefit because I have not been compensated". "There is no benefit to me. The only people who are getting the benefit are the group ranch committee. They use money given to the group ranch members for themselves". "I get no benefits, only losses". However, 25 subjects (20.7%) said that the PCF/compensation was a benefit they personally received because of carnivores. "There is the benefit of compensation project unlike before when they kill the livestock and no payment"**.** Eleven subjects felt that the benefits received by the individual and the group ranch were the same, while 20 subjects felt the both the individual and the group ranch received no benefits**.** Fifteen subjects gave multiple responses to this question.

Response	Frequency	%
PCF/compensation	25	20.7
Employment	8	6.6
Bursaries	7	5.8
Sponsorships	5	4.1
Able to see the carnivores	5	4.1
Tourism	3	2.5
Development projects	3	2.5
Medical clinic	3	2.5
Benefits to the ecosystem	1	0.8
None for women, only for men	1	0.8
Benefits for future generations	1	0.8
Research	1	0.8
Other	1	0.8
No Benefits	53	43.8
I Don't Know	1	0.8
No Response	3	2.5
Total Responses	121	99.9

Table 14: Perceived benefits of carnivores to the individual

4.3.4 Research Collars

Of the 87 subjects asked about their familiarity with radio-telemetry collars (seen one first-hand or heard of them), 52 (59.8%) subjects responded that they were familiar with the collars; 69.2% of that portion were men ($P < 0.001$). Subjects who indicated a familiarity with collars were asked about the purpose/meaning of the collar, while those who indicated a lack of familiarity with collars were given a description of the collar and asked the same question. A variety of responses were given (Table 15). Only 23.4% of subjects understood the research collar to be an indication the animal was part of a scientific study. More often, subjects believed the collar was a device that reported when an animal was killed and who killed it. "I heard (the collar) will report you if you kill it".

Response	Frequency	%
Reports the animal's killer	27	35.1
Indicates that animal is part of a scientific study	18	23.4
Indicates that someone owns the animal	10	13.0
Indicates that animal is being protected	5	6.5
Decoration	1	1.3
Protection device	1	1.3
Indicates that if animal kills livestock, compensation will be given	1	1.3
Doesn't mean anything	1	1.3
I Don't Know	11	14.3
No Response	2	2.6
Total Responses	77	100.1

Table 15: Perceived meaning of radio-telemetry collars

Forty-nine subjects (48.5%) indicated they would not kill a lion wearing a radio-collar that attacked/killed their livestock. "I cannot kill a carnivore with a collar because that collar can report me". Thirty-three (32.7%) said they would kill a collared lion. "I will kill it anyway because it is like a robber coming to my boma". Fifteen more (14.9%) said it would depend on whether the PCF were in effect or suspended at the time of the attack. Five subjects indicated they did not know what they would do in this situation.

4.4 Experience with the Predator Compensation Fund

4.4.1 General Awareness and Perceived Impacts

All 101 subjects were aware that the PCF existed on MGR. However, of the 69 subjects asked if they were aware of the current status of the PCF (this question was added after interviews had already begun, so not all subjects were asked this question), only 59.4% (n = 41) were able to give a positive response. Regardless of socioeconomics (i.e. age, zone, etc), 73.5% (n = 34) of the men were aware of the current status of PCF, while only 45.7% (n = 35) of women were aware (P = 0.041).

Almost equal portions of subjects (n = 39, 38.6% and n = 38, 37.6%, respectively) indicated they thought the PCF was going well or that they did not know how the project was going. "I don't know how the project is going because it comes and disappears sometimes".

Another 14.9% (*n* = 15) thought the project was going well but definitely had problems. “The project was average, good and bad, because when a livestock is lost you are paid, but you get penalized also, which is not fair because (the herder) didn’t lose (the livestock) on purpose. It is as well bad because sometimes you are paid 13,000 Ksh whereby you could have sold for 40,000”. Only 3% (*n* = 3) thought the project was going badly. “It is not that good because it doesn’t compensate as required by people”. “I hate the project completely…but I am doing what my leaders are saying so that is why I am accepting the project”**.**

The majority of subjects (85.1%, *n* = 86) believed the PCF stopped people from killing carnivores. Another 2% believed that the PCF sometimes stopped people from killing carnivores but indicated this was dependant on the status of the PCF (in effect or suspended). “The recent killings in Ormosua (2 young male lions killed in June, 2005; see Photo 1) show that the PCF works sometimes but not always; I don’t think the agreement is strong enough”. Nine subjects (8.9%), seven of which were women, said they did not know the effect of the PCF on predator killings.

4.4.2 Compensation Money and Financial Impacts

Despite some opinions about how the PCF was going, 87.1% (*n* = 88) of the subjects indicated the PCF was important to their livelihood, 43.1% (*n* = 38) of which had never filed a claim. “It’s important because sometimes the amount paid is more than selling a cow in the market”. Of the remainder, 5% (*n* = 5) were resolute in their opinion that PCF does not impact their lives financially; only 1 of these had ever filed a claim. “It is only important if it reaches everyone….It is good to other people but not to me because I am not compensated if a carnivore kills a livestock because I am a woman”.

When asked how money received from compensation was used, the most frequent response (71.9%, *n* = 87) was that the money went towards replacing the livestock. Another

15.7% (*n* = 19) indicated compensation money was spent on household needs (food, clothing, etc.). “I will buy food because the amount is not enough to buy another cow”. Another 5.8% (*n* = 7) said the money went toward paying school fees while, 4.1% (*n* = 5) indicated that it depended on what was needed (household needs or school fees) when the money was received. Only 1 response included putting the money into a business. Nineteen subjects gave multiple responses to this question.

A variety of responses were given to the question “Where do you think the money for compensation comes from?” (Table 18), though the majority of subjects indicated that they did not know. After “I don’t know”, the second most frequent answer was that PCF money came from *wazungu* living abroad. It is important to note that only 1 subject’s answer regarding funding included that a portion of compensation came from MGR funds.

Response	Frequency	%
Abroad (“*Wazungu*-land”)	23	22.8
Tourist who visit MGR	21	20.8
PCF	8	7.9
An unknown source outside of PCF	4	4.0
Wazungu on MGR	3	3.0
Government	2	2.0
Kenya Wildlife Service	1	1.0
Abroad, “*Wazungu*-land” and MGR funds	1	1.0
Tom Hill’s (ODWPT Treasurer) personal money	1	1.0
I Don’t Know	36	35.6
No Response	1	1.0
Total Responses	101	100.1

Table 18: Perceptions of where PCF money comes from

Just over half of the subjects (53.5%, *n* = 54) felt the 2 month pay period schedule was fair, though of this portion, men only comprised 37% (*P* < 0.054). Another 44.3% (*n* = 43) felt the pay period was not fair and offered alternatives: 13.9% (*n* = 14) felt the compensation payouts should be made within 1 month, while 24.8% (*n* = 25) felt payouts should be made immediately. Others suggested payments be made after 1 week (1%, *n* = 1), after 2 weeks (1%, *n* = 1) and after 3 days (1%, *n* = 1). “The project is a loss to me because I must wait 2 months to be

paid". "I prefer to be paid no more than one month after so that I can replace my animal quickly"**.**

4.4.3 Claims

Fifty-two subjects (51.5%) indicated they had filed at least one claim (reported and verified) with PCF for livestock attacked and/or killed by a carnivore (Table 16). Though not statistically significant, the data shows 52% of the female subjects and 54% of the male subjects made at least 1 claim ($P = 0.737$). A total of 122 claims were represented by 51.5% of the subjects ($n = 52$), making the average number of claims per subject 0.8 (2.4 claims per subject for the portion who filed claims). Owners with larger herds of livestock (100 or more) were found to be more likely to make a PCF claim than those with smaller herds ($P < 0.001$).

Claims per subject ranged from 1 to 9, though 86.5% of subjects filing claims ($n = 45$) indicated they made between 1 and 3 claims each. It is important to note that 11 out of 36 multiple-subject households yielded at least one pair of subjects whose claim amounts were identical. These claims account for as many as 25 of the total claims represented by subjects. However, it impossible to determine if the identical claims from each household were, indeed, the same or distinct claims, so the corresponding statistics were left unaltered.

Response	Frequency	%
1 claim filed	16	15.8
2 claims filed	17	16.8
3 claims filed	12	11.9
4 claims filed	1	1.0
5 claims filed	3	3.0
6 claims filed	1	1.0
7 claims filed	1	1.0
8 claims filed	0	0
9 claims filed	1	1.0
No Claims filed	47	46.5
Unclear or No Response	2	2.0
Total Responses	76	100.0

Table 16: Number of claims filed per subject

Significant correlations were found between subjects who indicated they had filed claims and the zone ($P = 0.014$) and clan ($P < 0.001$) of the subject. In zone B and E, zones among those with the highest risk of carnivore attacks/kills between August, 2004, and March, 2005, (Maclennan, 2005b), 87.5% ($n = 7$) and 100% ($n = 6$) of subjects, respectively, filed claims with PCF. Zone G, on the other hand, was found to be an area of low risk, both by Maclennan (2005b) as well as in this study; only 31% ($n = 9$) of its subjects indicated they had filed a claim. Over half (55.8%, $n = 29$) of the subjects who made claims were of the *Ilmoleia* clan. Claims made by subjects from the *Laiser* and *Ilaitayiok* clans together comprised only 40.4% ($n = 21$) of indicated claims.

Only 57.7% of those who made claims ($n = 30$) indicated they had ever received payment for claims made, and of that portion, just over half (53.3%, $n = 16$) indicated receipt of payment for every claim made (10 single claims). A correlation was found between subjects who received compensation payment and the zone of the claimant; residents of zones C, E and G indicated they received payment for at least one of their claims, while residents of zone A said they received no payments for any claims made ($P = 0.037$).

Of the subjects who indicated they had both filed a claim and been paid on at least 1 of them, 48.2% ($n = 14$) indicated they had also been penalized on at least 1 claim. Of those who filed a claim(s) and were paid and penalized, 64.3% were penalized on all of their claims (7 with single claims, 2 with two claims each). A correlation was found between claims penalized and the zone of the claimant; residents of zones A and F indicated that 0 of 4 and 1 of 8 claims, respectively, were penalized, whereas subjects from zone E were penalized on 4 of 4 claims ($P = 0.033$).

Of those who had filed claims, whether or not they were paid and/or penalized, 64.8% ($n = 35$) said that they were satisfied with the results. “People were getting very good returns for

their animals and the day of payment you'll realize this because everybody in this town seems very happy". However, of those indicating dissatisfaction with results, 66.7% (n = 10) were not penalized on any claims. A correlation between penalized claims and subject satisfaction should be noted; those who were penalized on as many as 3 claims were 6 times more likely to indicate satisfaction with the outcome of their claims than subjects who filed claims and were paid, but not penalized. Table 17 gives a further breakdown of the claim satisfaction.

Response	Paid	%	Not Paid	%	Paid/ Penalized	%	Paid/Not Penalized	%
Satisfied	21	75.0	2	20.0	12	85.7	8	44.4
Not Satisfied	7	25.0	8	80.0	2	14.3	10	55.6
Total responses	28	100.0	10	100.0	14	100.0	18	100.0

Table 17: Claim satisfaction of subjects

4.4.4 Herding/Boma Penalties

Sixty-two subjects (61.4%) indicated they were not familiar with the penalty for lost livestock (i.e. livestock attacked/killed while lost in the bush), 42 of which (67.7%) were women ($P < 0.001$). Thirty-four subjects (33.7%) indicated they were familiar with the lost penalty. Eight subjects gave an unclear response or declined to answer the question.

Forty-nine subjects (48.5%) felt the lost livestock penalty was unfair. "Herders do not deliberately lose cattle". "The amount paid (after a lost animal penalty) is very little compared to what it would have sold for in the market". "It is not fair to get penalized because carnivores have no herder. So it means that I am the one who suffers the loss because carnivores don't have herders". "Comparing the amount paid for a lost livestock, it is little and that is why I prefer no project at all and to go back to the former days before the project when lions were killed". Five subjects (5.0%) indicated the penalty was unfair despite feeling the herder and/or owner was to blame for lost livestock. "It is the herder's mistake but if you don't pay full price then the carnivores should be killed". "It is a herder's fault for losing as well as the lion's fault for killing the cow and the trust's fault for not compensating well". Thirty-nine (38.6%) felt the penalty was

reasonable. “It is fair because if a person always gets full price he will be reluctant to take care of his livestock”. **“**It is fair because the livestock owners allow their animals in the bush and bushes are for wild animals”,

With regards to the penalty for livestock attacked while no herder is present (falls into the lost penalty category though the animal may not technically be lost, just unattended), 15 subjects (14.9%) indicated that this situation does not occur (i.e. no one sends their livestock out without a herder or leaves them unattended). “No one will allow their livestock to go without a herder”**.**

Sixty-three subjects (62.4%) indicated they were not familiar with the penalty for a bad boma (i.e. livestock attacked/killed in a boma not meeting PCF standards), 43 of which (68.3%) were women ($P < 0.001$). Thirty-five subjects (34.7%) said they were familiar with the bad boma penalty.

Fifty-six subjects (55.4%) said they felt the bad boma penalty was unfair. “The penalty for a bad boma is not fair because it’s not my fault. I fence but the carnivore still comes in**”. “**It is not fair because in some areas there is no shrub for fencing”. Another 43 subjects (43.0%) felt the penalty was fair. “It is fair…some people are weak, others are lazy and others don’t care (about making a strong boma)”. One subject said the fairness of the penalty depended on the situation; “You may find that the owner is trying to construct a boma at the time of the attack”.

Of the 34 subjects who indicated they were familiar with at least one of the two penalties, 18 (52.9%) indicated they had not made any changes to their herding or boma because of the penalties, whereas 11 (32.4%) indicated they had made improvements to their herding practices (added herders or increased herder pay as an incentive for better herding) and/or their boma (increased boma height and/or thickness) because of the threat of penalty. “I have made only one improvement; I have increased (my herder’s) wages to motivate his work”. “I fence to the required height so it cannot get in to my boma”.

4.4.5 Zone Penalties

Fifty-seven subjects (56.4%) indicated they were not familiar with the zone penalty for false claims, of which 35 (61.4%) were women ($P = 0.001$). Thirty-two subjects (31.7%) said they were familiar with the false claim penalty. Twelve subjects (11.9%) gave an unclear response or declined to answer this question.

Sixty-eight subjects (67.3%) felt it was unfair to penalize a zone if the person who made a false claim refused to pay the fine. “This individual decided to lie by himself, so others should not be made to suffer”. Fourteen (13.9%) said it was fair to penalize the zone in such a situation. “It is fair for the zone to be fined so that they will not allow somebody to lie to the project”. Nine subjects (8.9%) believed that false claims did not occur. “It is not fair because nobody lies about a claim”.

Fifty subjects (49.5%) said they were not familiar with the zone penalty for killing a carnivore, of which 31 were women (62.0%, $P = 0.009$). Thirty-seven subjects (36.6%) indicated they were familiar with the penalty. Fourteen subjects (13.9%) gave an unclear response or declined to answer this question.

Sixty-four subjects (63.4%) felt that it was unfair to penalize a zone if the person(s) who killed a carnivore refused to pay their fine(s). “It is not fair. Everyone should carry his own problem…but he would not refuse to pay, he would pay according to the law”. Seventeen subjects (16.8%) said it was fair to penalize the zone. “If (a predator) is killed, they will be happy because an enemy has been killed so everyone accepts a fine”**.** An additional 4 (4.0%) indicated the fairness of the zone penalty depended on the circumstances surrounding the killing of the predator.

Sixty-eight subjects (67.3%) indicated if they knew someone killed a carnivore they would turn them into the PCF. Twenty-six subjects (25.7%) said they would not turn the person

in. “If they won’t turn themselves in, I also will not”. “I won’t turn them in because I am not paid to do it”. Fifty-six subjects (55.5%) said that if the person who killed the carnivore was a family member, they would turn him/her in, while thirty-six (35.4%) said they would not turn in a family member.

4.4.6 Likes and Dislikes

The most frequent response (68.4%, *n* = 78) given regarding the aspect subjects like most about the PCF was the money received as compensation for livestock killed by carnivores (Table 19). “Rates are fair because we are getting something out of nowhere. That predator would still kill the animal and you’ll not get anything if the PCF was not there”**.** “It is better to have compensation instead of killing carnivores and not getting your livestock back”.

Response	Frequency	%
Compensation (money from compensation)	78	68.4
Associated development projects (i.e. schools, medical clinic, etc)	5	4.4
Employment	5	4.4
Project is well organized	3	2.6
Fairness of project	1	0.9
Preservation of carnivores for future	1	0.9
Timely verification	1	0.9
When PCF is not on hold	1	0.9
PCF stops *Morans* from killing lions and getting hurt/killed	1	0.9
Good relations between ODWPT and community	1	0.9
Nothing specific	4	3.5
I do not like the PCF in general	3	2.6
I Don’t Know	2	1.8
Unclear or No Response	8	7.0
Total Responses	114	100.1

Table 19: Aspects of PCF subjects specifically liked

After “nothing specific” (16.9%, *n* = 22), unfair payment prices was the most frequent response (11.5%, *n* = 15) given for what subjects dislike most about the PCF (Table 20). “The project brings loss to the owner because livestock money might not be enough”. “Compensation is like we are selling our cows to the carnivores. So if we sell these cows so cheaply, it won’t be fair because the livestock is our livelihood”. “I like the reduction of money least because (per Maasai custom) when somebody steals a cow and is caught, he must pay back 2 cows. So when

the lion steals, this is not given but a good amount still should be paid". "We will stop killing (the carnivores) if you give us the prices we want".

Response	Frequency	%
Payment prices (unfair)	15	11.5
Circumstances when no payment is given (PCF suspended, claims invalidated, VO doesn't come)	11	8.5
Herding/boma penalties	10	7.7
PCF suspensions	10	7.7
Pay period	8	6.2
Any proposed reduction in payment prices	7	5.4
Reporting/verification time limit	7	5.4
Hyena rules/payment prices	4	3.1
Zone penalties	4	3.1
No compensation for herbivore damage	2	1.5
No transparency in project	2	1.5
Reporters are corrupt in their work	2	1.5
Not enough reporters	2	1.5
Not allowed to kill carnivores when PCF is suspended	1	0.8
No female voice	1	0.8
ODWPT and PCF organizational hierarchy difficult to understand	1	0.8
Unfair arrests when lions are killed	1	0.8
Clan biased employment choices by ODWPT & PCF	1	0.8
No compensation for people killed by wildlife	1	0.8
Lion researcher acting as verification officer	1	0.8
Nothing specific	22	16.9
I dislike everything about the PCF	2	1.5
I Don't Know	2	1.5
Unclear or No Response	13	10.0
Total Responses	130	100.1

Table 20: Aspects of PCF subjects specifically disliked

4.5 Future Compensation and Alternatives

The majority of subjects (47.2%, $n = 51$) feel there is no other way to conserve carnivores besides compensation. "There is no way apart from what is being done now". One subject suggested that "long-term conservation of carnivores can be done by increasing the amount of money paid because everyone likes compensation".

Eighty-three subjects (82.2%) indicated they would choose having the PCF with 2004-05 prices for the remaining duration of the project versus no project at all. Ten subjects (9.9%) said they would choose no project over the 2004-05 prices. Eight subjects (7.9%) declined to answer this question.

When asked if they would choose a reduction in 2004-05 prices or no project, subjects were divided. Forty-six subjects (45.5%) said they would choose a reduction in prices. “It is very risky but I would take the reduction of prices”. Forty-five subjects (44.6%) said they would prefer no project over a reduction in prices. Ten subjects (9.9%) declined to answer this question.

Forty-six subjects (42.6%) gave a variety of suggestions for alternatives to the PCF (Table 21). One subject indicated his suggestion of putting carnivores in a zoo would be contingent on there not being a compensation project: “If there is compensation, carnivores should be left to go on their own”. Five subjects (4.6%) said they did not know if there were alternatives to compensation. Six subjects (5.5%) gave an unclear response or declined to answer the question.

Response	Frequency	%
Employ guards/herders for carnivores	13	12.0
Fence carnivores in	9	8.3
Educate people on the importance of carnivores	8	7.4
Put carnivores in zoos	3	2.8
Set up sanctuaries for carnivores	3	2.8
Land subdivision	2	1.9
Increase development initiatives	2	1.9
Stop *Morans* from killing carnivores	2	1.9
Expand the PCF	1	0.9
Change herding behaviors and boma designs	1	0.9
Kill herbivores to feed to carnivores so they stop killing livestock	1	0.9
Give carnivores medicine to make them harmless	1	0.9
No other way	51	47.2
I Don’t Know	5	4.6
Unclear or No Response	6	5.5
Total Responses	108	99.9

Table 21: Subject’s suggestions for alternatives to compensation

Subjects were asked about specific alternatives to compensation. Forty–six subjects (45.5%) indicated they would be willing to participate in a livestock insurance scheme (small yearly premium per head of livestock per year with current market value payouts for attacked/killed animals) as an alternative to compensation. Of this portion, 50% were men. Forty-five more (44.6%) said they would refuse to participate in an insurance program. “I am not

willing because it is like I am the one compensating myself". One subject said he might be willing to participate in an insurance scheme, while 9 subjects (8.9%) declined to answer the question.

Sixty-two subjects (61.4%) indicated they would be willing to participate in a performance payment (PP) scheme as an alternative to compensation. Of this portion, 53.2% were men. "I will agree to this if the money comes directly to me but not through the group ranch committee". Twenty-seven subjects (26.7%) said they were not willing to participate in a PP scheme. One subject said he might be willing to participate in a PP scheme, while 11 subjects (10.9%) declined to answer the question.

Chapter 5: Discussion

5.1 *Tolerance Levels*

Data from the PCF suggests lion killings on MGR have decreased since the start of the PCF in 2003. Additional data from Frank *et al* (2006) suggests lion killings on MGR have remained lower than lion killings on at least 2 other neighboring group ranches and comparable to at least one other in the same time period. It is, however, important to note that in an area where the lion population has been severely reduced, as is the case on MGR, it is expected that lion killings will decrease since there are simply fewer animals to persecute (personal communications, L. Frank, September, 2006).

Despite various negative perceptions generated or exacerbated by the PCF and ongoing problems with the project, this data indicates that subjects, indeed, have tolerance for carnivores. However, this tolerance is largely conditional on the PCF being in effect. The percentage of subjects indicating they would kill a carnivore for attacking livestock increased from 4% with the PCF in effect to 45.5% with the PCF suspended. The 4% of subjects who indicated the PCF

would not stop them from killing a carnivore represents about 400 people of varying socio-economic backgrounds, who may pose a serious threat to the remaining carnivore populations.

The 4 lion killings which took place during the first 24 months of the PCF all occurred with the project in effect. However, only 5 days separated the restart of the PCF after a 3 month suspension and the killing of 2 lions in June, 2005. The short period between the restart and the killings may suggest that the *Morans* participating in the killings were not aware that the PCF had restarted. This issues is further discussed in section *5.2.2 Awareness of PCF Status.*

Table 22 shows a breakdown of the tolerance differences in each zone, though it should be noted that these same numbers where not found to be statistically significant on their own because of the relatively small sample size in some of the zones.

Zone	Will Kill with PCF in Effect (%)	Will Kill with PCF Suspended (%)
A	6.3	43.8
B	12.5	62.5
C	0	40.0
D	16.7	66.7
E	0	66.7
F	0	47.6
G	3.6	50.0

Table 22: Tolerance in each zone

Though progress had been made with the PCF toward conserving lions, and the MGR community, overall, was in favor of continuing the PCF, this study shows there were still several barriers preventing a more effective project. By addressing these issues and working with the community to create reasonable and sustainable improvements and/or solutions to problematic aspects of the PCF, the PCF would have fewer complaints, less resistance to its administration and, likely, even fewer lions killed within the MGR boundaries.

5.2 Project Transparency

5.2.1 Predator Compensation Fund Rules and Procedures

The results of this study show that the existence of the PCF is well known on MGR. However, it also shows that the rules and procedures are not well known or understood by many who use or have potential to use the project. “The problem is that most people don’t know how things are being run in the project and don’t know what is going on”. “I don’t like that the whole project is not being transparent, like…who is running the project? Where is the money coming from? Who will I ask questions when my animal is attacked and why are the prices are being reduced? Such things. I don’t know who to direct my questions to”.

There appear to be two reasons for the MGR community’s lack of familiarity and/or understanding of how the PCF operates. First, per Maasai custom, the PCF generally falls into the “men’s business” category, leaving many women relatively ignorant about how the PCF works. Women are usually excluded from PCF meetings and prevented from knowing specifics about the project by the men of the community. “I cannot ask anything about the project because men say that (women) are not to know”. In spite of this generalization, and in spite of the fact that Maasai women typically run the home (cooking, cleaning, childcare, etc), some women also deal with livestock issues such as herding, compensation reporting and payout collections. A PCF administrator indicated that on any given PCF payout day, there are always women present to collect payouts, either for their own livestock loss, or as stand-ins for male relatives. Thus, despite Maasai custom, some women on MGR use the PCF.

In August, 2005, several hundred MGR women gathered to protest Seamus Maclennan’s participation in the PCF as a verification officer, as well as the arrests of several *Morans* in association with the June, 2005, lion killings. The women apparently felt Seamus’ verification decisions were unfair and they refused to tolerate his participation in the PCF any longer. This

march gave a clear indication that some women of MGR not only used the PCF but some also had strong opinions about it. In fact, women's opinions were often times (at least 25% of the time) found differ from the opinions of the men from the same households. Thus, women were included in this study in order to find out what those opinions were and to find out exactly how much they knew and understood about the project.

Though MGR women generally know less about the PCF than men, they are interested and open to learning about it. At the end of each interview, no matter the sex of the subject, an offer to explain aspect of the project the subject was unaware of or understood incompletely was always made. Some of the male subjects declined the offer, however without fail, every female subject was interested in hearing as much as possible about the PCF. Additionally, several women indicated there was no female voice in the PCF and felt this lack of female representation was unfair since women participated in the project.

The lack of familiarity and understanding of PCF rules are likely to be linked to past PCF educational efforts and communication between the community and the project. According to PCF records, there have been 2 educational sessions held for the purposes of educating the MGR men about the PCF rules and procedures. In January, 2004, the first of two education "dialogue" plays was presented to MGR men. Using a role-play format, the dialogue explained the rules and procedures of the PCF. The second dialogue was presented in March, 2005, after changes were made to the 2005-PCF agreement. Both dialogues were performed in each zone, presumably so that community members would not have to travel long distances to attend. In addition to the plays, there were numerous PCF meetings with the MGR men to discuss the agreement, though generally these meetings focused on price negotiations and problems rather than familiarizing members with procedures and rules.

It is not clear why, but it seems even for men, past education efforts were not sufficient; 41% of male subjects were not familiar with the penalties for lost livestock and bad bomas. Not surprisingly, nearly 70% of female subjects were unfamiliar with penalties. Additionally, over half of the subjects did not have first hand experience with making a PCF claim, thus making it clear that most rely on word of mouth or active outreach by the project for PCF information. With respect to the MGR men, it is possible that a portion were not able to attend past educational sessions, sessions were not being given frequently enough or the information given at these sessions was not being retained. Future PCF evaluations could easily shed more light on the reasons for the lack of familiarity and understanding of the PCF rules and procedures. By simply questioning the subject about whether they have previously attended a PCF dialogue/educational session, rate of attendance and effectiveness of such sessions could be determined. Clearly such a question would have been enormously helpful in this study, however, I did not become aware if the issue until after I begun the data analysis.

Though the PCF did not actively discourage women from participating in the project (although as previously discussed, the PCF agreement does state that only group ranch members are eligible for compensation and women are generally not members), it did not support their participation either. It seems a considerable risk to allow approximately half of the MGR population and many PCF users to remain uneducated about the project's rules and procedures. In the future, an effort to educate the MGR women about the project is needed. Educational sessions could be conducted in all the major communities on MGR for women separately from the men. This solution would allow the tradition of all male meetings to continue while also allowing women to learn the same PCF information that is taught to men. It is true some women might still be prevented from attending sessions by their husbands, but there is reason to believe many women would be allowed to attend since, with the exception of women who were widows

or whose husbands lived/worked elsewhere, every female subject that participated in this study was given permission by her husband to do so.

In addition to educating women, holding more frequent educational sessions for both men and women could 1) reach a larger portion of the population and 2) allow for repetitive exposure to the information which, in turn, might aid in information retention. Additionally, open forums could also be held to address issues and questions the community might have between education sessions. Lastly, a simplified version of the PCF agreement, which lists the rules and procedures, could be translated into the 3 languages commonly used on MGR (i.e. Maa, Swahili and English) and distributed to each permanent boma on the ranch. There is a small population of literate adults and a growing number of literate youth on MGR who speak at least one of the three languages, so there are many who could read the rules and procedures to the remainder of the illiterate community. A similar method has been used for the MGR constitution and rules.

5.2.2 Awareness of Predator Compensation Fund Status

Wagner *et al* (1997) indicate that insufficient information about compensation projects can lead to frustration and impatience among the participating community. Indeed, a portion of the subjects expressed difficulty in being able to keep up with changes in the status of the project (suspensions and restarts). “I did not file for compensation because I did not know that the project had restarted”. The fact that only 40% of subjects were aware of the PCF status at the time of their interviews shows the word-of-mouth communication methods used by ODWPT and the PCF were not adequate in this case.

To keep their target community informed about their Russian tiger and leopard compensation project and to help increase the positive attitude and effect of the project, Hotte and Bereznuk (2001) advertise in local newspapers and on announcement boards on public buildings. The PCF would likely benefit from adopting a similar method of communication and

advertisement by outfitting information boards in strategic locations on MGR. The boards would need to be updated regularly or, at minimum, when changes occur in the project. The project status could be communicated in the 3 languages used on the ranch, for the literate population, and in symbols, for the illiterate population. For example, using the same color designations as with stoplights, a red lion symbol might be used to communicate a project suspension, while a green lion symbol might communicate that the project is in effect. The 3 translations of the PCF agreement could also be displayed on announcement boards for the literate community.

5.3 Benefits and Project Equitability

Though some subjects felt there were many benefits to conserving carnivores, many still viewed carnivores as a liability. Several subjects indicated the only benefit from conserving carnivores was compensation, and since many had not made a claim or received payment from a claim, they believed they were receiving no benefits. As such, the benefits from carnivore conservation were not seen as being equitable, and this was a source of negative feelings towards the ODWPT and the PCF. The view that there were no benefits or inequitable benefits from conserving carnivores may be, in part, because many subjects did not have a complete understanding of what the benefits of conserving carnivores were.

In reality, the presence of carnivores benefited the community in many ways, most due to or originating from ODWPT or ODW Safari Lodge. For example, various small-scale community development initiatives such as a medical clinic and new schools have arisen, a portion of revenue from tourism is added to community funds, and ODW Safari Lodge and ODWPT both have created employment opportunities for local people. However, with the community's lack of understanding of the benefits, it is difficult to determine whether the benefits are truly inequitable or if the distribution of benefits is misperceived because it is not understood.

Future education efforts might be more effective if they were to include information about all of the ways the presence of carnivores benefits the MGR community. Subsequent evaluations of the PCF from the community's point of view would give administrators a better understanding of how the benefits are distributed throughout the community and would allow them to make changes to the program to promote more equitable distribution of benefits.

5.4 Perceptions

5.4.1 More Carnivores

The PCF has caused a change in the perception of the MGR community regarding the number of predators found on the ranch before (in the "old days" and immediately prior to the start of the PCF) and after the start of the PCF. Most believe that the PCF caused an increase in the number of carnivores from the old days and just before the PCF started. However, without accurate data on carnivore numbers prior to the start of the PCF, it is impossible to say whether these perceptions are accurate. It is known from on-going lion monitoring by KLCP that the number of lions frequenting MGR at the time of this study was less than the area was capable of sustaining.

5.4.2 Carnivores are More Important than Maasai

In some cases, the PCF seems to have inadvertently prompted the MGR community to believe that *wazungu* value carnivores more than Maasai. "*Wazungu* feel the same about carnivores as Maasai do about livestock". "Why do you like carnivores more than people such that you compensate the carnivores?". "Carnivores kill livestock as well as people. Why haven't we heard of compensation for people when they are killed?". "When the compensation project came, we were very surprised because they made carnivores more important than Maasai and cattle."

A compensation project, in fact, does exist through the Kenyan government, which according to The Wildlife Conservation and Management Act (1985), "exists for the purpose of compensating people injured by wildlife or dependants of those killed by wildlife, as well as for damages to crops or property caused by wildlife". Thus, such persons "may make application to a District Committee…for the award of compensation for such injury or death or damage or loss. Compensation awarded…shall be payable out of moneys provided by Parliament for that purpose". At present, the family of a victim killed by wildlife qualifies to receive 30,000 Ksh (USD $407.77, as of June 15, 2006). However this amount has been controversial for some time, even called abusive and unrealistic by some since the amount has not changed in over 40 years (Xinchao and Haijun, 2004; Kwayera, 2006). Additionally, Shikwati (year unknown) states that the bureaucracy involved in payouts for claims of this nature could take 10 years to sort out.

To address and work toward dispelling the perception that carnivores are more important than Maasai, PCF administrators might consider including compensation for MGR residents injured or killed during the immediate defense of self or property from attacks by species covered by the PCF into the next agreement as a supplement to the existing government compensation project. Eligibility for this type of compensation would not include injuries/deaths incurred during active hunts of the species covered by the PCF (i.e. retaliatory or traditional hunts), and would necessarily include evidence verification of an attack, similar to that of a livestock claim (in order to rule out false claims). Payments could be the equivalent or slightly more than what is expected of a fine for the killing of a predator. When paired with increased education and communication with the community, such an addition would demonstrate concern for the well-being of the Maasai people of the MGR community.

Despite the existence of anecdotal accounts by some of 2-3 deaths by elephant over the past 10+ years on MGR, no formal reports on wildlife-caused deaths on MGR were found. Thus,

the financial impact of compensation for wildlife-caused human deaths would be minimal, yet its impact could prove to change the perception that carnivores are more valued than Maasai and, ultimately, help create more positive attitudes towards the PCF.

5.4.3 Predator Compensation Fund Rules Favor Carnivores

Many subjects believed the PCF rules unfairly favor carnivores. “If 7 lions kill one cow, only 1 cow is compensated, but if 7 *Morans* kill 1 lion, all 7 *Morans* are arrested. *Morans* can still be arrested 2 years after killing a lion, while the lion just has 1 day”. “There should not be a boundary in livestock compensation while no boundary for lion movement”. “It is not fair because there are not herders taking care of the lions”. “Two months is not fair because the lions are paid immediately, why not cows”. “I don’t like where the carnivore is made to be paid if someone kills it and still you don’t compensate full value in livestock….If you don’t compensate full price then we will kill the carnivores”.

Each of these statements reflects an inaccurate understanding of the PCF rules and procedures and/or the intent of the rules and procedures. On-going education initiatives to create familiarity and opportunities for “question and answer” sessions would likely go a long way in addressing community concerns and allaying any misconceptions that might arise before they spread as rumor.

5.4.4 Predator Compensation Fund Responsible for Carnivore Conflict/Free Money

The perception existed in the MGR community that because the PCF paid claimants for loss of livestock to predators, the PCF accepted responsibility for the carnivores or even owned them. “If the project is there to compensate for carnivores then it should not have boundaries. Provided the animal is killed by a carnivore, they should pay the full amount”.

This perception may have, in part, evolved from insufficient requirements for defensive action on the part of the livestock owners by the PCF. For example, owners can send their

livestock without a herder or build a boma which is not adequate to keep predators out, and when their animals are killed by predators, they can file a claim with the PCF and get reimbursed for the full or partial value of his animal, depending on the type, age and quality of the animal. Thus, the livestock owners can do everything wrong to defend their livestock and the PCF will still "pay" them when a carnivore kills their livestock.

Paying compensation when preventive measures were inadequate, even when combined with penalties, seemed to demonstrate to the MGR community that they had little or no responsibility for preventing carnivore damage, and, as such, seemed to reinforce the perception that predators were solely at fault for attacks on livestock. "If it was not for this carnivore, the cow could have come home….it is not the herder's fault because no matter how you take care they will get lost". However, because *wazungu* put collars on lions "for decoration" or "to identify the killer of a carnivore", arrest Maasai who kill carnivores and pay compensation for the damage they incur, it is not difficult to see why some believe the PCF is responsible for carnivores.

Ferraro and Kiss (2002) warn that paying an individual or community for **"**not doing something" (i.e. not killing carnivores) might be interpreted as a form of social welfare rather than development. Data from this study suggested that not only is compensation seen by some as charity or "free money" but for some the connection between compensation and the non-action behavior may have been lost. "The project is good because you didn't deserve to be paid". "The penalty is ok because the (livestock) is lost and (the money) is better than nothing". "There is nothing else you could do with a dead animal…(compensation) is like free money."

One way to potentially rectify both of these perceptions is to create more strict requirements for defensive action and reduce or withhold payments for insufficient protection of livestock. Such adjustments by the PCF will send the message to the community that

compensation must be earned, livestock owners are responsible for making the effort to ensure their livestock is adequately protected, and that inadequate protection will not be rewarded. Further details and suggestions about penalty modification can be found in 5.7 *Penalties*

5.5 Changes in Herding

According to the data, some shifts in who was herding seemed to have taken place on MGR. Subjects indicated a 4-fold increase the use of employed herders, while 6 times as many subjects indicated they used employed *Moran* herders now versus in the past. There was also indication of a one-third decrease in herding performed by family members.

The shift from family herders to employed *Morans* is noteworthy since it involves an increase in herding costs for livestock owners as well as the added challenge of trying to keep hired herders motivated. “Sometimes you find (herders) very reluctant. They don’t care much because they are not their cows. We pay them at the end of the month, so that is why you find lost cows.…there’s no proper herding but because they are workers, you have no choice”.

It is difficult to determine from the data if/how the use of child herders has changed. Looking only at the “children” data, one would conclude the use of child herders has increased. However, numbers from those indicating they, personally, performed herding duties and, indeed, were children at the time (“old days” self category) could be added to the past “children” numbers to get a more accurate figure for the “old days” children category. Comparing these numbers with present “children” numbers shows that the use of child herders has actually decreased. This conclusion betters reflects the comments from subjects who indicated fewer children were used for herding because “the children are in school”. There has, indeed, been a push to educate rural poor children in Kenya over the past 50 years (Campbell, 1999). With fewer children available for herding, livestock owners may have hired herders from outside the family, accounting for the increase in employed herders.

Additionally, due to multiple responses by some subjects with respect to current herding practices, there was a 30+ response difference between “now” and the “old days”. This might suggest that, overall, more herders are used nowadays. More herders might suggest more livestock to guard. It could also suggest due to poor grazing or over-grazing on MGR more recently, some owners have been forced to move some of their livestock off the ranch to better grazing areas. Shoats might be kept on the ranch while cattle might be taken elsewhere. Such herd divisions would likely necessitate more herders.

The perception that there were more carnivores on MGR at the time of the study than in the past gives another potential explanation for changes in herding. Livestock owners may have increased herding staff to guard against a perceived increase in predator populations. However, high numbers of carnivore killings over the past 5+ years in the Tsavo-Amboseli ecosystem makes an increase in carnivore numbers seem unlikely. A more plausible explanation for the perceived increase might be the following: due to insufficient grazing areas on MGR, herbivores were likely being out-competed by livestock and forced to leave the area for better grazing elsewhere. With less natural prey available, some carnivores might have turned to livestock as prey. An increase in carnivore attacks on livestock might have led the MGR community to think carnivore population had increased, and led some owners to hire additional protection for their herds.

It is unlikely the PCF penalties caused the overall changes in herding. The majority of subjects were not aware of the penalties, and of those familiar with the penalties, less than half indicated changes/improvements were made to herding practices or bomas as a result of PCF penalties.

Ultimately, without pre-PCF data for numbers of livestock, herders, carnivores and depredation rates, the accuracy of the herding data given by subjects and the reasons for the apparent changes in herding remains unknown.

It is worth noting that one subject indicated he used no herders to guard his livestock (8 cattle, 20 shoats, 2 donkeys) in his present herding practices. This subject also indicated he had never filed a claim with PCF for compensation. A particularly interesting aspect of this subject's choice not to use herders was that he believed carnivore populations had increased after the inception of the PCF. Though forgoing the use of herders is not a normal practice by livestock owners on MGR, it is of great concern; there could be other owners who also leave their livestock unattended, effectively inviting conflict with predators.

In late 2005, a herding study was conducted for KLCP by Ogetu Mwebi. The focus of his study was to observe herding practices on MGR and to understand how the herding practices influenced depredation rates. The study also included an evaluation of herding practices in Laikipia where depredation rates are much lower than on MGR. The results of Ogetu's study have yet to be released, yet once they are, the results of the study could be very helpful in determining which herding methods on MGR are effective, which contribute to high levels of depredation by carnivores, and what improvements might be implemented to help reduce depredation rates.

5.6 Reporting and Verification

Subjects were not specifically asked about the PCF reporting and verification personnel and/or procedures, even so, many subjects offered their thoughts on the topic.

5.6.1 Not Enough Zone Reporters

"The reporters are not enough. They need more reporters who report the attacked livestock in the zone. There should be at least two of them in each zone". "There are not enough

reporters. We have no reporter to report livestock that are killed by predators, or to report that a carnivore has been killed, so this can make us dislike the project especially….We need a reporter here in Ilchalai because this is a major problem in the project….We like the project, it's only that we have no reporter….That is why we say it is better to stop the project because we are not benefiting and so we continue to kill carnivores". Several subjects claimed that reporting attacks by carnivores entailed a long-distance walk because of the locations of the reporters. Additionally, some subjects indicated that when they arrived at the reporter's home, he was on patrol and unreachable. "The 24 hours given to report are not enough".

Figure 3 shows the locations of each of the 7 PCF reporters and the zones they are in charge of. Only reporters from zones A, E and F live in the zones where they do reporting. It should be noted that there has been a 2nd reporter assigned to work in zone E, though at last check with administrators (July, 2006), there has been no record of reports made by this reporter.

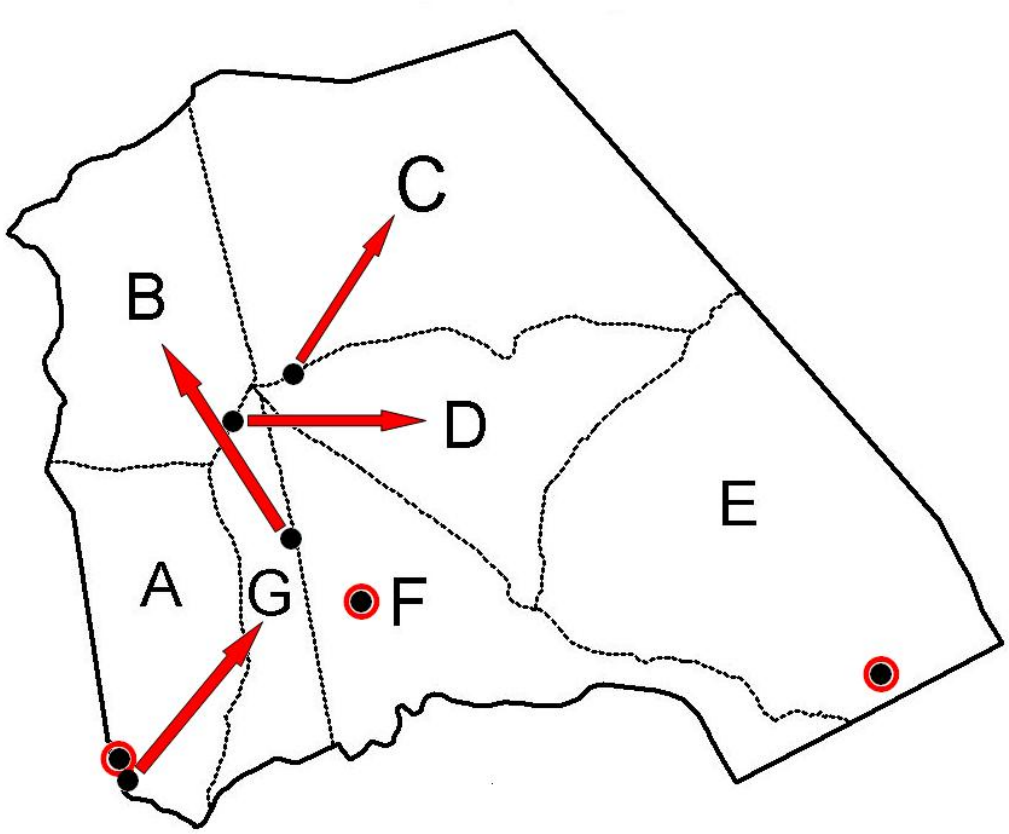

Figure 3: Locations of each zone's PCF Reporter boma (black dots with red circles indicate that the reporter lives and works in the same zone, whereas black dots with red arrows indicate the zone the reporter lives and works in different zones) (map provided by KLCP)

Rather than assign one reporter to each zone, another option might be to assign reporters to sites on MGR where the larger populations exist (Olbili, Ormosua, Ilchalai, Centre, Lemasusu, Isinet, Olmapitet, Mbirikani town, etc.). Having these sites covered by reporters would make them more accessible to the majority of residents. Some sites, such as Lenkiloriti, might only need a reporter seasonally since residents there are not present year round. Additionally, Chyulu would not require a reporter since the VO is based at ODW Safari Lodge and there are multiple methods there for reporting conflict.

Additionally, reporter accessibility might improve if reporters were to remain at or near their homes for the duration of their shift, or if they are required to patrol an area, a second hand-

held radio be left with a family member who has been trained to use the radio. Thus, if the reporter is on patrol when a livestock owner arrives at his boma to report an attack, the reporter would be more accessible.

5.6.2. Reporting and Verification Time Limit

The PCF agreement states that "the claim of loss must be reported within 24 hours of the loss" and if it is not, the claim will not be considered for compensation. This time limit is equivalent to the lower limit (24 to 48 hours) used by many other compensation projects world wide (Montag and Patterson, 2001)**.** However, such projects also generally add an additional 24 to 48 hour limit for verification on top of the reporting limit. Though the PCF agreement does not specifically give a time limit for verification, it is largely understood that if the verification does not take place within 24 hours of the report, the claim is invalidated.

Such an important limitation should be documented in the agreement so that disagreements over whether or not the time limit was exceeded might be avoided. Additionally, the community should be educated about the time sensitive nature of the verification process and in determining cause of death.

5.6.3 Verification Officers Numbers and Unverified Loss

In August, September and October, 2004, 3 of the 4 busiest months in PCF claim history, a total of 221 PCF credit notes were issued to MGR residents; the daily range during this period was between 0 and 7 claims, while the average per day was 2.4 (information from PCF claim records dated through March, 2005). This number of claims does not include those claims that were verified but not issued credit notes, or claims that were reported but not verified. Thus, in an area slightly larger than the state of Rhode Island, with the only roadways taking the form of dirt roads, this number of claims represents a heavy load for 1 permanent and 1 temporary VO.

Several subjects indicated that they called for verification, but the VO did not arrive or arrived so late that the claim exceeded the verification time limit and became invalid. Most such subjects said there were not enough VOs available to the community. “I called for him but no one came. The carcass rotted in a tree instead. The project let me down by not doing verification”. Other subjects cited circumstances wherein inclement weather and impassible roads prevented the VO from getting to the attack/kill site. “I called for verification, but it was wet so he couldn’t come”.

Nyhus (2003b) states that the problem of unverified loss remains a critical challenge for many compensation programs. However, the 2 types of unverified loss seen in the PCF (inadequate number of VOs and weather/road conditions) can be addressed and largely remedied in order to avoid such unverified loss.

The issue of inadequate numbers of VOs, in particular, is one that is not difficult to remedy. By increasing the number of VOs available to perform verification at any given time, logistics and/or heavy claim loads would be less likely to prevent the VOs from verifying most, if not all, claims within the verification time limit. There will likely always be instances where a VO is unable to get to a boma or attack site because of poor weather or road conditions. To minimize such instances, the PCF might consider stationing VOs on different parts of the ranch so that travel time is lessened and weather/road issues might be avoided.

It seems unfair that the claimant should pay the price for issues, such as bad weather/roads, logistics or emergencies, which prevent verification from taking place within the time limit. For such cases, the PCF might consider consoling, and thus mollifying, claimants with unverified loss. Assuming the claimant does his/her part in reporting the attack/kill, a consolation fee could be given when verification cannot take place.

5.6.4 Verification Officer Interactions

I had the opportunity to accompany Seamus Maclennan on several verification trips prior to starting this study. My observations of these verifications were that he was thorough in his investigations, reasonable and fair in his decisions, sometimes giving the claimant the benefit of the doubt when unsure of the evidence, and composed even when claimants vehemently disagreed with his decisions.

Since the MGR women protested Seamus for being unfair and biased toward to PCF in verifications, it is conceivable that the permanent VO displays opposite characteristics in his duties. The VO might, therefore, show lenience towards some claimants but severity towards others. Some subjects indicated this was, indeed, the case. “I don’t like the project because the verification officer usually refuses my claim and the cow has been eaten….sometimes he cannot understand even if you speak the truth”. A non-subject MGR member told me the following about the permanent VO:

> “If the VO is in good standing with a family, he will report a claim. If not, the he will refuse or penalize the claim. Once a neighbor’s donkey was killed by a hyena. The VO came and said the donkey was not with a herder and gave the penalty. All Maasai know that a donkey does not go with a herder. Another neighbor’s donkey was killed the next night while everyone was asleep. The VO did not give them a penalty so they got full payment. So you can understand why there is no trust between the community and the VO”.

Throughout my stay on MGR, I heard rumors of misconduct by the VO. Even ODWPT administers suspected the VO of cheating the project by accepting bribes and giving out credit notes without the deserved penalty or for false claims, though no definite evidence was found. When I, as a researcher, approached the VO for an interview about his duties, he refused, stating he did not know me and could not trust me, despite my presence in the area for 5 months and our frequent interactions during that period.

Without evidence, one can only speculate how his alleged leniency and biases have affected the PCF financially and in reputation. It is entirely possible the PCF has paid out more in claims in the first 2 years than it would have had it had more than 1 permanent VO or had administrators performed random check ups on the VO's performance.

A compensation project exists in the Kitengela corridor which connects Nairobi National Park and the Athi Plains. This project, run by the Kitengela Predator Consolation Programme (KPCP), uses a verification team in lieu of a single verification officer. The team, comprised of 1 individual from each of 4 stakeholders (KWS, Kitengela Ilparakuo Landowners Association, Friends of Nairobi National Park and KPCP), is responsible for verifying the validity of predator consolation claims and to testify that negligence was not involved on the claimant's part (personal communication, E. Loosli, KPCP chairman, September, 2006). The use of a multi-stakeholders verification team was designed to reduce the likelihood of a false claim getting through the verification process; it would be improbable that all team members could be persuaded or bribed into allowing a false claim given the investments each has in the project.

A similar team-verification method might be adopted by the PCF to address issues of cheating in the verification process. It may not be necessary that the verification team consist of 4 people from independent organizations, though the more stakeholders on a team, the better. At minimum, 2 individuals from different organizations who have different investments in the PCF could comprise the verification team. Another simple option would be to hire a team member from an outside organization with no ties to the Maasai tribe, the PCF or conservation (known as *third party verification*) to accompany the current verification officer.

5.7 Penalties

5.7.1 Herding/Boma Penalties

The intended purpose of penalties was to discourage livestock owners and herders from practicing inadequate husbandry methods, however, the PCF penalties did not seem to have the desired effect. PCF statistics show that the number of paid claims with penalties for lost livestock and bad boma outweighed those issued without penalties by almost 2 to 1 in 2005. Payment for unattended livestock in 2005 alone consumed more than 1.2 million Ksh.

Many subjects indicated the penalties were not fair because the money left over after the penalty was not enough to replace the livestock lost to predators. Moreover, 89% of subjects said the penalties did not persuade them to changes their herding practices and bomas.

Fourli (1999) suggests that high payment prices may make forgoing defensive action and allowing livestock to be taken by predators more profitable than if the livestock were sold at market. Indeed, I suspect those who understood the connection between their behavior and the penalties may have used the PCF to their advantage. For example, an owner might have sold an average cow at the market during the dry season, when livestock conditions were poor and prices low, for, as an example, 5,000 Ksh. If the same owner were aware of the PCF penalties and the corresponding prices and knew a lion was nearby, he might have chosen to leave that same cow out at night as easy prey, made a PCF claim and gotten 1,750 Ksh more, even with a penalty, than what he would have gotten at the market.

Wagner *et al* (1997) suggests that partial payments may actually be more frustrating to residents than no payment because of the perception that the organization accepts responsibility for wildlife damage when they implement a compensation project. This may be the case on MGR. “It should not (be) that some are paid full amount or half amount; as long as it is killed by a carnivore we should get full amount”. “I should be paid the full amount because if there were

no (carnivores) the livestock could have come home". Partial payments might also be frustrating to claimants if they are not able to afford husbandry or herding improvements.

Since PCF penalties seemed not to deter poor husbandry practices or inspire improvements to herding and bomas, likely confused the issue of responsibility and caused resentment towards the PCF, the project should consider adopting more drastic penalty measures.

The KPCP, unlike PCF, does not pay for livestock attacked/killed while lost or unattended; instead, KPCP's policy is to provide consolation only for claims in which the owner/herder has adequate preventative measures in place (personal communication, E. Loosli, KPCP chairman, September, 2006). Fouri (1999) suggests compensation that covers all types of damage regardless of conditions prolongs a risky situation and provides no incentive for the avoidance of certain types of damage. Thus, the KPCP method sends a clear message of responsibility to the participating community: care for your livestock properly or it will be taken by predators and you will receive no compensation for these losses.

With funding issues already having an impact on the project, the PCF can ill-afford to continue to pay for the current rate of claims made for lost or unattended livestock. Reducing or withholding certain types of penalty payouts might be just the wake-up call the MGR community needs. This change would need to be paired with extensive educational sessions to explain why money is being withheld for insufficient herding practices. Additionally, the project would need to clarify what herding practices would qualify for full payment and offer advice/assistance for those herders/owners who use inadequate herding methods.

Many subjects indicated that in some areas of MGR, there was not enough thorn available to create bomas that met PCF standards for height and thickness. Yet, even in areas where thorn trees and bushes are plentiful, some owners chose not to construct bomas to meet PCF requirement. PCF money might, therefore, be better spent on preventative measures rather

than compensation in the case of poorly constructed bomas. Rather than penalizing the claim and giving the payout to the claimant, payments given for loss taking place in a poorly constructed boma could be withheld and used by the PCF to make improvements on the involved boma. The number of internal walls could be increased to reduce the chances of livestock stampeding due to approaching predators (Ogada *et al*, 2003). Wire fencing could be used to strengthen the outer walls of the boma and adding a wooden or metal gate to boma entrances, as the LPP is doing at bomas and ranches in Kenya's Laikipia district, would reduce the chances of a predator entering the boma. Each boma receiving these improvements would go through this process only once. Any subsequent loss occurring at the improved boma would qualify for full compensation. If the owner were to deliberately destroy the improvements or refuse to perform any necessary upkeep, any loss from that boma would not be eligible for compensation until, at the owner's expense, the boma were restored to PCF standards.

Sharing the cost of boma construction as a preventative measure, particularly in areas where there are few thorn trees and bushes, may help reduce depredation rates in/around bomas and reduce the amount of compensation paid out for such loss (Montag and Patterson, 2001). Additionally, good boma construction has been associated with lower levels of depredation by large carnivores and the simple, low-tech solutions suggested can make substantial contributions towards resolving conflict with predators (Ogada *et al*, 2003). Since Maasai sometimes tear down or burn seasonal bomas, this suggestion might only be useful for permanent bomas, unless the improvements could be made to be transferable to other bomas.

Hill and Bonham (2006) indicate that there has been a "perilous decline in the number of trees" on MGR. To address the issue of tree loss, ODWPT started a small tree nursery at the ODWPT HQ, where MGR residents could purchase Acacia (thorn) tree seedlings at low costs.

Though subjects were not asked about their familiarity with the tree nursery, I suspect few, if any, subjects were aware of it.

Most Acacia thorn trees have fast growth rates under ideal conditions and are easy to propagate in arid climates (SANBI, year unknown). Thus, with some effort and development, ODWPT might expand the tree nursery project, making it more effective at battling tree loss on MGR. A full-time employee could be hired to increase propagation of the trees, while advertising, using the same notice board method suggested for the PCF, might increase awareness within the community. Initially, to encourage residents to plant trees, seedlings could be given at no cost and school programs might be developed to involve students in the effort to increase tree planting. With more attention, a reverse in the tree loss trend could be a reality in the near future. For those currently living in areas with little thorn, and increase in usable thorn trees might make them more inclined to build stronger bomas.

5.7.2 *Zone Penalties*

Like the herding/boma penalties, most subjects were not familiar with the zone penalties for false claims and killing of carnivores. As such, it is unlikely that these penalties have had the desired effect of creating peer-pressure to keep fellow ranch-mates from filing false claims and killing carnivores. For this to change, the community must be educated about zone penalties so that they understand the repercussions of going against PCF rules or allowing friends, family or neighbors to go against the rules. Likewise, education efforts must also explain the intent of the penalties.

Since a small portion of subjects do not believe anyone lies about PCF claims, past and future instances of false claims could be highlighted in education sessions to raise awareness that this type of cheating exists on MGR. In addition to paying a fine, PCF administrators might consider requiring those filing future false claims to make public apologies for their misdeeds.

Additionally, education efforts must explain that 30% of compensation money comes from MGR funds and that anyone who files a false claim is attempting to steal money that might otherwise benefit his/her neighbors, family members and friends.

5.8 Compensation Payout

5.8.1 Payment Period

Timely payment can help victims to get over their anger and reduce their incentives to retaliate against the animals that caused the damage (Nyhus et al, 2003b). The word "timely" poses some difficulty since different stakeholders might have different definitions of the word. Also, what might be seen as timely to one community might be considered unacceptable to another. According to Montag and Patterson (2001), many, if not most, compensation projects compensate within 2 to 4 months, though a project in the French Pyrenees takes, on average, only 3 weeks to pay. On the other end of the spectrum, some projects take as long as 16 months to make payouts.

The payment period for the PCF was 2 months, though Hill and Bonham (2006) indicate claimants wait, on average, only 1 month for compensation payouts. In spite of this, just under half of the subjects felt the 2 month pay period was unfair and made claimants wait too long for compensation. Some subjects, in fact, indicated payments should be made immediately following verification.

When compared to the information Montag and Patterson (2001) give for other compensation projects world-wide, the PCF's payment period clearly fell into the "timely" category. It is unlikely MGR residents are aware of payout periods for any other compensation projects, thus, PCF administrators might consider using this information to put the PCF's payment period into perspective. The MGR community might change their minds about the fairness of the PCF's payment period if they knew how long some communities must wait for

compensation. Such information, as well as an explanation of why the immediate payouts are not made, should be included in future education efforts.

The PCF agreement indicates that the time limit for collecting compensation payouts is the same as the payment period; if the claimant does not collect compensation on the payout date immediately following the attack/kill, he/she risks the claim being invalidated. Though most claimants were able to cash in their credit notes on the required date, there will likely always be a handful who, for various reasons, are unable to meet the deadline. Invalidating such claims would save the project little in payouts overall, but has the potential to be a source of further resentment towards the project. Thus, to avoid further negative attitudes now and in the future, the PCF administrators might consider removing this rule from the agreement.

5.8.2 Payment Prices

Many subjects indicated the payment prices were too low, with or without penalties. PCF administrators counter-argue this criticism by saying payment prices reflect average market values for livestock for Kajiado District. Requests have been made of PCF administrators for information regarding the livestock price assessment: when the assessment was made (i.e. over what time period, the rainfall/drought conditions during that period, etc), what ages and types of livestock (juveniles, lactating females, prize bulls, rare breeds, etc.) were included in the assessment and what price ranges were observed. Such information would very likely shed light on compensation prices, however, thus far, this information has not been received.

To battle the issue of fair payment prices, other compensations update market price lists at regular intervals so that payment prices are closer to the real cost endured by livestock owners (Montag and Patterson, 2001). Since there has been little change to the compensation prices since the start of the PCF, despite numerous fluctuations in the market, it would behoove the PCF to adopt this method and perform market value assessments of livestock prices at regular

intervals. If future assessments were to find that average market prices were lower than current compensation prices, PCF administrators might use the information to show the community that they are getting more than they could in the market. If the prices were found to be higher, administrators would have current and accurate information available to negotiate new compensation prices should the MGR committee request an increase.

Future education efforts should include information on how payment prices were determined and how compensation prices compare to market prices at any given time.

5.9 Education

Thorough and detailed information on the PCF needs to be disseminated to the MGR community via educational sessions on a regular basis in order to better familiarize the community to the rules and procedures of the project and to open up the lines of communication between the community and project administrators. Such efforts, in conjunction with question and answer sessions, will help make the project more transparent, will allow the PCF to monitor the community's perceptions and opinions and will help change some of the negative attitudes the community has about the project.

In addition to starting an education effort for the women of MGR and increasing the frequency of educational sessions for men and women, the PCF should consider investing in 2 other groups on MGR: *Morans* and children.

For *Morans*, the risk of being caught and arrested by game scouts or KWS for killing carnivores and the threat of legal prosecution seemed to be of little concern, and for good reason. Though several *Morans* have been arrested for killing carnivores on MGR in the past, none have ever been convicted. As cases against *Morans* enter the Kenya's judicial system, deals are made, evidence goes missing, and *Morans* go free with little more than a few nights in jail and, maybe,

a few angry words from the few people on MGR who realize the financial repercussions of the *Morans*' actions.

Such was the case with 3 *Morans* arrested for killing 2 young male lions in June, 2005 (see Photo 1). Though the case made it to court, convictions were not made. The defense attorney, who was also the MGR attorney, argued in court that there was no evidence the 3 participated in the killings, despite several eyewitnesses present at the kills, and that the 3 *Morans* were victims in the case (personal communication, G. Solonka, September, 2005). The 3 *Morans* were set free. As Frank *et al* (2006) point out, it's more often the game scouts that make the arrests who pay much higher prices for their enforcement of Kenyan law.

One subject indicated that long-term conservation can be accomplished by "stopping *Morans* from killing carnivores". *Morans* are the group largely responsible for carnivore kills on MGR, by *Olamayio* (traditional lion hunts) to prove their manhood or in retaliation for attacks on livestock. For this reason alone, special attention should be paid to *Morans*. Not only do they need to be further educated about the PCF, but further research should be performed to fully understand their views of the PCF and carnivores, and to hear what ideas they might have regarding conservation issues.

Children (pre-*Moran*) are the other group in need of attention. A study by Ali (2002) showed that Kenyan children have a general lack of understanding of scientific explanation and understanding of issues of wildlife, and only a portion understand the social implications of these issues. Thus, it is only after Kenyan children enter adulthood that they are exposed to wildlife and conservation issues. By that time, biases and negative opinions may be so ingrained about these issues that the level of difficulty in working with them to exchange knowledge and information may increase drastically.

In the Maasai culture, adulthood and/or *Moran*-hood is reached sometimes while the individual is still in his/her early teens. This means that the window available to the PCF and ODWPT, when children are more likely to be open to other viewpoints, is fairly narrow. Additionally, children who participate in conservation education are proving to be effective at spreading the conservation message to their parents and other adults, as has been the case with a wild dog conservation project in Zimbabwe (personal communication, G. Rasmussen, October, 2006). PCF education efforts might not be successful at influencing all children's opinions, but children receiving PCF education will enter adulthood more informed and knowledgeable about wildlife and conservation issues and compensation, and the PCF will have made further investment in the Maasai culture and in the future of wildlife on MGR.

5.10 Funding

Funding is one of the major challenges of any compensation scheme. Nyhus *et al* (2003b) advise that a compensation program must have a sustained source of sufficient funding which is capable of responding to variations in damage over time. Funding has already proven to be an issue for the PCF, since during agreement negotiations in 2005, proposed price reductions due to funding issues led to a PCF suspension. Though the MGR contribution to compensation payouts increased by 5% in June 2005, it did so out of necessity rather than intention.

Tom Hill, PCF administrator, indicated the PCF was never intended to be self-sustaining and would always require funding beyond the MGR contribution (personal communication, September, 2005). With the growing need for conservation efforts worldwide, funding will no doubt become increasingly more difficult to secure. If a sustainable source of external funding is not found in the near future, the PCF could be at risk of further suspensions and project termination.

One option PCF administrators might consider is switching to an alternative to compensation to either reduce operational costs of the project or make the project independently sustainable for the long-term. Details of such options are discussed in section 5.12, *Alternatives to Compensation*.

Most subjects did not know or were misinformed about the source of the PCF's funding; many thought the PCF was government-sponsored or funded by KWS or tourists. Of greater concern were the perceptions that compensation money came from the *wazungu* living on MGR, or that Tom Hill personally funded the project. Some subjects were aware that compensation money came to the PCF from sources abroad, however, only 1 subject knew that the MGR funds covered a portion of the compensation payouts. It is unclear why more were not aware of the funding sources or the MGR contribution, but it was an issue brought up several times in interviews. It is possible that the MGR committee was aware of this information but did not communicate it to the community, or it could be the PCF has not adequately addressed this issue. Communicating this information will help the community further understand how the PCF works from start to finish, and help stop misinformation about funding from spreading through the community.

5.11 Measurement of Success

J. Christopher Haney, Director of Conservation Science at Defenders of Wildlife, indicates that over the past 5 years there has been a paradigm shift to questioning, if not formally documenting, success in conservation efforts. For compensation, this means asking "how, when, where and why do we know that compensation programs are making a demonstrable impact on conservation prospects for wildlife?" Answering this question involves examining a project from the perspective of the 6 known dimensions of success: biological, economic, social equity, public opinion, legal/regulatory, and administrative. Though all of these dimensions may not be an

essential ingredient for the success of a compensation project, a project cannot be successful by engaging just one and furthermore, a project may only need fail in 1 dimension to have an overall failure of the project (presentation by J. Christopher Haney, Wildlife Society annual meeting, Anchorage, Alaska, September, 2006).

The measurements of success stated in Hill and Bonham (2005) deal only with a portion of the biological dimensions involved in the PCF coverage, namely the lion population. Since there are other measurement factors involved in the PCF, administrators should consider including additional measurements of success which deal with, at minimum, the remainder of the biological dimension (non-lion species) and the human dimensions (social equity, economic and public opinion). The following are some suggestions:

- A decrease or cessation in the number of non-lion species killings.
- A decrease in human-wildlife conflicts by evidence of fewer claims made to the Predator Compensation Fund.
- An improvement in the livestock husbandry of the Mbirikiani Group Ranch community.
- A provision of equitably distributed indirect benefits which aim to lessen the Mbirikiani Group Ranch community's economic hardships (i.e. development projects).
- An increase in the Mbirikiani Group Ranch community's familiarity and understanding of the Predator Compensation Fund rules and procedures.
- An improvement in the Mbirikiani Group Ranch community's opinions and attitude towards predators and the Predator Compensation Fund

5.12 Alternatives to Compensation

The idea of replacing the PCF with a PP or insurance scheme has been discussed by KLCP and PCF personnel in the past. PCF administrators believe a PP scheme would fail because compensation has set the precedence for carnivore-damage payments, while insurance would fail because the Maasai would refuse or not be able to pay premiums. However, 46% and 45% of subjects indicated they would be willing to participate in insurance or PP, respectively,

as an alternative to compensation. Since lion killings have continued on MGR even after the implementation of the PCF, PP and insurance as alternatives to compensation might be worth additional discussion.

As discussed in the *Literature Review*, PP has many advantages over compensation. Unlike compensation, everyone in a participating community has the potential to see direct benefits from a PP scheme because everyone would have a responsibility to help maintain or increase the size of the carnivore populations. PP also provides incentive for the community to adopt whatever mechanism the PCF might choose to reduce carnivore conflict, rather than incentive to decrease defensive action. Also, PP does not provide incentive for participants to increase the size of their livestock herds, nor does it confuse the issue of responsibility for carnivore damage. However, since PP scheme would likely be more expensive to operate than compensation, a mixed compensation-PP scheme would be a better option as an alternative to compensation than a PP scheme alone.

In a mixed scheme, compensation would continue as per normal PCF rules and procedures, however PP would be put into effect in addition to compensation. The projects would necessarily function separately to reach the same goal of reducing/eliminating killing of carnivores, though with very different approaches. Unlike compensation, PP would have no link to carnivore damage. Instead, payments for the number of carnivores on MGR would ensure everyone in the community, not just those experiencing loss of livestock, would benefit from the presence of carnivores. If compensation were to be suspended due to a carnivore killing, PP would remain in effect in the mixed scheme to deter further carnivore killings. However, the next payment made would be reduced because of the killing (fewer carnivores = less money).

The KLCP's continuing lion monitoring might be used to determine the number of lions on MGR. However, monitoring efforts would need to be modified in order to accommodate

hyena, cheetah and leopard populations, since all large carnivores are at risk from retaliatory killings.

With compensation in place to cover carnivore damage, PP prices would not need to be as high as prices for a stand-alone PP scheme. Household-level payment would be effective on MGR and would ensure that each family received a direct benefit. The household-level might also be useful for inducing peer pressure effects similar to what was intended with zone penalties, since if a person killed a carnivore, that person would reduce the benefits each household might receive (Nyhus *et al*, 2003b). Complaints about the MGR committee's hoarding and stealing of community money were sufficient to demonstrate that community level payments would likely be ineffective.

Despite what some say about insurance in developing nations, insurance might be a better alternative to both compensation and a mixed scheme on MGR because of its self-sustaining nature. Money for payouts would come from premiums paid by livestock owners to cover potential damages caused by carnivores. The 30% contribution of MGR funds could also be carried over to insurance to help keep premiums affordable. Additionally, insurance and outside support need not be mutually exclusive. The PCF could continue to raise funds to put into the program, yet without such support, the program could still function.

Assuming the PCF, or a similar body, were to administer the insurance program, as opposed to an insurance network, the issue of catastrophic risk would not be applicable; depredation rates on MGR have already been established through the PCF, thus financial risk would be known ahead of time. Premiums for insurance could also be made comparable to what the PCF pays for each head of livestock on MGR, which was $0.30 in 2004 (Hill and Bonham, 2005) and $0.50 for all 3 years of compensation (presentation by T. Hill, Wildlife Society annual meeting, Anchorage, Alaska, September, 2006).

Another option would be to implement a livestock vaccination program in lieu of or in addition to compensation. The Snow Leopard Trust (SLT) has implemented such a project in a community in the Chitral region of Pakistan in order to conserve snow leopards (SLT, 2006). Since loss to natural mortality and disease is often more extensive than loss to predators (Mizutani *et al*, 1999), the vaccination project works to increase the survival and productivity of herds, thereby increasing and stabilizing household incomes. With more money available, livestock owners are more easily able to absorb loss to predators, and accordingly, are less likely to feel the need to retaliate.

As part of the program agreement, the SLT vaccination program requires that the community freeze the size of their livestock herds at the start of the program. By limiting livestock numbers, more grazing is left for wild herbivores and when wild prey is abundant and healthy, snow leopards are less likely to turn to livestock as prey. Smaller herds help livestock owners in other ways as well. Healthier herds produce more milk and meat, and can be sold at market for higher prices. Since SLT personnel administer the vaccinations, herd sizes are easily monitored. Anyone found violating the herd freeze is excluded from the program for 1 year (personal communication, B. Rutherford, SLT Executive Director, October, 2006).

In 2003, the first year of the vaccination program, SLT paid 100% of the vaccination costs at a cost of 50 cents per animal. In each subsequent year, as local incomes improved, the SLT decreased their contribution by 25%**.** Thus, by 2007, the program will be fully self-sustaining and villagers will be able to purchase their own vaccines with money made from selling extra livestock (that would otherwise have died from disease) at the local market.

Regardless of the nature of the change in the PCF, a level of transparency and involvement of the MGR community, which has thus far not been achieved with compensation, would be necessary. With time, effort and communication, a mixed compensation-PP scheme,

insurance and/or a vaccination program have great potential to accomplish on MGR what compensation has, thus far, not been able to.

5.13 Continued Conflict

In order for conservation efforts to be successful in a populated area, the human population must remain stable (Bulte and Rondeau, 2005). This issue could prove to be problematic for conservation efforts in the Amboseli area because the Maasai population there is increasing by over 4% annually **(**Fratkin, 1997**),** which is higher than the national average of 1.5% (Globalis). Though group ranch membership may negate the immigration of outsiders to MGR for agricultural purposes, the presence of Mbirikani Health Clinic, which gives medical treatment, including those for HIV and AIDS, at no cost to the patient, may have a similar effect of drawing people to MGR from other regions.

The growing Maasai population alone makes it unlikely that livestock numbers will decrease in the future. On the contrary, livestock numbers are likely to increase with the increasing Maasai population. More livestock means more potential for human-wildlife conflict. In the absence of incentives for rural residents to protect their assets, a permanent state of conflict is assured (Nyhus *et al*, 2003b).

The perceived lack of transparency, inadequate information dissemination and insufficient education efforts combined with the community's dissatisfaction with carnivore conflict and compensation fuel the community's negative attitudes towards carnivores and the PCF and make it highly probable that illegal killing of predators will continue on MGR (Kruuk, 2002). "People will not stop killing (carnivores) just because their livestock is being paid".

Results to the KLCP herding study should shed light on what herding and husbandry practices lead to conflict with carnivores on MGR. Educating the community about the findings and working with them to change these below-standard methods should help decrease conflict

and, in turn, the number of claims made to the PCF for carnivore damage. But ultimately, improving herding and husbandry is just one of the methods that should be used with compensation in order to solve depredation problems. Additional preventative measures, as well as conflict resolution, education and information dissemination are also fundamental components to the success of compensation schemes (Montag and Patterson, 2001).

Frank *et al* (2006) state that limited data from the Tsavo-Amboseli ecosystem indicates that at least 108 lions have been killed throughout the ecosystem between 2001 and early 2006. So, even if the PCF objective of halting lion killings on MGR is achieved, lions will still be at risk of being killed in other areas of the ecosystem. Okello (2005) suggests negative opinions about wildlife resources and conservation on neighboring Kuku Group Ranch are, in part, due to the lack of benefits from wildlife. Thus, expanding compensation or implementing a different scheme throughout the ecosystem may be one of few remaining options available to prevent the extinction of lions and other carnivores in the ecosystem. Without the entire ecosystem involved in an incentive scheme, the current rate of spearing and poisoning of lions makes their extinction inevitable within a few years (Frank *et al*, 2006).

5.14 Conclusion and Recommendations

In places, such as MGR, where carnivores and people coexist, human-wildlife conflict is inevitable. The PCF is one of many conservation efforts worldwide which uses compensation for carnivore damage to reduce the financial burden of living with carnivores and to increase tolerance for carnivores. Though tolerance levels have increased on MGR due to the PCF, negative attitudes towards carnivores persist, and retribution and/or traditional killings continue.

The way the PCF is perceived by the MGR community and the issues surrounding it are complex. Thus, determining the PCF's performance is challenging. While the PCF administrators consider the project to be largely successful in its endeavor to stop lion killings,

the MGR community felt the project was unfair, inequitable and non-transparent. Misperceptions and lack of understanding of the project appeared to be a major reason for negative attitudes towards the PCF.

In addition to highlighting some of the issues the MGR community has with the PCF, this paper also reveals some potential strategies for resolution. Understanding the reasons behind the human-carnivore conflict on MGR is important for, eventually, reducing the need for compensation through improved husbandry. However, of immediate importance is the need for correcting misperceptions, increasing the community's understanding of the PCF, and ultimately effecting positive changes in the community's attitudes towards the PCF. Such changes can be addressed with more frequent and extensive education efforts and information dissemination about the PCF. Additionally, changes in penalty procedures would help shift the perception of responsibility for carnivore damage, while changes in verification would help make procedures fairer for both the community and the PCF.

This study presents PCF administrators with an opportunity to hear the views of the MGR community and to consider changes based on these views. Ultimately, however, I recommend that subsequent work be undertaken on MGR to 1) present the findings of this study to the community, 2) further educate the MGR community about the PCF, and to 3) use various participatory methods to allow the community to make suggestions for solutions to the issues found in this study. Additionally, I strongly recommend that pre-implementation evaluations be conducted on all Maasai group ranches that have the potential to be involved in any future ODWPT/PCF incentive scheme and subsequent evaluations be made on MGR at pre-set intervals. Taking these steps will allow subsequent evaluations of newer project to be more effective and informative, and by taking the communities views into consideration, will allow the PCF to evolve into a more equitable and valuable project on MGR. Such steps will also allow

ODWPT and PCF administrators to build a stronger and more cooperative relationship with the MGR community, and begin building relationships with communities on other group ranches, by further shifting the project-people relationship from “telling” to “listening”.

Addendum

Since the completion of this research in 2005, several major events have taken place on MGR and in the Tsavo-Amboseli ecosystem, as well as with the PCF itself. In the April-May, 2006 timeframe, a total of 9 lions were killed on various Maasai group ranches in the ecosystem, including one on MGR (refer to Frank *et al*, 2006, for more details). The MGR lion, a radio-collared female with two older cubs, was killed by *Morans* in zone E near the town of Olbili on April 24, 2006. The elders in the Olbili area held meetings about the killing, some with PCF administrators, to decide what would be done about the situation. Despite PCF rules, PCF administrators chose not to deny payments in zone E, though payment for Olbili claims were withheld for one month. Additionally, no arrests were made for the killing. There was concern that the lionness' two cubs might not survive without their mother, but KLCP personnel has spotted them in the months since their mother was killed, and they appear to be doing well.

A second permanent VO was (May, 2006 timeframe) added to the PCF. The new VO was previously the main reporter for zone E (a new reporter has replaced him); because zone E is a high conflict area, his verification duties are limited to claims in that zone.

At least one change in the PCF rules and procedures have been made since September, 2005. With respect to fines for those participating in lion hunts/kills, fine due dates and fine amounts are now set and collected by the MGR committee. If fines are not collected by the timeframe given, the committee seizes the monetary equivalent of the fine in livestock. If the culprit does not own livestock or enough to cover the fine, the livestock is seized from his family's herds.

In the first 3 weeks of August, 2006, it was reported that at least 5 lion cubs were killed by *Morans* in the Tsavo-Amboseli ecosystem. It is not known if arrests were made for these killings.

A compensation scheme is planned on Kuku Group Ranch (directly south of MGR). The project will be administered by the Maasai Wilderness Conservation Trust. Thus far, no details are known about the project.

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Appendix I: Species compensated by the Mbirikani Group Ranch Predator Compensation Fund

Striped Hyena (*Hyaena hyaena*) (Photo credit: Florence Mclean)

Cape Buffalo (*Synerus caffer*)

African Lion (*Panthera leo*)

Elephant (*Loxidonta africana*)

Side Striped Jackal (*Canus adustus*) (Photo credit: Ross Warner)

Leopard (*Panthera pardus*)

Cheetah (*Acinonyx jubatus*) (Photo credit: Diana Tyler)

Spotted Hyena (*Crocuta crocuta*) (Photo credit: David Anderson)

Black-backed Jackal (*Canus mesomelas*) (Photo credit: J. G. Hall)

Appendix II: Interview Questions

Mbirikani Group Ranch Predator Compensation Fund Evaluation
Shari Rodriguez
SIT Master's Research
For Kilimanjaro Lion Conservation Project

Record:

Name (for subject identification in research context only)
Research code
Zone
Sex
GPS coordinates of subject's boma
Date and time of interview

Questions:

1. Are you aware of the compensation program here on Mbirikani Group Ranch (MBR)?
2. Have you ever filed a claim for livestock lost to a predator? If not, do you know anyone who has?
3. How many times? For how many animals? Were you paid full price? (Describe each claim)
4. Were you or the person you know satisfied with the outcome of the claim(s)? Why/why not?
5. What are your livestock holdings? (cows, shoats, donkeys)

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6. What is your age set?
7. What is your age?
8. How long have you lived on MGR? Were you born on MGR?
9. What is your clan?
10. What is your religion?
11. What is your occupation?
12. What is your level of education?

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13. In the old days who did the herding in your family? (children or adults; hired or family)
14. Who does the herding now for your livestock? (children or adults; hired or family)

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15. Are there more carnivores on MGR now than compared to when you were young (in the "old" days)? Is this good or bad?
16. Are there more carnivores on MGR now than before the compensation project started?
17. How would you feel if all predators on MBR were gone?
18. What are the benefits to MGR of having carnivores on the ranch?
19. What are the benefits to you of having carnivores on the ranch?

20. If the compensation project is suspended, what will you do if predators kill your livestock?
21. If you were to kill a predator(s), how would you do it? (If no answer ask: would you: spear? poison?
22. What specifically keeps you from killing predators when the project is in effect?
23. Is it difficult to find carnivores on MGR?
24. Do you know if members on neighboring ranches kill their predators? How do you feel about that?

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25. Are you familiar with a research collar (have you ever seen a lion with a collar on its neck)?
26. If a lion that had a research collar on came to your boma and killed your livestock, what would you do? Would you kill it? Why or why not?
27. What does the collar mean?

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28. Are you familiar with the penalty for livestock that are killed while lost?
29. How do you feel about being penalized for livestock that are killed while lost? Is it fair?
30. Are you familiar with the penalty for livestock killed when there is no herder present?
31. How do you feel about being penalized for killed when there is no herder present? Is it fair?
32. Are you familiar with the penalty for livestock killed in or from a boma that does not meet PCF standards/a “bad boma”?
33. How do you feel about being penalized for having a “bad boma”? Is it fair?
34. How do you feel about being an entire zone being penalized in a pay period when a predator is killed and the killer(s) refuses to pay the fine? Is it fair?
35. How do you feel about an entire zone being penalized in a pay period when someone makes a false claim and the liar refuses to pay the fine? Is it fair?

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36. What do you think the effect of the PCF has been so far? Has it stopped people from killing carnivores?
37. If you knew someone had killed a carnivore, would you choose to turn that person in or accept the zone penalty?
38. If you knew a member of your family killed a carnivore, would you choose to turn that person in or accept the zone penalty?
39. Is the compensation program important to your livelihood?
40. Do you think the 2-month payout period is fair? Why or why not?
41. What do you do with the money you receive from compensation? Do you replace your lost livestock? Save it? Spend it? On what?
42. Where do you think the money for the compensation program comes from?
43. How do you feel the compensation program is going in general?
44. What aspects of the compensation program do you specifically like?
45. What aspects of the compensation program do you specifically not like?

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46. What do you suggest for the long term future for conserving carnivores?
47. Is there any other way to conserve carnivores besides compensation?
48. Would you be willing to pay a very small amount for each head of livestock each year to a company so that if any of your livestock were killed you would get market value back for that animal? This is called “insurance”.
49. Instead of being paid for livestock that are killed, how would you feel about being paid for the amount of carnivores that are alive in your area? (performance payment)?
50. If you had a choice between having the 2004-05 rules/prices for the compensation program for as long as the project continues or not have a program at all, what would be your choice?
51. If you had a choice between having a reduction in prices (from 2004-05 prices) for as long as the project continues or have no project at all, what would be your choice?

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52. Have you ever been a committee member? When?
53. What do you think of these questions?
54. Do you have any questions for me? Is there anything you would like to know about the compensation project?