



LIVING WITH LIONS



LAIKIPIA PREDATOR PROJECT KILIMANJARO LION CONSERVATION PROJECT

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Photo: Mike Calvin



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Executive Summary

We are working to restore, conserve and manage viable populations of large carnivores by developing management techniques that foster coexistence of people, livestock and predators in areas bordering parks and other regions without formal protection.

Large predators have been eliminated from most of the world because they prey on livestock and populations in Africa are plummeting. Few parks are large enough to ensure lions' long term survival, and because conflict with livestock is by far the most serious threat to large carnivores, it is critical that we find methods to integrate predator conservation with realistic livestock management.

The Laikipia Predator Project is the first integrated investigation into the ecology, management and conservation of large predators in human-dominated African landscapes. Laikipia is the only part of the world where ranchers enthusiastically tolerate a healthy population of large carnivores, making it an ideal laboratory in which to develop realistic and progressive predator and livestock management practices.

The Kilimanjaro Lion Conservation Project is attempting to save one of the world's most important remaining lion populations. Maasailand is the vast ocean of grass straddling the Kenya-Tanzania border, home to Serengeti, Ngorongoro, the Maasai Mara, and Amboseli National Parks. On the Kenya side, lions are under severe and increasing pressure, as people are spearing and poisoning lions at a rate which threatens population extinction within a very few years.

If viable predator populations are to persist between protected areas, two conditions must be met:

- **Pastoralists and ranchers need affordable and culturally acceptable methods of protecting their domestic animals from large carnivores; and**
- **They must realize significant financial gain from predators to offset the costs of living with them.**



Photo: Arthur Court

DEGREES EARNED

We are extremely pleased that three colleagues have been awarded Master's Degrees in 2007 for their research as part of the KLCP:

- **Leela Hazzah**, University of Wisconsin, Madison. *Living Among Lions (Panthera leo): Coexistence or Killing? Community attitudes toward conservation initiatives and the motivations behind lion killing in Kenyan Maasailand*. Leela is continuing her research on her PhD. from UW.
- **Ogeto Mwebi**, London South Bank University, UK. *Herding Efficiency as a Factor in the Human-Carnivore Conflict in Kenya: A Comparative Study of the Laikipia and Mbirikani Group Ranches*.
- **Shari Rodriguez**, School for International Training - Brattleboro, Vermont. *Perceptions and Attitudes of a Maasai Community in Southern Kenya Regarding Predator Damage Compensation, Wildlife Conservation and the Predators that Prey on their Livestock*

LAIKIPIA PREDATOR PROJECT

Nowhere else in the world do commercial ranchers enthusiastically tolerate a healthy population of large carnivores. This makes it an ideal laboratory in which to develop realistic predator and livestock management. The Mukogodo Maasai of Laikipia are traditional pastoralists, and their communally owned lands are ecologically and socioeconomically representative of many Africa rangelands. Principles of 'predator-friendly' livestock practices that we have established in Laikipia are widely applicable in the rest of Africa.

PROJECT STAFF:

- Director:** Laurence Frank, PhD.
- Project Biologist:** Alayne Mathieson, MSc.
- Predator Conservation Officer:** Steven Ekwanga
- Hyena Conservation:** Stephanie Dolrenry
- Hyena Assistant:** Samuel ole Putanoi
- Pilot:** Andrew Francombe

Alayne Cotterill and Steven Ekwanga: *Field Work*

Over the course of the project, we have handled 146 lions a total of 200 times; 118 have been radio collared. This year, twelve new lions were collared and a further three had old collars replaced.

Steven Ekwanga: *Eramatere Naata Dupoto* In 2005-6, Steven assisted Richard Jones and Jenny Sharman (True Nature Films) in making a one hour video in the Maasai language on predator conservation and livestock management in the called *Eramatere Naata Dupoto*, or "Benefiting from Good Management". The film is beautifully made, with a lot of wildlife footage and a sound track by a traditional Mukogodo Maasai musician. It has sections on the role of lions and other predators in traditional culture, many ways of protecting livestock from predators, the economic importance of tourism, and overgrazing/rangeland management. The Denver Zoo donated funds for a generator and video projector. In the past year, Steven has done 49 showings, mostly in one-room school houses, in Laikipia, Samburu and Maasailand. They have been of all the local pastoralist tribes including Maasai, Mukogodo Maasai, Samburu, Njemps, Pokot, and Turkana.

When Steven shows the film outside of Laikipia, he trains a local person in presenting the material, answering questions and leading discussions. This way, we are building up a core of people who can show it on their own. On Mbirikani Group Ranch in Kajiado District he trained Anthony Kasanga, Lion

Guardian coordinator, and also the head scout on Kuku Group Ranch, in leading the discussions and answering questions. In the Mara and in Samburu he also trained head scouts.

Over 4000 people have watched this film and their feelings and increased tolerance are obvious. They are all very receptive to the message; in discussions afterwards, everyone finds it very educational and informative, especially since it is in their own language and about livestock, the central aspect of their own culture. With a grant from Conservation Force, we are now producing a Swahili version that will be shown in non-Maasai speaking areas, including Tanzania, and for broadcast TV.

District	Showings	Viewers
Laikipia	18	1497
Samburu	4	470
Kajiado/Loitokitok	18	1524
Narok	9	553
TOTAL	49	4044

We are working with the International Livestock Research Institute (ILRI), to include the video in their educational efforts with pastoralists throughout much of Kenya. Steven did an initial showing with ILRI in the Kitengela area, bordering Nairobi National Park, where many lions were killed in the last few years.



Photo: Kathryn Combes

Community film show in Laikipia, Sept. 2006.

Demonstration Bomas Assessment: Over the last few years, Steven has erected 115 Demonstration Bomas throughout Laikipia and parts of Samburu, to show people how small improvements in their bomas and herding practices can reduce losses to predators. To evaluate how communities have adopted our recommendations, we are currently working with the Community Liaison Officers and Dr. Delphine Malleret King of the Laikipia Wildlife Forum on a formal assessment of results.

Alayne Cotterill: What Makes Good Lions Go Bad? Alayne has started her D.Phil. research at Oxford University, affiliated with the Wildlife and Conservation Research Unit (WildCRU). Her goal is to understand the factors that cause certain individuals and prides to become chronic livestock killers, in

order to develop tactics to prevent the development of livestock depredation behaviour, thus reducing the number of lions killed in retaliation. Previous research by the LPP has shown which husbandry techniques reduce attacks from lion, but almost nothing is known about how changes in land use and husbandry techniques affect the behavioral ecology of the lions themselves. The fact that lions perceive hunting livestock as high risk and try to avoid it is highlighted by the fact they are found to take livestock in smaller proportions than would be expected from well-established foraging models. However, some lions are much more willing to take the risk of killing livestock than others and it has become clear that understanding the factors which affect this difference is crucial for effective conflict resolution.

Alayne's research is designed to answer the following key questions:

- What age, sex and social category of lions are most likely to become livestock killers?
- What are the most effective ways to reduce livestock depredation behaviour?
- How does lion behaviour change in response to persecution?
- Do changes in the demography of a lion population due to lethal persecution actually increase the likelihood of livestock depredation behaviour in the remaining lions?
- How does the use of good boma design affect livestock depredation behaviour in lions?
- Do lions learn stock killing when their home range includes communal land (where livestock is superabundant but wildlife is rare), or on commercial ranches with poor husbandry practices?

Coupled with what we already know about effective husbandry practices and lion biology, this knowledge will contribute significantly towards designing a comprehensive strategy for the management and conservation of large carnivores in human/livestock dominated landscapes. Proper management of lions would help reduce livestock depredation, improve people's attitudes towards lions, ultimately reduce the conflict between lions and people and help reverse the decline in lion numbers. The findings from this project will therefore be essential for the conservation of lions in human/livestock dominated landscapes across Africa.



Photo: Josep Oriol

Alayne and Steven with newly GPS-collared male on ole Naishu Ranch.

Alayne is taking advantage of the fact that ole Naishu Ranch, which until recently simply bedded cattle down in an open area, is now installing lion-proof bomas. She is testing the hypothesis that exposure to increased opportunity leads to increased livestock depredation. Good livestock husbandry is very important in preventing the development of livestock-killing behaviour in lions. Lions are able to assess local risks involved with livestock depredation associated with differing livestock husbandry practices on different properties and adjust their behaviour accordingly.

All the prides regularly using the Ole Naishu area have had an adult pride member fitted with a Vectronic GPS collar taking fixes every hour through the night, and another adult pride member fitted with a VHF collar. These four collars are being used to collect base line data on lion movements and aspects of livestock depredation behaviour while there are no bomas. Secure bomas for livestock are currently being built and deployed. Data on every livestock depredation event is also being collected. The work on ole Naishu will also be replicated on the ranches and community areas of northern Laikipia, as part of the management study described below.

Steven Ekwanga, Alayne Cotterill, Laurence Frank: Northern Laikipia Lion Management

Nowhere in Africa has anyone ever attempted to manage lions outside protected areas, either for coexistence between pastoralists and lions, or for biologically informed sustainable trophy hunting. The Laikipia Predator Project has shown that ancient methods of livestock husbandry are remarkably effective in protecting livestock from predators. In spite of those, some lions will always become livestock killers, and our current research in Laikipia focuses on understanding the factors that lead to stock-raiding. Our long term partner ranches in northern Laikipia, comprising over 1200 km², are collaborating with us to help manage the lion population to maximize lion numbers for tourism while minimizing livestock losses. Initially, this will involve more formal information sharing on problem lions among ranches and the LPP, and improved collaborative Problem Animal Control practices in the region. Steven will have primary responsibility for collaring and monitoring lions in the study area. We hope that KWS will be an active partner in this effort. This is an unprecedented opportunity that will lead to advances in conservation of lions in both livestock-producing regions (i.e., most of savanna Africa) and in the hunting areas of Tanzania, Mozambique, Botswana, Zimbabwe, and Zambia.

Mike Calvin and Debby Wettlaufer of Sosian Ranch have been very involved in monitoring lions in their area. In an extraordinarily generous act, they have donated their Landrover for use in the lion management project.

Stephen Gold and his associates donated a state-of-the-art solar electric system to LPP, replacing the expensive and noisy generator we have used for years. Having plentiful full time electricity makes our lives far easier, and we are extremely grateful to Steve.

Stephanie Dolrenry: Spotted Hyena Behavioral Ecology and Conservation in Human-Dominated Landscapes Spotted hyenas (*Crocuta crocuta*) endure in the human-dominated pastoralist landscapes of Kenya where lions have been eliminated and little wild prey exists. In the absence of lions, spotted hyenas cause the most depredation on Maasai livestock; to the Maasai, hyenas are vermin without benefit, inciting hatred, not only for hyenas, but for all carnivores. This project addresses spotted hyena predation on Maasai bomas in an effort to attenuate conflict and increase tolerance for all carnivores. All previous hyena studies have focused on populations in protected areas. Stephanie is undertaking this research for her PhD work through the University of Wisconsin – Madison under Dr. Laurence Frank and Dr. Adrian Treves.

The goal of the hyena conflict ecology project is to reduce conflict, not only between hyenas and Maasai, but also to serve as a model for reducing human-predator conflict on a regional level. This is the first

integrated and comprehensive investigation into the causes and resolution of human-hyena conflict. Results from this study will be relevant to rural people throughout Africa where depredation by hyenas and other predators affects livelihoods and threatens predator populations with extinction. Stephanie has found that people in the Amboseli region kill many lions in retaliation for hyena depredation, carried out by salting carcasses with poison and by spearing. The widespread use of poison against hyenas also severely impacts all other carnivores and the magnificent array of African vultures. We expect that reduction of conflict between Maasai and spotted hyenas will decrease retaliatory killing and increase tolerance for all predators, including lions.

There are two primary aims of this research, which will be carried out in both LWL study regions. The first is to understand the social and foraging behavior of Africa's second largest carnivore within pastoralist-dominated ecosystems; The second is to use this information to develop practical methods for reducing hyena depredation on livestock. Both goals benefit from a mixture of ecological research and social science methods.



Photo Samuel ole Putanoi

Steven and Stephanie with GPS collared hyena Ntang'eno

To achieve the first aim, Stephanie is using GPS collars and advanced remote video technology in conjunction with participatory rural appraisals and extensive community involvement. To achieve the second, she will work with participating households to experimentally manipulate livestock husbandry and waste disposal practices. There will be four replicates in different communities, encompassing variability in wild prey availability, primary livestock species, and existing anti-predator tactics utilized by Maasai in both regions. All sites are within the study regions of the Living with Lions projects, thus supplementing existing conflict depredation and boma manipulation data.

To aid with the implementation of this project, Stephanie is using the previous research and conservation actions that have been tested and applied successfully by LPP's Demonstration Boma Project and the KLCP. A critical predictor of success are the excellent community relations that Stephanie and other team members have developed in the rural communities of Laikipia and Mbirikani Group Ranch.

In July 2006 and in July 2007, we deployed GPS collars (Vectronic Aerospace, Berlin) on three spotted hyenas in the Mukogodo Maasai communal areas of Laikipia District. They were programmed to take GPS locations every 15 minutes from 6 PM to 6 AM and the data were overlaid in ArcView 3.2, on the boma locations. These revealed 'trap-lining' behavior, the hyenas traveling from one boma to the next. In April 2007, Stephanie moved to Il Polei Group Ranch. Living in a traditional Maasai hut within the home range of one of the collared hyenas, she recorded relevant characteristics of every boma, including quality of fencing, the number and health of dogs, proximity to conservation areas, number of livestock, conflict history, etc. This questionnaire presented over 30 questions to each homestead.

While the days were spent visiting bomas and community members, the nights and early mornings were spent collecting data on hyena's movements using their spoor and vocalizations while also identifying den sites, both natal and communal. We used census techniques such as call-in to get an idea of numbers of these persecuted animals. Also, used were opportunistic carcass observations at bomas. These observations contributed to our knowledge of the hyenas approach and behavior near the boma.

For data on diet, Stephanie collected hyena scat from den sites and from human settlements. Wild prey transects were done in the area during the night, revealing very low numbers of natural hyena prey. We are now compiling all these data, mapping the bomas and their characteristics along with the conflict data to overlay onto GPS hyena movement data.

In addition, Stephanie coordinated the Kilimanjaro Lion Conservation Project for five months while Seamus MacLennan was at Oxford. She also undertook the initial training of the Lion Guardians, teaching them radio-tracking, how to systematically track predators and to fill out the corresponding datasheets.

KILIMANJARO LION CONSERVATION PROJECT

An exceptionally important wildlife area, Maasailand covers much of southern Kenya and northern Tanzania. However, for the past few years, the Maasai throughout this vast region have been killing lions at a rate which will drive the population to extinction within a few years. Based on Mbirikani Group Ranch (MGR), the KLCP is an effort to understand the recent loss of tolerance, and to find solutions to it. The project combines studies of the surviving lion population, employment of young warriors as Lion Guardians, and intensive education on livestock husbandry, and monitoring of the compensation plan for livestock losses run by the Ol Donyo Wuas Trust.

PROJECT STAFF:

Director: Laurence Frank

Project Biologist: Seamus MacLennan

Field Assistant: Ernest Lenkoina

Lion Guardians

Supervisor: Leela Hazzah

Coordinator: Anthony Kasanga

Guardians:

- Mokoi Lekanayia
- Lekina Ngida
- Melubo Ole Nakenyu
- Ritei Kashu
- Olubi Lairumbe
- Masarie Ologela
- Kapande Narok
- Koikai Mutungei

- Kipamba Seleka

Hyena Conservation: Stephanie Dolrenry

Pilot: Richard Bonham

Camp Staff and Data Entry: Justus Supeet and Maria Saruni

Seamus Maclennan: Fieldwork

Lion collaring and monitoring

Lion monitoring has continued in the primary study area, MGR. One lioness, “Charley”, had her collar changed in September 2006, and in 2007 we have collared 3 males and 2 females on Mbirikani. KLCP now has collars on 10 individuals, which are monitored from the ground or air at least once weekly. There are 15-20 lions on the ranch, possibly an increase over last year.

Regional Expansion of lion monitoring

After extensive discussions with Luca Belpietro of the Maasai Wilderness Conservation Trust on Kuku Group Ranch to the south of MGR, Seamus is assisting with lion monitoring on that 960 km² property; he has thus far collared two males and one female. This expansion nearly doubles the area of lion monitoring in this region, and will allow Luca to evaluate the impact of a livestock compensation scheme he began there in early 2007.

Collaboration with WildCRU

In late 2006, Seamus spent four months at Oxford University’s WildCRU as an academic affiliate, analyzing and writing up data from the Mbirikani Predator Compensation program; that paper will be submitted by the end of 2007. This is the beginning of a longer-term collaboration between Oxford and Living with Lions; Seamus will be doing his MSc. degree at WildCRU.

Aircraft

Seamus has obtained his private pilot’s license (self-funded), and it appears that he will soon have access to a Super Cub aircraft being bought by the OI Donyo Wuas Trust. This will vastly improve his ability to monitor lions in the region.



Seamus in the cockpit.

Development of KLCP research base

Donations from The Philadelphia Zoo and the Denver Zoo were used to build a modest office and storage area. Construction of the office was completed in June 2007. A modern solar electrical system donated by **Stephen Gold** has transformed life in camp, powering electric lights, laptop computers, printers and equipment chargers. A satellite internet system at Ol Donyo Wuas Lodge has been expanded to reach our camp, vastly simplifying communications.



Photo: Seamus Maclellan

New office and storage building, donated by Denver Zoo and Philadelphia Zoo

Leela Hazzah: Lion Guardians

Retaliatory and traditional spearing by Maasai warriors (*murrans*) is the greatest threat to the survival of lions in Kenyan Maasailand today. In response to the slaughter of over 130 lions in the Amboseli-Tsavo ecosystem since 2001, and in collaboration with the local communities of MGR, the Living with Lions project and the Maasailand Preservation Trust created a program called “Lion Guardians” in October 2006. This program is rooted in Leela’s studies of conservation attitudes and changing culture among the Maasai, and is directed by her. The Lion Guardian’s program attempts to reduce the pressure on lions by employing their greatest threat, *murrans* (warriors), to conserve them rather than kill them. Since the onset of this project there have been no lions killed on Mbirikani ranch. Throughout Kenya, the vast majority of Maasai gain little or nothing from conservation, while often paying a high price in livestock lost to predators, and in competition for grass between their cattle and wild grazers. Further, most young men are uneducated and unemployable in a rapidly changing world. Thus, Lion Guardians offers income from wildlife for the most disaffected segment of Maasai society.

The Guardians have two major duties: 1) to monitor lions and other carnivores by both radio and traditional tracking, and 2) aid their communities in avoiding livestock depredation losses. Specifically;

- informing herders of lion presence so that they can graze their cattle elsewhere;
- improving livestock *bomas*
- helping herders find lost livestock that are left out in the bush (which represents approximately 65% of all depredation events on Mbirikani Ranch)
- educating communities about the importance of carnivores and conservation; and

- most importantly, Lion Guardians dissuade other *murrans* in their communities from killing lions.

Since the inception of the project, guardians have actively prevented at least six hunting parties from killing lions. During the same time period, over 16 lions have been killed in surrounding group ranches by *murrans*. Given that the guardians come from the communities in which they work, and are older *murrans* (many have also killed lions in the past) they are very well respected by all community members and can assuage a tense situation of angry warriors wanting revenge for their dead cow.



Lion guardians and Leela

Photo: Anthony Kasanga

Currently nine guardians are employed in the seven communities on the ranch where lion-livestock conflict is highest. The program is managed by Leela Hazzah and a Maasai coordinator, Anthony Kasanga. Each guardian has been trained to document lion and other carnivore presence using telemetry and GPS units, and as most are nonliterate, they record data on a simple form with pictures rather than words. Each lion that has been collared since the start of the project has been given a Maasai name by the guardian/s that helped with the collaring. In addition, every employee has a cell phone that is used to report back any significant sightings of lions or any illegal activity to KLCP. Anthony maintains a blog at <http://www.wildlifedirect.org/blogAdmin/lionguardians>

In March 2007, we conducted 40 interviews throughout the ranch to assess community awareness of and attitudes towards the LG program. We will conduct similar interviews every six months to monitor community and individual changes in attitudes and tolerance of carnivores, and to measure the success of the program. During May and June, meetings were conducted in each area where Lion Guardian's work. These meetings provided a forum where guardians could fully explain their duties and also where community members could provide suggestions to improve the program. Today, the LG program is very well known throughout the ranch and the excitement is spilling to neighboring group ranches which want their own programs.

In the past few years, the majority of lions killed in the A-T ecosystem were carried out on and around Olgulului Group Ranch (OLG) by Olgulului *murrans*. In June we spent a week in OGR, showing the education Maasai film (*Eramatare Naata Dupoto*), and speaking with *murrans* about the Lion Guardian program. The film reached over 650 people, many whom had never seen a film before. There is a high

demand for additional showings of the film from communities in OGR, and we returned in July for another round of showings. The idea of the LG program was very well received by the OGR *murrans*, and they have requested a Lion Guardian program their area, confidently stating that the program would quickly end lion killing. We are seeking funds to establish a program on OGR.

Leela's PhD research will extend into other regions of the Amboseli-Tsavo ecosystem where lion killing continues (specifically, Olgulului GR, Kuku GR, and Mbirikani GR). Her study has three aims:

1. To assess the social and spatial variables of risk and vulnerability of livestock to carnivores.
2. To investigate how outside forces (including compensation, religion) shape coping ability and strategies.
3. To examine the effect of participatory conservation on increasing broad community tolerance of carnivores by analyzing the effect (and the how to) of Lion Guardians.

Ogeto Mwebi: Herding Study

Herders often lose livestock while out grazing during the day, and often fall prey to predators. Ogeto compared herding mechanics of Maasai pastoralists in Kajiado and Laikipia districts during the dry seasons. The study was conducted on Mbirikani Group Ranch between December 2005 and March 2006 and on Laikipia Group Ranches between August and October 2006. The two study areas were chosen for comparison because available data showed that there were differences in livestock predation patterns between them. Data collection methods used included livestock predation incident verification, interviews and observations in order to validate and triangulate information.

A total of 46 (35 in Mbirikani and 11 in Laikipia) livestock predation incidents were reported during the study and 71 livestock were killed. Due to the presence of the Mbirikani Predator Compensation Fund on MGR, all Mbirikani incidents were verified but only three of the Laikipia ones were. Most of the Mbirikani attacks were of lost livestock by cheetah and spotted hyaena and those in Laikipia were mainly by spotted hyaena breaking into bomas.

Ogeto conducted 110 interviews of household heads and herders indicated that Laikipia residents had fewer livestock than those of Mbirikani but that general herding strategies were the same in both areas. Laikipia pastoralists discipline herders who lose livestock in the field while on Mbirikani herd owners consider losing livestock as normal and do not discipline their herders for losses.

Herding observations showed that Laikipia herders lost fewer livestock than Mbirikani herders. Their efficiency is attributable to consequences of trespass on private neighboring ranches, high chances of encountering elephants and expected disciplinary action from herd owners. Mbirikani herders relaxed more in the herding fields and lost livestock more often because they expected no disciplinary action from herd owners, had unlimited ranging areas, did not count their livestock and returned to boma later than those of Laikipia. Mbirikani herders take their animals further, water them less frequently and leave them out later in the day. All these factors contribute to higher rates of loss.

Shari Rodriguez: Perception of Compensation by the MGR Community: KLCP works closely with the privately funded Mbirikani Predator Compensation Fund, organized by Tom Hill and Richard Bonham, the first experiment in compensation for livestock kills since the Kenya government abandoned its own corruption-riddled system years ago. The PCF is a carrot-and-stick approach, providing generous payments for livestock killed by predators but requiring verification of claims by a team of Predator Game Scouts and reduction in payouts for losses due to poor husbandry. KLCP lion monitoring is essential to assessing the success of the PCF.

Shari's study examined the Predator Compensation Fund from the perspective of the participating community. Using stratified random selection, 101 male and female adult subjects were interviewed over a 4 month period during mid-2005, using a semi-structured interview format. The results showed that 63% of subjects felt the Predator Compensation Fund was effective at stopping people from killing carnivores. Indeed, subjects indicated the Predator Compensation Fund increased tolerance levels for carnivores by 47%. The majority of subjects indicated they liked compensation (68%) and indicated the Predator Compensation Fund was important to their livelihood (87%). Yet despite their desire for the project to continue (82% in favor), numerous comments were made suggesting that there were still misunderstandings about the rules and procedures. While almost 85% of subjects felt Mbirikani Group Ranch as a whole benefited from carnivore-related projects, 44% felt they personally received no benefits. Successful resolution of these issues depends on frequent and extensive education efforts about all aspects of the project to increase the project's transparency. Adjustments to some rules and procedures are also 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 carnivores attack. Implementing effective, resolution-minded changes should have significant positive effects for the Predator Compensation Fund, Mbirikani Group Ranch and, ultimately, carnivores.

COLLABORATIONS

KWS: Large Carnivore Conservation Task Force and National Lion Conservation Strategy

Mbirikani Predator Compensation Fund KLCP continues to work closely with this privately administered fund to collect detailed data on conflict between people and large carnivores.

Mpala Research Centre: Margaret Kennard, the new director of MRC, is emphasizing conservation biology and collaborative research programs involving major landscape species, including predators, elephants, and zebras. Of particular relevance to us is the establishment of a GIS database that will collate, organize and present GPS collar data from all large mammal studies, overlain on layers representing relevant ecological and socioeconomic factors.

Laikipia Wildlife Forum: Demonstration Boma Program and assessment.

National Institutes of Health, Laboratory for Genomic Diversity: We provide blood and tissue samples for on-going studies of FIV and other diseases

Samburu-Laikipia Wild Dog Project: We provide samples and data for on-going investigations of rabies and other diseases.

PUBLICATIONS in 2006-7

Hazzah, L. and Dolrenry, S. 2007. Coexisting with predators. *Seminar*: <http://www.india-seminar.com/semframe.html>

Lindsey, P.A., Alexander, R., Frank, L.G, Mathieson, A., and Romañach, S.S. 2006. Potential of trophy hunting to create incentives for wildlife conservation in Africa where alternative wildlife-based land uses may not be viable. *Anim. Cons.* 1-9.

Lindsey, P., Frank, L.G, Alexander, R., Mathieson, A., Romañach, S.S. 2007. Trophy hunting and conservation in Africa: problems and one potential solution. *Cons. Biol.* 21:88

Wagner, A.P, Frank, L.G., Scott Creel, S. In press. Spatial Grouping in Behaviourally Solitary Striped Hyenas (*Hyaena hyaena*) *Anim. Behav.*

Wagner, A.P, Scott Creel, S., Frank, L.G, and Kalinowski, S.T. In press. Patterns of Relatedness and Parentage in an Asocial, Polyandrous Striped Hyena Population. *Molec. Ecol.*

White, P.A., Frank, L.G., Barber, P. H. 2007. A remotely operated motorized burrow probe to investigate carnivore neonates. *J. Wildl. Manage.* 71:1708-11.

Woodroffe, R., Frank, L., Lindsey, P.A., Ranah, S.M.K., Romañach, S. 2006. Tools for conserving large carnivores in Africa's community rangelands: a case-control study of livestock husbandry. *Biodivers. Cons.*

Papers to be Submitted by December 2007

Hazzah, L.; Naughton, L.; Borgerhoff Mulder, M.; Treves, A.; Frank, L. *In prep.* Lions and Warriors: social factors underlying declining African lion (*Panthera leo*) populations and the effect of incentive-based management in Kenyan Maasailand.

MacLennan, S.D., Groom, R., Macdonald, D. W., Frank, L.G. *In prep.* The Mbirikani Predator Compensation Fund: an example of a direct incentive scheme to bring about tolerance of lions.

POPULAR MEDIA 2006-7

Print:

Frank, L.G. 2007. Spud Buff: Big Bore Adventure for the Vegetarian Hunter. *Dakota Magazine*. Spring 2007

Hazzah, L. 2007. Letter from the field "Living with Lions" *Wildlife Conservation Magazine*. April 2007: 6-9

MacLennan, S. 2007. Lions, Livestock, and Spears. *Africa Geographic*, September:60-66

USA Today 30 August 2006 "Southern Kenya's Maasai tribe, lions locked in battle"

http://www.usatoday.com/news/world/2006-08-30-lions_x.htm

TV:

FLL productions August 2006. *The Kilimanjaro Lion Conservation Project*, a 10 minute video introduction to and summary of KLCP. <http://www.f-l-l.nl/content/view/1/6/>

May 2007 (FLL productions) "Lion Guardians", a 10 minute introduction to the Lion Guardians program <http://www.f-l-l.nl/content/view/17/22/>

Internet:

<http://www.wildlifedirect.org/blogAdmin/lionguardians>

<http://news.nationalgeographic.com/news/2007/04/070410-lions-kenya.html>

LECTURES

Conferences attended, talks presented:

- Savannas Forever organizational meeting, Dar es Salaam, Tanzania (July 2006): **Leela and Laurence**
- Wildlife Conservation Society, New York (July 12, 2006): **Leela**
- Wildlife Conservation Network Expo; Palo Alto, California (October 6-9 2006): **Leela, Stephanie, Laurence**
- Large Carnivore Seminar, Morua, Cameroon, October 31, 2006: **Seamus**
- Ecole de Faune, Garoua, Cameroon, November 3, 2006: **Seamus**
- Human Wildlife Conflict Collaboration; Washington D.C. (November 1-2, 2006): **Leela and Laurence**
- Colorado State University, Colorado (December 7, 2006): **Leela**
- University of Wisconsin, Madison (September 29 and November 18, 2006): **Leela**
- Kenya Lion Researchers (April 2007): organized by **Seamus**, attended by **Seamus, Stephanie, Alayne, Leela and Laurence**

- Research Imperatives for Biodiversity Conservation and Management Nairobi (18th to 20th April 2007): **Laurence**
- East African Wildlife Society, Nairobi, Kenya, July 2007: **Laurence**
- Society for Conservation Biology, Port Elizabeth, South Africa (July 1-5, 2007): **Seamus and Leela**
- Wild Felid Biology and Conservation Conference, Oxford University, September 17-22, 2007 – **Laurence**
- Kenya Wildlife Service Education Officers, Nyeri, Kenya, October 10: Solutions to Human-Predator Conflict: **Steven**

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