

# Attitudes Toward Predators and Options for Their Conservation in the Ewaso Ecosystem

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**ABSTRACT.** The act of killing predators over livestock predation has been the principal cause of declining predator populations throughout Africa. Finding solutions for the coexistence of people with predators in the Ewaso region is of great importance for the local tourism industry and for the persistence of Kenya's wildlife outside of protected areas. We report results of an assessment of attitudes toward predators by landholders and land users in the Ewaso region and their tolerance of livestock losses, relative to socioeconomic factors. Although prospects are good for predator conservation on large-scale private ranches, the future of predators on communally owned properties remains uncertain. Prospects would be improved not only by finding solutions to reduce livestock depredation but also by ensuring that individuals tolerating losses from predators receive benefits from having predators on their land. Additionally, policy changes are needed to allow landholders to capitalize on benefits from wildlife, which would encourage their participation in wildlife conservation.

## PREDATORS AND PEOPLE

Predators are among the hardest animals to conserve because they range widely, often outside of protected areas and onto land *not* used for wildlife conservation. Predators can become a liability to landholders, who incur financial losses when livestock are killed. As a result, people kill predators, often preemptively. For example, lions (*Panthera leo*) are killed in Kenya because of conflict over livestock (Woodroffe and Frank, 2005). Predators, including wild dogs (*Lycaon pictus*) and cheetahs (*Acinonyx jubatus*), are suppressed on some wildlife ranches in southern Africa where they kill antelopes, which are valuable for ecotourism and trophy hunting (Sillero-Zubiri and Laurenson, 2001; Ogada et al., 2003; Marker et al., 2003; Lindsey et al., 2005). Persecution of predators has resulted in serious declines in the population sizes and distributions of many predator species (Woodroffe and Ginsberg, 1998), and it remains the most important source of their mortality.

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Finding ways to increase tolerance of predators is critical for their survival (Hackel, 1999; Woodroffe, 2000). Strenuous attempts have been made to improve local citizens' attitudes toward predators in rural Africa through community-based conservation projects, education campaigns, and outreach programs (e.g., Painted Dog Research Project, Zimbabwe; Cheetah Conservation Fund, Namibia). Some successful programs have focused on generating income from predators through ecotourism or sport hunting (Adams and Hulme, 2001). For such programs to work, financial returns from wildlife must reach individuals who bear the costs of living with wildlife and must be adequate to offset not only direct costs but also opportunity costs. This prerequisite is difficult to achieve because the benefits any individual can receive from predators are often diluted by the number of community members among whom benefits must be shared (Walpole and Thouless, 2005), whereas costs are accrued individually. Accordingly, predator population sinks can form outside of protected areas, threatening predators both outside and inside of protected areas.

## CONSERVATION CHALLENGES IN KENYA

Kenya's national parks and reserves house 35% of the country's wildlife; the remaining populations are found on land that is privately or communally owned or held in trust by local government (Grunblatt et al., 1996; Western et al., 2009). The persistence of wildlife is important for the persistence of Kenya's primary industry, tourism (Ottichilo et al., 2000). Human populations continue to grow, resulting in the movement of people from densely populated areas to Kenya's rangelands to practice subsistence livestock farming, where they overlap with the majority of the country's wildlife (Ottichilo et al., 2000). Over the last decade Kenya's human population has grown nearly 4% per year (Shikwati, 2004). Rising human populations have driven habitat conversion to accommodate subsistence pastoralism and agriculture, resulting in increased conflict between people and wildlife and population declines of many wildlife species (Awere, 1996).

## EWASO ECOSYSTEM

Kenya's Ewaso ecosystem is an area dominated by livestock, but it retains the potential to host viable wildlife populations. With six large carnivore species indigenous to the area (cheetahs, lions, leopards [*Panthera pardus*],

spotted and striped hyenas [*Crocuta crocuta* and *Hyaena hyaena*], and the endangered African wild dog), reducing conflict between people and predators is essential for the persistence of wildlife in this area. This need is particularly true for predators, which range across a mosaic of land uses, including subsistence pastoralism, patchy small-scale agriculture, large-scale commercial livestock ranches, and wildlife conservation and tourism areas. In this chapter we report results of an assessment of attitudes toward predators by local landholders and land users, and their tolerance of livestock losses, relative to socioeconomic factors. Our goals were to examine the challenges facing people and predators and to identify ways to improve their potential for coexistence in the region.

## INTERVIEWS

We interviewed 416 community members and commercial livestock ranchers in the Ewaso ecosystem in 2004–2005 to assess their attitudes toward predators, tolerance for livestock kills, and options for predator conservation (Figure 1). We conducted interviews with 23 commercial ranch managers or owners. Nine local assistants interviewed 393 rural community members who owned livestock, including people from 10 tribes (Maa-sai and Samburu are the predominant tribes in the area, although people from other tribes, including Borana, Kalenjin, Kikuyu, Merian, Pokot, Rendile, Somali, and Turkana, were also interviewed).

Before each interview, we assessed the respondents' familiarity with predators (e.g., hunting behavior) using an illustrated card with color drawings of each predator (for interview details, see Romañach et al., 2007). The questionnaires were designed to assess respondents' attitudes toward and tolerance for livestock losses from cheetahs, jackals (*Canis mesomelas*), leopards, lions, spotted hyenas, striped hyenas, and wild dogs. We quantified respondents' tolerance for predator attacks on livestock by recording how many livestock (measured as the number of cattle or the combined number of sheep and goats) respondents were willing to lose before trying to kill the predator responsible. Older interviewees were also asked what their tolerance for livestock losses to predators was 20 years ago. Interviewers asked respondents whether they would want predators on their properties if they were to start tourism operations. We asked whether people thought trophy hunting should be legalized again in Kenya, an industry banned in Kenya in 1977 because of poor control and coordination and large-scale poaching (Outoma, 2004). Interviewees were also asked, in an open-ended question,

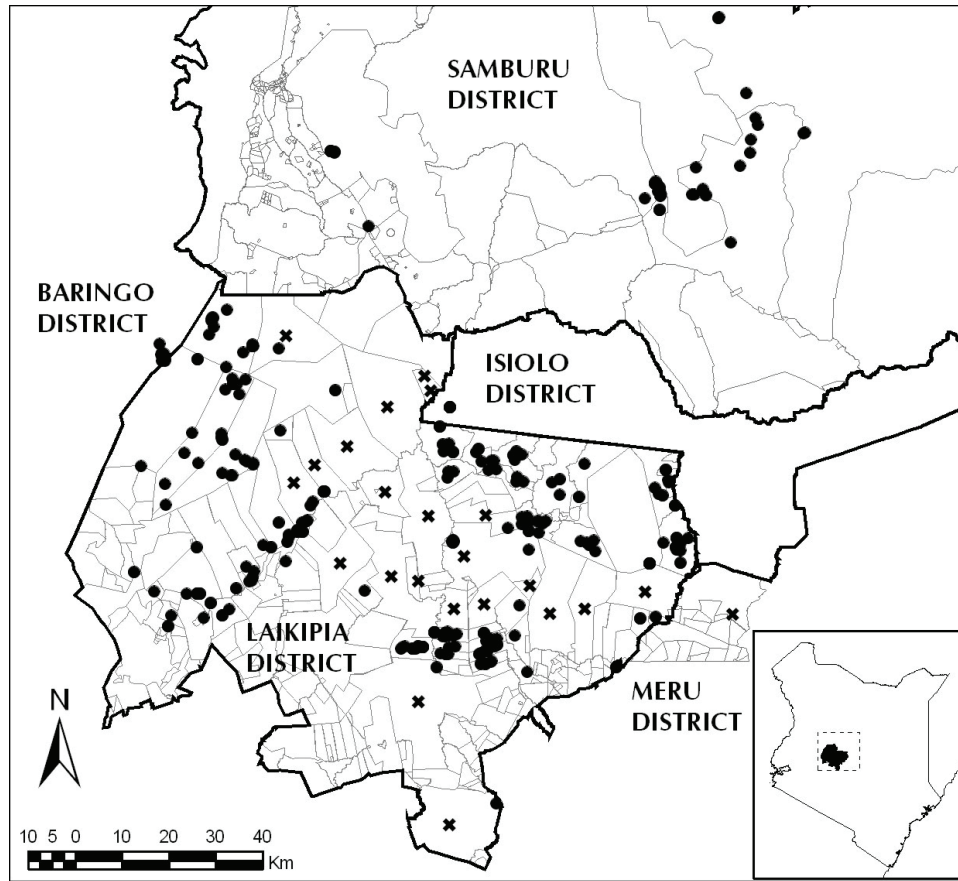


FIGURE 1. Map of locations for commercial rancher interviews (x) and community member interviews (•). (Source: Romañach et al., 2007.)

to provide suggestions for methods to promote coexistence between people and predators.

During each interview, we recorded information on characteristics of the property where the interviewee was living at the time of the interview: land use type (e.g., group ranch, commercial ranch); if the property had wildlife tourism as a form of income at the time of the interview; primary source of property income; benefits received from wildlife (e.g., dams built, communications radios purchased); whether the property had a wildlife conservation area set aside (where livestock did not graze); whether there was an immediate (within two years) plan to start a wildlife conservation area if there was not one at the time of the interview; presence of each predator on the property; and for commercial ranchers, whether ranch activities served as the primary source of income for the ranch owner, compared to having a subsidized income, for example. We recorded personal information about each interviewee: age, gender,

number of years of formal education, primary source of household income, and the number of their livestock killed by each predator in the last year.

## FINDINGS AND IMPLICATIONS FOR PREDATOR CONSERVATION

### ATTITUDES AND TOLERANCE

More than 90% of commercial ranchers were in favor of having predators on their land (Figure 2). We found that commercial ranchers want to have all predators in question on their land, regardless of the rancher's personal characteristics (e.g., age, education) or the ranch characteristics (e.g., primary source of property income, presence of tourism). Commercial ranchers were also more tolerant of livestock losses from all predators compared to the tolerance of community members.

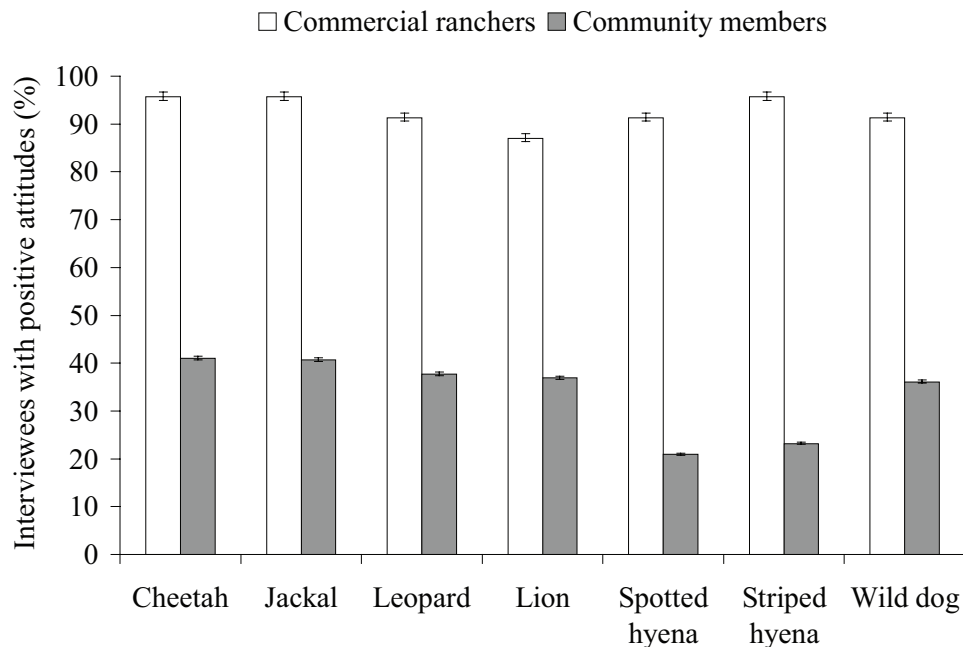


FIGURE 2. Percentages (95% confidence intervals) of commercial ranchers and community members who wanted each predator on their property. (Source: Romañach et al., 2007.)

Community members were less enthused about the presence of predators. For example, only about 20% wanted to have spotted hyenas on their land, and about 40% wanted to have other predator species. Community members were more likely to want predators on their land if benefits from having predators reached the individual, not if benefits were only given to the community as a whole (e.g., dams built). We found that people with more education were more likely not to want predators on their communal land; however, the higher the level of education, the higher interviewees' stated level of tolerance for predators that were on their land. These findings suggest the value of education in conservation of biodiversity in that although people might not like predators, higher levels of education lead to greater tolerance. Another factor contributing to interviewees' increased tolerance was if their community was planning to start a wildlife conservancy in the next two years, as opposed to if they already had a conservancy. Our results also show the danger of false hope brought by the promise of tourism when planning to start a wildlife conservancy if the plan does not come to fruition and also for individuals who are part of a conservancy but who do not personally receive benefits. Distribution of benefits so that they reach individuals, particularly reaching those

that tolerate livestock losses, will be important to the future of predators on communal land.

Over half (53%) of all interviewees reported having lost livestock to at least one predator in the year prior to the interview. Lions, leopards, and spotted hyenas were reported to be the most troublesome killers of livestock (Table 1). Lions are thought to be the most problematic of predators and therefore may have the most uncertain future.

Some respondents said they would not kill predators in response to livestock attacks, no matter how many head of stock were lost; this "no-kill" policy was largely for stated tolerance of cheetahs and wild dogs. Conversely, other respondents stated they would kill predators on sight, even if no attack had occurred. Of commercial ranchers, only one rancher held a "kill-on-sight" policy, and it was for spotted hyenas. Of community members, depending on predator species, 77%–88% of interviewees stated having a kill-on-sight policy. Community members were least likely to want to kill wild dogs, which we attributed partially to the belief of Samburu respondents that wild dogs are sacred and partially to the perception that a successful wild dog research and conservation project in the region has provided jobs. This sentiment was particularly notable in areas where full-time field scouts are employed to

**TABLE 1.** Survey results of commercial ranchers and community members asked to rank predators as worst attacker of livestock and owners who lost livestock to predators in the preceding year. Some respondents did not give a ranking for all predators, and some had livestock killed by multiple predators; thus rows will not necessarily total 100%.

Measurement	Cheetah	Jackal	Leopard	Lion	Spotted hyena	Striped hyena	Wild dog
Commercial ranchers (%)							
Ranking predator worst for cattle attacks	0	0	0	70	30	0	0
Owning cattle killed by predator	0	0	17	78	22	0	0
Ranking predator worst for sheep/goat attacks	9	0	35	9	48	0	0
Owning sheep/goat killed by predator	17	4	48	26	43	0	4
Community members (%)							
Ranking predator worst for cattle attacks	2	5	3	71	9	1	1
Owning cattle killed by predator	1	0.3	24	21	11	1	0.3
Ranking predator worst for sheep/goat attacks	7	6	27	2	35	6	9
Owning sheep/goat killed by predator	14	21	29	5	31	8	4

monitor movement of wild dogs on their community land (e.g., Kijabe Group Ranch). The Samburu-Laikipia Wild Dog Project (SLWDP; headed by Rosie Woodroffe) had been running in the region for three years (since 2001) at the time of the interviews.

Despite the high number of community members reporting a kill-on-sight policy, all native large predator species are at least present over large areas of communal land in the region. Lions are not common on communal lands, however, and are heavily persecuted (L. G. Frank, personal communication, University of California, Berkeley, 2004). Seventy-seven percent of respondents stated a kill-on-sight policy for wild dogs, but none reported having killed wild dogs in the previous year, and only 15% reported having killed any predators in the previous year. Additional data from the study area show that at the time of our interviews, only 2 of 33 (6%) radio-collared wild dogs had been killed by humans (R. Woodroffe, unpublished data, 2005), and the population size of wild dogs continues to increase. This increase is particularly striking given that wild dogs primarily occur on community land in the region (Woodroffe et al., 2004), where they are generally unwelcome. Two of the goals of the SLWDP are to help reduce livestock depredation by wild dogs and to encourage wild dog ecotourism for income. SLWDP has been successful in meeting its goals and, as a result, has been increasingly gaining the support of locals for the protection of wild dogs.

Thirty-one percent of all interviewees (commercial and community) who owned or managed livestock for the

last 20 years reported increased tolerance for predators today, and 6% reported being less tolerant of predators today. Commercial ranchers are prepared to lose between four and eight stock (cattle or sheep/goats) before eliminating the responsible predator, which is about twice the tolerance they said they had 20 years ago. Community members were less tolerant and were unwilling to lose more than one head of stock at any time before attempting to eliminate the predator.

#### LETHAL CONTROL

We found that people (commercial ranchers and community members) who lost livestock to predators in the last year were much more likely to have killed them compared to people who had not experienced livestock losses. This finding emphasizes the importance of improving methods of livestock protection (e.g., stronger corrals) to decrease retribution killings and thus to increase coexistence of people with predators through greater tolerance. Commercial ranchers were more likely to have killed predators in the last year if the income generated by their ranch was the ranch owner's primary source of income (compared to ranches that have subsidized incomes, for example, through foreign investment). This finding highlights the financial difficulty of tolerating livestock losses to predators and the difficulty of coexistence between people and predators even on large-scale ranching areas.

Interviewees were asked how they would kill predators responsible for livestock attacks. Commercial

ranchers and community members differed in their preferred means of lethal control. Ranchers who would kill predators would largely shoot them; however, when considering lethal control of spotted hyenas, one respondent would gas them inside of their dens, and another would use general carcass poisoning. No commercial ranchers would set wire snares to kill predators.

Of community members, almost half (47%) would use carcass poisoning to kill predators, and 9% would set wire snares. To kill cheetahs, 60% of respondents would use spears or knives, 13% would use poisoned arrows, 8% would trap the cheetah with no mention what they would do with the animal once trapped, 6% said they would call the government authority (Kenya Wildlife Service) to take care of the problem, 4% would use clubs, 4% would shoot the animal, and 1% would hunt predators with domestic dogs.

#### COMMUNAL LAND

Communal land makes up 60% of Laikipia District and nearly all of the surrounding districts. It is therefore the land use type of greatest concern—and potential—for conservation. We found that community members living on group ranches (i.e., those with title deeds) were most positive toward predators compared to those on government land and squatters. The Laikipia Wildlife Forum (LWF), African Wildlife Foundation, other nongovernmental organizations, and commercial landowners have been helping communities to gain title deeds to their land in the region. Promoting group landownership could have positive implications for predator conservation over the large areas in Africa. Property rights provide residents with incentives for the sustainable use of natural resources, given that they will have access to those resources in future. Group ranches have the benefit of being a size large enough for holding suitable populations of wildlife species compared to smaller-sized, individually owned land. Such a model is preferable to the subdivision of formerly communally owned land into small privately owned parcels. Such land tenure shifts in parts of Kenya have been demonstrated to be associated with declining diversities and densities of wildlife (Norton-Griffiths, 2007).

Community members who lost livestock to predators in the last year killed more predators than those whose livestock were not attacked. Of community members interviewed, Masais and Samburus were the most positive toward predators. However, Samburus had a relatively high incidence of killing predators in response to livestock attacks. We found no association between livestock lost

to a particular predator and likelihood for that specific predator species to be killed. This finding suggests that if people lost livestock to any predator, they were more likely to kill all predators in retaliation.

#### COMMERCIAL RANCH LAND

Attitudes were most positive and tolerance was greatest among commercial ranchers. These positive attitudes are noteworthy given that 30% of commercial ranchers receive no benefits from tourism and no income subsidies and yet are interested in conserving predators that can have negative effects on their livestock ranching activities. Tolerance for predators among commercial ranchers has improved compared to their tolerance 20 years ago. Most respondents attributed their increased tolerance to realizing the importance of wildlife conservation (citing education from LWF) and, for some, experiencing economic return from wildlife. Commercial ranchers in the Ewaso region hold more positive attitudes than southern African ranchers (Marker et al., 2003; Lindsey et al., 2005), indicating great promise for the Ewaso ecosystem. Although prospects for predator conservation are greatest on commercial ranches, ranches cover only 40% of the Laikipia District and very little to none of the neighboring districts; therefore, great efforts are needed to promote wildlife conservation participation on communal land for wildlife to persist across the mixed land uses.

### OPTIONS TO PROMOTE COEXISTENCE BETWEEN PEOPLE AND PREDATORS

When asked as an open-ended question about how attitudes toward predators could be improved, the most common suggestion from all respondents (commercial ranchers and community members) was to give value to predators, with most citing using ecotourism and trophy hunting.

Tourism is the world's fastest growing industry, with ecotourism its fastest growing sector (Gössling, 2000), and developing nations are increasingly popular destinations (Goodwin, 1996; Gössling, 1999). With the number of successful tourism operations in the Ewaso region growing and with visitors increasingly interested in both wildlife and human cultures, tourism should continue to improve attitudes toward predators. There are a number of successful tourism operations in the region, several of which are on community land (e.g., Il Ngwesi Lodge, Sarara Camp, Koiya Starbeds), with more lodges in the development stages. The Ewaso ecosystem houses

globally important populations of endangered wild dogs and Grevy's zebra (*Equus grevyi*), as well as cheetahs and lions, all of which are of interest to tourists.

The development of tourism operations on communal land in the region would be facilitated through the development of public-private-community partnerships, whereby commercial ranchers form partnerships with adjacent communities in the development of an ecotourism enterprise. A community neighboring Savé Valley Conservancy in Zimbabwe, for example, has voluntarily removed all livestock and incorporated 40 km<sup>2</sup> of their land into the conservancy (Lindsey et al., 2008). This community will receive full financial gains from wildlife as well as become part of wildlife management decision making.

When interviewees were asked directly about their attitudes toward legalizing trophy hunting in Kenya, older community members were generally in favor of trophy hunting, mentioning benefits brought by employment. Younger community members had mixed views, with negativity stemming from the fear that trophy hunters would kill all wildlife and leave nothing to show visitors. Hunting was banned in Kenya in 1977, so most Kenyans lack firsthand experience of tourist hunting, and many are concerned that it would pose a threat to the country's wildlife populations (see Box 1). However, most wildlife species in Kenya have declined significantly since hunting was

banned, suggesting that the ban has not been an effective conservation measure (Western et al., 2009). In fact, the hunting ban may have exacerbated the decline by removing a key option for landholders to derive financial benefits from conserving wildlife (Norton-Griffiths, 2007). One of the major challenges with the management of trophy hunting (and ecotourism) is ensuring that a sufficiently large proportion of revenues accrue to communities.

Current government policy in Kenya is such that its citizens would not be able to adequately benefit from trophy hunting as a wildlife land use because wildlife belongs to the state. If trophy hunting were legalized, changes would also be required to grant full user rights over wildlife to private landowners and communities. In Zimbabwe, for example, positive effects for wildlife conservation were seen as a result of the Communal Areas Management Programme For Indigenous Resources (CAMPFIRE), which resulted in devolution of user rights over wildlife from central government to local government (Child, 2000). However, most practitioners believe that CAMPFIRE would be more successful still if user rights over wildlife were devolved further to the community level. Without the devolution of user rights to wildlife, locals cannot benefit adequately from wildlife and therefore lack incentive to protect it.

Predators can pose a cost to people living with or near them, so to conserve these species, conservationists must

### **BOX 1. Potential for trophy hunting in Kenya.**

Reinstating trophy hunting in Kenya would provide incentives for wildlife conservation over a wide area. Hunting and ecotourism are largely complementary land uses; trophy hunting is often conducted in areas not desired by ecotourists, such as areas with low wildlife densities and where people and livestock predominate. Trophy hunting has been successful in creating incentives for conservation on communal lands in other parts of Africa, particularly in Namibia, Botswana, and Zimbabwe. In Namibia, following legislative changes that made provision for communities to obtain user rights over wildlife, income from trophy hunting has been the primary stimulant for the development of a network of communal conservancies now covering more than 126,000 km<sup>2</sup> in which wildlife populations are recovering rapidly (Jones and Weaver, 2008; M. Lamprechts, Trophy Hunting in Namibia from the 1960s to the Present Day, [http://www.huntersnamibia.com/Lamprecht\\_Paper.doc](http://www.huntersnamibia.com/Lamprecht_Paper.doc)). The Namibian conservancy example clearly illustrates the importance of allocating user rights over wildlife to communities and allowing the option of utilizing wildlife consumptively. Properly managed trophy hunting has potential to offset losses of livestock due to depredation and to create incentives for predator conservation. Visiting hunters pay particularly high prices for opportunities to hunt predators. In southern Africa, hunters pay US\$6,000–32,000 in trophy fees per safari to hunt lions in addition to US\$1,300–4,000 per day for a minimum of 15–28 days (Booth, 2009). Potential earnings from trophy hunting are particularly high in Kenya because of the presence of a number of species and subspecies that do not occur or are rare elsewhere and because the country is viewed with nostalgia by many hunters as being the original hunting safari destination (Lindsey et al., 2006). There are problems associated with trophy hunting that prevent the industry from benefiting conservation and local development to its potential. For example, there is inadequate regulation of the hunting industry in some areas, and in some cases local communities do not receive an adequate proportion of hunting revenues. However, the net impact of trophy hunting on conservation is almost certainly positive through the creation of financial incentives for the retention and development of wildlife as a land use, especially in areas where alternative income sources such as ecotourism are not viable (Lindsey et al., 2007).

find ways to reduce costs, increase the value of predators, or, preferably, both. If benefits from wildlife are increased, communities might be encouraged to establish wildlife areas on their land, as has occurred elsewhere in southern and eastern Africa. In Zambia, for example, some communities chose to stop agricultural production in favor of forming wildlife areas for trophy hunting for the greater financial benefit (Lewis and Alpert, 1997). The conversion from agriculture- to wildlife-based land use has provided a greater amount of habitat, which is critical for the persistence of wide-ranging species. A key means of reducing the costs of living with predators is reducing livestock losses, for example, through improved livestock husbandry (e.g., Treves and Karanth, 2003; Jackson and Wangchuk, 2004; Woodroffe et al., 2007) and seasonal stocking strategies (Patterson et al., 2004). In another pastoralist area in Kenya, Kruuk (1981) suggested that constructing stronger, less-penetrable corrals should reduce livestock losses, but Ogada et al. (2003) found that corral height and thickness had no effect on livestock losses in Laikipia (see Frank, 2011, this volume, for further discussion on livestock predation). Setting aside conservation areas to conserve wild prey may also reduce livestock losses by increasing the abundance of available wild prey (Woodroffe et al., 2005).

Positive attitudes of community members regarding predators were generally based on the hope of financial gain from wildlife. Our interview results show that community members in the Ewaso region were generally more tolerant of predators if they had tourism on their properties and thus were receiving a benefit. Thirty-five percent of community respondents had tourism operations on their land at the time of our interviews, and an additional 21% had plans to start a wildlife conservancy in the next two years. As a result, a maximum of 56% of respondents should be able to earn income from wildlife tourism in the near future. If the planned tourism schemes come to fruition, community members' attitudes toward predators should improve. However, previous work has shown that when people do not receive expected benefits, their attitudes may ultimately become worse (Western, 1994; Walpole and Goodwin, 2001; Walpole and Thouless, 2005). Although we found that community members' tolerance for wild dogs was greater if some of their household income came from tourism, we found no increased tolerance for predators if benefits were shared among the community as a whole (e.g., schools built). This finding is in keeping with the increasing realization that if benefit-sharing schemes are to succeed, benefits must reach individuals (Walpole and Goodwin, 2001; Walpole and Thouless, 2005).

The best prospects for enhancing predator conservation lie in promoting wildlife-based land uses. Options for communities to benefit financially from predators and other wildlife species would be significantly enhanced if government policies were changed such that user rights to wildlife were granted and consumptive forms of wildlife utilization were permitted.

Among commercial ranchers, increased tolerance for predators compared to 20 years ago is encouraging. Commercial ranchers are considerably wealthier than their communal counterparts, and a significant proportion of them favor wildlife, including predators. On the commercial ranches in the region that favor wildlife, prospects for predator conservation in the Ewaso ecosystem are therefore excellent.

## CONCLUSION

Attitudes toward predators have generally improved in Laikipia over the last 20 years, but further improvement is still possible and is necessary to ensure the persistence of predators. Kenya has recently been going through a process to try to improve its wildlife policies for the benefit wildlife and the people living with wildlife. Implementation of policies that allow people to maximize benefits from the wildlife they live with should advance local citizens' interest in expansion of habitat for wildlife conservation.

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