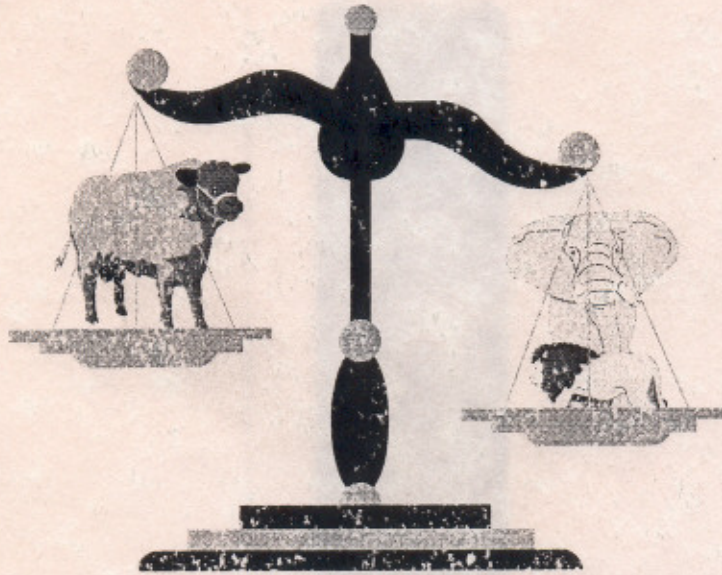



Laikipia Wildlife Economics Study
Discussion Paper CEC-DP-1

Making Wildlife "Pay" in Laikipia, Kenya



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A F R I C A N
W I L D L I F E
F O U N D A T I O N

Conservation, Economics and Commerce Program

Summary of Main Findings

Successful wildlife tourism businesses provide the main economic justification for wildlife as a land use (alone or mixed with livestock) in Laikipia. Commercial returns per hectare for wildlife viewing are up to four times that for livestock alone. However, market entry requires land area of at least 10,000 hectares, good access, excellent wildlife viewing opportunities, the right partners, access to capital and a defensible market niche, factors which exclude most Laikipia landholders from becoming significant players.

Wildlife cropping (as part of the KWS pilot utilization project) has to date generated little in the way of economic benefits, and does not at present justify keeping wildlife on private land. Cropping has so far been below quotas agreed and landholders are retaining less than 5% of the final value of the wildlife products. Proposals for a pilot safari-hunting project in Laikipia have so far been shelved, so ranches not suitable for tourism currently have no alternative economic wildlife use.

Without a significant change in the current framework of economic incentives, the trend will be for wildlife to be removed from all land except that supporting successful wildlife tourism ventures or where the landholder has non-economic reasons for conserving wildlife.

Acknowledgements

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1. Introduction to the Study

At the invitation of the Laikipia Wildlife Forum, the African Wildlife Foundation (AWF) is undertaking a Laikipia Wildlife Economics Study. This paper is the first of four discussion papers planned as outputs from the study. The other three are:

- Discussion Paper 2: *Opportunities for Increasing Income from Wildlife Tourism and Cropping* (due out in December, 1997)
- Discussion Paper 3: *The Opportunity Cost of the Hunting Ban to Laikipia Landholders* (due out in January, 1998)
- Discussion Paper 4: *Assuring a Future for Laikipia's Wildlife* (due out in February, 1998).

Background information for the study has been collected from research already completed by Mpala Research Center, Laikipia Research Program, the ASAL project based in Nanyuki, KWS, and by key locally based experts. The quality of information available is generally high, though is perhaps weakest in the economics area.

This paper is based on field research undertaken with specific Laikipia landholders. To date we have worked with 7 ranches and have had free access to their financial and management information. Where possible financial data has been cross checked between management accounts and audited accounts, and the assumptions verified through interviews with key staff.

We have differentiated four primary land use activities: agriculture, livestock, wildlife tourism and wildlife cropping. For each ranch all operating income and expenses, capital employed and land area used for the period 1993-96 have been allocated between the four activities using agreed assumptions. The data has been entered on a spreadsheet which then calculates figures for returns per hectare and returns on investment by activity for each year. Though the focus of this paper is on commercial returns to different land use, where appropriate we have also addressed broader economic issues.

2. Laikipia's Wildlife Resources

An estimated 60-70% of Kenya's wildlife lives outside its largely unfenced protected area system, making the conservation of wildlife populations on communal and private lands vitally important to the health of the nation's wildlife resource base. Surveys show that Laikipia and Taita-Taveta are the most important districts in Kenya in terms of wildlife population densities after Narok and Transmara (Bojo 1996).

Furthermore wildlife populations in Laikipia are being broadly maintained where those in other districts have fallen, some dramatically. Table 1 gives three recent counts of wild herbivores in Laikipia district and compares them with a DRSRS count from April 1995. Interpretation of these figures generally concludes that overall populations remain healthy across the critical

species, with variations consistent with what is known about different habitat/climatic preferences and changing district land use (Heath 1996a, Mpala 1996, Wafula 1997).

Table 1

	April 1985	November 1994	September 1996	February 1997
Burchell's Zebra	20,217	34,109	33,388	35,859
Impala	10,253	7,909	6,590	8,436
Grant's Gazelle	6,123	6,145	4,055	6,997
Thompson's Gazelle	6,775	8,418	4,471	5,150
Eland	6,467	2,854	3,393	3,667
Buffalo	2,318	3,200	1,915	2,655
Elephant*	1,648	1,945	2,392	1,847
Hartebeest	3,786	1,909	1,729	n.a.
Giraffe	1,902	1,254	1,647	1,856
ORIX	1,286	618	734	1,385
Waterbuck	36	236	571	621
Grevy's Zebra*	416	181	837	870
Gerenuk	0	72	20	319

Source: 1985 and 1994: Heath 1996(a) (from DRSRS and Laikipia Wildlife Forum); 1996: Mpala; 1997: Wafula (from DRSRS)

* endangered species

Laikipia is home to significant populations of endangered species such as elephant, Grevy's zebra, Kenya hartebeest, black rhino and reticulated giraffe. Laikipia has five private rhino sanctuaries protecting a total of 106 rhinos (Wafula 1996). A survey of large predators is also currently underway and initial findings indicate relatively stable populations of lion, leopard and cheetah (Frank, pers.com.).

Decisions made by individual and group landholders within Laikipia hold the key to the survival of the district's wildlife. Laikipia's wildlife is for the moment being tolerated, and in some cases actively protected, despite there being:

- 1) no formal protected areas in the district;
- 2) no real transfer of wildlife property rights (except some limited use rights) to landholders from the state; and
- 3) a widespread belief that livestock and wildlife do not mix.

The goals, preferences and decision processes of landholders vary significantly across the district. The main factors driving land use choice are:

- 1) the available options as dictated by physical resources such as topography, soil, water, access;
- 2) the economics of alternative land uses as driven by customer preferences, available markets and potential net income; and
- 3) personal landholder preferences in terms of lifestyle, traditions and personal values.

At present all three factors are working to support wildlife conservation in Laikipia. For much of the lower rainfall part of the district there are no economic options other than extensive livestock ranching - the most wildlife-compatible land use. The potential economic gains from wildlife tourism and the pilot wildlife-cropping program are still believed by many to be high. Many individual landholders also choose to protect wildlife for non-economic reasons.

Yet this is an unstable situation. Laikipia has one of the fastest growing human populations in Kenya, and this combined with the promotion of land sub-division is increasing land pressure significantly. Future projections suggest that the area occupied by wildlife may be severely reduced (Mpala 1996). More large ranches, particularly in western Laikipia, are being sold as small plots, and smallholders are understandably intolerant of wildlife which damage their crops and threaten their families and livestock. The Laikipia ecosystem is now functionally isolated from the Aberdare and Mt. Kenya ecosystems by cultivation and human settlement (Mpala 1996).

This study confirms that the potential economic gains from wildlife tourism have yet to be accessed by the majority of landholders and the returns from the pilot cropping program have been very low. All these factors indicate the scale of the challenge in seeking to assure a future for Laikipia's wildlife

3. Commercial Rates of Return to Different Land Uses

One of the key issues in assessing land use returns is in establishing which activities are substitutes or complements. In Laikipia most high potential agricultural land has already been converted to agriculture, and the wildlife populations that remain are principally on low-medium potential land best suited for ranching. The opportunity cost of keeping wildlife on this land is therefore dependent on the extent to which livestock and wildlife are complementary, not on what is a near-zero opportunity cost of agriculture. Other studies indicate the pressure that high opportunity costs of agriculture can put on wildlife elsewhere in Kenya (Norton Griffiths and Southey 1995, Norton Griffiths 1995).

As hunting is still banned in Kenya, the main ranching options are livestock, wildlife viewing tourism and wildlife cropping. Table 2 describes some of the key factors determining the extent to which livestock and wildlife are complementary land uses in Laikipia.

Table 2: Economic linkages between livestock and wildlife land uses

Factors driving impact of :	On: Livestock	On: Wildlife Tourism	On: Wildlife Cropping
Livestock		<ul style="list-style-type: none"> tourist perceptions of livestock (often don't want to see) livestock as lure for predators (tourists do want to see) risk of disease transmission to wildlife 	<ul style="list-style-type: none"> complementary (herds well separated; few incremental security costs)
Wildlife Tourism	<ul style="list-style-type: none"> risk of livestock predation risk of human/ wildlife conflict risk of crop/ fence damage risk disease transmission to livestock herbivores compete for fodder all wildlife compete for water 		<ul style="list-style-type: none"> makes cropping more costly because must be done at night and far from tourists
Wildlife Cropping	<ul style="list-style-type: none"> complementary reduces competition for fodder, water still risk disease transmission 	<ul style="list-style-type: none"> most tourists don't want to see cropping, abattoirs provides game meat for tourists 	

Source: Interviews

Wildlife cropping and livestock are essentially complementary activities, particularly when predators and elephants are excluded from the area. Predators and elephants can be excluded through fences or other security measures, thereby minimizing the risks. Cropping allows the landholder to manage wildlife (within quota limits) as well as livestock numbers for range and water conditions. Wildlife tourism and wildlife cropping can be complementary activities depending on the incremental costs and benefits of keeping tourists and cropping separate (assuming tourist attitudes towards cropping cannot be changed) and tourist demand for game meat. The linkages between livestock and wildlife tourism are more complicated and depend critically on the benefits and costs of tolerating predator and elephant populations.

Rates of return per hectare have been calculated for the ranches involved in the survey to date. "Livestock" includes all farming of domesticated animals – principally cattle but also including sheep, goats, chickens and camels. The "wildlife tourism" product assessed here is middle-top market game viewing from lodges/tented camps. "Wildlife cropping" is the shooting, transport, processing and sale of products, principally from zebra, in accordance with agreed quotas. "Agriculture" is given here for comparison only, demonstrating the returns that can be made from wheat on suitable land in Laikipia. Table 3 summarizes the initial findings. A range of

figures is given reflecting differences between the ranches and over two calendar years, 1995 and 1996.

Table 3: Returns per ha for alternative land uses in Laikipia

Activity	\$/ha (p.a.) (1995-1996)
Wildlife tourism	4.40-4.70
Wildlife cropping	0.20-0.40
Livestock	0.20-1.40
Agriculture (high potential)	132.50-166.20

Source: Interviews, management accounts for 7 ranches

Livestock Ranching

These figures suggest that returns to livestock ranching in Laikipia are currently low at only \$0.20-1.40 per hectare p.a. for the period 1995-1996. Livestock returns vary somewhat between ranches depending on physical factors and between years depending on rainfall and the state of the domestic beef market.

Wildlife Tourism

Compared with this the potential returns from high value wildlife viewing tourism are very attractive at \$4.40-4.70 per hectare p.a., at least four times that for livestock. This figure represents the direct commercial profit from tourists in the form of entry fees, facility profits and add-on expenditures. The multiplier effects of tourism revenues into the local economy through local employment and procurement are not included here, but are thought to be very significant. The analysis undertaken within this study to date has focused on the provision of luxury high-end accommodation for wildlife viewing. This option is open to landholders, whether individuals or groups, with large ranches (10,000 ha minimum, says Mwau 1996), good access and excellent wildlife viewing options. The returns to wildlife tourism are particularly sensitive to type of venture, strength of partners, pricing and market resilience.

One opportunity for increasing district wildlife tourism income will be developing more Laikipia circuits and marketing Laikipia as an all-in-one safari destination. Operators believe that Laikipia could be developed into a prime high value circuit within Kenya, with no need for tourists to travel outside the district to get their safari needs fulfilled. That this is possible is demonstrated by the developing Borana, Lewa, Il Ngwesi circuit. Operators believe that there is significant capacity to develop other high value facilities in Laikipia and to extend and vary the circuit. Some of these issues will be addressed in the next discussion paper.

Wildlife Cropping

Returns from wildlife cropping have also been disappointingly low at \$0.20-0.40 per hectare p.a. These low returns are due to a number of key factors, including the restrictive regulatory framework, low cropping rates, and the low percentage of value added that accrues to the

landholder. Because of its concerns about possible over-consumption and illegal harvesting, KWS maintains very tight control over the processing and sale of wildlife products. Present KWS policy does not allow trade in skins with hair on within Kenya, nor advertising campaigns for venison. Special licenses are required to export skins, venison and skulls/skeletons (Bos 1996). Meat may only be sold to butcheries licensed by KWS.

Wildlife cropping rates have been well below quota in Laikipia. In 1996 no species except giraffe was cropped to more than 50% of the quota agreed with KWS; actual figures were buffalo 8%, eland 3%, giraffe 86%, impala 11%, Grant's gazelle 3%, Thompson's gazelle 20%, waterbuck 31% and zebra 43%. Cropping rates have been low for several reasons. Many of the ranches given quotas choose not to crop for their own reasons. Cropping is still a fairly new activity in Laikipia and the quality of a skin is very dependent on the selection and shooting skills of the cropper and the terrain in which the carcass falls. The markets for meat and skin products are restrained by regulations, with demand fairly limited and profits highly sensitive to prices and transport costs. In 1997 there have also been huge cash flow problems with wholesalers unable to pay their debts to abattoirs that are in turn unable to reimburse landholders for animals cropped.

Livestock Predation

Excluded from the figures in Table 3 the average cost of predation across the ranches totals \$0.50 per hectare p.a., though this figure is heavily influenced by one particularly tolerant ranch where lion predation is tolerated for tourism purposes. Box 1 indicates the potential returns from combining land use activities given in Table 3.

Box 1: Combined Land Use Returns

Indicative Returns to Combining Land Use Activities (from Table 3)

livestock ranching alone yields **\$0.20 to \$1.40** per hectare p.a.

if wildlife tourism is not an option, adding wildlife cropping to livestock alone yields a maximum return of **\$0.40 to \$1.80** per hectare p.a., assuming no additional costs of predation.

livestock together with high value wildlife tourism yields a total of **\$4.10 to \$5.60** per hectare p.a., having taken off the average costs of predation

combining livestock, wildlife tourism and cropping yields a total of **\$4.30 to \$5.80** per hectare p.a.

Agriculture

The figures in Table 3 also confirm that the per hectare commercial returns to agriculture (on high potential land) in Laikipia can be over 100 times higher than those to livestock ranching (on low-medium potential land).

Comparative Studies

The figures generated by the study are confirmed by other studies in Laikipia and other parts of Kenya. For example, Heath estimates that a 20,000 ha Laikipia ranch can earn 240,000 Ksh p.a. from livestock, equivalent to \$0.20 per hectare p.a. (Heath 1996a). Mwau estimates that extensive livestock ranching in Kenya earns on average \$0.70 per hectare p.a. and wildlife cropping \$0.25 per hectare p.a. (Mwau 1996). Wildlife cropping in Machakos District in 1992, by comparison, earned \$1.03 per hectare p.a. (Sommerlatte and Hopcraft 1993), though this was highly sensitive to the price per kg for game meat and the demand for high quality cuts in Nairobi.

One recent study in Kenya investigated likely earnings from different types of wildlife tourism ventures (Mwau 1996). Mwau estimates that a 25-bed viewing safari camp might generate net profits of up to \$400,000 p.a., or a maximum of \$40 per hectare p.a. (assuming a minimum viable land area of 10,000 hectares). The rate of return per hectare depends critically on the type of facility and target market segment, and on the land area involved. Indicative figures from other parts of Africa suggest that a figure of \$10,000 profit p.a. per bed for luxury wildlife viewing facilities is readily achievable (AWF, Community Tourism Enterprises in Southern Africa, work in progress).

The figures from the study to date indicate that successful wildlife tourism ventures provide the main economic justification for wildlife as a current land use in Laikipia. The economic benefits from wildlife cropping do not yet justify keeping wildlife on private land. Without a significant change in the current framework of economic incentives, the trend will be for wildlife to be removed from all land except that supporting successful wildlife tourism ventures or where the landholder has non-economic reasons for conserving wildlife.

4. Return on Investment for Different Land Uses

In calculating the rate of return on capital employed, the critical factor is the market value of land. Even for intensive crop farming in Laikipia, the total value of non-land capital (i.e. net total value of buildings, vehicles, plant & equipment and net current assets) is worth less than 5% of the land value. For the purpose of Table 4 land values of Ksh 7,500 per hectare (Heath 1996a) and 200,000 per hectare have been taken for rangeland and crop land respectively.

Given a minimum discount rate for capital projects in Kenya of at least 5% p.a. in real terms, these figures are very low. The implication is that, given the low potential returns from its best economic use, the current market price of ranch land in Laikipia is overvalued. This is confirmed by the apparent disparity between the relative rates of return and land prices for agriculture and ranch land – even though the earnings ratio is over 100:1 (agriculture:ranch) the land price ratio is only 25:1 (200,000 Ksh/ha compared with 7,500 Ksh/ha). Presumably this

reflects the value of land for non-economic purposes, in a country where land ownership is crucial and where land is valued for its long-term security by comparison with other investments. This also helps explain why the price per hectare for small (1-10 ha) plots is significantly higher than for larger ranches (10,000 ha plus), despite the fact that only the large ranches have the scale from which to enter the high value wildlife tourism viewing market.

Table 4: Return on capital employed by land use in Laikipia

Activity	% p.a.
Wildlife tourism	2.20
Wildlife cropping	0.30
Livestock	0.70
Agriculture	4.70

Source: Interviews, management accounts for 7 ranches

Given that there is no incentive for new players to enter the livestock ranching business in Laikipia, the challenge for existing ranchers and for those promoting wildlife conservation is to improve the economic returns to combined livestock and wildlife land use. This will be the subject of the next two discussion papers assessing opportunities for increasing landholder earning from wildlife tourism and cropping, and the opportunity costs of not allowing hunting in Laikipia.

5. Distribution of Returns to Wildlife Use

It is difficult to establish how many wildlife tourists visit Laikipia and their economic value to the district. However, it is clear that tourism is already providing a good economic justification for a mixed livestock and wildlife land use on large ranches with an attractive tourism product.

The economic costs of wildlife, including those identified in Table 1, hit the smallest and poorest farmers the hardest. They are most at risk from the injury and damage inflicted by predators and large herbivores. The economic benefits of wildlife accrue principally to the government in the form of taxes and other charges levied on the tourism industry, and to the private sector, particularly the wholesalers and retailers in the tourism and wildlife product industries. Though the benefit of employment for skilled and unskilled laborers in wildlife related activities is vitally important within Laikipia.

The pressure to remove wildlife from land is highest where the benefits are least and where landholders have to make land use decisions for purely economic reasons. Community/group

ranches and ranches that have already been sub-divided into smallholder plots are under the most pressure to reduce wildlife stock, particularly predators and elephants.

The wider economic costs and benefits of wildlife are distributed unevenly between key stakeholder groups, as Table 5 illustrates:

<i>Stakeholder Group</i>	<i>Economic Costs of Wildlife</i>	<i>Economic Benefits of Wildlife Tourism</i>	<i>Economic Benefits of Wildlife Cropping</i>
International		SS	
Central and district government, Kenya		SS	
Kenyan commercial sector		SS	\$
Large landholders	● ^{*/}	SS	\$
Group/communal landholder	● ^{*/}	\$	\$
Medium landholders	● ^{*/} ● ^{*/}		\$
Small holders	● ^{*/} ● ^{*/} ● ^{*/}		
Landless laborers	● ^{*/} ● ^{*/}	\$	

Source: Interviews (●^{*/}/S= some, ●^{*/} ●^{*/}/SS= significant, ●^{*/} ●^{*/} ●^{*/}/SSS=major)

Box 2: Wildlife Cropping as a Reliable Community Income Source?

The Case of West Laikipia Farmers

In 1990 KWS allowed limited cropping of wildlife in Laikipia as part of a pilot wildlife utilization program across 4 districts. 54 ranches in these districts have now been granted use rights, of which 11 are community ranches (Wafula, 1996).

In 1993 West Laikipia Farmers, incorporating Ol Morani and Sipili, were given a quota to crop zebra. Despite the fact that the new policy has not allowed for hunting or trade in live animals, it has dramatically altered landowners perceptions of wildlife (Heath 1996b and 1996c).

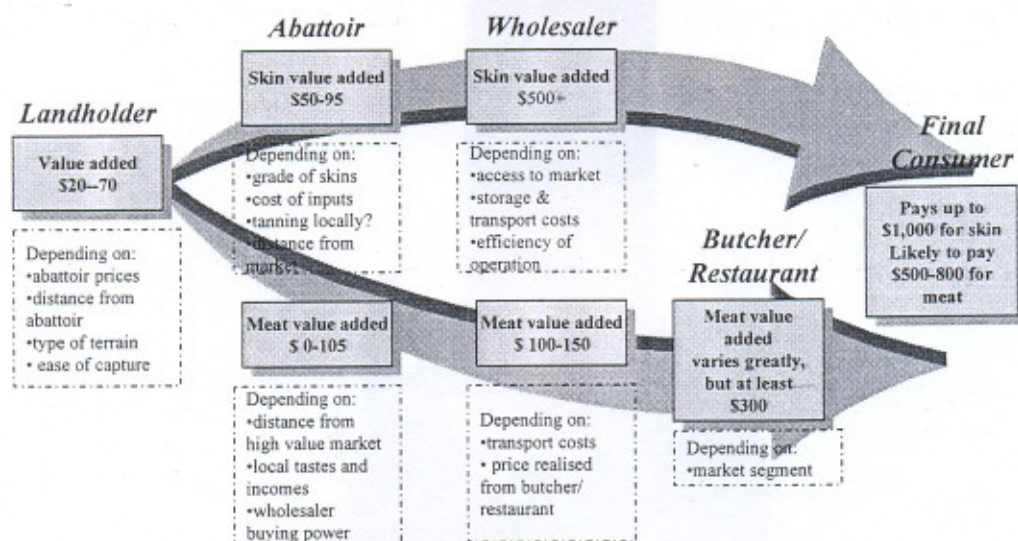
By the end of 1996 Ksh 500,000 had been earned by the Ol Morani community from cropping (LWF 1997). West Laikipia Farmers now employ their own game scouts and are in the process of buying out absentee landowners and creating a conservation area on land that is unsuitable for agriculture (Heath 1996b).

However, the 1996 quota was delayed for 4 months, only 28 zebra were cropped and most of the skins rejected reducing earnings for that period to Ksh 30,000 from the Ksh 750,000 expected (Wafula 1997). This money was not enough to pay their community scouts, let alone the community project that was planned.

Wildlife tourism can provide an important potential source of income for community/group ranches within the district. The case of Il Ngwesi demonstrates that it is possible for a community to build and manage a high-end wildlife tourism facility on their own land, though the cash flow to date has been greatly boosted by the fact that all capital expenditure was met through grants. We will explore the issues of community based wildlife tourism in more depth in the next discussion paper.

Wildlife cropping has been an unreliable income source for communities to date. Box 2 illustrates the experiences of two community ranches with wildlife cropping. The following diagram illustrates the value chain for zebra, and shows that the average Laikipia landholder captures less than 5% of each animal's total market value. Most of the value accrues to wholesalers and retailers of the meat and skin products.

Currently most zebra value accrues to wholesalers and retailers



Source: Interviews

The challenge is to find mechanisms for increasing the economic returns to all Laikipia landholders through diversifying wildlife use opportunities and increasing value added to landholders from existing wildlife uses.

6. Implications for Long Term Conservation of Laikipia's Wildlife

The conclusions to date from the Laikipia Wildlife Economics Study are important. Successful wildlife tourism appears to provide the best economic justification (alone or mixed with livestock) for wildlife as a land use in Laikipia. The returns appear to be four times higher for wildlife tourism than for livestock ranching alone. However, market entry requires land area of at least 10,000 hectares, good access, excellent wildlife viewing opportunities, the right partners, access to capital and a defensible market niche, factors which exclude most Laikipia landholders from becoming significant players. Tour operators see important opportunities for increasing landholder earnings from wildlife tourism by developing the high-end circuits through new facilities and district-wide marketing, as well as diversifying the tourism products offered by small-medium sized ranches.

The returns to wildlife cropping have so far been poor. Cropping rates have generally been well below agreed district quotas and landholders are retaining less than 5% of the final value of wildlife products. The scope for increasing landholder earnings from wildlife cropping appears to be significant, but will depend on establishing marketing and distribution routes for high value products.

We conclude that, without a significant change in the current framework of economic incentives, the trend will be for wildlife to be removed from all Laikipia ranch land except that which supports successful wildlife tourism ventures or where the landholder has non-economic reasons for wanting to conserve wildlife.

The next two discussion papers will investigate the scope for improving commercial returns to current wildlife uses (tourism and cropping) and the opportunity costs of not having hunting as an optional wildlife land use.

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