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Correlates of wildlife snaring patterns in Tsavo West National Park, Kenya

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ARTICLE INFO

Article history:
Received 23 November 2005
Received in revised form
25 April 2006
Accepted 3 May 2006
Available online 14 July 2006

Keywords:
Snaring patterns
Wildlife
Tsavo West
Habitat types
Sustainable harvest
Bush meat
Socio-economic activity

ABSTRACT

Habitat loss and hunting are currently the twin threats to wildlife across the world. Hunting is such a threat across the tropics that some recent studies have estimated wildlife extraction at six times the sustainable rate in parts of Africa. The traditional methods of wildlife hunting, like setting traps and snares are no longer sustainable as the reasons for hunting are largely moving from subsistence to commercial.

We assessed the spatial patterns of snaring activities against target species distribution, habitat types, distance from park border and security patrol efforts using a stratified random sampling design in Tsavo West National Park. Tsavo is not only the largest park in Kenya, but also one that faces an enormous threat from poachers. The finding indicated that the seven strata surveyed had different wildlife density and snaring intensity. Areas of the park adjacent to highways, trans-national borders, ranches and town strata had high wildlife snaring pressure. There was a significant difference between snare size and habitat type but total numbers of snares across habitats were not significantly different. The total wildlife species encountered were influenced by habitat types. Regression analysis between snare density and security patrol effort did not show any trend. There was no significant difference in snare density as the distance increased from the park border.Conservation agencies and volunteer patrol teams specialising in snare collection should intensify their patrol efforts in areas of the park around highways, trans-national borders, ranches and town.

1. Introduction

Hunting of wildlife for food, rather than habitat loss, is the most significant threat to the conservation of biological diversity in the tropics over the next 15–25 years (Robinson et al., 1999; Wilkie and Carpenter, 1999). Overexploitation of wildlife accounts for almost one-quarter of extinctions for which the cause can be identified (Groombridge, 1992; Mace and Reynolds, 2001; Rowcliffe et al., 2003), while hunting and international trade still contribute to the extinction risk of approximately one-third of the bird and mammal species listed as threatened by the World Conservation Union (IUCN) (Mace and Reynolds, 2001). This trend may cause irreversible loss of value these species confer to rural communities and to the world (Wilkie and Carpenter, 1999).

The situation is even more striking in Africa, where the number of consumers has increased from 100 million in 1900 to over 800 million in 2000, and is expected to reach 1.6 billion in less than 25 years (Apaza et al., 2002). Wildlife habitat in Africa has declined since 1900 as the demand for

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0006-3207/$ - see front matter © 2006 Published by Elsevier Ltd.
doi:10.1016/j.biocon.2006.05.010

meat increases over eightfold. It is therefore unlikely that wildlife production will provide African households with a significant portion of their animal protein, because demand for meat is growing faster than wildlife population (Wilkie and Carpenter, 1999; Barnes, 2002). The search for a sustainable approach to managing wildlife in Kenya dates back to the 1970s post-independent wildlife policy that gave emphasis to preservation of land occupied by wildlife leading to creation of numerous National Parks and Reserves (John, 2004). Kenya's wildlife authority has alternated between supporting and restricting the consumptive utilisation of wildlife. In 1975, the Government outlined a concept of conserving wildlife while optimising returns from its utilisation for the benefit of the land owners who coexisted with wildlife (Session Paper No. 3, 1975). The pilot project failed to develop economically viable cropping techniques, and was halted in light of decreasing wildlife populations as agricultural development consumed habitat and poaching pressures became severe (Berger, 1993). Kenya has since maintained a very restrictive stance on consumptive wildlife utilisation with wildlife policy focused on the promotion of all non-consumptive forms of utilisation such as photographic tourism (Ottichilo, 1995). Kenya's policy has slowed down poaching significantly within its borders in the short term. However, due to availability of market for wildlife products and the resentment of locals over resource use, poaching problem has exacerbated over the recent years (Cater, 1989).

Traditional hunters conserved their wildlife resources by decreasing the overall rate of hunting as game density declined, reducing of hunting effort in patches of the environment which had been severely depleted of game species and maintaining taboos for particular game species or even a particular age or sex class of endangered species (William, 1964). These practices were thought to prevent game species from overexploitation. Many such traditional institutions are no longer working for most tribes in Kenya because they do not own wildlife leading to "the tragedy of the commons" (Hardin, 1968).

Consumptive options of wildlife utilisation are seen to be more applicable to many rural areas as it would provide more benefits to the communities through revenue and meat distribution (Barnett, 1997). The lack of such option may be one reason for the limited progress made in greater community participation in wildlife management outside of the protected areas in Kenya, and for the continued decline of wildlife population in these areas (Kock, 1995). The proponents of this school argue that if benefits do not reach the local communities, they will continue viewing wildlife as a liability and the negative impacts on wildlife through subdivision of land, fencing and illegal hunting is expected to prevail (Barnett, 1997). Although prohibition of the use of bush meat is well defined in the current legislation and policy, increasing poverty levels and unemployment rates within the country (Ministry of Planning & National Development, 1998), coupled with lack of law enforcement capacity especially outside of the protected areas has resulted in bush meat being increasingly utilised for subsistence consumption and for trade.

There is an urgent need, therefore, to identify geographical regions where hunting threat may be most acute, and to determine what interventions might be most effective in alleviating the threat where it is severe (Robinson and Redford, 1991). Ideally, the impact of wildlife exploitation should be monitored closely by making regular estimates of off take rate and the size of stock available for exploitation (Robinson and Redford, 1991). However, in practice this level of monitoring is possible in very few situations because it requires wildlife stocks and hunting rates to be readily measurable, and even in the best case it requires considerable time, resources and effort to measure them (Rowcliffe et al., 2003). In African countries where wildlife harvesting is practiced legally, tools that allow the impacts of hunting to be assessed indirectly, like surveying meat in the market, could make a key contribution to the provision of information for management. In countries where consumptive wildlife utilisation is illegally practiced, like in Kenya, monitoring the harvest is even more complicated because the hunters do not provide the information as they would risk being arrested. To assess hunting patterns in this case would require indirect techniques that can be used to assess harvest rates over time for given levels of hunting effort. Secondly, the model should aim at elucidating predator pursuance behaviours, as well as prey avoidance strategies (Rowcliffe et al., 2003). The popular belief is that traditional methods of wildlife harvesting like snaring, were sustainable and the major reason is for subsistence (John et al., 2002). In contrast to bows and arrows or guns where hunters can select target species and individuals carefully, snares are unselective and can kill other species not used for meat (Hofer and Marion, 1995, unpublished). A better understanding of the snaring activities will assist park and project managers to develop effective methods of regulation to save wildlife from unsustainable exploitation by identifying "hot spot" areas and focusing efforts and resources on these sites to minimise wildlife loss.

We investigated the factors that influence snaring patterns and intensities in the park. We examined spatial patterns of snaring activities against target species distribution, habitat types, distance from park border and security patrol efforts.

2. Methods

2.1. *Study sites*

We conducted this study in Tsavo West National Park (Fig. 1) between September and November, 2004 during the short rainy season. Tsavo was gazetted in 1948 as Kenya's second national park after Nairobi N.P. (Sheldrick, 2002). A combination of tsetse fly and lack of water had kept this great tract of land from being occupied by humans (Sheldrick, 2002). Tsavo West national park covers 9000 km^2, approximately 30% of Kenya's area under parks, and contains a diversity of habitats, wildlife and a mountainous scenic landscape (KWS, 2005). It is situated in South Eastern Kenya, inland from Mombasa. The altitude ranges between 200 and 100 m. Temperature ranges from 20 to 30 °C and rainfall from 200 to 700 mm. Rainfall is bimodal. Long rains fall in March/April and short rains in November/December (Sheldrick, 2002). The park's habitats include open plains alternating with savannah bush and semi desert scrub, acacia woodlands; rocky ridges and outcrops and more extensive ranges and isolated hills; belts of riverine