



Who hunts lemurs and why they hunt them



Cortni Borgerson^{a,b}, Margaret A. McKean^{c,*}, Michael R. Sutherland^d, Laurie R. Godfrey^b

^a Department of Environmental Health, Harvard T.H. Chan School of Public Health, Boston, MA 02115, United States

^b Department of Anthropology, University of Massachusetts, Amherst, MA 01003, United States

^c Department of Political Science, Duke University, Durham, NC 27708-0204, United States

^d Sutherland Associates, United States

ARTICLE INFO

Article history:

Received 11 June 2015

Received in revised form 1 February 2016

Accepted 8 February 2016

Available online xxxx

Keywords:

Bushmeat

Lemurs

Conservation

Hunting

Human health

Child malnutrition

Poverty

Masoala

Madagascar

ABSTRACT

The main threats to lemurs are habitat loss and hunting. Conservation policies often assume that people will decrease lemur hunting if they understand government prohibitions on hunting, are educated and/or involved in ecotourism, have access to affordable meat, and/or are healthy and financially secure. Yet these assumptions are often not well tested where conservation policies are implemented. We interviewed every member of a focal village in one of the most biodiverse places on earth, the Masoala peninsula of Madagascar. The factors that best predicted the decision to hunt lemurs were poverty, poor health, and child malnutrition. Knowledge of laws, level of education, involvement in ecotourism, traditional cultural values, taste preferences, opportunity, and human–wildlife conflict had no impact on lemur hunting. Our results suggest that the welfare of humans and lemurs are linked. The key to discouraging illegal hunting and improving the viability of Endangered lemur populations may be improving rural human health and welfare.

© 2015 Published by Elsevier B.V.

1. Introduction

Because humans interact dynamically with ecological systems, collaboration between the social and biophysical sciences is critical for advancing conservation and public health priorities (Gibson et al., 2000; Costanza et al., 2001; Ostrom, 2005; Milner-Gulland, 2012). Madagascar is a global biodiversity hotspot and a conservation priority (Myers et al., 2000). The island nation also currently faces a dual crisis in biodiversity and public health. Ninety-four percent of lemur species are threatened with extinction (Schwitzer et al., 2013), and the food security of Madagascar's people has plummeted to nearly last in the world (EU, 2014). Meanwhile, Endangered lemurs continue to be hunted for food (Borgerson, 2015a).

We know that unsustainable hunting can threaten biodiversity as well as human health and food security (Milner-Gulland et al., 2003; Golden et al., 2011). Sound conservation policy to curb such practices must be grounded in the knowledge of why people choose to hunt Endangered animals and how they view their risks and alternatives. Of

course, it is not easy to identify or quantify the reasons people hunt illegally when they have a great stake in keeping such activities hidden (Razafimanahaka et al., 2012). However, collecting these data is essential to devising effective conservation strategies. Conservation efforts will be more effective when they include site-specific policies that address why people illegally hunt wild animals.

Most forest resources are common-pool goods, both subtractable in consumption and difficult to exclude from potential users, thus challenging to provide and easy to deplete (Ostrom, 1990; McKean, 2000). Although national governments and international regimes for governance of specific resource systems may claim ownership or regulatory rights, local people retain the physical opportunity to utilize the forests. They can respect, ignore, or defy the government's laws. Conservation policies proposed for Madagascar aim to deter people from illegally hunting Endangered species by increasing their education and knowledge of hunting laws (Jenkins et al., 2011; Keane et al., 2011), by increasing their involvement in ecotourism (Schwitzer et al., 2014), by alleviating poverty (Sunderlin et al., 2005; Gardner et al., 2013), by reducing rural dependence on forest-based livelihoods (Gardner and Davies, 2014), and by improving domestic animal husbandry to increase access to affordable sources of animal-based protein, fats, and valuable micronutrients (Golden et al., 2011; Razafimanahaka et al., 2012). These assumptions, surprisingly, are often not well tested where conservation policies are implemented, and may not even be correct. We simply do not know how a person's knowledge or fear of the

* Corresponding author at: Department of Political Science, Duke University, Durham, NC 27708-0204, United States.

E-mail addresses: cborgers@hsph.harvard.edu (C. Borgerson), mamckean@duke.edu (M.A. McKean), drchisq@gmail.com (M.R. Sutherland), lgodfrey@anthro.umass.edu (L.R. Godfrey).

government's hunting laws, their education, wealth, involvement in ecotourism, access to affordable meat from domesticated animals, or family health actually affect the decision to hunt threatened species. For example, hunters may be fully aware of lemur hunting laws and may fear rigorous enforcement and punishment, but may still decide to hunt in spite of high risks because the alternatives are worse. Without concrete knowledge of the factors that drive individuals to hunt lemurs, conservationists cannot effectively change the incentives or alter the behavior of hunters.

Within Madagascar, the Masoala peninsula, a UNESCO world heritage site, is one of the highest priority areas for conservation (Kremen et al., 2008). Despite nearly 20 years of conservation efforts on the peninsula, people there still hunt lemurs and other threatened mammals (Golden et al., 2014; Borgerson, 2015a,b).

We interviewed every person in a focal village and asked over 600 interview questions on extraction and use of forest and marine products and on variables that might predict which individuals and households hunt lemurs. We asked individuals about government regulation and local community rules concerning food and resources, level of education, involvement in ecotourism, demographic traits of household members, traditional cultural values about livelihoods and food, taste and preference for animal foods, opportunities for hunting, conflicts with wildlife, access to alternative animal foods, wealth and income, and the health of individuals and households in order to learn *Who hunts threatened lemurs and why do they hunt them?* We tested the following hypotheses about the proximate and ultimate causes of the decision to hunt lemurs:

H₁. Institutions and resource regulation: People who are aware of the laws against lemur hunting and the potential consequences of their enforcement will decide not to hunt lemurs despite the potential strong incentives for hunting lemurs.

H₂. Formal education: People with greater formal education will have opportunities for income and employment or a greater understanding of ecosystem services, so will not hunt lemurs.

H₃. Ecotourism: People involved in ecotourism will not hunt lemurs. People who gain income from ecotourism may prefer to leave lemurs alive in the wild to attract ecotourists to the area and thereby increase their own personal income, so will avoid and discourage lemur hunting.

H₄. Demographic traits of household members: People in households with more men, more people, or more children to support will hunt lemurs. Men may trap more than women. Households with more people to support, or more children to raise, may also do more hunting to enlarge the food supply for the household.

H₅. Traditional cultural values about livelihoods and food: People who embrace traditional values will hunt lemurs. Holding traditional values may affect hunting in multiple ways. Lemur-hunting might be a traditional occupation or activity for some households, and traditional values or food cultures may encourage or prohibit certain kinds of hunting.

H₆. Taste and preference for animal foods: People who prefer or value the taste of lemurs over other foods will hunt lemurs.

H₇. Opportunity: People with livelihood strategies that require spending large amounts of time in the forest will hunt lemurs.

H₈. Human-wildlife conflicts: People whose crops and domestic animals have been threatened by wild animals will hunt lemurs.

H₉. Access to alternative animal foods: People with less access to alternative sources of meat will hunt lemurs to supplement their diet.

H₁₀. Wealth: Wealthy people will not hunt lemurs. People with relatively little wealth and income will hunt lemurs as free supplements to their diet, whereas people with more wealth and income will not need to do this.

H₁₁. Health: People in households whose members are malnourished and frequently fall ill will hunt lemurs as an important dietary supplement more often than will people in better health.

2. Methods

2.1. Study site and data collection

This study took place over twelve consecutive months (July 2011–June 2012) in a focal village on the Masoala peninsula, in northeast Madagascar. The Masoala peninsula contains the wet and mountainous Masoala National Park, which is a UNESCO World Heritage Site and the largest national park in Madagascar (Kremen et al., 1999). The livelihoods of the predominately rural local people depend primarily on subsistence-based agriculture. The staple crop is rice, and rice production is supplemented by a wide variety of other crops including tubers, bananas, and greens (AGEVAREN, 2009). Livelihoods are also supplemented by fishing, growing cash crops (e.g. vanilla and cloves), and raising small numbers of domesticated livestock (e.g. cows, chickens, ducks, geese, and pigs). People also depend on the forest environment as a source of many materials essential for daily life, including housing materials, plant-based medicines (Golden et al., 2012), and food (Golden et al., 2014; Borgerson, 2015a,b). Hunting in the region is common, is practiced primarily for subsistence, and can be targeted (using a wide variety of passive snare traps, some requiring considerable planning and investment of labor), opportunistic (using sling shots of found materials), or incidental (in the form of less valuable by-catch) (Borgerson, 2015a,b).

We selected the study site after completing a rapid assessment of resource use in 36 villages bordering the Masoala National Park. We chose this village because of its proximity to the park and the trusting relationship that we had established with members of this community during previous research. There are 10 species of lemurs at the study site (*Varecia rubra*, *Eulemur albifrons*, *Hapalemur griseus*, *Microcebus rufus*, *Allocebus trichotis*, *Cheirogaleus medius*, *Phaner furcifer*, *Lepilemur scottorum*, *Avahi mooreorum*, and *Daubentonia madagascariensis*); 50% of these species are Endangered or Critically Endangered and 90% are Threatened (IUCN, 2014). *E. albifrons*, *V. rubra*, *H. griseus*, and *C. medius* are hunted most frequently (Borgerson, 2015a,b).

Borgerson speaks the local dialect of Betsimisaraka, has worked in the region since 2007, and has earned the trust of the local people. She conducted extensive structured interviews of community members and unstructured interviews of a focal trapper during 12 months of trapper shadowing. Borgerson interviewed at least one member of every household (N = 36), and conducted follow-up interviews with every person (N = 112) in the village. Interviews lasted between four and twelve hours over the course of one to two days, and were punctuated with frequent breaks. We defined households as units comprising all people who shared the use of a single kitchen. We defined adults as individuals 18 years and older, and children as individuals less than 18 years of age. Borgerson obtained informed consent from all participants. Interviews included over 600 questions about behavior and potential incentives for resource use, at both individual and household levels, allowing us to test many of the assertions found in the literature about illegal lemur hunting.

2.2. Data analysis

We defined active lemur trappers as people who had intentionally trapped and caught lemurs within the prior year. We used bivariate nominal logistic regression analysis to test the impact of potential

Download English Version:

<https://daneshyari.com/en/article/6298406>

Download Persian Version:

<https://daneshyari.com/article/6298406>

[Daneshyari.com](https://daneshyari.com)