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# Comparative Analysis Of Wildlife Management Strategies

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## Abstract

Worldwide, huge numbers of species are in decline because of habitat loss and overexploitation, among other threats. To protect large wildlife, we must identify which management strategies best conserve their populations. Management strategies differ in their regulation of hunting, ownership of wildlife, funding mechanisms, and the biological and socio-political contexts in which they operate. These cross-country differences are so vast that few have undertaken the task of comparing wildlife management strategies on a global scale. This broad comparison speaks to the question of, “What works where, and why?” for wildlife conservation.

To answer this question for policymakers and wildlife managers, we conduct a comparative analysis of three distinct “models” of wildlife management found worldwide: the North American Model, the Southern African Model, and the No-Hunting Model. This report conceptualizes compares and ranks these models based upon their performance, using measurable indicators and highlighting differences in context. We considered a model successful if it sustains and/or increases wildlife populations, generates high revenues compared to costs, and provides benefits to local people living near conservation areas.

## 1.1: Introduction

Worldwide, over 50% of all large mammal species are in decline, and 25% face extinction (Channell and Lomolino 2000, Ceballos et al. 2005). Although threats to wildlife differ by region, habitat loss and overexploitation are the most prominent (Ceballos et al. 2005, Pimm and Raven 2000). Human populations and settlements are expanding, edging out wildlife in the few places they still thrive. Large mammals are particularly threatened due to their need for expansive habitats and abundant food sources (Rondinini et al. 2011). These large, charismatic mammals, however, are often the species that attract the most conservation efforts, media attention (Redford et al. 2011).

To protect large wildlife, we must identify which management strategies best conserve their populations. Management strategies differ in their regulation of subsistence and commercial hunting, private versus public or government ownership of wildlife, funding mechanisms, and the biological and socio-political contexts in which they operate. These cross-country differences are so vast that few have undertaken the task of comparing wildlife management strategies on a

global scale. This type of broad comparison speaks to the question of, “What works where, and why?” regarding wildlife conservation, which allows for the exchange of ideas between countries. Which wildlife management strategies increase wildlife populations, and which generate the economic returns for their country? What political and economic institutions enable the sustainability of these benefits? With this question in mind, we conducted a comparative analysis of three broad general strategies of wildlife management:

- 1) North American (U.S. and Canada), also used (in part) in Australia and Europe
- 2) Southern African (South Africa, Tanzania) also used in Mozambique, Namibia, Zimbabwe, and Zambia
- 3) No---Hunting (Kenya and India). Also used in Botswana, Costa Rica

We considered the three pillars of sustainability to create the framework of this report. A successful model of wildlife management generates positive outcomes for people and wildlife. In other words, we considered a model successful if it sustains and/or increases wildlife populations, generates high revenues compared to costs, and provides benefits to local people living near conservation areas. Additionally, we compared conservation policies and protected area coverage among models to provide the context of each model’s institutional support of wildlife and habitat conservation. We also examined three case studies of megafauna to demonstrate how each model contributes to the species’ conservation and to the country’s economy. We present these models individually and comparatively in this report.

This report offers a novel comparison of national wildlife management strategies on a global scale. With the exception of North American model, these models have not been conceptualized nor compared in the literature until now. Our objective is to increase policymakers’ and wildlife managers’ awareness of the similarities, differences, and benefits for large wildlife and human communities among the three models.

## **1.2: The Wildlife Management Models**

This report focuses on three broad models of wildlife management, each with different strategies for ownership, funding sources, and wildlife utilization laws. Although each model has fundamental contextual differences, we are still able to compare them based on simplified, measurable outcomes, such as wildlife trends and economic revenues. We are also able to describe each model’s relative strengths and weaknesses. However, making recommendations regarding the interchangeability of the three models (eg. transferring one particularly successful component from one model to another) is beyond the scope of this report.

In general, Asia’s model is characterized by state or governmental ownership, and Africa’s by community---ownership of land by large private or corporate holdings (also common in Latin America). In contrast, North American model is characterized by public ownership of wildlife.

	<b>North American</b>	<b>Southern African</b>	<b>No-Hunting (Kenya &amp; India)</b>
<b>Wildlife ownership</b>	Public	Private	Government
<b>Wildlife conservation funding</b>	1. Sport hunting (US) 2. Public Taxes (Canada)	Eco-tourism Sport Hunting	1. Eco-tourism

**Table 1: Summary of three wildlife management models**

\*The North American model of wildlife conservation is characterized by public ownership of wildlife and a “user pay, user benefit” system in which hunters and anglers contribute to funding for wildlife conservation. This model is credited with success as it generates millions of dollars each year for conservation and local economies, promotes public interest in wildlife, and promotes stable populations of wildlife (Geist et al. 2001).

\*The Southern African model of wildlife management centers on the privatization and commercialization of wildlife resources, with devolution of rights over wildlife to private landowners and local communities. The model finds its success in its ability to simultaneously benefit wildlife populations and local communities, which are able to capitalize on the booming consumptive and non---consumptive tourism industry in Africa

\*The No---Hunting model is characterized by a complete ban on commercial hunting (with minor exceptions for subsistence), and a reliance on tourism revenues and government subsidies to cover operating costs for wildlife conservation. The two main arguments made in support of the No---Hunting model state that hunting wildlife 1) harms wildlife populations, and 2) is unethical. Wildlife, both dead and alive, is owned entirely by the state.

### **1.3: Methodology**

The present work conduct an extensive review of the literature regarding wildlife management models, contextual difference among models, and outcomes for people and wildlife. It is cited over 280 documents and reviewed many more. The researcher relied primarily on government and peer---reviewed literature, but also collected data from white, grey, and popular literature. We present results in this report for each country and model individually. Within the literature review, we collected data on the historical context and wildlife policies of each model, in order to provide the background and storyline of each model’s development.

Although we did not utilize this research to compare among models in a quantitative manner, these stories help to explain how and why each model of wildlife management developed, and how it has since evolved.

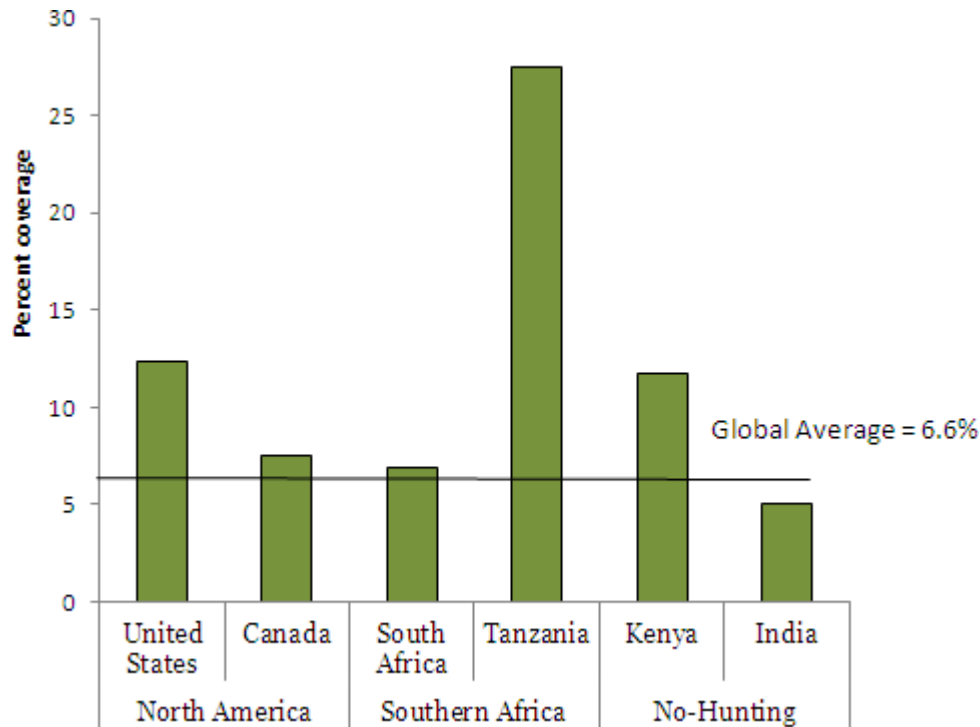
#### **1.4: Standards and Limitations**

This analysis requires comparisons between nations with drastically different economies and populations.

Several limitations influence our results. First, we only account for national level policies and revenues, and not state or provincial level; this allows us to compare countries both within and among models. Secondly, we only include nationally---designated protected areas as listed in the World Database of Protected Areas. As we did not include private reserves, our results are conservative estimates of protected area coverage. Finally, we focused exclusively on large (>5kg) terrestrial mammals; this level of focus allows us to capture the most biodiversity in the most efficient manner (i.e. the umbrella species approach). Finally, we accounted only for legal activities, as this constitutes the ‘model.’ We did not compare poaching or illegal wildlife trade among models, as this was beyond the scope of our report.

#### **1.5: Results: Comparisons among the Models: Protected Areas**

We examined the coverage of protected areas for each country as a way to understand the status of habitat conservation among models. We compared models statistically and found that there is no significant difference among models in terms of terrestrial or marine protected area coverage. However, compared to the other countries, Tanzania has the highest coverage of terrestrial protected areas at 28%. This is attributed to, in part, the existence of many protected areas before Tanzania gained independence. Additionally, Tanzania receives significant NGO contributions annually (around US\$14 million), which aid in its ability to support protected area management (Brockington et al. 2008).



**Figure 1:** Comparison of protected area coverage among models. There is no significant difference between terrestrial protected area coverage among models (Kruskal-Wallis chi-squared,  $df = 2$ ,  $p$ -value = 0.6514). Source: IUCN and UNEP 2012.

This analysis is limited in that it does not speak to effectiveness or support of biodiversity, as these factors are not necessarily indicated by protected area coverage. Additionally, results may be an underestimate of actual coverage as they include only nationally designated protected areas, and exclude private reserves.

Our analysis provides a static comparison of protected areas in 2012. In addition, examining regional trends in protected area coverage may further aid in comparing models.

The No-Hunting model fails to deliver reliable returns due to its reliance on tourism as the only revenue source. Tourism is inherently a fluctuating industry; it is susceptible to numerous external market forces, including global economic changes, political unrest, and strength of advertising campaigns. With this uncertainty acknowledged, however, tourism can still offer a lucrative and potentially sustainable revenue source for wildlife conservation. Wildlife tourism can bolster local economies, support infrastructure development, and improve social welfare. It incentivizes effective conservation in the places where it matters the most: rural areas surrounding protected areas. When not developed sustainably, however, unregulated tourism can harm wildlife and ecosystems and commodify people and places (Karanth et al. 2012).

Governments must create and enforce policies to guide the tourism industry's development.

### **1.5.1: Economic Incentives for Conservation**

The table above demonstrates some of the national-level economic incentives to protect wildlife populations. Economic incentives are also important on the individual-level, as they can play a major factor in deciding whether or not individuals and communities support wildlife conservation efforts. Giving local communities a share in conservation's direct and indirect financial benefits gives them incentives to ensure effective conservation in the long-term. Wildlife-based benefits can include tourism/hunting revenues, employment, or access to natural resources.

- As the most privatized and commercialized system, the Southern African model provides the most economic incentives for individuals to conserve wildlife. In this model, individuals can manage wildlife to sustain their own livelihoods; they directly profit from individual wildlife.
- The North American model provides indirect benefits for the public good, but fewer direct, individual incentives for conservation. Although individuals in this model can benefit indirectly from conservation through larger deer populations or healthier ecosystems, for example, they do not directly profit from wildlife as in the Southern African model.
- The No-Hunting model offers very few indirect, and no direct financial incentives for conservation. In this top-down, state-owned wildlife management strategy, individuals can only profit indirectly from tourism, and from some ecosystem services provided by protected areas.

According to one study in Kenya, the equitable distribution of benefits, rather than the quantity, may be the most important factor in generating support for conservation efforts (Groom and Harris 2008). The study found that local communities receiving financial benefits from conservation were most concerned about fair distribution of benefits to all community members; for example, that they received the same amount as their neighbor, even if this amount is small. They were more likely to support conservation if at least one member in their extended family received some benefit from conservation, even if they did not receive any benefit themselves. This emphasizes the importance of distributing benefits widely and equitably among households.

### **1.5.2: Social Support for Conservation**

There is an increasing agreement that successful environmental conservation depends upon the involvement and participation of local communities (Child 2000, Gibson and Marks 1995, Groom and Harris 2008). Human communities living in and around a protected area ----- especially those without enforcement or fencing) ----- can determine its fate, either by overexploiting its resources or by supporting its boundaries and laws.

National-level policies may be the best way to ensure that conservation's benefits are shared with local people. These policies should clearly define the quantity and the process of benefit sharing. We ranked each wildlife management model based upon the existence of national-level policies

that ensure that successful conservation shares benefits with local communities.

In the North American model, all citizens can benefit from wildlife, as it is a public trust resource. The Southern African model has several policies that require the equitable distribution of conservation benefits to local communities. Tanzania's Wildlife Management Areas offer up to 65% of revenues to participating communities. In South Africa, the federal government pays communities to lease their lands as national parks. The No---Hunting model, however, has no policy requiring that tourism revenues are shared with local communities, even though many of their protected areas are surrounded by rural, resource---dependent communities for whom wildlife is often a harm rather than a benefit. With human populations only expected to rise in future years, these models of wildlife management must find ways to generate local support for conservation efforts, particularly through benefit---sharing, in order to preserve wildlife for future generations.

### **1.5.3: Hunting vs. Tourism**

The three models differ widely on their policies regarding hunting. The Southern African Model has privatized and commercialized it, the North American Model promotes it as a public right and as a funding source, and the No---Hunting Model bans it as an unethical, damaging practice for wildlife. The arguments on either side of the hunting debate are explained below.

#### **The No---Hunting Argument**

Supporters of the hunting ban contend that hunting is unethical, 90% of lions hunted in South Africa are 'canned'; Hunting harms wildlife populations. Many wildlife populations are already declining; hunting will push them over the brink. Corruption leads to overharvest even in regions with well---regulated hunting industries (Baldus and Cauldwell 2004). Many quotas are set without reliable biological knowledge of populations. Ecotourism is worth more than hunting, so it is better to protect wildlife for tourism instead of use it for hunting. Most No---Hunting countries ----- including Kenya and India described here ----- have banned hunting in response to alarming declines in wildlife populations. Botswana and Zambia recently. Although these actions are taken with the goal of stopping the wildlife decline, a hunting ban often does not address the root causes of the decline: habitat loss due to human expansion, human---wildlife conflict, and illegal poaching. For this reason, the hunting bans in India and Kenya have failed to stabilize wildlife populations.

Supporters argue that where wildlife pays, it stays (Lindsey et al. 2007). The ban on hunting gives wildlife little or no economic value to much of the population, causing local people to view wildlife as a liability rather than an asset to be protected. As a result, landowners invest in agriculture which decreases wildlife habitat and increases the potential for human---wildlife conflicts (Lindsey et al. 2006, Norton---Griffiths 2007). Hunting, on the other hand, has spurred private sector investment in wildlife conservation and provides economic incentives for conservation over vast regions of southern Africa and Tanzania (Lindsey et al 2006). Well monitored trophy hunting is inherently self---regulating and self---protecting, because modest harvest is required to ensure high trophy quality and thus marketability of the area in future seasons (Lindsey et al 2006). It can operate in

areas with low populations and diversity of wildlife, because hunters focus on individual trophies, whereas photographic tourists desire wildlife abundance and diversity (Booth 2010).

Supporters of the multiple-use approach argue that hunting and tourism are compatible. When used in tandem, the two methods can provide the broadest range of benefits to the largest number of people and wildlife species. Trophy hunting of a few older males can generate funds to conserve the entire population. Tourism can utilize the most accessible parts of a reserve, while hunting can bring a small number of high-paying clients to remote areas.

## **1.6: Conclusions**

No wildlife management model is perfect, as there will always be trade-offs between economic, ecological, and social goals. Ideally, an effective model would provide high quality habitat, generate adequate funding, and offer incentives for local people to conserve wildlife.

The future of conservation hinges on our ability to sustain wildlife populations while balancing the needs of peoples and economies. National and international policy makers must incorporate these demands in policy and practice in order to ensure sustainable wildlife management.

Our literature review and comparative analysis allows us to make broad comparisons while illuminating the complexity of each wildlife management model.

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