BUILDING PRIVATE-SECTOR PARTNERSHIPS FOR CONSERVATION:

Lessons learned from the collaboration between WCS, CIB, and the Republic of Congo in forestry concessions.

WILDLIFE CONSERVATION SOCIETY

John R. Poulsen

October 2009

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This project was made possible by the generous support of the American people through the United States Agency for International Development (USAID) under the terms of Cooperative Agreement No. RLA-A-00-07-00043-00 Under LAG-A-00-99-00048-00. The contents are the responsibility of the Africa Biodiversity Collaborative Group (ABCG) and do not necessarily reflect the views of USAID or the United States Government. This brochure was produced by the Wildlife Conservation Society (WCS) on behalf of ABCG through the Biodiversity Analysis and Technical Support (BATS) program for USAID/Africa Bureau.

Front cover photographs by: elephants, gorilla and antelope, T. Breuer; others by J. Poulsen.

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ACRONYMS

CAR	Central African Republic
CARPE	Central African Regional Program for the Environment
CIB	Congolaise Industrielle des Bois
BZP	Buffer Zone Project
FSC	Forest Stewardship Council
ICDP	Integrated Conservation and Development Project
ITTO	International Tropical Timber Organization
LCAOF	Liz Clairborne Art Ortenberg Foundation
MEF	Ministère de l'Economie Forestière
NGO	Non-Governmental Organization
NNNP	Nouabalé-Ndoki National Park
NTFP	Non-Timber Forest Products
PA	Protected area
PROGEPP	Projet de la Gestion des Ecosystèmes Periphériques au Parc
PSPC	Private Sector Partnerships for Conservation
ROC	Republic of Congo
USFWS	US Fish and Wildlife Service
WCS	Wildlife Conservation Society

EXECUTIVE SUMMARY

There is no single strategy to effectively curb the loss of biodiversity while facilitating sustainable livelihoods in rural areas. But as tropical countries work to develop their economies, national and international industry will have a larger impact on natural lands and resources than ever before. Engagement with the private sector through the development of partnerships for conservation is one of the most important tools. Private-sector partnerships for conservation (PSPCs) are alliances between businesses and conservation organizations, public agencies or local communities to promote mutually beneficial and ecologically and socially responsible activities.

One such partnership unites a logging company, international conservation organization, and government for the management of hunting and wildlife in the Republic of Congo. The Buffer Zone Project (BZP), also known by its French acronym "PROGEPP," has worked since 1999 to protect the Nouabalé-Ndoki National Park (NNNP) from hunting pressure, to manage wildlife in four logging concessions adjacent to the protected area, and to mitigate the negative effects of logging on biodiversity and the livelihoods of local residents. Guided by five key wildlife management principles, the BZP implemented a multi-pronged approach that combined law enforcement, development of alternative activities, education and awareness-raising, and research and monitoring. This paper draws from the experiences of the BZP to summarize the risks and benefits of building a PSPC, the components of a successful partnership, and several management strategies for conservation.

Engaging in PSPCs entails both risks and benefits for member organizations. Different types of organizations are motivated to enter into PSPCs by different goals. Industry does what is good for profits; government pursues social-economic development; non-governmental organizations (NGOs) are motivated by gains in conservation. In addition to compulsory standards, businesses enter into partnerships to improve their image, open access to markets and financial resources, improve relationships with communities, and benefit from conservation expertise. Conservation organizations enter into partnerships to access financial and logistical resources, work in areas of high biodiversity value that would otherwise be off-limits, increase their authority to do conservation, and improve resource management. PSPCs can be a risky venture for member organizations: money, livelihoods and reputations are at stake. Working in a PSPC takes time, effort, dedication and money.

The lessons for effective collaboration are many. The selection of partners is key to success. Partnerships based on a shared vision are more enduring than those of convenience, but effective relationships can be built from shared experiences and a willingness to understand the motivations of partner organizations. Effective partnerships are founded on formal protocols that define the roles and responsibilities of each partner organization. Effective partnerships are maintained when each organization plays a role in implementing conservation on the ground. Talk is cheap; partnerships become real through action.

Effective partnerships evolve when adversity tests the integrity of the institutions and individuals involved. Challenges to partnerships can be overcome if partners trust and respect one another. But just in case, procedures should be put in place to resolve disputes and important decisions should be depersonalized and based on evidence.

Biodiversity conservation is fundamentally about people – it involves modifying behaviors and practices that are detrimental to the environment so that people can be sustained by nature and natural resources. Conservation is therefore complex, and no single strategy will work in all situations. Working through a PSPC broadens the expertise that can be applied to conservation management: organizations and agencies that specialize in wildlife management, community development, and law enforcement can and should be incorporated depending on need.

With the combined expertise and resources of a PSPC, conservation can be conducted at bigger scales. The biggest conservation gains are likely to come from management of landscapes because conservation of protected areas alone is unlikely to protect entire animal populations, and biodiversity value in industrial sites would be otherwise sacrificed. In most cases, management for biodiversity conservation will necessitate a diversity of management actions from law enforcement, to awareness-raising and community development. These actions will be most successful when communities are incorporated early into land-use planning and when the access rights of indigenous people to land and resources are recognized and guaranteed.

PSPCs are likely to find certification schemes advantageous to conservation because they provide an incentive for companies to invest in biodiversity conservation. Companies earn certification by implementing high industrial, social, and environmental standards that allow them to gain wider access to markets and sell their products at higher prices.

Several recommendations for replicating the PSPC model are provided. This assessment of PSPCs is just a beginning and is meant to catalyze the development of new PSPCs as much as it is meant to be a guide. Hopefully this paper will inspire confidence about multi-sector partnerships, and the development of new tools and approaches for conservation practitioners in the future.

SECTION 1: INTRODUCTION

Plant and animal populations and species are going extinct at an unprecedented rate (Pimm et al. 1995, Hughes et al. 1997). The greatest biodiversity losses occur in the species-rich tropics where deforestation and hunting reduce the extent of habitat and numbers of animals. Deforestation, driven by agriculture and urban development, can lead to catastrophic extinctions with over-hunting contributing to the extirpation of large vertebrates (Brook et al. 2003, Fa et al. 2005). Despite the recognition of the extinction crisis for nearly two decades, deforestation of tropical forests continues at a rate of 13.1 million hectares per year, slightly higher than the deforestation rate of 12.9 million hectares per year from 1990 to 2000 (FAO 2005). A massive loss of biodiversity is widely anticipated should these rates of deforestation continue unabated (Dirzo and Raven2003, Sohdi et al.2004).

Although the rate of forest loss has not slowed, the drivers of deforestation and defaunation have changed. As the impact of small-scale economic activities by the rural poor lessens, industry is taking its place as the primary source of deforestion.

Although the rate of forest loss has not slowed, the drivers of deforestation and defaunation have changed. From the 1960s to 1980s, small scale, slash-and-burn agriculture and ranching by the rural poor were the primary threats to forests and their biodiversity, causing two-thirds of all tropical deforestation (Myers 2002). Government policies, such as agricultural loans, tax incentives and road construction, encouraged the cutting and burning of tropical forests for rural development and reduction of poverty (Butler and Laurance, 2007). To decrease deforestation by rural people, conservationists developed and employed strategies (e.g. Integrated Conservation and Development Projects – ICDPs) that linked conservation with sustainable rural development.

Global trends in population growth and urbanization have lessened the impact of rural populations on tropical forest in the last decade. Population growth is slowing in many tropical countries and urbanization is intensifying as rural populations move to cities (United Nations 2004). The percentage of people living in rural areas in developing regions is expected to fall from an overall level of 60 percent in the year 2000, to 43 percent by 2030 (United Nation 2005). An increase in urban living relative to rural living does not tell the entire story: some countries will be exceptions to this trend, economic downturns can lead to urban-to-rural migration and research for agricultural land and new resources can lead to rural-to-rural migration (Oglethorpe et al. 2007). But taking tropical areas as a whole, recent projection models suggest that previous estimates of future deforestation are exaggerated and that it will slow as population growth slows and urbanization increases (Wright and Muller-Landau 2006, but see Brook et al. 2006). The result is that small scale agricultural and economic activities by rural communities are no longer the primary sources of deforestation and habitat degradation.

As the impact of small-scale economic activities by the rural poor lessens, industry is taking its place as the primary source of deforestation. In today's globalized financial markets, loss of tropical habitat and biodiversity is largely driven by a worldwide hunger for commodities fed mostly by the private sector. Industrial logging, mining, oil and gas development and large-scale agriculture are emerging as the dominant causes of tropical forest deforestation and degradation (Nepstad et al. 2006). In Brazilian Amazonia, for in-

stance, large-scale ranching has exploded and logging and soy farming have grown dramatically (Fearnside 2001, Nepstad et al. 2006, Butler and Laurance 2008). In central Africa, selective logging is currently the most extensive land use (Global Forest Watch 2002); but palm concessions are expected to grow in area and intensify deforestation (Laporte et al. 2007a). The global thirst for biofuels and the rising standards of living in developing countries have created a surge in the demand of grains and edible oils (Laurance 2007, Scharlemann and Laurance 2008).

As the drivers of deforestation and biodiversity loss have changed, so too must the tools for preventing and mitigating their impacts. New strategies can and must involve the private-sector in the conservation of tropical habitats and their biodiversity. One strategy for involving the private-sector in conservation is the development of private-sector partnerships for conservation (PSPCs). PSPCs are alliances between private companies and conservation organizations, public agencies and/or local communities that seek to conserve habitat and biodiversity through ecologically and socially responsible activities. Such alliances could take on many different forms, but most importantly they take advantage of two trends. On the one hand, globalization and resource extraction are playing a larger role in tropical deforestation and biodiversity loss. On the other hand, public concerns about environmental sustainability put pressure on companies to protect forests and resources. By working with industry, there is now an unprecedented opportunity to change the way it does business that may ultimately be good for both the company and biodiversity.

Private-sector partnerships for conservation (PCPCs) are alliances between private companies and conservation organizations, public agencies and/or local communities that seek to conserve habitat and biodiversity through ecologically and socially responsible activities.

Growing environmental awareness and concern of consumers and shareholders provides a strong incentive for the private sector to invest in biodiversity conservation. Many companies sell their products on international markets that are beginning to require proof of the ecological sustainability and socio-economic fairness of production (e.g. fair trade, organic and shade grown coffee). For example, "green" timber products, those produced in an environmentally sustainable manner, accounted for $7.4 billion in sales in the Unites States in 2005, and sales are expected to grow (Yaussi 2006). Sensitivity to environmental and social concerns may be greatest in highly educated and developed countries. Not all societies are as enthused by "green" products as Europeans and Americans; Asian consumers, for example, have so far shown little interest in eco-certified timber products (Gale 2006). However, the adoption of environmentally sustainable business practices by progressive companies is likely to cause other companies to follow suit. First, the tropical countries in which businesses operate are likely to mandate higher standards as the government and the people become aware of the differences between those companies that are environmental and socially responsible and those that are

Box 1. Alternative solution to biodiversity loss.

One proposed solution to mitigate biodiversity loss in tropical forests is to integrate production forests into existing conservation strategies (Rice et al. 1997; Chazdon 1998; Whitmore 1999; Pearce et al. 2003; Bhagwat et al. 2008). If properly managed, the large size and varied habitats of production forests could complement the existing system of protected areas, enlarging the "conservation estate" (Putz et al. 2001). In recent years, numerous forestry companies have adopted a paradigm of sustainable forest management that, in theory, promotes biodiversity conservation (ITTO 2005; FSC 2006).

Box. 2. Definitions.

'Biodiversity' is the full complement of plant and animal species that inhabit an area.

'Bushmeat' is a term widely used across West and Central Africa to refer to wild meat that is hunted in contrast to domestic meat that is reared for consumption (Milner-Gulland et al. 2003).

'Poaching' refers to hunting that is illegal. Depending on national laws, hunting can be illegal because it is conducted in the wrong place, wrong time, using the wrong methods, and/or because it targets species that are protected by the law.

not. Even nationally-based companies can succumb to market pressures if their deleterious practices become publicized to the local public. Second, as companies grow, they will be forced to raise standards to gain access to more environmentally aware (and often richer) markets. Finally, international financial institutions will leverage pressure for responsible and sustainable industrial practices. The current global recession is likely to slow down the "greening" of extractive industries in many sectors, but when markets pick up again so will the pressures and motivations to invest in sustainable practices.

Working with the private-sector offers unparalleled opportunities for biodiversity conservation. Compared to strategies linking conservation and rural development (ICDPs), integrating business into conservation through PSPCs may result in faster and more effective biodiversity conservation. Rather than attempting to modify the practices of hundreds of millions of forest colonists, conservation efforts can focus on a much smaller number of resource-exploiting or resource-damaging corporations. A single company typically has a larger impact on the environment than any single individual, thus the stakes are higher and the gains are potentially greater working with industry. For example, 45% of tropical forests in central Africa have been leased to companies (Global Forest Watch 2002), and any single logging concession can include tens of thousands of hectares of forest (Pérez et al. 2005). Importantly, the private-sector also possesses resources that can be leveraged for biodiversity conservation (e.g. Elkan et al. 2006). No one strategy will curb the loss of tropical habitat and biodiversity, and the impact that rural people have on the conservation of forests and biodiversity should not be discounted, nor should their traditional, customary and legal rights to exploit and manage forest resources be forgotten. The most complete conservation equation will integrate non-governmental organizations, businesses, local communities, and governments.

The goal of this document is to examine the necessary elements for building successful PSPCs that encourage sustainable resource use and wildlife and biodiversity conservation. The Buffer Zone Project (BZP; Box 3) serves as a case study to examine the management structure required to achieve effective partnership. The BZP is a PSPC that brings together government, private industry, and an international conservation organization: the Congolese Ministry of Forestry Economy (MEF), the Congolaise Industrielle des Bois logging company (CIB), and the Wildlife Conservation Society (WCS). The partners collaborate to protect the Nouabalé-Ndoki National Park from hunting pressure, manage wildlife in the CIB logging concessions, and mitigate the negative effects of logging on local people.

The possibilities for partnership with the private-sector are endless: from working with ecotourism companies to monitor wildlife and educate tourists, to collaborating with local transport companies to prohibit their drivers from transporting bushmeat, to partnering with logging or mining companies to manage wildlife over thousands or millions of hectares of forest. While some of the experiences from the BZP may be specific to logging and to central Africa, the lessons learned about the components of an effective collaboration for biodiversity conservation and sustainable resource use should extend more generally to a wide variety of industries and types of partnerships.

This paper is organized in six sections, including the Introduction (Section1), as follows:

1. Section 2 presents the BZP as a case study of the PSPC model. It starts by describing the primary threats to wildlife imposed by industrial logging so that readers understand the institutional and ecological context of the conservation problem. PSPCs need to be tailored to the specific ecological and socio-economic context of a site. The rest of the section outlines the goals, activities, and management structure of the BZP.

2. Section 3 examines the pros and cons of PSPCs, including the risks to which government, companies, and NGOs expose themselves in engaging together. This section borrows examples from the BZP to identify the characteristics of an effective PSPC, emphasizing the necessary institutional components and building and maintaining institutional relationships.

Box 3. The Buffer Zone Project.

The Buffer Zone Project is a PSPC that was originally established in 1999 as the Projet de la Gestion des Ecosystèmes Périphériques au Parc (PROGEPP). The three partners, the Congolese Ministry of Forestry Economy (MEF), the Congolaise Industrielle des Bois logging company (CIB), and the Wildlife Conservation Society (WCS) manage wildlife and conserve biodiversity in three forestry concessions (Kabo, Pokola, Loundoungou/Toukoulaka) adjacent to the Nouabalé-Ndoki National Park in the northern Republic of Congo (Brazzaville).

The principle objectives of the BZP (PROGEPP 2007) include:

1) to sustainably manage the ecosystems, in particular the wildlife, in the forestry concessions adjacent to the Nouabalé-Ndoki National Park;

2) to protect the Nouabalé-Ndoki National Park (NNNP) from the harmful impacts of forestry by managing wildife in the logging concessions adjacent to the park;

3) to collaborate with local communities to sustainably manage their lands and natural resources.

Unlike conservation of most protected areas, the BZPs goal is not to reduce hunting to zero. Rather, the idea is to protect threatened and endangered species and reduce hunting of game species (defined in Congolese wildlife laws) to sustainable levels so that biodiversity is conserved and indigenous people and CIB workers have access to wild meat now and in the future. The project seeks to evolve towards a locally-managed solution where incentives exist to ensure that local people and local law enforcement work towards the sustainable management of wildlife.

3. Section 4 evaluates lessons learned from the BZP after nine years of working as a PSPC. This section focuses on the principles of wildlife management that have been the most effective in curbing poaching, protecting biodiversity, and integrating people into natural resource management. It also includes lessons learned from mistakes that were made so that the PSPC model can be replicated in other countries and regions.

4. Section 5 briefly outlines the steps to replicating the PSPC model in other areas.

Box 4. Examples of the impacts of industry on the environment in Africa.

This document uses the example of timber concessions in the Congo Basin as a sector in which PCPCs can reduce the threat of industry on the ecological integrity of tropical forests, including their wildlife and biodiversity. The case of oil exploration in Nigeria is perhaps the most notorious example of environmental degradation associated with an extractive industry in Africa. In this case damage to the environment and the failure to share benefits has led to armed conflict. Alluvial mining of diamonds in places like Sierra Leone and Angola is associated with the devastation of gallery forests and aquatic fauna; in Zambia, copper and uranium mines threaten rivers with heavy metals and acidic discharges which have negative consequences to the health of local inhabitants and wildlife. In Senegal and Mauritania, distant water fishing fleets threaten artisanal fisheries. Growing demand for Africa's natural resources means that money is available for exploration and extraction. But it also means more money can become available for responsible, sustainable practices.

SECTION 2: CASE STUDY OF THE BUFFER ZONE PROJECT

Description of the Ndoki landscape

The Nouabalé-Ndoki National Park (4000 km$^{2)}$ and adjacent logging concessions (Kabo, Pokola, and Loundoungou, Toukoulaka) under long term lease to CIB (16,000 km^2) form a contiguous landscape that covers approximately 20,000 km^2 in the northern Republic of Congo-Brazzaville. The landscape forms a part of the Sangha Tri-national network of protected areas that also includes the Lobéké National Park (LNP) in Cameroon and the Ndoki National Park (NNP) in the Central African Republic. These tropical forests comprise a vast stretch of tropical lowland forest interrupted by swamps and forest clearings that provide water and minerals to animals (Blake 2002). The forests are rich in flora and fauna, support a diverse tree community, and are home to some of the continent's most endangered species, including forest elephants, western lowland gorillas, chimpanzees and bongo (Elkan 2003, Poulsen and Clark 2004, Blake et al. 2007, Clark et al. 2009, Harris and Wortley 2008). In fact, large mammal surveys conducted in 2005 found that 46,000 gorillas inhabit the area – the largest known population of gorillas in the world (Stokes 2007).

The forests in the logging concessions also provide natural resources (medicine, construction materials, food and animal protein) critical to the livelihoods of local and indigenous forest peoples. Of dietary protein consumed by residents of the logging concessions, approximately 47% comes from freshwater fish and 45% comes from wild animals (BZP, unpublished data). A conservative estimate of bushmeat offtake in five logging villages was estimated at 129 tons per year (Poulsen et al. 2009). Local people cut trees to make canoes; collect lianas and poles for construction; and harvest mushrooms, roots, caterpillars, beetles, fruits and leaves for food.

Figure 1. Gorillas and a sitatunga in Mbeli bai, Nouabalé-Ndoki National park. Photo by T. Breuer.

The Ndoki landscape traditionally had a low human population density of indigenous Ngombé and Mbendzélé pygmies (<0.5 km$^{2)}$, who subsisted as semi-nomadic hunter-gatherers, and indigenous Bantu communities including the Pomo, Bomassa, Sangha-sangha, Yasoua, Ngondji, Bonguili, Kaka, and Moundongo who practiced subsistence fishing and hunting. Over the past five decades these communities established several permanent settlements along the Sangha and Motaba rivers.

Selective logging was initiated in northern Congo in the 1960s when CIB gained concessionary rights to the Pokola concession. The government leased the Kabo and Loundoungou/Toukoulaka concessions to CIB in 1997 and 1999. But logging operations in northern Congo were relatively limited in scope until the end of civil war in 1999. Logging accelerated at the turn of the century as demonstrated by the rapid construction of roads in previously inaccessible, frontier forests (Laporte et al. 2007b). Over the past decade, CIB constructed sawmills and offices in two towns, Pokola and Kabo, and established three forest towns for its workers, Ndoki 1, Ndoki 2, and Loundoungou. The population of the five logging towns grew by 70% (10,122 to 17,164 people) from 2000 to 2006 (Poulsen et al. 2009).

The population boom was largely the result of immigration from other parts of Congo: 69% of the new logging town residents were immigrants, 13% were indigenous people, and 18% were foreigners from outside of Congo (Poulsen et al. 2009).

CIB employs low intensity, reduced impact logging techniques (<2.5 trees ha^{-1}). Four species make up 90% of the logged volume, with 29 species logged in total (CIB 2006). In 2003, the company made a commitment to seek certification for its concessions. The Forest Stewardship Council certified the Kabo concession in 2006, making it only the second concession to be certified in Central Africa (Box 5). In 2008, the company gained certification for the Pokola concession, and preparations for certification of the Loundoungou/Toukoulaka concession are under-way. The successful certification of all three concessions would make it the largest contiguous block of certified forest in the world.

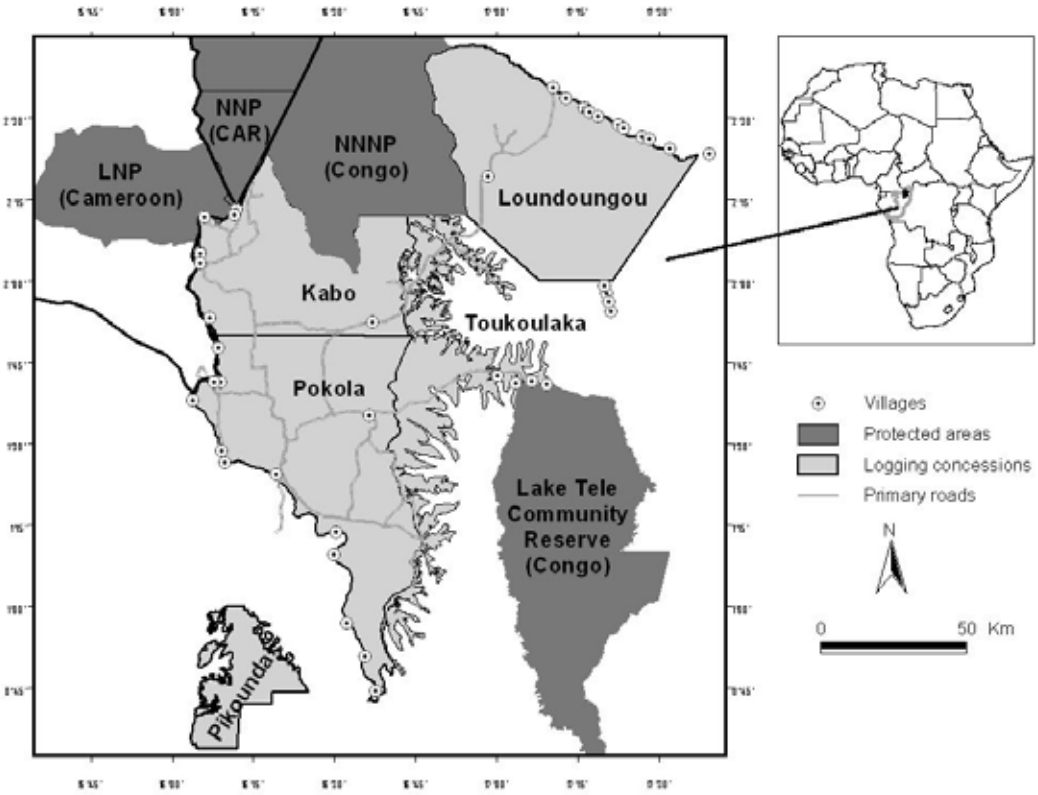

Figure 2. Map of northern Congo showing the logging concessions (light grey) leased to CIB and the national parks and reserves (dark grey). Map by G. Mavah.

Threats to the biodiversity of the Ndoki landscape

Industry can have a diversity of impacts on tropical forests and animals. These impacts are not always negative. Because the goal of this document is to improve conservation practices, it necessarily focuses on deleterious effects that need to be mitigated. Impacts on biodiversity and wildlife can be both direct and indirect (Box 6).This section briefly discusses the main threats that industrial logging imposes on biodiversity in northern Republic of Congo.

The *direct* impacts of logging like the extraction of trees and opening of the canopy can have positive, negative, or neutral effects on wildlife and biodiversity. The effect of logging on wildlife seems to vary from species-to-species, or at least by functional groups of species (e.g. those that occupy similar niches), and depends on the species' resource requirements in terms of diet, shelter, territory, and social needs. For example, in the CIB logging concessions, populations of large mammals responded differently to logging depending on the number of years after logging occurred (Fig 2). Changes in animal abundance over time were partially explained by a vertical shift of resources (Clark et al. 2009). For several years following logging, wildlife experiences a net movement of resources to lower levels of the forest strata, benefit-

Box 5. Brief description of the Forest Stewardship Council.

The Forest Stewardship Council (FSC) certifies forestry concessions that have met the standards set by the council. FSC principles have become the dominant standards for sustainable forest management, and include:

1. **Compliance with the law and FSC principles:** Forest management shall respect all applicable laws of the country in which they occur, and international treaties and agreements to which the country is a signatory, and comply with all FSC principles and criteria.
2. **Tenure and Use Rights and Responsibilities:** Long-term tenure and use rights to the land and forest resources shall be clearly defined, documented, and legally established.
3. **Indigenous Peoples' Rights:** The legal and customary rights of indigenous peoples to own, use, and manage their lands, territories, and resources shall be recognized and respected.
4. **Community Relations and Workers' Rights:** Forest management operations shall maintain or enhance the long-term social and economic well-being of forest workers and local communities.
5. **Benefits from the Forest:** Forest management operations shall encourage the efficient use of the forest's multiple products and services to ensure economic viability and a wide range of environmental and social benefits.
6. **Environmental Impact:** Forest management shall conserve biological diversity and its associated values, water resources, soils, and unique and fragile ecosystems and landscapes, and, by so doing, maintain the ecological functions and the integrity of the forest.
7. **Management Plan:** A management plan — appropriate to the scale and intensity of the operations — shall be written, implemented, and kept up to date.
8. **Monitoring and Assessment:** Monitoring shall be conducted — appropriate to the scale and intensity of forest management — to assess the condition of the forest, yields of forest products, chain of custody, management activities, and their social and environmental impacts.
9. **Maintenance of High Conservation-Value Forests:** Management activities in high conservation-value forests shall maintain or enhance the attributes which define such forests. Decisions regarding high conservation-value forests shall always be considered in the context of a precautionary approach.

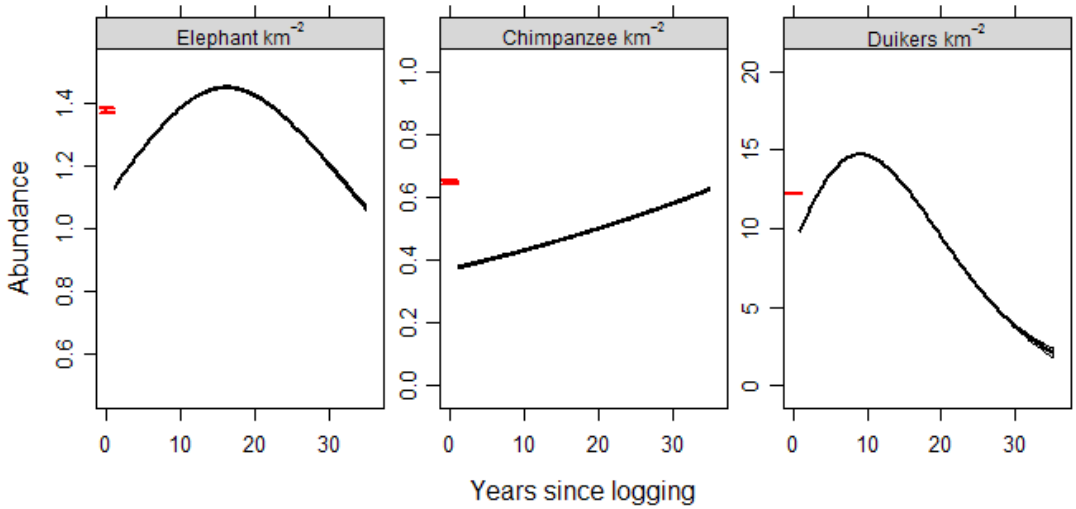

Figure 3. The abundance of elephants, chimpanzees, and duikers over time since logging in the CIB concessions. The red point demonstrates the abundance of the species in unlogged forest; whereas the black line depicts abundance from 1 to 30 years after logging. Both elephant and duiker abundances increase as the forest recovers reaching a peak around 10 to 15 years after logging. Chimpanzee abundances fall after logging, but recover to the unlogged abundance after nearly 30 years.

ing terrestrial and semi-terrestrial species. Resource gradients gradually shift back towards the upper strata as pioneer trees and seedlings are released from the understory and fill canopy gaps, resulting in the return of understory vegetation resources to levels more closely resembling un-logged forests. The intensity of logging and logging technique result in different levels of forest disturbance, and therefore are also likely to affect wildlife populations. For example, in studies of chimpanzees at three different sites, chimpanzee populations have been reported to increase, decrease, or show no change following logging (Plumptre and Reynolds 1994, White 1994, Hashimoto 1995). The results of studies that examine the direct impacts of logging on wildlife are often inconsistent and sometimes difficult to translate into management strategies.

By contrast, the evidence documenting the negative indirect impacts of logging is constantly mounting. Logging inevitably opens up remote forest because roads are necessary to transport timber to sawmills and markets. Logging trucks can covertly transport bushmeat and hunters along the same roads, facilitating the bushmeat market by reducing the production costs of the hunter and increasing labor efficiency through the rapid transport of wild meat to markets (Wilkie and Carpenter 1999, Wilkie et al. 2000). For example, from 2000 to 2005, the rate of road construction for logging across Central Africa increased dramatically, opening up an additional 29% of the central African forest to increased hunting pressure (Laporte et al. 2007b).

In addition to providing access to frontier forests, logging also attracts large numbers of people (workers, family members, and traders) into sparsely populated areas, igniting population growth, urbanization, and increased hunting (Poulsen et al. 2009). Forestry companies pay relatively high wages, growing the local economy and expanding local populations (workers, family members, and traders) into sparsely populated areas (Wilkie and Carpenter 1999). Because logging typically takes place in remote forest (away from urban markets, agriculture and ranching) companies fail to provide their workers with animal protein, so they exploit bushmeat. Thus, logging unites multiple threats to wildlife over a large area, and as timber is extracted from the forest, so is the wildlife.

Even though the total harvest of bushmeat in the Afrotropics has been estimated at 1 to 5 million tons annually (Wilkie and Carpenter 1999; Fa et al. 2002), the ecological consequences of over hunting and increased bushmeat trade are only beginning to be understood (Milner-Gulland et al. 2003). Even moderate hunting has been demonstrated to alter the structure of rainforest mammal communities in central Africa (Laurance et al. 2006). Overhunting of wildlife for meat across the humid tropics has caused the decline and local extinction of animal populations (Fa et al. 2001,Cortlett 2007, Peres and Palacios 2007). This alteration in mammal communities has been demonstrated to have consequences for ecological processes like seed dispersal and seed predation that play roles in forest maintenance and regeneration (Wright et al. 2007, Terborgh et al. 2008). Thus, vertebrate loss from hunting, even in areas where logging companies practice sustainable forest management, could alter composition and structure of the forest over time.

Threats to the peoples of the Ndoki landscape

Industry also has impacts on people, their culture and socio-economic situation. Like threats to biodiversity, impacts of extractive industries on people can be direct (exploitation of indigenous people's resources) or indirect (sedentarization of nomadic peoples with urbanization). (Here the term "indigenous" refers to people who lived in the area before the arrival of industrialized logging in the 1960s). Of course the way in which extractive industries affect people will vary considerably depending on the industrial activity and the way people use their natural resources.

Extractive resources are a factor in pulling people into an area, particularly frontier areas, increasing the local population (Oglethorpe et al. 2007). In CAR, the Dzangha-Sangha Reserve is threatened by extensive logging in buffer zones around the reserve and widespread artisanal mining (Mogba et al. 1996). In parts of eastern DRC, an inrush of miners occurred in the late 1990s due to a surge in the world price of coltan (Hart and Hart

Top: Figure 4. Logs being loaded onto a logging truck in the Kabo Concession. Photo by P.Elkan

Bottom: Figure 5. Wheelbarrows of bushmeat (red river hog and several species of duikers) confiscated from a logging truck. Photo by P. Elkan.

2003). In northern Congo, human population of five logging towns increased 69% over six years: 87% of these people were from outside of the area, representing real immigration rather than migration from rural areas within the concessions to logging towns (Poulsen et al. 2009). Population growth associated with immigration contributes to resource degradation and biodiversity loss as more people live off the same resources.

In villages such as those found in Central Africa, the level of dependence on natural resources may have created the situation of hunters curbing their own use (Runge 1984; Dietz et al. 2000). Village institutions often provide mechanisms to govern resource exploitation, such as restricting who has the right to exploit them and limiting where exploitation can occur. The effectiveness of these mechanisms, however, depends on strong village institutions and interpersonal relationships (Rose 2000). When large numbers of outsiders immigrate into an area or when resource exploitation (like hunting) becomes a commercial activity rather than a subsistence activity local mechanisms fail. Outsiders exploit resources and reduce their abundance without regard to local traditions. Immigrants rarely possess the same incentives to control their consumption of common pool resources as local residents because they do not identify with the land or the community and may not have a long-term interest in the area. In northern Congo, immigrants hunt 72% of all bushmeat, which suggests that the short-term benefits of hunting accrue disproportionately to outsiders to the detriment of indigenous peoples who have prior, legitimate claims to resources. Thus, the environmental impacts of immigration go well beyond a simple increase in the number of resource users in an area. Indigenous peoples and local residents may find their social institutions disrupted, losing control over land and resources.

The social impacts of extractive industries can include, among other things, (1) population growth with immigration, (2) exploitation of resources by outsiders, (3) disruption of local social institutions, (4) loss of traditional ownership and management of land, (5) interruption of traditional resource use patterns, and (6) urbanization and sedentarization.

Box 6. Direct and indirect threats of industrial activity.

Direct threats are a result of the principal industrial activity (e.g. decline of freshwater fish populations because mining sludge is systematically emptied into streams). Direct impacts are often industry-specific (see de Queiroz et al. 2008 for a general introduction to some industry-specific impacts).

Indirect threats are often unintended consequences of the industrial activity. For example, immigration of employees and their families into remote areas for the industrial activity grows the local population. Population growth exerts pressure on natural resources, both NTFPs and wildlife.

The basic threats – opening of forest, population growth, development of markets – that drive overhunting in the tropics are not unique to logging. Without active management, large-scale operations of extractive industries like mining, oil exploitation, industrial agriculture, and logging can all potentially lead to overhunting, local extinction of some species, and the loss of ecosystem services.

Extractive industries change the balance of power at the institutional level. In frontier areas local communities are often governed by traditional leaders with little interference from far-away governments. The arrival of industry imposes rules, at least to the extent that local people cannot interfere with resource extraction, and is likely to bring greater attention from law enforcement. For example, hunting laws went completely un-enforced in north-

ern Congo until the arrival of the timber industry created a competition for wildlife resources between local communities and company employees. With the leasing of land to industry, indigenous people must share resources and territories that they traditionally occupied and must compete with the private sector in the establishment of management and governance systems and the determination of development priorities. Without the financial resources of industry and its easy access to high levels of government, indigenous people and local residents are at a disadvantage when it comes to influencing management of natural resources.

Extractive industries also change the balance of power at the individual level. Company employees (often times immigrants with learned technical skills) can be disproportionately influential in the management of natural resources because they work for the company, and thus have wealth and prestige and are well organized compared with non-workers. For example, CIB employees are organized in unions that lobby the company and government to protect their rights and increase their benefits. In fact, the wildlife and hunting rules adopted by CIB (Box 9) incorporate specific benefits (bimonthly hunts and certain alternative activities) for workers as a result of negotiations with the workers' union.

Of course, extractive industry can also bring development and economic opportunity to indigenous people. Local residents, like immigrants, gain direct employment from the company or can indirectly benefit by providing services or products to company employees. Where industry builds hospitals, schools, and provides transport, indigenous people can also gain from these social services.

On the other hand, urbanization and sedentarization can be detrimental to semi-nomadic cultures unaccustomed to settling down in villages and cities. For example, forest people like the Mbendzélé semi-nomads in northern Congo traditionally traded forest products for agricultural and modern goods. With the arrival of extractive industry they often gain opportunities to hunt to provide meat to company workers in exchange for very modest reward (e.g., cigarettes, alcohol, a portion of the meat). With little experience with exchanging currency and the monetary trade system, many Mbendzélé have found themselves in deep debt to villagers, sometimes resulting in physical violence or jail time. In an environment divorced from easy access to natural resources, indigenous people may be faced with higher rates of alcoholism, disease, and malnourishment in urban centers than in their traditional, rural environments.

Figure 6. Traditional village chief who determined who had access to the forest. Photo by J. Poulsen.

Responding to threats: The Buffer Zone Project

In 1999, Wildlife Conservation Society, Congolaise Industrielle des Bois (CIB), and the Congolese Ministry of Forestry Economy(MEF) formed a partnership to mitigate the potential impacts of logging on wildlife in the CIB logging concessions and on NNNP (Elkan and Elkan 2005, Elkan et al. 2006).

The direct product of the partnership was the Buffer Zone Project to which each organization contributes based on its institutional capacity and expertise. The management structure of BZP is defined by an official protocol of collaboration signed by the three project partners (PROGEPP 1999). The original protocol was updated in 2008 (PROGEPP 2008), but the key components stayed the same. Among other things, the protocol established a steering committee and an evaluation committee to provide annual oversight of the project. Both committees are important for guiding the mission of the project and consist of members from each of the partner organizations as well as outside donors and experts. The protocol also outlines the roles and responsibilities of each partner. At the project level, the MEF and WCS jointly implement BZP activities.

WCS is responsible for implementation of most project activities with the exception of law enforcement. WCS takes the lead role in environmental education, community conservation and promotion of alternative activities, and research and monitoring of conservation activities, wildlife populations, and socio-economics. In practice, WCS has historically played a large role in law enforcement by offering logistical support and technical assistance for the planning of law enforcement missions, management and discipline of ecoguards, and monitoring of law enforcement results. In addition to project implementation, WCS raises approximately three quarters of the funding for project activities through international donors.

The MEF is responsible for the enforcement of hunting and wildlife laws, which involves the management of the ecoguard unit. At any one time, the government appoints 3 to5 agents to the project, including a project coordinator, the head of the ecoguard unit, and 1 to 3 patrol leaders. The MEF also represents the project in case of litigation and serves as the liaison to other governmental departments and personnel. In addition to law enforcement, the MEF contributes to the planning, implementation, and oversight of all other project activities.

Relative to MEF and WCS, CIB plays a secondary role in the management of BZPs conservation activities. The logging company's principal role in the project involves contributing to the logistical and financial support of the ecoguard unit – paying approximately three quarters of the overall cost. It also contributes infrastructure, providing housing for most of the BZP employees. CIB also plays an important role in biodiversity conservation by educating its employees about wildlife laws, penalizing them for infractions of wildlife laws, and prioritizing conservation as a company goal. These activities are the outcome of CIB modifying its company rules to include wildlife conservation and principals at the creation of the BZP partnership. As described below, CIB has invested materials and manpower to increase availability of domestic protein for its workers and their families. Compared to other logging companies operating in central Africa, CIB has taken unprecedented steps to integrate wildlife management into logging procedures and policies and land-use management.

Responding to threats by managing hunting and wildlife

The primary goal of the BZP partnership is to mitigate the direct and indirect impacts of CIB logging practices on wildlife. As previously described, the project aims are: 1) to protect the Nouabalé-Ndoki National Park (NNNP) from

hunting pressure coming from logging operations and human immigration; 2) to manage wildlife in the concessions for sustainability; and, 3) to identify, monitor, and mitigate potentially negative effects of logging on people and wildlife. To achieve these goals, a wildlife management system was established based on five key principles:

1) Regulating access to wildlife resources through land-use planning;

2) Promoting selective hunting through law enforcement;

3) Involving communities in wildlife management;

4) Developing economic and protein alternatives to hunting and bushmeat;

5) Adapting management strategies to the on-the-ground circumstances.

Below, the activities undertaken by each project partner to implement the management principles are described.

Regulating access to wildlife through land-use planning

The goal of land-use planning in the CIB concessions was to limit the number of people with rights to resources so that offtake would be sustainable. Access to a resource is regulated by defining who has access, where, and when. Regulating access to resources was done through land-use planning and occurred at two levels. For timber, the plan defined where and when logging can take place to prevent overharvest of tree species and to conserve the forest for other uses. For hunting, the plan defined who can hunt and where they can hunt to avoid unsustainable wildlife harvest and to ensure that people with legitimate rights to wildlife benefit from them.

Box 7. BZP leadership and personnel.

The BZP is managed by personnel appointed by MEF and WCS. The MEF Coordinator and WCS Principal Technical Advisor (PTA) plan and implement project activities together, with the Coordinator being responsible for law enforcement and the PTA being responsible for donor-funded activities. A WCS-appointed Project Administrator manages the accounting and logistics. The two project leaders are also assisted by the MEF Brigade Chief that manages the ecoguard unit on a daily basis. MEF also appoints 1 to 3 other Team Leaders that lead law enforcement missions in the field. The project has a personnel of approximately 75 people, including ecoguards, researchers, extension agents, and support staff.

The MEF Coordinator and WCS PTA liaise regularly with the Coordinator of CIB's forest management department to discuss planning, management, and logistics.

Land-use planning for timber sought to maximize timber production and economic profit within the limits of sustainable forestry norms. The National Forestry Management Directives define five types of "*series*" or land use categories: 1) the production *series* is set aside for logging operations and economic production; 2) the conservation *series* guarantees the existence of timber species and protects biodiversity, wildlife, and landscapes; 3) the protection *series* safeguards fragile habitats, particularly watersheds, watercourses, swamps and soils that could be degraded by erosion; 4) the community development *series* is reserved for use by local populations to exploit natural resources for their livelihoods and community development; and 5) the research *series* demarcates areas that can be used for ecological and forestry research. In the Kabo concession, 72.3% (2,140 $km^{2)}$ of the area is included in the production *series*, 20% (593 km^2) in the protection *series*, 5.1% (151 km^2) in the conservation

series, and 2.6% (76 km^2) in the community development *series*. The entire area is included in the research *series*.

CIB carried out the land-use planning for timber following the National Forestry Management Directives. In addition to economic and technical considerations, CIB's forestry management unit consulted with local communities and stakeholders so that their interests could be taken into account in the plan. This participatory process included stakeholder meetings, mapping of community zones, and setting aside areas that were deemed important for environmental (e.g. critical habitat for endangered species) or cultural reasons (e.g. sacred trees or cemeteries).

Land-use planning for wildlife involved the creation of hunting zones within the production and community development *series*. Other non-timber forest products (NTFPs) can be exploited throughout the concessions with the exception of the protection *series* which is off-limits to any form of exploitation. Through a series of meetings with local villages, BZP created three types of wildlife use zones: village hunting zones, conservation zones and protected zones (Figure 3) Village hunting zones reserve access to the forest for hunters from the adjacent village and are subdivided into zones for indigenous villagers, residents of logging sites and the controlled hunt (a monthly hunt organized for CIB Congolese employees). The demarcation of village hunting zones took place following months of discussions with local villages. Based on traditional land use patterns, BZP researchers mapped traditional hunting territories for both Mbendzélé (semi-nomadic pygmies) and Bantu inhabitants, incorporating data collected from stories, hand-drawn maps, and visits to landmarks with local people to identify boundaries. Conservation zones prohibit hunting with firearms, but permit hunting and trapping with traditional weapons like spears, crossbows, and hand-woven nets. Fishing and gathering are allowed throughout the year. Protection zones conserve areas of particular importance for large mammals (e.g. the buffer around the park borders and large forest clearings) and all hunting, either modern or traditional, is prohibited.

The conservation and protection zones serve to protect populations of game and key habitat, and presumably serve as a source of wild animals to replenish wildlife stocks in neighboring hunting zones. The Kabo concession, for example, is divided into village hunting zones (1,396 km^2, 47% of the concession), conservation zones (1,154 km^2, 39% of the concession), and protected zones (413 km^2, 14% of the concession). It is important to emphasize that hunting by traditional techniques by Bantu or semi-nomadic Mbendzélé communities can occur year-round in both the village hunting zones and conservation zones (86% of the concession).

The first level of land-use planning – logging zones – was largely carried out by CIB and MEF in consultation with local stakeholders. WCS provided technical advice concerning the set-asides where logging should not take place, which was followed in some cases and in others advice was disregarded resulting in logging of key biodiversity areas. The second level of land-use planning – hunting zones – was primarily carried out by WCS and MEF in consultation with local communities. A MEF official accompanied BZP teams during participatory mapping of hunting zones. CIB included the hunting zones in their management plans. The adoption of the concession management plans by the government of Congo formalized both land-planning systems in the Kabo and Pokola concessions.

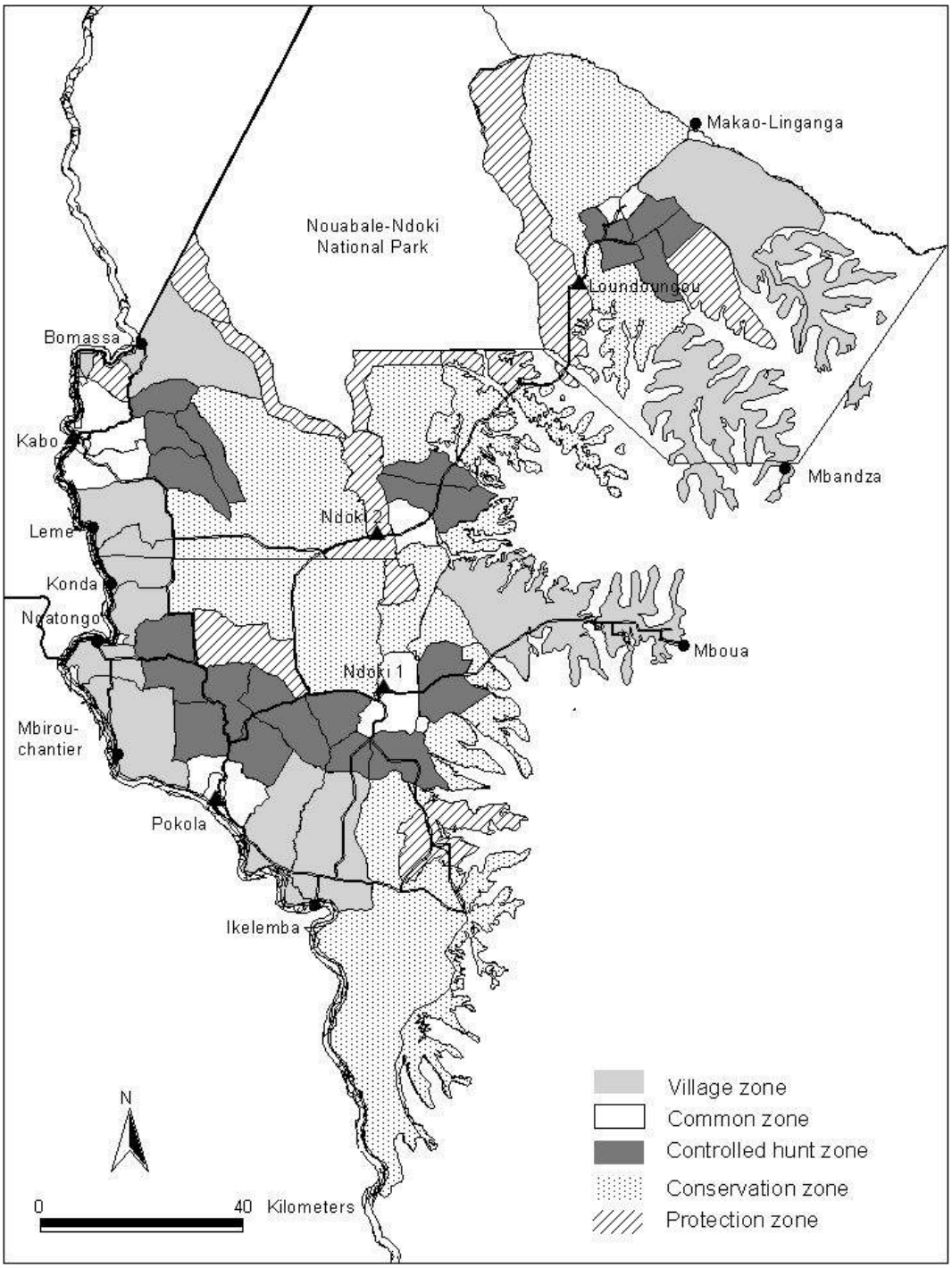

Figure 7. Map of CIB concessions with the hunting zones in the Kabo and Pokola concessions, and proposed zones in the Loundoungou concession. Map by G. Mavah.

Land-planning within the Loundoungou concession (which has been merged with Toukoulaka to form a single concession) has already been accomplished and should be legally established with the adoption of a management plan in the coming years.

In the Republic of Congo, all forest is legally viewed as the property of the government and local and indigenous peoples do not have land tenure rights. To the extent that the land-use planning process is participatory, it provides an opportunity for local peoples and stakeholders to be involved in the management of their forests. Moreover, the establishment of the community development series and hunting zones essentially ensures local people legal access rights to the forest.

CIB integrated Congolese hunting laws into its company rules. In so doing, it made a commitment to educating its employees to the rules and enforcing them.

While land-use planning for wildlife has largely focused on defining who does and does not have access to hunting zones, the goal of the BZP is to transfer management of the hunting zones to local communities. Although a great deal of work and capacity building still needs to take place, the communities would eventually have a much greater role in the management of the lands and resources they depend on. Specifically, this could entail: 1) implementing community-based wildlife monitoring systems, 2) creating management plans for community zones that determine local hunting rules (e.g. rotating what part of the territory can be used in a particular year), and 3) creating community-based regulatory systems so that hunting rules are obeyed and enforced (e.g. tracking illegal access by outsiders and alerting ecoguards to poaching).

Box 8. Hunting laws.

Congolese law 48 defines the protected status of game species and sets the rules and regulations for their harvest. For example, endangered species like elephants and gorillas are protected from hunting; species like forest buffalo with low population numbers are partially protected and can only be hunted with a big game hunting license; and non-endangered species, including most species of small antelopes and monkeys, are unprotected and can be hunted with a small game hunting permit. The hunting laws also dedicate the period from November through May as a no-hunting season, during which time modern weapons cannot be used for hunting but traditional weapons (e.g. hunting nets, spears, and crossbows manufactured out of natural forest resources) can be used. Finally, the hunting laws also define offtake quotas – the number of animals of each species that can be hunted during a single outing and over a season.

Promoting selective hunting through law enforcement

While access rules determined who can hunt and where, the goal of enforcement of hunting laws was to promote sustainable off-take by managing the level of use. The level of use is managed by regulating how people use a resource. Congolese hunting laws determine what (species and number) and how (techniques) people can hunt (Box 8).

As part of its role in the BZP, CIB integrated Congolese hunting laws into its company rules (Box 9). In so doing, it made a commitment to educating its employees to the rules and enforcing them. With technical advice from WCS, CIB incorporated standards which exceeded the national laws (Elkan and Elkan 2005). Most notably, the restriction on exporting bushmeat from one site to another is not part of Congolese law, although it was enunciated in a policy statement by the Minister

of MEF and therefore supports national-level policy.

The rules are intended to maintain biological diversity and protect habitat in the concessions, protect endangered species, ensure sustainability of wild animals and reduce the indirect impacts of logging on the Nouabalé-Ndoki National Park (CIB 2006). Employees that break company wildlife rules may be penalized, possibly losing part of their pay or even their jobs.

The hunting laws and CIB rules are enforced by a unit of 25-40 paramilitary guards (ecoguards) that police the logging concessions. The ecoguards are trained and managed by the BZP, with help from military officials and other experts. Ecoguard teams survey the concessions through targeted forays into the forest, searching for poachers and snares in areas thought to be threatened by illegal hunting, and through searches of vehicles at roadside posts and along the logging road network. If a person is apprehended for poaching or transporting prohibited materials or hunters, the ecoguards write a ticket that is transferred to the MEF agent in charge of the ecoguard unit. Every two to four weeks, these tickets are sent to the MEF regional office where poachers may be fined or even imprisoned. For CIB employees an additional ticket is sent to the CIB office where employees can be penalized or fired for infractions of the CIB hunting rules.

BZP ecoguards do not enforce the hunting laws to their full extent both because the laws are impractical and because of insufficient manpower and logistical resources. In reality, very few people use traditional techniques for hunting. Therefore, stopping all hunting with modern weapons during the no-hunting season (November through April) would leave concession residents with insufficient animal protein. For similar reasons, daily and seasonal quotas are also not implemented, although a hunter found to possess more than four animals on a single day is likely to be apprehended on the basis that Congolese wildlife laws forbids "commercialization" of hunting. Finally, while hunting of protected species is strictly prohibited and enforced, offtake of partially protected species is often overlooked (Box 8).

Box 9. CIB company rules on hunting.

1. The hunting of protected species and the use of snares made of metal or nylon are prohibited.
2. Workers must obtain a hunting permit and license to carry a firearm.
3. The transport of hunters, firearms and bushmeat in company vehicles is banned.
4. Drivers are responsible for the people and materials transported in their vehicles (thus drivers can be penalized if they carry bushmeat or hunters).
5. Drivers must stop at control posts and permit ecoguards to search vehicles.
6. Driving at night without written authorization is prohibited.
7. Land-use zoning must be respected, thus protected and conservation zones are off limits to hunting.
8. The export of bushmeat outside the zone where it was captured is banned (i.e. only local consumption of wild meat is allowed).

In most cases, employees that break company rules for the first time receive a written warning. The second and third violations result in unpaid leave from work for 1 to 8 days and the loss of a year-end bonus. The fourth violation results in the loss of employment.

Poaching of a protected animal species, considered the most serious violation, results in immediate dismissal from the company.

Figure 8. Herdsman and cattle in front of the Kabo sawmill. The cattle are imported by CIB from northern Cameroon to provide domestic meat for logging town residents. The beef is sold at the butcher shop built by BZP. Photo by J. Poulsen.

The law enforcement unit is "flexible" when it comes to the enforcement of hunting for subsistence purposes, but takes a much stronger stance when it comes to poaching of protected species or hunting facilitated by logging vehicles or on-duty company employees. In theory, all vehicle drivers or logging company employees that break the rules are ticketed without exception. Stopping the transport of bushmeat on logging vehicles is a priority for BZP ecoguards because the risk of losing their jobs keeps employees from hunting while at work or from transporting large amounts of bushmeat to markets.

Developing economic and protein alternatives to hunting and bushmeat

The goal of developing economic and protein alternatives to hunting and bushmeat was to reduce the level of use of wildlife. Nearly 45% of all animal protein in household diets of logging towns is derived from hunting and bushmeat (Elkan et al. 2006, Poulsen et al. 2009). In the face of a growing population, even legal levels of wildlife and NTFP harvest may not be sustainable in the long-term, threatening both biodiversity conservation and food security. To provide alternative sources of protein and revenue to bushmeat and hunting, the BZP has experimented with several types of animal husbandry and alternative activity projects.

The BZP worked with local people to promote vegetable gardening and improve animal-husbandry techniques through education and training sessions in concession villages. Among other things, the BZP vaccinated chickens against Newcastle disease and provided technical advice to raise chickens in coops. The BZP provided locally organized fishing associations with fishing equipment at cost, which developed into a good collaboration between the project and local fisherman (Elkan et al. 2006). Material assistance was provided to local gardeners, chicken farmers, and fishermen (Elkan et al. 2006). The BZP technicians also experimented with guinea pig, porcupine, rabbit and snail farming. Most of these activities were unsuccessful in terms of total animal protein produced by local people. Although local people welcomed training and materials, they did not easily modify their habits, and most household-level projects failed within a few months (Elkan et al. 2006).

The production of protein was also targeted in logging towns through activities started by BZP and then largely taken over by CIB as the company assumed a greater responsibility for providing protein to its employees. Early in the project, CIB and BZP established two large fish farms, four chicken farms, two butcher shops, one slaughterhouse, and five cold rooms to store imported meat. CIB provided the supplies and manpower to establish the different structures (e.g. bulldozers were used to dig the fishponds). CIB also assisted local tradesmen in the importation of cattle and frozen meat every few months. Despite targeting

motivated individuals with good work records (most were CIB employees), the fish farms never produced significant harvests and the chicken farms no longer operate. However, the importation of frozen domestic meat and the importation of live cattle have been successful. Poulsen et al. (2009) found that domestic meat peaked at about 15% of protein consumption for a particular month. Annually, domestic meat accounts for 5-7% of all protein in logging towns.

Though a great deal more animal protein needs to be produced to support the daily protein requirements of just the logging company employees (Poulsen et al. 2007), the fact that domestic meat accounts for 5% of protein consumption indicates that local people are willing to consume alternative sources of protein if it is available. An opinion poll conducted in 2005 by BZP also found that local people prefer to eat beef and chicken over many types of bushmeat (PROGEPP, unpublished data). The alternative activities program and CIB's efforts to provide domestic protein to its employees breaks dramatically from the typical practice of feeding logging employees through hunting (Robinson et al. 1999).

Box 10. Obstacles to success of alternative activities.

Environmental constraints: The rainforest is a difficult environment in which to raise domestic animals that have not evolved defenses to tropical diseases. Likewise, agriculture is made difficult by pests and poor soils, and often requires clear-cutting of the forest via slash-and-burn agriculture.

Cultural constraints: Culture contributed to the failure of alternative activities in northern Congo. The people do not have a tradition of animal husbandry and agriculture and are used to living off the forest. When resources are abundant, hunting, fishing, and gathering can take less time and less physical labor than agriculture. There was also a distrust of the unknown. When chickens died after being vaccinated (of a different cause), many people attributed it to the inoculation and refused to have their chickens vaccinated again. Other people refused from the outset because they believed outsiders were trying to poison them.

Participatory resource management: Involving communities in wildlife management

Like land-use planning and law enforcement, the goal of participatory resource management was to promote sustainable offtake of wildlife by limiting access to resources and the level of use. Instead of a top-down management approach, the goal of involving communities in wildlife management was to change patterns of resource use by raising awareness of laws, natural resource management, and conservation.

Within the community hunting and NTFP zones, BZP works with local communities to raise awareness of hunting laws and conservation principles like sustainable offtake, threatened and endangered species, and adaptive management. Awareness-raising efforts started with a campaign on the Congolese hunting laws and protected animal species. Even though the laws were on the books, the government did not actively educate the public or enforce the laws. Therefore, BZP needed to first raise awareness of hunting regulations before it could expect CIB employees and local people to abide by them. This campaign was carried out primarily through village meetings where the hunting laws were read and discussed. Knowledge of protected species was also promoted through the distribution of posters and t-shirts that depicted endangered animals with their Lingala and French names.

Awareness-raising themes and mediums propagated quickly to reach all demographic groups. BZP took advantage of CIB's radio and television stations to broadcast weekly radio discussions in Lingala about conservation issues within the concessions and to show nature films to improve the public's understanding of ecology (Elkan and Elkan 2005). BZP awareness-raising agents diversified their methods for interacting with village groups, transitioning from purely informational meetings to thematic discussions to game show-like formats where the agent would pose questions about conservation and award small prizes (pictures of animals, pens, conservation posters, etc…) for correct answers. In Kabo village, BZP educators held a weekly nature club for children aged 5 to 12, where they played games, did art projects, and went on small field excursions focused on nature and conservation. Several children also participated in a theatre group. With the help of a BZP educator, the children created several skits that highlighted conservation issues such as "what does an ecoguard do?", "why do we need to conserve animals?", and "human-elephant conflict". The troop of actors visited several concession villages acting out the skits to large, enthusiastic audiences.

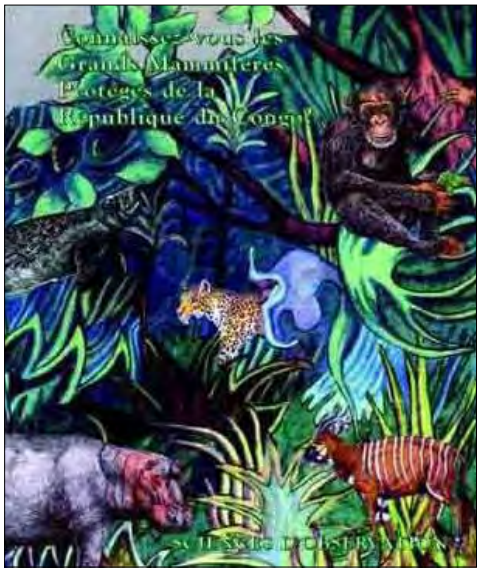

Figure 9. Cover of the BZP environmental education book, written by Connie Clark and Sarah Elkan, titled "Do you know the protected large mammals of the Republic of Congo?"

Formal environmental education was conducted in concession villages with elementary schools. BZP wrote and published a book on the protected species of Congo: each chapter included a description of one animal species, its behavior, ecological importance, and threatened status. Representatives from each school were invited to a weeklong training in which the book was explained, weekly lessons were created, and books were distributed. The teachers then taught one chapter a week, with BZP educators visiting each of the schools to help teach lessons and assess the progress of each class by observing teachers and giving quizzes to the children.

BZP also works with local communities to increase capacity and involvement in the management of their natural resources through the organization of resource management committees in local villages and Mbendzélé camps. Resource management committees offer a conduit for information exchange with local communities and a structure for involving people in the development of hunting rules and zones. BZP seeks to empower communities to make and implement wildlife management decisions (e.g. developing hunting rotations around villages, reducing harvest of rare species or developing systems to restrict the use of hunting zones by outsiders, if necessary). The forest lifestyle and semi-nomadic culture of the Mbendzélé have led to a relative lack of formal organization and representation compared with villagers. At present, policy decisions (e.g. determining which areas are to be set aside from logging or hunting or where and how CIB workers can hunt) are primarily made by the logging company, the government, WCS and elite members of villages. Resource management committees will hopefully ensure that the Mbendzélé, like villagers, will be involved in policy decisions.

Adapting management strategies to the on-the-ground circumstances

The goal of adaptive management was to determine the most effective wildlife management strategies possible in an environment of uncertainty: both PSPC model and managing wildlife in a logging concession were new to CIB, MEF, and WCS. Adaptive management is the integration of design, management and monitoring to systematically test assumptions in order to adapt and learn. It involves monitoring and evaluation of management strategies, testing what works and what does not, and modifying decisions based on the new information. Since the conception of the project, monitoring of the effort and results of BZP activities has been a principal component of management (Elkan et al. 2006). Although it is tempting to manage by gut instinct, particularly when one is familiar with an area or when financial resources are tight, the BZP puts a premium on gathering data and using the information to modify and guide its conservation activities and policies.

The BZP monitors the effort and results of its awareness raising, alternative activities, and law enforcement. For example, to monitor the effort expended BZP educators record the number of students that participate in its environmental education classes and they use both oral and written tests to assess conservation knowledge before and after classes. Alternative activity teams note the number of chickens given to villagers and the number of eggs and chickens produced over time. Similarly, the number of hours spent by an ecoguard team in the forest or at roadside posts is recorded with their weekly seizures of shotguns and snares. This type information allows BZP to assess the efficacy of its activities over time and in different situations.

Box 11. Monitoring for adaptive management.

Although a thorough explanation of how to monitor conservation efforts and results is beyond the scope of this paper, a few basic rules should be kept in mind.

1. Objective: Specify the desired outcome of a project or activity. A good objective is outcome-oriented, measurable, time-limited, specific, and practical (e.g. after 3 years, 75% of school children will know all the protected species in Congo).
2. Indicator: Determine a unit of information measured over time that indicates whether the objective is being met. A good indicator is measurable, precise, consistent, and sensitive (e.g., scores from semi-annual quizzes in classrooms on the identity of Congo's protected species).
3. Methods: Determine the methods used to collect data for each indicator. Good methods will be repeatable, avoid bias, and balance sample size with practicality (e.g., give students 15 minutes to complete a quiz naming Congo's protected species, administering the quiz in 1 randomly chosen classroom in every school in the 10 villages in the logging concession).
4. Train, test, and retrain: Determine who will collect the data, when they will do it, and how they will do it. Develop a system to verify that the methodology is being followed (e.g. randomly choose a date and classroom in which to accompany the person administering the quiz to make sure he is following the established procedures).
5. Use the data! Data that are collected, but that are never entered into a computer and analyzed is a waste of money and effort.

The BZP monitoring methodologies are detailed in several procedural documents, including: Procedures for the Controlled Hunt, Procedures for Monitoring Wildlife, Zoning Procedures for Wildlife Management, and Socio-economic Procedures.

There are many good resources for monitoring, including White and Edwards (2000) and several documents on the Wildlife Conservation Society webpage: www.wcs.org.

Figure 10. BZP researchers look for animal sign along a transect to monitor abundance of wildlife species in the CIB concessions. Photo by J. Poulsen.

To evaluate the success of conservation in the logging concessions, the BZP monitors a number of indicators on the level of threats to natural resources and the status of wildlife populations. Some of these indicators include: 1) number and species of animals in the markets of logging towns; 2) proportion of bushmeat, fish, and domestic meat in the diets of concession households; 3) monthly number of tickets written, arrests, and wire snares seized by ecoguards; 4) annual human population of logging concessions; 5) presence of animals in natural forest clearings; and 6) the density of large mammals within the concessions.

SECTION 3: GUIDELINES FOR BUILDING AND MAINTAINING PRIVATE-SECTOR PARTNERSHIPS FOR BIODIVERSITY CONSERVATION

There is a growing recognition that working with industry can be an effective way to conserve biodiversity (Cyranoski 2007). The BZP is one of the few long-term examples of private sector partnerships for biodiversity conservation in the tropics. In comparison to other such partnerships in central Africa, the BZP is remarkable for its intensive, multi-pronged approach to wildlife management (Hurst 2007). The success of this approach would not have been possible without the strong commitment of all three partners to sustainable forestry, conservation of biodiversity and rural development. Despite the success of the BZP, the road has not always been smooth. Not only has the project faced international criticism, at times the very partnership has been at risk of falling apart. Hopefully the lessons learned through the BZP can make the road a little less bumpy for future PSPCs.

Knowing what you are getting into: the pros and cons of PSPCs

Companies and NGOs have different goals and different methods of working. The first step in building a PSPC is to understand the goal of your partner organization and its motivation in entering into a partnership. A high-level manager in CIB once gave the following advice, "Private enterprise would take on board any environmental measure as long as it is convinced that it makes business sense. Therefore try to understand what motivates private enterprise and be sympathetic to their concerns so that you can demonstrate the environmental as well as the financial benefits to them". Therefore, it is worthwhile to first discuss some of the reasons why industry would partner with conservation organizations. Of course, partnership is a two-way street; this section also includes some of the reasons why conservation organizations would partner with industry.

> "Private enterprise would take on board any environmental measure as long as it is convinced that it makes business sense. Therefore try to understand what motivates private enterprise and be sympathetic to their concerns so that you can demonstrate the environmental as well as the financial benefits to them".
> -- CIB manager.

The private-sector contributes to biodiversity conservation because it is good for the bottom line. In conservation organizations, companies gain a partner that can help them meet international environmental standards, obtain access to financial resources, or meet needs that the company is unable to meet by itself, or can only meet with great investment and cost. Some of the pros of partnering with NGOs include:

1. **Complying with legal standards** – Both national and international laws may require industry to take measures to reduce or mitigate its environmental impact on biodiversity. In Congo, for example, national laws require logging companies to

contribute to the protection of wildlife by paying for ecoguards to enforce wildlife laws. The goals of a logging company are to produce timber and make profits, and managing ecoguards and wildlife is outside of their expertise. Partnership with a conservation NGO makes compliance with government standards easier.

Box 12. Government membership in a PSPC.

Section 3 focuses on the pro's and con's of entering into a PSPC for business and conservation organizations. Government can also be a member of a PSPC (e.g. BZP), but its role will largely depend on the national context of the country, including the technical capacity of its personnel, the wealth of the country, and the level of democratization. Membership in a PSPC also has benefits and risks for government.

Pro's for government:

1. Financial and logistical assistance in managing wildlife and enforcing laws.
2. Technical assistance in monitoring wildlife, impacts of industry, etc.
3. Greening its reputation.
4. Tax revenue, infrastructure development, and employment gained from environmentally- and socially-responsible resource exploitation.
5. Environmental and social benefits of resource conservation.

Con's for government:

1. Pressure to improve standards or investment in conservation.
2. Criticism for not doing its share – case of developing countries without the personnel, technical capacity, resources, and/or political will to act as an equal partner in the PSPC.
3. Loss of national autonomy to international NGOs.
4. Sacrifice of national good and natural resources to business interests.

2. **Projecting a "green" image** – By partnering with well-known NGOs, a company can improve its reputation and justify its presence and its methods. As CIB expanded its operations in northern Congo, it faced accusations from critics that loggers were killing apes (World Rainforest Movement 2003). Partnering with WCS blunted those attacks by demonstrating that the company was willing to collaborate for conservation, thus "greening" its public image.

3. **Expanding access to markets** – More and more, European countries and other markets are requiring that products like timber and fish be sustainably harvested. Partnering with an organization that specializes in environmental issues can help the company achieve environmental standards and a green image so that it can meet market standards or obtain certifications that ultimately allow the company access to markets and perhaps even higher prices for its products.

4. **Opening access to financial resources** – Access to multilateral funding agencies like World Bank and IFS are often conditioned on having good environmental practices. Partnering with a conservation NGO demonstrates a commitment to good environmental practices, particularly because the NGO is expected to blow the whistle if the company does not meet its commitments. In addition, companies can also gain access (at least indirectly) to their partner's donors. Through its donors like US Fish and Wildlife Service (USFWS), Liz Claiborne Art Ortenberg Foundation (LCAOF),

International Tropical Timber Organization (ITTO) and others, WCS has raised millions of dollars for conservation of wildlife in the CIB concessions, and all those funds are indirectly helping the company by allowing it to meet environmental standards to promote the sale of its timber products. This investment by outside sources is justified given the biodiversity conservation gains within the concessions and the protection of the adjacent park.

5. **Conserving resources** – Companies that derive profits from renewable resources like fisheries, timber, safari hunting and ecotourism have an interest in conserving the ecosystems that produce those resources. Companies may also benefit from the conservation of resources from which they do not directly profit. For example, although logging companies are primary concerned with the production of timber, wildlife and freshwater fish can serve as principal sources of protein for their employees and their families (Poulsen et al. 2009). Without natural resources like fish and wildlife, the company would have to invest considerably greater time and money into providing sources of animal protein for its personnel.

6. **Benefiting from conservation expertise**–Most conservation NGOs have technical and conservation knowledge gained from years of experience. Subjects of importance to conservation of biodiversity – population biology and genetics, community ecology, animal behaviour, experimental design, statistical analysis, law enforcement of hunting and wildlife laws – may not always find their way into the logging yard or the boardroom. Companies can tap into that experience and knowledge through partnerships with NGOs.

7. **Building relationships with local communities** – Relationships with local communities can be strained or even contentious when companies 1) hire outsiders, or 2) exploit what local people perceive as their resources. Many companies compensate communities through community relations and development (e.g. giving uniforms to a soccer team, building schools, providing jobs, or environmental clean-up). PSPCs can avoid or mitigate conflict by working with local people to manage their resources. Conservation projects like BZP also provide jobs for uneducated sectors of the community (e.g. forest guides, ecoguards, etc...) that are not competitive for jobs with the industry.

"Conservation organizations will partner with the private-sector to the extent that it contributes to biodiversity conservation. Adding a private-sector partner to the equation can provide much needed resources and legitimacy."

Conservation organizations will partner with the private-sector to the extent that it contributes to biodiversity conservation.Adding a private-sector partner to the equation can provide much needed resources and legitimacy. Some of the pros of partnering with business include:

1. **Accessing financial and logistical resources** – Private-sector partnerships are usually based on an exchange of financial and logistic support for resource management and conservation. For NGOs and public agencies with tight budgets, these resources can be critical to their effectiveness and sometimes their existence. Private-sector money often comes with fewer restrictions

compared to government or donor funds. For example, whereas US government funds (e.g. USFWS) cannot be used to pay ecoguard salaries, private logging companies rarely have such restrictions. In northern Congo logging companies are starting to pay ecoguard salaries to enforce wildlife laws. Logistical support can also be critical in remote areas where access is difficult: CIB provides electricity, fuel, and electrical and mechanical services to BZP, without which the project would be unable to function. Logistical support may be provided on a pay-for-services basis, but without the company the services would be unavailable.

2. **Gaining access to areas of high biodiversity value** – Industry, particularly mining, logging, and petroleum, usually lease the concessions they exploit. Leases give them legitimacy vis-à-vis the government and local communities, sometimes providing the companies with the power to decide which other stakeholders work in the area and what they can do. Thus, conservation organizations can gain access to areas of high biodiversity value that could otherwise be off-limits or in which their roles could be largely restricted.

3. **Planning for the future** – In some cases, industry may stay in an area for long periods of time. For example, selective logging in northern Congo is planned on a 30 year rotation (CIB 2006). A company that plans its operations over a long time horizon is more likely to make investments in the long-term management and conservation of an area than a company that plans to exploit and exit. Most donors to conservation projects give money on a 1 to 3 year timeframe, even though managing threats to biodiversity usually takes decades. Thus, in a world where environmental donors tend to fund the newest, trendiest issues, the financial and logistical support from the private sector may be the best opportunity for keeping biodiversity conservation going continuously over many years.

4. **Providing authority** – A formal partnership with industry provides the conservation organization or project with authority in the eyes of company employees (Elkan et al. 2006). Even with governmental permission to work in the same area as industry, conservation projects can be treated as a nuisance or perceived as competing with the company that is providing jobs and salaries. Acceptance by the company leadership, and the image that the company and conservation organization work together, legitimizes conservation management and makes it easier to accomplish.

5. **Improving resource management from the inside** – A formal partnership with the private-sector provides the conservation organization access to company leadership. Both formal and informal meetings with company personnel can dramatically influence the company's policies and actions towards the environment and biodiversity. For example, informal conversations between BZP personnel and CIB crew leaders about increasing incidences of elephant poaching led crew leaders to crack down on their own employees.

6. **Improving conservation at the conference table** – Through PSPCs, conservation organizations gain a seat at formal meetings with industry, government and other stakeholders. Such meetings are another opportunity to influence policies and standards. During the development of management plans for the CIB concessions, WCS participated in meetings with CIB and the government to determine logging techniques and road construction standards. In addition to voicing the conservation perspective, NGOs have the opportunity and responsibility to infuse science into policy discussions so that decisions are based on solid, technical information. Data-supported, science-based arguments for management and policy decisions hold much greater weight than "beliefs" or "positions".

The benefits of partnering with industry or conservation organizations come with a cost. Many of the potential risks are shared by both partners, and include:

1. **Taking on financial and logistical burdens** – One of the primary contributions that the private-sectors brings to a PSPC are logistical and financial resources (see above). Depending on the level of commitment, these costs can be considerable. Moreover, the contribution could grow over time either because the industry's impact on the environment becomes larger than originally expected, national standards grow more rigorous, or the breadth of activities undertaken by the partnership increases.

2. **Sleeping with the enemy** – Conservation organizations that partner with the private sector may be perceived as "sleeping with the enemy". They may be accused of lowering standards or compromising ethics for financial gains, thus "green washing" the company. It is the burden of the conservation organization and PSPC to prove critics wrong.

3. **Receiving bad press** – Business, NGOs, and public agencies sometimes make bad decisions, suffer poor management, and fall into problems of corruption or low performance. If any of these problems inflict a PSPC the "innocent" partner can be implicated by design and may receive bad press. For an NGO, bad press will hurt its reputation, ability to work elsewhere, and ability to maintain funding or raise new funds from donors. For business, bad press will not only hurts its public image, but could impact its sales and profits.

4. **Arguing among "friends"** – Companies and conservation organizations do not have the same goals and will not always see eye-to-eye. While effective PSPCs have mechanisms for resolving conflict, partnerships can turn bad for unforeseen reasons. At a minimum, resolving conflict entails an investment of personnel, time, and energy from all involved organizations. At a maximum, it can result in a broken partnership, bad relations, bad press, and organizational conflict.

5. **Inviting pressure to improve standards** – By partnering for biodiversity conservation, companies are opening their doors to conservation organizations and inviting them to the conference table. As such, the NGO or public agency

can put pressure on industry to go farther in its environmental standards that it had originally intended at increased expense.

6. **Inviting pressure to compromise standards** – Just as industry invites pressure to improve its standards at increased cost to the company, conservation organizations invite pressure to compromise their standards. Sometimes this may be healthy: unrealistic standards can be softened by understanding competing interests (social, cultural, and economic) and through negotiation. However, NGOs or public agencies that turn a blind eye to unethical or illegal practices or lower their standards too far will lose their effectiveness and compromise their reputation.

7. **Guilty by association** – One of the benefits of PSPCs for conservation organizations includes being viewed as a legitimate stakeholder by company employees and local communities. If local communities hold either the company or conservation organization in a poor light, their disapproval may be shifted to the partnering organization.

8. **Banking on continuity** – Any number of disruptions in the structure of one of the member partners could compromise the resources, time and effort invested in a PSPC. Turnover in staff could alter interpersonal and organizational relationships on which the PSPC was founded. Larger disruptions such as turnover in government or change in company ownership could also have major impacts on the partnership.

Components of an effective collaboration

Complementary institutional capacity and expertise

The selection of partners may determine the success or failure of a PSPC. For each management structure, there is a set of management roles and activities that are likely to positively affect conservation of wildlife and natural resources (Castillo et al. 2006).The BZP has been successful because the partnership of MEF, WCS, and CIB created an effective blend of institutional capacity and expertise. Institutional capacity is the legal mandate and authority as well as the financial resources to influence a problem. Institutional expertise is the technical know-how to solve a problem.

The capacity to affect biodiversity conservation was enabled at the local and national levels by the MEF and CIB partners. The government of Congo is highly centralized and without buy-in from the government any conservation effort or project can easily be stalled through lack of bureaucratic movement or killed outright by failure to receive permits or authorization from the government. With the participation of the MEF, national and regional authorities and other government departments usually took the initiative seriously and mostly provided assistance rather than roadblocks. As one of the largest companies in Congo and the primary employer in the area, CIB wielded a great deal of power in the government and in the region. This was particularly the case shortly after the 1997 civil war when the project was started. CIB's participation demonstrated a commitment to biodiversity conservation to its employees, legitimizing the project's activities, particularly the enforcement of wildlife laws.

By contrast, WCS provided capacity at the international level. Through its established reputation as a conservation NGO, WCS legitimized the efforts made by CIB to manage wildlife and forests. A senior CIB manager described the role of WCS:

> "You [WCS] were able to do things which we would never have gotten away with; for instance, giving guns to people. As an NGO most stakeholders would automatically give you the benefit of the doubt and would not question your intentions for anything other than trying to protect wildlife. If the ecoguards were recruited, armed, trained and managed by CIB, even with our best intentions, stakeholders and the international NGO community would have forever remained skeptical and would probably have constantly accused us of gross human rights abuses conducted by our 'private army'."

Each of the BZP partners contributed financially to the operation of the project. WCS has raised the most funds (approximately three-quarters of the annual operating budget) through donations from governments and non-profit donors. CIB has contributed most of the remainder of the budget through its consistent monthly payment of ecoguard salaries and field patrols. CIB also provided infrastructure and logistical aid to the BZP. The MEF's major financial contribution has been to assign government officials to work for the project. The MEF Coordinator is usually given a small functioning budget for his office and some equipment (vehicle, copy machine, etc.) The government also contributed by giving WCS diplomatic and tax exempt status so that it does not pay duties on imported equipment and supplies.

In addition to capacity, each partner contributed a technical expertise that enabled the project to function effectively. MEF provided knowledge of the laws so that the project operated within the legal framework of the country. CIB offered its expertise in forest management and selective logging to minimize the damage its operations caused to the environment and wildlife habitat. Not surprisingly, WCS provided the greatest direct contribution to wildlife management -as its business is biodiversity conservation. Its technical expertise and experience in wildlife ecology and research made it the major contributor to the development of the wildlife management systems and principles embodied in the BZP.

Same objective, different goals

Even though the success of a PSPC depends on the capacity and expertise of individual institutions, often times there is little choice when it comes to selecting partners. For conservation organizations, most decisions to partner with industry will be driven primarily by the biodiversity value of an area rather than characteristics of the potential private-sector partner [see de Queiroz et al. 2008 for specific criteria to consider when vetting a company for a partnership]. The value of the site may not be the primary consideration when industry initiates a partnership to mitigate its impact on the environment or as an offset for habitat that it has heavily damaged. In the case of the BZP, the partnership was developed more out of convenience than a deliberate vetting process (Box 13).

The BZP has been successful because the partnership of MEF, WCS, and CIB created an effective blend of institutional capacity and expertise. Institutional capacity is the legal mandate and authority as well as the financial resources to influence a problem. Institutional expertise is the technical know-how to solve a problem.

Box 13. History of the Buffer Zone Project.

Starting in 1993, WCS and the government of Congo collaborated to establish and manage the NNNP to the north of the CIB concessions. In 1998, WCS presented a plan to the government to create a buffer zone around the Nouabalé-Ndoki National Park. The plan proposed setting the concession areas bordering the park off-limits to logging and hunting to avoid the hunting pressure created by industrial logging from spilling into the park. The Minister of MEF, Henri Djombo, rejected the plan, but asked WCS to negotiate a collaboration with CIB. This deal led to the creation of the BZP and wildlife management throughout the CIB concessions (Elkan and Elkan 2005).

Whether by design or by luck, the mix of partners in BZP proved to be a mostly successful one. In addition to possessing complementary institutional capacities and expertise (see above), the three partners shared the same long-term objective –despite having vastly divergent institutional goals. All three partners share the objective of managing wildlife both as a way to preserve biodiversity and endangered species and also as a way to conserve a source of wild meat for local people. This objective clearly fits with WCS's institutional goal of conserving wild places and wild animals. However, CIB's goal is to produce timber and wood products to make a profit for its shareholders. Wildlife management complements these goals to the extent that it permits the company to gain certification and maintain a reputation as a responsible, environmentally friendly company. The government of Congo's goal is to develop its economy and infrastructure; wildlife management fits these goals as a means of providing protein and food security for local people and burnishes its image with international donors and local communities.

Figure 11. BZP ecoguards standing in formation during a training exercise. Under the management of the MEF, the ecoguards are responsible for enforcing Congolese hunting laws and the CIB hunting regulations. Photo by A. Moukassa.

The greatest conflicts have come when there were perceived differences in the objectives of the PSPC. The MEF's greatest criticism of the project over the years has been the very modest results of the protein and economic alternatives activities program. With the notion that the alternative activities program could produce supplemental income for local families, the government has considered BZP efforts to be inadequate. In contrast, although WCS considers the development of alternative activities as an important step towards decreasing pressure on wildlife, BZP has had neither the budget nor expertise to implement the large-scale program necessary to provide domestic protein and income for 20,000 people. Moreover, the NGO held the opinion that CIB should be responsible for providing food and protein resources for its employees. Thus, WCS focused its efforts on traditional villages, rather than logging towns, with the view that the most lucrative alternative activity to hunting in the concessions is employment by the logging company.

Another more fundamental conflict occurred over the definition of the BZP goals. Whereas WCS defined the primary goal of the BZP as the protection of the

NNNP; CIB adamantly defined its primary goal as management of wildlife in the CIB concessions. At the center of this debate was the question of where most resources would be dedicated: around the park or throughout the concessions. For its management plans and FSC certification, CIB needed a wildlife management and protection strategy that covered the entirety of its concessions. With limited resources and personnel, WCS viewed the biggest gains in biodiversity conservation as coming from protecting the park from incursion by poachers. As long as NNNP remains mostly inviolate by poachers the BZP will continue to operate over the entirety of the concessions; but an upswing in incidents of poaching in the park could cause this to change. This particular conflict has put considerable strain on the relationship. It was exacerbated by CIB's decision to construct a major transport road and sawmill in close proximity to the PNNN despite WCS efforts to convince the company to build them farther away at no additional cost to the company. The company was perceived as needlessly endangering the park.

Conflicts of this nature have the potential to derail partnerships and conservation progress. Some of the factors that allowed the three organizations to resolve these conflicts are discussed below.

Definition of the roles of stakeholders

The roles of all partners should be well-defined by formal protocols describing their rights and responsibilities. The definition of roles assigns responsibility for specific aspects of management to the appropriate stakeholder and prevents overlap or doubling of efforts by different organizations. In the case of wildlife management, ecoguards might be employed to enforce hunting laws. It must be clear who manages them and is responsible for their actions, failures and success. When their work is deficient (e.g., poor performance or corruption), the responsible partner can immediately take action to improve their management. This protects other members of the PSPC from being blamed for their failure. The lack of defined responsibilities exposes organizations to lawsuits, loss of reputation, and can result in conflict among partners.

For natural resource management, other responsibilities that must be clearly assigned to a partner include: 1) assurance of food security of concession workers and local people; 2) collection of the biological and socio-economic data necessary to make management decisions; 3) incorporation of local peoples into resource management; 4) management of different forest resources such as wildlife, timber, NTFPs, fisheries, etc.; and, 5) resolution of conflict among institutions and other stakeholders.

For its management plans and FSC certification, CIB needed a wildlife management and protection strategy that covered the entirety of its concessions. With limited resources and personnel, WCS viewed the biggest gains in biodiversity conservation as coming from protecting the park.

The definition of roles and responsibilities should also include an explicit recognition of the actors to be consulted and the process of consultation for an industrial or management activity that could impact the environment. The construction of roads to gain access to timber or mineral resources may fragment important habitat for endangered species or destroy sites sacred to local or indigenous people. It should be clear which partners or stakeholders are involved in the planning of the road and how their input will be taken into consideration. The list of actors to be consulted should be clearly defined and based on criteria such as the proximity of people to an activity, their livelihood interests, etc.

Figure 12. CIB logging truck transporting timber from the forest to the sawmill. Photo by BZP.

Getting your hands dirty

Although there are many ways that PSPCs could work, one of the strengths of the BZP model is that each partner plays a role in implementing conservation on the ground. The MEF agents work side-by-side with WCS managers and employees, and both are in frequent contact with CIB managers. Whether logging roads are being planned, poaching rings are being shut down, or policy is being developed to protect indigenous rights, all three partners meet and talk about the issues to come to solutions.

"Getting your hands dirty" is critical for the conservation organization or public agency with the conservation expertise. Working at a site alongside partners builds trust. Both MEF and CIB have on different occasions expressed their appreciation for organizations like WCS that have a long-term commitment to working in an area. In fact, in a meeting to inaugurate the Makao bridge, Henri Djombo, Minister of MEF, openly criticized advocacy NGOs like Green Peace that parachute in, create a great deal of conflict around an issue, but do not stick around to solve the problems. Similarly, CIB compared on-site NGOs to those who visit once or twice a year, leave a 30-page report with "recommendations" and do not assist in implementation. A CIB manager articulated the importance of working together,

> "Most importantly WCS was not only willing to conduct studies and make recommendations, but also to implement those suggestions. As a private company we are very good at throwing money at a problem. If we don't have the experience we can always just ship in an army of consultants. But once a consultant has made their report they leave again and then the company is left alone to try and implement it, which can be quite daunting if you do not master the subject."

Hard times build trust

After working together for nearly nine years, the BZP partners have been confronted with and overcome hard times and difficult issues. Working through problems and crises together builds 1) an understanding of the issues that confront your partners, and 2) trust among the organizations. The very creation of the BZP resulted in criticisms from individuals and environmental groups that considered working with industry to be "selling out".

For example, the World Rainforest Movement (2003) summarized allegations from Dale Peterson's book, "Eating Apes", writing in an online article:

> "The WCS has long known of CIB's impact on wildlife and its involvement in the extraction of bushmeat but has done little to give these findings prominence. In 1995, the WCS and a team of IUCN assessors even co-signed a Protocol with CIB which repudiated 'unjustified attacks' made on CIB - the evidence in the video

> documentaries. CIB, which has been unwilling to submit its forestry operation to scrutiny by independent certification processes like FSC, has been able to vaunt its close relations with WCS to fend off criticism of its operations: 'I have opened my concession for research… for forestry and wildlife studies', claims CIB owner Hinrich Stoll, my company is 'working very closely with the Congolese National Park, Nouabalé-Ndoki, which is managed by Mr. J.M. Fay of the Wildlife Conservation Society (WCS), (the oldest non-governmental ecological organisation in the world).'"

These allegations are an example of the risks the partners had taken by entering into a PSPC. CIB realized that WCS was risking its reputation by doing conservation within it concessions, while WCS realized that CIB could be attacked for its shortcomings despite being progressive in its integration of wildlife management into its operating procedures. Ironically, under constant pressure by WCS to invest more in conservation and to take even greater steps to manage hunting, CIB never thought that WCS ignored its impact on biodiversity. And, CIB welcomed FSC into its concessions as early as 2005 to gain certification of its Kabo concession in 2006.

Weathering criticism reinforced the working relationship between CIB and WCS by building respect and appreciation for the risks the partner organization was taking. A CIB manager explained it this way:

> "… CIB's initial cynicism of WCS's intentions got replaced by a certain amount of good faith, especially the periods where the two organizations had to stand together and be supportive of each other due to outside criticisms /attacks. A classic case of: "enemies of my enemies are my friends". Of course that only laid the basis, and I think in time CIB's emerging awareness of certification, and what it would mean for our business, became the driving factor [of its commitment to biodiversity conservation]. No cost or burden was too much to ask as long as CIB saw it as an investment that would ultimately lead to increased returns."

The trust built through overcoming hard times can only be capitalized upon if there is an institutional memory of shared history. Institutional memory can quickly be lost if there is no consistency in the individuals that work within the PSPC.

Personal relationships can't be underestimated

Institutions define goals and objectives and individuals implement them. Even the best match of organizations, with complementary capacities, expertise, and common long-term objectives defined by a detailed memorandum of understanding, can fail if personal relationships break down. The foundation of the BZP PSPC was built on strong personal relationships developed through frequent and transparent communication (Elkan and Elkan 2005, Elkan et al. 2006). The importance of personal relationships is just as strong today despite the years of working experience.

Personal relationships between individuals of each of the partner organizations can be improved through the transfer of institutional knowledge and history. This is particularly important when there is a change in personnel in one of the organizations. First, the managers representing MEF, WCS, and CIB need to understand the objectives of the project and the goals

Box 14. Points of conflict between BZP partners.

1. Construction of a CIB sawmill in the Loundoungou concession.
2. Location of major roads and logging camps in relation to the border of NNNP.
3. Protection of high value biodiversity areas within the concessions.
4. Establishment of logging and wildlife management norms for management plans with 30 year timeframes.
5. Responsibility for management of BZP funds.
6. Role of WCS and CIB in management of the ecoguard unit when problems of corruption or poor performance arise.
7. Relative investment of BZP funds and effort into rural development versus law enforcement and/or conservation research.
8. Personal conflicts among WCS, CIB, and MEF personnel stemming from the notion that one person was not fulfilling his duties or was not sufficiently incorporating other partners in decision-making.

of the member organizations. Second, as much as possible, a historical perspective needs to be imparted to the managers; they need to understand the challenges the PSPC has faced and why and how they have been overcome. Third, managers need to understand the issues, past and present, that the organizations agreed and disagreed on and why and how decision were made.

Establishment of methods to resolve conflict

No partnership will be conflict-free. As mentioned above, conservation organizations, governments, and industry have different goals. By their very nature, they will disagree on issues and management approaches. An effective PSPC will have measures to resolve conflict such as an advisory board or a steering committee. These measures should be incorporated into the protocol of partnership so that when conflict does arise it can be dealt with quickly and effectively.

Over the years, the BZP has overcome several major conflicts (Box 14). These have ranged from discussions over how to best manage timber and wildlife resources to arguments over the responsibilities of each organization to personal conflicts between WCS, CIB, and government personnel. Programmatic disputes were typically resolved during yearly steering committee meetings. These meeting are important for determining the larger vision of the project and setting the tone for project managers to work in the field. Serious personnel conflicts or charged issues like the establishment of a sawmill sometimes required intervention from higher levels. When all other solutions had been exhausted, the leaders of the PSPC members (WCS' Vice President of International Programs, CIB's Vice President, and the MEF Minister) would step in to resolve conflicts; they could implement organization policy decisions removed from the day-to-day stress of management on-the-ground. In several cases (sawmill establishment, road placement near the Park and cutting close to the Park boundary, etc.) mutually agreeable solutions were not found. Despite the setbacks in these cases, the parties chose to continue in the partnership due to the overall gains for the collaboration relative to the loss incurred by the issue at hand.

Support decisions with data

Negotiations on a particular issue (e.g. width of logging roads, distance of logging operations from a national park, level of investment in law enforcement) should be conducted in an upfront manner, taking into consideration the partner organization's position, and with scientific

or economic data to back management decisions. By exaggerating one's requirements or needs to get a better bargaining position, the partnership can be damaged and the "offending" organization will ultimately be taken less seriously. WCS argued for a very large buffer around clearings, but could not offer sufficient data to convince its partners that most wildlife species needed such an extensive buffer. Whether right or wrong, CIB and the government thought the NGO was exaggerating the needs of wildlife and WCS' strength in future negotiations was weakened. Of course industry could find itself in the same position by exaggerating the economic losses resulting from management decisions.

Roles of stakeholders evolve

Roles of all partners are likely to evolve as the goals of the PSPC or the expertise of the partners change. Assuming the partnership evolves in a positive direction for biodiversity conservation, the PSPC needs to be sufficiently flexible to adapt. Growing pains are likely to occur at the level of the partnership and the individual organizations.

In its early days, the BZP focused on law enforcement and awareness-raising due to the extent and intensity of illegal hunting.. The emphasis of the project changed as the socio-economic and ecological context evolved and as the networks of commercial hunters were dismantled. At the inception of the project, logging roads were lined with hunting camps, poaching of endangered species was rampant, and people were almost completely unaware of hunting regulations (Elkan and Elkan 2005, Elkan et al. 2006). The BZP necessarily responded to the immediate threats at hand before it could move onto bigger, long-term threats. As law enforcement and awareness-raising reduced the threat to wildlife, particularly on endangered species such as elephants and apes, the BZP started the next phase of integrating local communities more directly into wildlife management.

CIB's commitment to conservation and the demands it put on BZP changed as it entered into the certification process. By seeking FSC certification, CIB committed itself to high social, industrial and environmental standards to position itself more competitively in the world market and to sell its timber at higher prices. Principle #6 of FSC's International Standard defines the criteria for minimizing the negative impact of logging on the environment. The most relevant criterion for wildlife management states:

> "Safeguards shall exist which protect rare, threatened and endangered species and their habitats (e.g., nesting and feeding areas). Conservation zones and protection areas shall be established, appropriate to the scale and intensity of forest management and the uniqueness of the affected resources. Inappropriate hunting, fishing, trapping and collecting shall be controlled."

This standard and others are evaluated by independent auditors who decide whether the logging company meets the criteria for certification, and once obtained, whether the company is in compliance and can retain its certification. By gaining FSC certification for its Kabo and Pokola concessions, wildlife and biodiversity conservation took on a financial interest for CIB. If the BZP's wildlife management program was ineffective, CIB would be held responsible, and it could lose its certification, marketplace, and profits. As

By gaining FSC certification for its Kabo and Pokola concessions, wildlife and biodiversity conservation took on a financial interest for CIB.

a result, as CIB entered into the certification process, it became more involved in law enforcement and protecting the rights of indigenous peoples. Moreover, CIB needed ecological and socio-economic data for its management plans and started to make demands upon BZP to produce the required data. While the change in level of attention given to the BZP by CIB originally resulted in distrust of its motives, the partnership evolved to fit the new circumstances.

Like CIB, the role of MEF also evolved over time. Biodiversity conservation was a fairly novel concept to the government of Congo in the late 1990s; it had just emerged from civil war and was focused on development from logging revenue. The government has become increasingly aware of the importance of protecting biodiversity and some of the potential benefits from eco-tourism. With growing awareness of the role of forest conservation in stemming global climate change, sustainable forest management has taken on new importance to the government. As MEF agents have become more aware and experienced in the issues, they have grown capable of taking a bigger role in the management of BZP.

Lessons on Private Sector Partnerships for Conservation

This section has discussed some of the components of an effective PSPC. The dance between a conservation organization and a company can be intricate and complicated. First, both partners do not necessarily dance to the same music. While the conservation organization waltzes to the symphony of big ideals and far-off goals, the company marches to the profit-focused cadence of its shareholders and clients. In many cases, a third partner, government, must also be in step. Sometimes it is not clear who is leading the dance. What is becoming clearer is that what matters the most is that you are dancing.

SECTION 4: MANAGEMENT STRATEGIES FOR PSPCs

Section 3 described the traits of the BZP private-sector partnership for conservation that contributed to its success in conserving wildlife over the last nine years. Section 4 describes the management strategies that have been the most effective in curbing poaching, protecting biodiversity, and integrating people into natural resource management. Many of the principles described below are drawn from the successes of the BZP. The principles also incorporate lessons learned from its failures and shortcomings with the hope that future PSPCs can be even more effective at conserving biodiversity. By learning from the BZP, the PSPC model of conservation can be replicated and scaled up so that biodiversity conservation extends beyond protected areas to multiple use sites and beyond NGOs to many different partners.

Conserve landscapes

The limited area, number and distribution of protected areas in the tropics render them inadequate to prevent continued biodiversity loss (Soulé and Sanjayan 1998; Fagan et al. 2006). Most wildlife is found outside of protected areas. Thus, strategies to protect tropical forest diversity outside of parks and reserves present an opportunity to extend the conservation estate (Ferraro and Kiss 2002; Pearce et al. 2003). When possible, linking conservation efforts inside and outside of protected areas can create a larger landscape for wildlife (Figure 1).

A single national park managed in isolation may be too small for the long-term conservation of wide-ranging species. Not to mention that the effort and money invested in species conservation would have been invested in vein once animals stray across park borders into unmanaged lands where the threats of hunting or habitat destruction are high. By linking a PSPC with a protected area, the protected area can be defended from encroachment and the overall size of the conservation landscape can be increased. For species like elephants that range hundreds of miles, linking multiple conservation areas may be their only real hope for survival (Blake et al. 2006).The BZP extended the protection of wide-ranging, endangered species from 4000 km^2 to 17,000 km^2 by managing hunting and wildlife in concessions adjacent to the NNNP.

Figure 13. A sign designating the borders of the no-hunting zone: "Safari Zone / Hunting Strictly Prohibited". Photo by J. Poulsen.

Take a multi-faceted approach

The multi-faceted approach to conservation undertaken by BZP has been one of its greatest strengths (Elkan et al. 2006). Through the combination of law enforcement, alternative activities, and awareness-raising, both "sticks" and "carrots" were employed to incorporate local people

into biodiversity conservation. Before the creation of the BZP, the logging company employees and local people exploited wildlife and forest resources without regard to the law or long-term sustainability. If the BZP had not provided information to local communities and company employees about Congolese wildlife laws and the importance of conservation, it is possible that they would have revolted against the ecoguards. The alternative activities program was created to offer revenue alternatives to hunting for local people and protein alternatives to bushmeat for logging company employees, essentially a reward for accepting law enforcement. Linking the benefits gained from the company (jobs, schools, health centers, etc.) to acceptance of wildlife laws was key to the success of the program.

This multi-faceted approach also combined research and monitoring with conservation facilitating an adaptive management approach to conservation.

Add a development partner to the mix

The failure of BZP's alternative activities program to produce substantial revenue or to find alternative sources of protein to bushmeat for local people was partially due to the lack of an easy solution: there are very few, if any, successful alternative activities projects in central Africa. The rainforest is a difficult environment in which to raise domestic animals that have not evolved defenses to tropical diseases. Likewise, agriculture is made difficult by pests and poor soils, and often requires clear-cutting of the forest via slash-and-burn agriculture. In addition to environmental factors, culture contributed to the failure of these activities. The people of northern Congo do not have a tradition of animal husbandry and agriculture and are used to living off the forest. When resources are abundant, hunting, fishing, and gathering can take less time and less physical labor than agriculture, especially given the difficult environmental conditions. Overcoming these obstacles will require expertise, resources, and time. The incorporation of a development organization at the early stages of the PSPC, with culturally-relevant experience and an expertise in animal husbandry, gardening, and other micro-projects might have increased the productivity and success of the alternative activities program.

Adding a development organization into the mix could be done in several ways. The organization could be either a non-governmental or governmental organization: the choice of an organization would depend on its technical capacity and resource base. During the first five years of the BZP the government of Congo appointed an agricultural agent to the project to oversee the alternative activities program. But the agent had few resources at his disposal and was primarily trained in agricultural techniques applicable to the southern part of the country which is composed of extensive scrub savanna, and not tropical forest. If industry or government can finance the program (including the training of technicians, purchase of materials, etc.), a local NGO or government agency with development experience would have the advantage of understanding local society and how to overcome cultural obstacles. In the case of BZP and many other PSPCs, an international development organization that can tap expertise regionally or globally and that can secure additional donor funding might be most effective.

The development organization could be incorporated on a contract basis or as a partner in the PSPC. The addition of a fourth partner of a PSPC would of course require a revised protocol that carefully

defined the goals and role of the development organization. It would be critical to limit the scope of the development activities: the goal should be to improve the livelihoods of current residents, not to develop cities in logging concessions which would be contrary to the goals of forest and biodiversity conservation (Poulsen et al. 2009). Even with the addition of a development partner, the relatively small scale of most alternative activity programs is unlikely to reducing hunting to sustainable levels or to supply the human population with protein. CIB's program to import beef and other frozen animal protein available to its employees did not supply more than a small fraction of the needs of its workers (Poulsen et al. 2007).

Formalize land-use planning

Land-use planning that designates who can exploit an area and the methods of exploitation should be formalized through management plans and made public. Management plans typically describe an activity (industrial or otherwise) to take place in a site, the impacts of the activity on the environment and society, and the plans for mitigating any negative impacts. Management plans have been written and adopted by the government for both the Kabo and Pokola concessions. These plans, written by CIB in collaboration with the BZP, described in detail the wildlife management system developed by BZP, including the demarcation of hunting and no-hunting zones, alternative activities, law enforcement procedures, and wildlife monitoring procedures (CIB 2006).

In the past, central African countries have been lax in requiring management plans of companies and conservation organizations. For instance, the BZP and CIB operated for years in northern Congo without a formal management plan. This trend is changing (see below). Even if all stakeholders have participated, negotiated, and agreed upon the zoning and rules for exploiting resources, the procedures and principles must be incorporated into a formal management plan. First, this ensures that the plan is in agreement with national (and sometimes international) laws and standards. Second, this ensures that outside actors respect the plan. For example, after the adoption of the Kabo concession management plan in 2006, a MEF official delivered a large game (buffalo, sitatunga, etc.) hunting permit to a group of expatriate hunters. By consulting the Kabo management plan, which does not include provisions for safari hunting, the mistake was immediately recognized and the hunters were quickly directed to a different forestry concession where hunting was permitted.

Figure 14. Hunters walking a logging road to the forest. Photo by BZP.

Involve multiple actors in land-use planning

Industrial sites like forestry concessions generally serve multiple purposes in addition to resource extraction. Most tropical forestry concessions served as home to indigenous peoples and habitat for wildlife long before concessionary rights were sold to logging companies by the government. Before logging began in the CIB concessions, for example, nearly 12,000 people lived in permanent villages and temporary camps, making their live-

lihoods from the forest (Wilkie et al. 2001). Therefore, timber production should be perceived as an economically important activity introduced onto a previously existing landscape of ecological, livelihood, economic, and cultural activities. As such, multiple stakeholders have interests in the forests within timber concessions and all must be incorporated in the land-use planning process.

Too incorporate all actors, there must be a platform by which they can express their interests, particularly local communities that tend to be less empowered than formal organizations like companies, NGOs and worker unions. By working directly and frequently with local communities, the BZP helped promote indigenous people's rights (including conservation of their traditional territories) to the company and the government. In this way their interests and needs in terms of natural resources were incorporated into the management plan. Later, once the formal plan was drafted, village leaders and local people were invited to open forums to express their opinions, opposition, interests and needs. In addition to making the land-use planning process as open and transparent as possible, there should also be a mechanism for conflict resolution for situations when stakeholders simply cannot come to agreement.

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Plan and restrict road development

Roads provide access to outsiders, and for frontier areas, roads facilitate the use and commercialization of land, forests and other resources by providing access to markets. A large body of literature attests to the strong effects of roads on facilitating land clearing for agriculture in frontier areas (Barreto et al.2006, Kaimowitz et al. 1999, Pichón 1997). Animal abundance is often lower near roads because of the higher incidence of hunting and the effects of forest fragmentation (Blake et al. 2007, Clark et al. 2009, Laurance et al. 2006). In the absence of further road expansion, there is little doubt that the process of settlement and habitat loss would slow.

Logging roads have opened access to most of the Congo Basin (Laporte et al. 2006). In the CIB concessions, BZP has worked to minimize the impact of roads by working with the logging company to reduce the size of roads and to blockade roads once they are no longer active for logging. Despite these efforts to restrict access to the forest, the planning of road layout has failed to take into consideration biodiversity conservation: CIB built a primary road within 5 km and logging camp within 16 km from the border of the NNNP,

Probably the single best way to reduce pressure on natural resources is to direct roads away from valuable conservation areas. The effort invested in good road planning will pay off for the PSPC because with less pressure on wildlife and other resources, the costs of law enforcement will also be reduced.

Base biodiversity conservation on data, balanced by economic and social needs

Wildlife management and land-use planning should be based on rigorous biological and socio-economic data. Too often conservation is done by gut instinct. While an experienced manager may often be right in his or her decisions, only data

and information can satisfactorily justify those decisions to the PSPC members and outside critics. More importantly, without data it is impossible to judge the efficacy of conservation actions.

For extractive industries, inventories are conducted for exploitable resources like timber, minerals, and petroleum. Likewise, inventories need to be conducted to determine the abundance and spatial distribution of plant and animal species and non-timber forest products across the concession. Just as logging companies base their annual harvest on the location of their target timber species, exploitation of natural resources for non-industrial purposes and land-use planning should be based on surveys of wildlife and other natural resources. If possible, inventories should be conducted before logging. Pre-logging assessments of wildlife, for example, could be used to set long-term conservation goals (e.g. maintaining wildlife populations at or near pre-logging levels.)

Once land-use zones have been designated, procedures for harvesting the resources can be determined. To allow some offtake by local communities, and to take into account natural variation in wildlife populations and error in measurement of wildlife densities, maintaining populations within 10-25% of their pre-logging levels may be practical. In many cases, the optimal conditions for conservation (e.g. a buffer of 15 km around forest clearings used by elephants) are not achievable, and must be balanced by economic and resource needs of the company and local people.

The wildlife management system developed by BZP has largely succeeded in the CIB concessions because it incorporates multiple actors and is based on data collected over many years. Before management plans were written, the BZP had completed studies on wildlife populations, bushmeat, NTFPs, and timber species in addition to socio-economic studies of the movements of semi-nomadic peoples, their traditional territories, and annual demographic censuses of the human populations within the concessions (Auzel and Wilkie 2000, Eves and Ruggiero 2000, Blake 2002, Eaton 2002, Elkan 2003, Elkan et al. 2006, Poulsen et al. 2007, Malonga 2006, Mockrin 2008, Clark et al. 2009, Poulsen et al. 2009). Incidentally, one way to offset the costs of data collection is to invite universities and research centers to collaborate with the PSPC: in addition to technical knowledge, researchers from these organizations oftentimes come with funding and just need logistical support.

Prioritize the rights of indigenous people to land and resources

Industrial activities alter traditional patterns of natural resource use and social power, and therefore particular attention needs to be paid to protecting the rights of indigenous people. Most organizations are starting to recognize the rights of indigenous peoples (defined here as people who lived in the area before the arrival of industrialized logging) to the lands, territories and resources they have traditionally owned or used. These include the right to exert control over lands, establish management systems and maintain cultural and intellectual heritage.

Industrial activities alter traditional patterns of natural resource use and social power, and therefore particular attention needs to be paid to protecting the rights of indigenous people.

Land-use planning in northern Congo always included consultation of local communities, but local residents do not yet exert control over lands and establish their own management systems. Adoption of a

Figure 15. Semi-nomadic Mbendzélé hunter-gatherers temporarily camp along a logging road during a several month long expedition in the forest. Photo by J. Poulsen.

zoning system based on land use practices of indigenous people was a first positive step towards reinforcing local authority over their traditional hunting, fishing and gathering zones. At present, however, policy decisions are still largely initiated by the logging company, the government, and the PSPC. Progress must still be made in preventing management decisions in logging concessions from marginalizing indigenous populations. For example, CIB employees enjoy privileges not extended to non-workers because of their relatively greater wealth, their ability to organize themselves through worker unions and the simple fact that the logging company is interested in treating its workers well so that they will be productive employees. This puts non-workers at a disadvantage because they lack organization and representation. This is particularly true for the Mbendzélé, whose lack of formal education, attachment to an 'immediate return' economy and forest lifestyle results in a lack of representation within the logging company and government (Lewis 2002).

It is critically important that both the industry and the conservation partners embrace participatory processes in engagement with stakeholders; it is altogether too common to attribute community leadership to the wrong individuals, and even more common to confuse support from community leaders with support from communities.

Reduce the negative impacts of industry and conservation on indigenous people

In addition to prioritizing the rights of indigenous people to land and resources, several other measures should be considered to ensure that indigenous people benefit from industry and conservation. First and foremost, local residents should be given priority to employment with extractive industries. Where local people lack the necessary technical skills, training programs should rectify shortcomings. Investment in training may be cost effective in the long run. Hiring locally would reduce the level of immigration for employment which should keep the pressure on natural resources close to pre-industry levels and avoid potential social conflict between indigenous people and immigrants. By keeping the number of immigrants and human population relatively low, the required investment in infrastructure and social services by the company would presumably be lower.

When extraction of resources by industry reduces access to land and resources of local residents, they should be compensated. Compensation might be

accomplished by replacing land taken by industry with land of equal value. Land substitution is unlikely to be a solution in most cases as land is usually a limiting resource and because of what makes a place valuable to people is their history on it. At a minimum, local residents should be guaranteed resource use areas where the community has sole access rights to fulfill their livelihood needs. In northern Congo, community use zones are set aside around villages and local residents can use them for agriculture and other forms of resource exploitation. In addition, for every cubic meter of timber cut, CIB puts 300 F CFA into a community development fund. Each community independently determines how to use the funds. The key to any compensation mechanism is that the community freely chooses how it is compensated without pressure or influence from industry, government or NGOs.

Promote certification schemes

The growing market for certified wood, particularly in European countries, has started a trend in better forest management and land-use planning. Many countries require that imported wood comes from legal and sustainable sources. Three forestry concessions (including the Kabo and Pokola concessions) have now been certified by the FSC in central Africa, and several companies have committed to seeking certification in the coming years. Companies only receive certification if their logging procedures meet the standards of the organization that bestows the certificate which is assessed by independent audits of the company. Auditing is a systematic process of verification, usually conducted at the level of the forestry concession, to determine whether the operation meets a predefined set of criteria or performance standards. If the operation meets the minimum standards, a certificate is granted. If not, corrective actions may be requested. The corrective actions must be completed in a specified timeframe for certification to be achieved. Subsequent spot checks and monitoring audits are then conducted to keep the certificate valid. For producers like CIB, certification brings systematic management systems, potential market access and improved image. For conservation, certification provides a mechanism for influencing management practices. For consumers, it provides information on the legality and the environmental and social impacts of the wood being purchased. To date, the only internationally recognized performance-based scheme issuing certificates for tropical forests is the Forest Stewardship Council (Box 4).

In northern Congo, FSC certification pushed CIB to take a more active role in wildlife management and conservation of indigenous rights than it previously had. However, certification schemes fall short when it comes to wildlife management and biodiversity conservation (Bennett 2002). Although most certification bodies address wildlife conservation to some extent, their principles and guidelines are typically focused on protection of endangered species and protection of critical sites and habitats. The protection of endangered species is not a sufficient goal for biodiversity conservation and resource management, particularly where local communities rely on bushmeat as a critical source of protein and income.

Find a sustainable long-term funding plan
Throughout this document the BZP has been used as a case study for the PSPC model. One aspect of the project that is not replicable is its financial structure. On average, WCS and its donors pay for three-quarters of the annual budget, including contributions to the ecoguard

program and salaries of government officials working with the project. This level of financial support by an NGO is unsustainable in the long-term. WCS has footed the lion's share of the bill to trial a conservation model (e.g. BZP) and because the NNNP is extremely valuable for conservation. This is unlikely to be the case elsewhere.

In theory, the PSPC model should work because industry needs to mitigate its impact on the environment and is willing to pay for assistance in the task. The expense of doing biodiversity conservation is therefore either offset by more efficient, cost-effective operations or is passed off to customers through higher prices. In some rare cases, the private sector may accept the loss of some part of its profits to "do the right thing". As mentioned above in Section 3, PSPCs do open access to financial resources for the private sector and some costs can be incurred by partner organizations, but the private sector should be prepared to pay for most baseline data collection and management actions.

Figure 16. A CIB logging town, Ndoki 2, set amid a sea of tropical forest. Photo by K. Redford

An additional consideration when it comes to funding biodiversity conservation is the cycle of economic booms and busts. The global recession has hit the timber industry in Central Africa hard, causing some logging companies in northern Congo to temporarily stop production and others to close down altogether. During difficult times investment in conservation might be a hard sell to shareholders, and yet stopping the payment would set back the conservation gains achieved over years of work and could risk the loss of certifications or damage the company's image. One alternative is for the private sector to invest in a trust fund during good economic times that could keep the PSPC going through rough times. This might be a particularly good investment in industries that work on long time horizons and have long-term leases to land.

Set region-wide standards through enforcement of national laws

There is a trend towards better land-use planning and forest management in central Africa. Central African governments have recognized the need for management plans for concessions, and at least in the case of the Republic of Congo, the existing forestry laws correspond to or even surpass internationally recognized standards. Moreover, the Congolese government is slowly starting to enforce its own legislation: nine management plans are advanced in their development, including the Kabo and Pokola concessions that have been adopted and received FSC certification. Of the 69 forest management units in Republic of Congo, 50% are committed to the process of sustainable forest management planning.

Certain companies like CIB have made considerable investments in infrastructure and procedures to promote sustainable forest management, social development, and wildlife management. But to promote land management and conservation at a regional scale, forestry laws should be applied to all companies and all concessions without exception – central African countries need to enforce their own laws.

Box 15. Weak governance and industry.

In northern ROC, the government has relied upon timber companies to build infrastructure and provide social services. CIB has built hospitals, roads, markets and schools, and provides electricity, water, television and radio in its logging towns. Attracted by these services and the economic boom, the once quiet village of Pokola is a growing urban center of over 20,000 people. To some extent, CIB has taken on the role of government. Assuming this role puts a financial burden on the company. The large population of immigrants puts pressure on natural resources throughout the concessions. Urbanization should be avoided in timber concessions (or other industrial concessions). Biodiversity conservation will only be achieved through an investment in the development of cities with good infrastructure and social services by government (Borner and Atok 2007). If possible, sawmills and wood-finishing factories should be built and operated in or close to existing cities to avoid the growth of urban centers in forests and other wild lands (Poulsen et al. 2009).

SECTION 5: RECOMMENDATIONS FOR REPLICATING THE PSPC MODEL

In previous sections this paper examined the impacts of industry on biodiversity and local communities and described a model for reducing its adverse effects through a multi-organizational partnership – the private-sector partnerships for conservation. Using the BZP as a case study, the paper evaluated the risks and benefits of joining a PSPC, the components of an effective partnership, and the management strategies for conservation in an industrial site.

The PSPC model has great potential for extending the conservation estate by extending environmental management to industrial sites, but to do so the model must be replicated. The following actions are recommended in the development of a PSPC:

Determine the conservation goal.
The first step in the establishment of a PSPC is to define the goal of its existence. Over what area will the PSPC work? Will conservation be constrained to the industrial site or include other lands? Will conservation goals be broad (landscape conservation) or narrow (specific species)?

Assess the threats of the industrial activity to the conservation goal.
Before management actions can be implemented to achieve the conservation goal, the impacts of the industrial activity on biodiversity and livelihoods of local residents must be determined. Ideally the PSPC would be organized before the initiation of industrial activities in which case threats should be determined from a review of industrial impacts in other areas.

Quantify pre-industry biodiversity and livelihood baselines.
If possible biodiversity and socio-economic livelihood surveys should be conducted before industrial activity. Such surveys could establish a baseline to assess both the impacts of industry and the impacts of management actions taken for conservation.

Identify the appropriate partner organizations for the PSPC.
With knowledge of the conservation goal and the potential threats of industry to the goal, the appropriate mix of partners can be identified for the PSPC. The scale of the conservation goal will largely determine the type of partner organization to incorporate. For example, mitigation of a single community forest might best be done with a local NGO or civil society group, whereas conservation of an entire ecosystem might be more effective with an international NGO that has more experience and resources. Similarly, if community development or research is a major component of the project, then a development organization or research group should be incorporated early on. Likewise, if law enforcement is necessary then government likely needs to be involved. Taking a lesson from Section 3, partner organizations must also have the blend of institutional characteristics to be effective: more partners are not always better.

Plan and implement the management actions to mitigate the threats to biodiversity.

Once the planning is done and the PSPC built, the hard work begins with definition of conservation strategies (see Section 4) and the implementation of management actions. The BZP demonstrates that a multi-faceted approach works best, combining actions that target both threats to the environment and livelihoods of local residents. Some areas of management actions include law enforcement, development of alternative activities, education and awareness-raising, and research and monitoring.

Monitor the results of management actions on biodiversity and livelihoods

The final step is to constantly re-evaluate conservation strategies and management actions so that successful actions can be continued and failed actions can be revised or discontinued. Monitoring is most effective when it is based on scientific methods and quantitative data.

This paper is an evaluation of PSPCs based on the experiences of the BZP in northern Congo. This assessment of PSPCs is just a beginning and is meant to catalyze the development of new PSPCs as much as it is meant to be a guide. Hopefully this paper will inspire confidence in multi-sector partnerships, and the development of new tools and approaches for conservation practitioners in the future.

ACKNOWLEDGMENTS

The Government of Congo and the Ministry of Forestry Economy for its support of the BZP. Since its inception, the Governments of Switzerland, Japan, USA, France, and Republic of Congo, International Tropical Timber Organization (ITTO), US Agency for International Development(USAID), Central African Regional Program for the Environment(CARPE), US Fish and Wildlife Service (USFWS), Global Environment Facility (GEF), Wildlife Conservation Society (WCS), Congolaise Industrielle des Bois (CIB), Liz Claiborne Art Ortenberg Foundation (LCAOF), Goldman Foundation, and Columbus Zoo have contributed to the funding of the project.

The BZP and the activities described in this paper have benefited from the ideas and work of numerous people. Paul Elkan and Sarah Elkan deserve special acknowledgement for designing and establishing the project for WCS in 1999 and managing it for five years until 2004. Without their skillful labors, the BZP would not exist and conservation in northern Congo would be much less advanced.

I also thank the following people for their contributions on-the-ground to the project and wildlife management in the CIB concessions: Jim Beck, Connie Clark, Jean-Claude Dengui, Olivier Desmet, Joy Ferrante, Jacques Glannaz, Pierre Kama, Bienvenue Kimbembe, Germain Mavah, Calixte Makoumbou, Richard Malonga, Olivier Mbani, Jean-Marie Mevellec, Pierre Mbom, Antoine Moukassa, Yves Nganga, Marcel Ngangoue, Hussein Ondaye, Dominique Paget, Jean-Michel Pierre, Colby Prevost, Lucas Vander Walt, and Moise Zoniaba. Many other people have worked for the success of BZP, most notably members of the WCS-Congo program, WCS-NY office, CIB management and staff, and the Republic of Congo MEF. Special thanks as well to the local communities and the BZP employees and ecoguards who are the foundation of the project.

Thank you to T. Breuer, P. Elkan, G. Mavah, A. Moukassa, K. Redford, and others who generously provided photos and maps.

The US Agency for International Development (USAID) Office generously provided support for this publication.

Connie Clark, James Deutsch, Paul Elkan, and Nancy Gelman provided helpful comments on this paper.

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