Extracting Hope for Bushmeat:
Case studies of oil, gas, mining and logging industry efforts for improved wildlife management

Prepared for
The Bushmeat Crisis Task Force
By
The Sustainable Development and Conservation Biology
Problem Solving Team [1]

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Executive Summary

This document offers insights as to why extractive companies may be willing to promote conservation objectives to protect wildlife, reviews a sample of extractive companies that have taken measures to protect wildlife on their concessions, describes where NGO groups or donor agencies may help companies implement wildlife protection measures on their concessions, and presents potential measures to limit the impacts of hunting on extractive industry concessions.

This document highlights nine extractive companies and/or projects, ranging from Central and South America to Central Africa, that have made efforts to minimize their direct and indirect impacts on wildlife by reducing hunting on their concessions. These case studies include five logging companies (CIB-Congo, Bordamur-Gabon, HFC-Cameroon, R. Pallisco-Cameroon, Ecoforest-Panama), two World Bank pipeline projects (Chad-Cameroon pipeline and Bolivia-Brazil pipeline), one oil company (Shell-Gabon) and one mining case study (Coltan). We also discuss a novel approach to wildlife protection, the conservation concession. These case studies all take place in or near protected areas. All of the companies reviewed in this document are international companies or are funded by international donor agencies. All of these projects involve companies that have partnerships or collaborations with NGOs or have consulted with NGO's. This is by no means an exhaustive list of companies that have acted responsibly to protect the environment. These projects or companies were suggested as potential models for implementing wildlife management on logging concessions by NGO representatives that are experts in bushmeat related issues.

Specifically this document covers the history of each project, funding, partnerships and collaborations, stakeholder responsibilities, actions taken to reduce hunting, benefits and struggles of each project, as well as the potential replication of each project. The success of the various wildlife protection measures on hunting could not be assessed for all projects.

Possible funding options for improving wildlife protection on logging concessions are also discussed in this document, including trust funds and debt-for nature swaps.

Although the nature of operations for oil, gas, mining and logging industries is not necessarily analogous, there are several lessons from these case studies that can be applied to logging concessions. The potential for any of these projects (or aspects of these projects) to be replicated will depend on the degree of hunting in the region, access to hunting areas, human population density, species that are being threatened and therefore potential funding, size of concessions and length of tenure, capacity of government to participate and possibly enforce laws, and proximity to protected areas.

Based on a review of the measures taken to protect wildlife in each of these projects we recommend at a minimum the following set of measures be taken to reduce hunting pressures on logging concessions.

The first step is developing a management plan for a concession based on the results of an environmental impact assessment (as in the Chad-Cameroon pipeline project, Bolivia-Brazil pipeline project, and Gabon Biodiversity project). Assessing the conditions on the concession is an important for determining the number of wildlife guards required, placement of guards and the time that should be dedicated to patrols. This assessment should include information on the level of hunting taking place on the concession, the species that are in threat, proximity of the concession to source populations or protected areas, and the number of access points for hunters. This work should be done by NGO staff, biologists and/or anthropologists. The management plan that will be developed should rely on an adaptive management approach so that it can be adjusted with experience (as in the Gabon Biodiversity Project).

Companies need to commit to very clear regulations to protect wildlife (as in CIB-PROGEPP, Minkebe, Shell-Gabon, R. Pallisco, Bolivia-Brazil and Chad-Cameroon pipeline projects) including:

- No hunting, within no-hunting zones;
- No weapons can be carried within concessions;
- No access to the concession is allowed by anyone not affiliated with company; and
- No transport of bushmeat within company vehicles.

These regulations need to be enforced either by company employees (as in CIB-PROGEPP, Shell-Gabon, R. Pallisco, Chad-Cameroon and Bolivia-Brazil pipeline projects) or government officials, such as Ministry of Forest Economy staff in Congo or Ministry of Forests staff in Cameroon (as in CIB-PROGEPP, Minkebe projects). The size of the concession and the degree of hunting pressure will determine the number of people that will be necessary to survey and protect wildlife on a concession. There are benefits to having patrols rotate between concessions to prevent the potential for corruption from relationships forming between logging employees and patrollers (P. De Wachter, pers. comm.). However, the involvement of community members in protection efforts may increase locals stake and interest in respecting company regulations (as in CIB-PROGEPP concessions).

Basic education on company policies and regulations needs to be carried out for employees and local villagers. It needs to be made clear to employees that violations of these regulations will be strictly enforced (as in Chad-Cameroon pipeline, CIB-PROGEPP, Minkebe project, Gabon Biodiversity Project, HFC)

It is important that employees are either provided with food, or are paid sufficiently and have access to bushmeat substitutes (as in R. Pallisco, CIB-PROGEPP, Chad-Cameroon and Bolivia-Brazil pipeline projects, Shell-Gabon projects, Minkebe Project).

Communities should be consulted when developing management plans, particularly if there are historical wildlife use areas, such as for indigenous groups (as in Chad-Cameroon and Bolivia-Brazil pipeline projects, Minkebe, CIB-PROGEPP projects)

In order for the adaptive management approach to be useful, periodic monitoring of populations and surveys of bushmeat consumption will be important to evaluate the project.

These measures represent the minimum requirements that companies should take to reduce hunting pressures on their concessions. One step beyond this would be to introduce animal husbandry on concessions (as in R. Pallisco, CIB-PROGEPP), to lead education initiatives to foster conservation awareness with local communities (as in PROGEPP, Shell-Gabon, Chad-Cameroon pipeline project), and establish community hunting zones to establish ownership and value to wildlife (as in CIB-PROGEPP).

NGO's may be instrumental early on in the development of management plans, but may not be needed after plans are developed and initial implementation phases. NGOs may however play an important role in monitoring the implementation of management plans and in providing funding for wildlife protection efforts.

There are several lessons to be learned about wildlife management from extractive industries working in tropical forests. In our research we have found that:

- Few extractive companies in tropical forests focus on wildlife concerns;
- Government enforcement of wildlife laws may be minimal to non-existent;
- Where companies do focus on wildlife concerns, they can be successful;
- Industry-NGO partnerships may be viable when they occur; and
- NGOs have been slow to take risks and to attempt new projects on wildlife management where there are extractive operations going on.

There is however much work being done to prevent anthropogenic impacts on wildlife in isolated locations. We are hopeful that the momentum for protecting wildlife on logging concessions is building and will be effective at abating the bushmeat crisis in Central Africa.

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1.0 INTRODUCTION

This document offers insights as to why extractive companies may be willing to promote conservation objectives, reviews a sample of extractive companies that have taken measures to protect wildlife on their concessions, describes where NGO groups or donor agencies may help companies implement wildlife protection measures, and presents potential measures to limit the impacts of hunting on extractive industry concessions.

This document highlights nine extractive companies and/or projects, ranging from Central and South America to Central Africa, that have made efforts to minimize their direct and indirect impacts on wildlife by reducing hunting on their concessions. These case studies incude five logging companies (CIB-Congo, Bordamur-Gabon, HFC-Cameroon, R. Pallisco-Cameroon, Ecoforest-Panama), two World Bank pipeline projects (Chad-Cameroon pipeline and Bolivia-Brazil pipeline), one oil company (Shell-Gabon) and one mining model (Coltan). We also discuss a novel approach to wildlife protection, the conservation concession. These case studies all take place in or near protected areas. All of the companies reviewed in this document are international companies or funded by international donor agencies. All of these projects involve companies that have partnerships or collaborations with NGOs or have consulted with NGO's. This is by no means an exhaustive list of companies that have acted responsibly to protect the environment. These projects or companies were suggested as potential models for implementing wildlife management on logging concessions by NGO representatives that are experts in bushmeat related issues.

Specifically this document covers the history of each project, funding, partnerships and collaborations, stakeholder responsibilities, actions taken to reduce hunting, benefits and struggles of each project, as well as the potential replication of each project. The success of the various wildlife protection measures on hunting could not be assessed for all projects.

Possible funding options for improving wildlife protection on logging concessions are also discussed in this document, including trust funds and debt-for nature swaps.

1.1 CASE STUDIES

1.1.1 African Projects

1.1.1.1 CONGO REPUBLIC (Brazzaville)

1.1.1.1.1 PROGEPP

1.1.1.1.1.1 Overview

One of the most publicized efforts to reduce unsustainable and illegal hunting on logging concessions is a joint initiative called the Project for Ecosystem Management in the periphery of Nouabale-Ndoki National Park (PROGEPP). PROGEPP is a partnership between the logging company Congolaise Industrielle des Bois (CIB), an international NGO, Wildlife Conservation Society (WCS) and a government agency, the Ministry of Forest Economy (MFE) of the Rebublic of Congo. With this project WCS embarked on a unique mission to protect Congo's threatened species including gorilla, elephant and chimpanzee populations using a landscape approach. The project protects wildlife in buffer areas surrounding the Ndoki-Nouable National Park and two other nature reserves in close proximity, Lac Lobeke in Cameroon, and Dzanga Ndoki National Park in CAR. The project began in 1999 with the

stated local, regional and national goals of, "…survey[ing] and monitoring continued efforts for species of concern, collaboration with [a] logging company for [implementing] wildlife management on [their] concession, [and] collaboration with company, community and government, to influence national policy" (P. Elkan 2002)

1.1.1.1.1.2 Company Statistics

Congolaise Industrielle des Bois (CIB) is a German company in Northern Congo, founded in 1912 (Forests Monitor 2002). CIB currently owns rights to three concessions; Kabo, Pokola and Loundougou. The Pokola concession was acquired in 1997 and comprises 480,000 hectares. Kabo was obtained in 1997, and covers 280,000 hectares. The Loundougou concession was also obtained in 1997 and covers an area of 390,000 hectares. The human population of the Pokola concession increased from 7200 people in 1999 to 11, 389 people in 2002 (P. Elkan 2002). Kabo grew from a population of 1,406 people in 1999 to 2, 333 in 2002 as logging operations increased in the area (P. Elkan 2002).

1.1.1.1.1.3 History of Partnership

In the early 1990's WCS began managing the Ndoki-Nboule National Park in Northeastern Congo (Meder 1995). Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ), (a German development agency somewhat parallel to USAID) monitored buffer regions of the park until civil war caused GTZ to leave the region (S. Elkan, pers. comm.). In that time-period, hunting by CIB employees was reportedly threatening wildlife populations around Ndoki-Nouable (Meder 1995). In order to better address these threats, WCS staff developed relationships with CIB officials and negotiated an agreement to work within CIB concessions (H.Eves, pers.comm.).

In June 1999 CIB signed an agreement with Wildlife Conservation Society, The Congolese Ministry of Forest Economy and Congo Safari (a private safari/tourism company) to ensure wildlife conservation on their concessions by prohibiting illegal hunting, developing land–use plans and fostering conservation awareness (FORM 2000). The project was given a five-year time frame with the option for renewal (FORM 2000). Wildlife protection efforts started in Kabo and expanded to all of CIB's concessions (P. Elkan, pers. comm.). Paul and Sarah Elkan are the Director and Coordinator of PROGEPP, respectively.

1.1.1.1.1.4 Project Funding

Funds for this project have come from CIB as well as from government resources, international aid from WCS, USAID, CARPE, ITTO, USFWS, Columbus Zoo, Congolese Government and other sources. The estimated costs are $1 US per hectare/year for up to 300,000 hectares, 0.75$ up to 1,000,000 hectares (P. Elkan & S. Elkan 2002).

1.1.1.1.1.5 Stakeholder Responsibilities

Each of the program participants was given unique responsibilities to fulfill the project's mission. The following list highlights stakeholder requirements from the original PROGEPP contracts that are relevant to wildlife protection (FORM 2000):

MEF

- Authorize experimental annual quotas for subsistence hunting in the village of Kabo;
- Provide equipment for wildlife protection;

Congo Safari

- Maintain year-round wildlife protection in its assigned zone;

WCS

- Lead the execution of the program and assign a program manager;

- Train and manage ecoguards, researchers, educators, and other personnel;
- Provide technical expertise;
- Communicate with international environmental organizations and media;
- Evaluate results and produce reports on the progress of the project;

CIB

- Adapt company regulations to facilitate wildlife management and conservation in its three concessions, including:
    - Control of hunting and transport of bushmeat in vehicles, exploration camps and by personnel;
    - Apply disciplinary measures to CIB employees found violating company regulations
- Provide lodging, driver, vehicle and fuel for program personnel;
- Provide materials to construct a guard post and control shelters on the major roads in the concession; and
- Inform local communities about program's objectives concerning wildlife management.

Congo Safari left the project soon after the agreement was signed because they could not get authorization for bongo hunting. This did not present significant problems for the project (P. Elkan, pers. comm.).

1.1.1.1.1.6 Project Implementation

This project combines several strategies to protect wildlife on the concession. The following measures have been taken to protect wildlife on CIB concessions:

- **Company Regulations** Company regulations prohibit the transport of bushmeat using company trucks and roads. The use of snares is prohibited (P. Elkan & S. Elkan 2002).
- **Zones** with varying intensities of hunting restrictions were created including; No hunting zones, Community hunting zones (establishing local community ownership of wildlife) and buffer zones (around the National Park) (P. Elkan & S. Elkan 2002). Hunting protected species has been strictly prohibited throughout the concessions (P. Elkan & S. Elkan 2002).
- **Ecoguards** who control hunting on the concessions are trained on site by ministry officers, military officers and project staff. There are mobile patrols as well as stationary check points (P. Elkan & S. Elkan 2002). Guards are recruited locally (P. Elkan & S. Elkan 2002). Training lasts 6-8 weeks and includes training on wildlife laws, principles, company regulations, GPS, and wildlife monitoring (P.Elkan, pers. comm.). The number of ecoguards per hectare is dependent on the density of the population and the species at risk (P. Elkan, pers. comm.). In early 2002 4-6 MFE officers and 25 ecoguards were working on the concessions, and more were to be hired (P. Elkan 2002).
- **Protein alternatives/employee provisions** Methods for providing protein alternatives to employees and local communities have also been introduced (following consumer taste preference surveys) including tilapia farming, beef importation, animal husbandry and gardening. CIB is also increasingly providing food to employees (P. Elkan & S. Elkan 2002). Price controls are in place to increase the cost of bushmeat relative to other sources of protein.
- **Educational campaign** An extensive educational campaign was developed to foster conservation awareness on a local level. These efforts address women, potential hunters, children and company employees. Communities have been engaged in PROGEPP through meetings, seminars and nature clubs (P. Elkan & S. Elkan 2002).

Training sessions and materials have been created for regional schools that focus on various local ecological and nutritional issues (P. Elkan 2002).

- Television programs, films and radio programs have been used to promote the project and conservation awareness nationally and internationally (P. Elkan & S. Elkan 2002).
- A Kabo football team wears a "large mammals of northern Congo" emblem on its uniform (sponsored by the Columbus Zoo) (P. Elkan 2002).
- **Evaluation and monitoring** are continually conducted to evaluate PROGEPP's accomplishments. These efforts involve conducting surveys of households and markets and species population monitoring (P. Elkan & S. Elkan 2002). Also, an independent assessment of PROGEPP is scheduled for early 2003.

1.1.1.1.1.7 Benefits and Successes

PROGEPP officials are currently in the process of publishing detailed accounts of the projects successes and of the lessons learned (P. Elkan pers. comm.). To date it has been reported that wildlife management has been extended to more than 500,000 hectares of CIB's nearly 1,000,000 hectare concession (P. Elkan & S. Elkan 2002). Since the project began snare rates have decreased, hunting weapons have been confiscated by ecoguards and CIB staff, zoning is being respected, and ministry authorities have enforced PROGEPP regulations.

One of the most important successes of this project is that it is influencing the national approach to wildlife problems on concessions. As a result of this pioneering project's efforts to address wildlife problems, the Congolese government is now requiring all logging companies operating in Northern Congo to pay for ecoguards and wildlife management on their concessions (P. Elkan & S. Elkan 2002)

CIB has seen reductions in diesel fuel theft and in employee time spent hunting. Improved management has spread to areas that were not managed before (P. Elkan, pers. comm.).

PROGEPP teams have been asked by the government to help with in service training of ecoguards for other logging concessions in Northern Congo, following new government requirements based on PROGEPP (P. Elkan, pers. comm.).

1.1.1.1.1.8 Struggles

Although PROGEPP's intensive, multi-faceted approach is nearly unparalleled, it has received its share of criticism as well as praise. Karl Amman, a well-recognized animal welfare activist and photographer, publicly criticized PROGEPP for green-washing a company that, in his opinion, has not taken sufficient steps to minimize hunting on their concessions. His position is that industry, not the international conservation community, should be responsible for funding efforts to limit industry impacts on the environment (K Amman 2001).

CIB has recently been penalized due to criticisms from WWF and Greenpeace regarding the company's forestry practices. WWF and Greenpeace asserted that CIB was not implementing sustainable forestry practices and that its social programs in regard to forestry practices were not sufficient (G. LeJeune, pers. comm.). For these reasons, acceptance of their certificate by Keurhout was withdrawn (G. LeJeune, pers.comm.; K. Bosdijk, pers.comm.).

CIB has not benefited from an increase in sales due to their efforts at Kabo and Pokola. Robert Hunink of ttTimber, an affiliate of CIB, suggested that this may be a deterrent for other companies to engage in similar measures (M. Hatchwell pers. comm. to P. Elkan 2002).

1.1.1.1.1.9 Replication and Expansion of Project

PROGEPP is a landmark project that merits attention and imitation, however it is important to recognize potential difficulties in replicating PROGEPP in other locations.

- **Concession size/population density and Forest access** Northern Congo logging concessions are large compared to many other concessions in Central Africa, population densities are low, and there is relatively limited access to the forest, which inhibits wildlife hunting. Where these conditions are not met in other locations it may be difficult to replicate PROGEPP-like efforts (P. Auzel, pers. comm.). For example, Congo's population was estimated as 3,200,000, in mid-2002 as compared to Cameroon's population of 16,200,000 (Population Reference Bureau, 2002).
- **Funding** This project relies on a significant amount of NGO support and financing. This may be a limiting factor with other projects.
- **Proximity to protected areas** CIB's concessions are close to ecologically valuable protected areas that attract international support. This is not the case for all concessions.
- **Species in threat** Funding may also depend on the composition of species that are threatened by logging operations and their draw for support from donor agencies.

Future projects modeled after PROGEPP will need to be tailored to local conditions. Currently negotiations are being held to expand similar efforts to other logging concessions near CIBs concessions.

A 2002 workshop was held in Brazzaville that brought together managers, policy makers and experts to design and institutionalize a standard scheme for implementing wildlife management on forest concessions. The standards that were developed were based on results from PROGEPP and advice from the US Forest Service, and other international delegates. The final report from this workshop includes general approaches to wildlife management that should be incorporated into plans for other concessions (WCS 2002).

1.1.1.1.1.10 Former CIB President's perspectives

Hinrich Stoll shared his opinions on the PROGEPP partnership and its role in the interaction between industry, poverty alleviation and conservation as the following (H. Stoll, pers. comm.).

> "…the future of the Congolese population has to be prepared by using the country's natural renewable resource "forest" for ensuring…long-term better quality of life of Congolese people and to integrate the Congolese economy into the world market by sales of their products…All sorts of environmental and protective activities, such as wildlife management need to be accompanied by permanent information and education…The present generation and children have to understand that they should not take more from their forest than what they inherited from their parents…None of the stakeholders can solve the problems alone...Partnerships and mutual understanding between the stakeholders are necessary to improve things."

Stoll described the CIB/MFE/WCS partnership as a " practical and realistic solution for combining conservation of the forest resources with development and poverty alleviation".

1.1.1.2 GABON

1.1.1.2.1 Minkebe Project: WWF/MINEF-Bordamur

1.1.1.2.1.1 Overview

World Wildlife Fund has worked with the Gabonese Ministry of Water and Forests (MINEF) to control illegal hunting on the Bordamur logging concession that borders the Minkebe Forest Reserve (now a national park) in Northeastern Gabon. Since 1999 WWF and MINEF have been working with Bordamur, the provincial government and local villages to create and enforce strict regulations on hunting within the concession. The rules are codified in a negotiated MOU between MINEF, the Provincial Authorities, local villages and the logging company. The Minkebe Project's work in logging concessions, "is about building law enforcement capacity, strengthening internal controls and rules by the company and getting authorities on board, as well as local communities agreeing on very strict and simple rules regarding hunting in logging concessions" (P. De Wachter, pers. comm.). This project has been largely successful and as a result, WWF/MINEF have begun working with other concessions in the region to expand patrolling efforts and replicate the Bordamur model elsewhere.

1.1.1.2.1.2 Company Profile and History of Minkebe Project

Rimbunan Hijau, a Malaysian company working under the local name Bordamur, has a logging concession west of the Minkebe Forest Reserve in Gabon, comprising 144,572 ha. In 1997 they began the construction of logging roads on their concession. Hunting levels increased mostly because of the influx of hunters with vehicles who used the logging road network to reach areas with high densities of wildlife. Employees were also hunting and using company vehicles to transport bushmeat. The Bordamur concession was essentially an open access zone. Bordamur had little capacity or authority to curb the problem due to lack of experience in the region, language differences and "generally tense relations between workers, authorities and the Malaysian management" (Pauwel De Wachter, pers. comm.). The governor and provincial delegations of MINEF were aware of the conditions on Bordamur's concession and supported efforts to assuage the problem.

During this period of time MINEF and WWF were involved in establishing the Minkebe Protected Area and executing reconnaissance surveys in the Minkebe Forest Block as well as initiating hunting surveillance in the area. In light of the high hunting levels taking place in Bordamur in 1999, WWF expanded their efforts and joined forces with the Provincial MINEF Inspection of Woleu-Ntem Province, and the Gabonese Wildlife Department (DFC) to control poaching on Bordamur's concession. They held regular anti-poaching missions to confiscate bushmeat and weapons. Clean–up missions lead MINEF and financed by WWF were held in 1999 to remove all hunting camps within the interior of the Bordamur concession (P. De Wachter, pers. comm.). MINEF and WWF's efforts in Bordamur mobilized the company and authorities to treat the hunting problem seriously. By the end of 1999 Bordamur was fined by MINEF for not implemented forestry regulations and for their complicity with poaching. A meeting in late 1999, presided over by the Director General of MINEF resulted in a proposal for WWF and MINEF to develop an MOU regarding hunting in Bordamur. This decision was based on a rule stating there can be "no link between hunting and rolling equipment (vehicles, bikes, pushbikes)". In 1999 WWF/MINEF began developing strict rules to control hunting in the concession. After extensive negotiations, in June, 2001 a memorandum of understanding (MOU) was signed by the governor of the region (representing the Ministry of the Interior), Bordamur, MINEF and four local villages to limit hunting on Bordamur's concession (P. De Wachter, pers. comm.). Pauwel De Wachter is WWFs Director of the Minkebe Project.

1.1.1.2.1.3 Project Funding

WWF has funded all anti-poaching operations on the Bordamur concession. They also funded negotiation meetings, equipment, and seminars. De Wachter estimates that the real cost of a project similar to theirs; monitoring 2-3 concessions, conducting, surveillance, conflict resolution, and negotiating and establishing rules would cost 100,000 USD/annually. WWF has not asked Bordamur to pay for law enforcement. They are considering the possibility of making companies pay total or partial costs in the future, such as for mobile MINEF units that travel to several concessions (P. De Wachter, pers. comm.).

1.1.1.2.1.4 Stakeholder Responsibilities

Pauwel De Wachter credits the MOU for engaging stakeholders in adhering to strict rules that are easy to enforce (P. De Wachter, pers. comm.). The following list highlights stakeholder requirements from the original Minkebe Project Memorandum of Understanding (MOU 2001):

MINEF (under the direction of the Division of Wildlife and Hunting)

- Control the implementation of the wildlife management measures (surveillance);
- Expand anti-poaching missions and awareness raising missions in and around Bordamur concessions and nearby villages; and
- Keep other stakeholders abreast of monitoring issues.

The Provincial Government and the Ministry of the Interior

- Expand the mission of the MOU to other concessions; and
- Respect the contents of the MOU.

Bordamur

- Construct and provide equipment for a field station;
- Install barriers;
- Contribute to the funding of a day guard; and
- Apply regulations outlined in the MOU.

Local villages (Assouk-Begue, Nkougou, Afia and Okala)

- Inform authorities of the presence of foreign hunters;
- Hunt within hunting zones-only on foot; and
- Respect Gabonese laws on hunting.

WWF and MINEF have been strong forces in building the law enforcement capacity of Bordamur, negotiating regulations and providing technical advice (P. De Wachter, pers. comm.). WWF/MINEF personnel live in the provincial capitals (Ovem and Makokou) and travel between concessions to help with patrols. MINEF wildlife teams of the Minkebe Project and assisted by MINEF Provincial Delegation patrol the site. Pauwel De Wachter explained that law enforcement is effectively conducted by outsiders, since locals and on site wildlife managers may be vulnerable to revenge by disgruntled poachers. It is the " WWF and MINEF teams that maintain the strict standards on the Bordamur concession" (P. De Wachter, pers. comm.).

Any breach in the MOU is punishable according to the existing legislation (MOU 2001).

1.1.1.2.1.5 Project Implementation

As summarized by Pauwel De Wachter of WWF, the main rules in the MOU are (pers. comm.):

- **Anti-hunting patrols:** There are no official wildlife managers based in the concession. Access road control is conducted by Bordamur employees (enforcement

at barrier), as is checking vehicles for bushmeat. MINEF/WWF routinely helps enforce internal regulations by checking company vehicles for bushmeat and conducting surveillance missions in the concession. Employee bags are checked for bushmeat by Bordamur concession managers before they are brought back to camp. Bordamur asked WWF/MINEF teams to be present as much as possible (P. De Wachter, pers. comm.).

- **Concession access:** Vehicles entry into the logging concession is strictly forbidden except by Bordamur, MINEF and its partner (WWF).
- Any link between hunting and rolling equipment is forbidden in the concession;
- **Vehicle use:** All transport of bushmeat, arms, munitions and hunters forbidden in Bordamur's vehicles.
- **Employee regulations:** No hunting at the place of work. Logging company workers can only hunt, on foot, and outside of work hours only around their main camp where they are housed (it is considered a village).
- **Hunting restrictions and zones:** Villages, along the public road Oyem-Mitzic, can only hunt on foot and with respect to the law. The maximum distance they can go is up to the Okano river, around 20 km as the crow flies.
- **Alternative protein sources** Bushmeat substitutes are available to employees at a lower price than other sources of protein.

Vehicle restrictions include bikes or other rolling transportation (MOU 2001).

1.1.1.2.1.6 Benefits and Successes

Bordamur has been a willing collaborator and a strict enforcer of the MOU guidelines, which has included firing workers for violating regulations. Bordamur has benefited from the new law enforcement capacity and control of its concession. Workers are no longer spending time hunting while on the job, trespassing and theft have also decreased. WWF/MINEF fined Bordamur in 1999 for being party to illegal hunting on their concession, and for abandoning timber in the forest (P. DeWachter, pers. comm.). The company is therefore interested in avoiding future penalties. Bordamur has been happy with the new discipline of their employees due to WWF/MINEF's presence (P. De Wachter, pers. comm.).

WWF has assisted MINEF in building Bordamur's enforcement capacity. Pauwel De Wachter reports that from late 2000 there have been no unauthorized vehicles entering the concession. Hunting by company employees has been kept to a strict minimum. Monitoring of this project has been conducted by interns from the Water and Forest school. They reported that 200 tonnes of bushmeat left the concession in 1999. In 2001 and 2002 very low levels of hunting were reported. No outsiders entered the concession, but some bushmeat was hidden in employee bags. WWF/MINEF accounts report the same results (P. DeWachter, pers. comm.). Although there has been no formal independent monitoring, several visitors have confirmed the success of the program as reported by Pauwel De Wachter, including representatives from Great Ape Survival Project (GRASP), IFAW, IUCN/Elephant Specialist Group. Minkebe Project employees (most from MINEF) are highly respected at the site (P. De Wachter, pers.comm.).

Local villagers who live along the public road were strongly encouraged to participate with developing the MOU. They have fully supported regulations that prohibit the use of logging roads for hunting. These villagers still hunt by foot, but rarely travel beyond 20 km which leaves the majority of the interior of the Minkebe Forest unhunted. This hunting is not solely for subsistence, but it is not considered a major problem (P. De Wachter, pers.comm.).

The project was described as, “a real success and comes quite cheaply”. The Ministry of Water and Forests of Gabon was described as being very supportive of the Minkebe project and, “[have] the will to extend this approach all around protected areas in Gabon”. The RH group has invited WWF to assist them with their other logging concessions in Gabon, however WWF has not been able to help because the concessions are in other regions of Gabon where WWF has no capacity yet (P. De Wachter, pers.comm.).

1.1.1.2.1.7 Struggles

Apart from regular law enforcement, no struggles have been reported by Pauwel De Wachter. A formal assessment was not possible.

1.1.1.2.1.8 Replication and Expansion of Project

Law enforcement has now been extended to several concessions in the area (P. De Wachter, pers. comm.). The same MOU was signed by Exploitation Forestiere et Negoce de Bois (EFNB), a neighboring French concession with holdings of at least 15, 000 ha (P. De Wachter, pers. comm.). FOREX, another company in the Minkebe region is following similar guidelines and has provided housing for the WWF/MINEF team. A similar MOU is under negotiation with SHM concession. ECOFAC has been proposing a similar approach for companies adjacent to the Lope reserve, and WWF-Belgium has been proposing similar rules for a CEB concession in Gabon (P. De Wachter, pers. comm.).

The European Union has agreed to finance replication of the Bordamur model all over Northeast Gabon through a 1,400,000 Euro grant to WWF from the Tropical Forest Budget Line. It is thought that during this phase companies will start to finance direct cost of law enforcement.

Support of government officials, villager cooperation, presence of law enforcement units with a high level of authority, as well as NGO funding and presence are the factors driving the success of this project. Mobile patrol units may be more effective than one patrol crew per concession since friendships between patrol teams and logging employees may not be ideal for ensuring the enforcement of anti-poaching regulations.

1.1.1.2.2 The Gabon Biodiversity Project: Smithsonian Institution, Shell Foundation, and Shell Gabon

1.1.1.2.2.1 Overview

In 2000, the Smithsonian Monitoring and Assessment of Biodiversity Program (Smithsonian MAB) began working within Shell Gabon to monitor biodiversity in the company’s concessions in the Gamba Complex (Biodiversity Economics Library 2002a, Campbell et al. 2000a). The project is based on models developed from a previous Smithsonian and Shell partnership in Peru that aimed to minimize Shell’s “environmental footprint” from the exploration and development of natural gas fields. As Phillip Watts, Chairman of the Committee of Managing Directors for the Royal Dutch/Shell Group of Companies, explains, these business approaches “help provide Shell with a business advantage…. Shell believes that customers, governments, and other stakeholders want to do business with companies that are developing imaginative and positive approaches to biodiversity” (Biodiversity Economics Library 2002b).

Shell Gabon enforces strict policies that prevent employee hunting in the company’s concession areas, and third-party access is carefully monitored. The company adopted these policies even before biodiversity researchers began their work in Gabon.

Smithsonian MAB's work is developing comprehensive baseline information to document the biodiversity of the Gamba Complex and laying the basis for future monitoring plans that will help Shell managers adjust their operations to address current and future biodiversity issues, including the impacts of operations on biodiversity. The results of the comprehensive biodiversity assessments are also intended to assist the government of Gabon to understand species diversity and composition in the Complex, which is home to two proposed national parks. This information will promote a relationship between government and industry in order to develop approaches for long-term biodiversity conservation once hydrocarbon production declines in areas that are currently managed by industry. Smithsonian scientists are studying concessions of various ages, which offers the opportunity to explore differences in biodiversity before and after development and incorporate findings into the long-term conservation strategies. (Campbell et al. 2000a,b; 2001; 2002).

1.1.1.2.2.2 Gamba Complex

Shell Gabon's concessions are in the Atlantic coastal plain of Gabon in a region called the Gamba Complex, which covers more than 11,000 square kilometers of tropical rainforest bordering the Atlantic Ocean and extending up to 100 kilometers inland. As described by Campbell et al. (2002), a mosaic of broadly defined habitat types characterizes the area, including beach and sand dunes, littoral forest, mangrove forest, coastal scrub forest, freshwater swamp, lowland seasonally flooded forest, upland non-flooded forest, open grassland and extensive lagoons and lakes adjacent to the ocean. Further inland are extensive tracts of upland forest occasionally dissected by lowland, seasonally flooded forest along rivers and larger streams. The entire area may represent a transition zone between the Guineo-Congolian tropical forest zones and the savanna ecosystems of the south, thus providing important habitat for migratory species. The area is rich in plant and animal biodiversity, including lowland gorillas, chimpanzees, forest elephants and nesting leatherback turtles (Campbell et al. 2002).

The Gamba Complex is a national Gabonese designation and an IUCN Wildlife Utilization Area that consists of two faunal reserves, three hunting areas, the Moukalaba Reserve and the Monts Doudou region (Campbell et al. 2000a). A recent government pronouncement to set aside ten percent of Gabon's land as national parks will establish two national parks and several other protected areas in the Complex. Selective logging takes place in and around the town of Gamba (population approximately 8,000), and oil production has been taking place there for nearly forty years (Campbell et al. 2000a).

1.1.1.2.2.3 Shell Concessions

Shell's oldest concession in the Complex is the Gamba concession, within the coastal savannah region. Roads, including a national road and secondary roads, are common in the vicinity of this concession. There is also an airport and nearby industrial areas. Many of the roads can be accessed by hunters. Shell also holds a concession for the Rabi-Toucan area (about 250 square kilometers) north of the Gamba concession (Campbell et al. 2002). The Rabi oil fields have been operating since 1986, while in adjacent Toucan, work is just starting. The Rabi-Toucan area consists of upland and lowland rainforest with a high degree of biodiversity (Campbell et al. 2002). Hunting is strictly forbidden in the Rabi-Toucan concession.

1.1.1.2.2.4 Smithsonian/Shell Partnership

In 1996, Shell approached Smithsonian MAB to conduct a biodiversity assessment and monitoring program in extremely remote rainforest of the Camisea region in southeastern Peru where the company was in the process of developing a natural gas field (F. Dallmeier pers. comm., Biodiversity Economics Library 2002a). The project was sponsored by Shell Prospecting and Development (Peru) BV (SPDP) and Shell International. Partners included

international research organizations and government and non-governmental entities (Campbell et al. 2000a). Smithsonian teams sponsored workshops to consult with scientists and local stakeholders. The objective was to determine the appropriate measures to address the issue of gas exploration and development in relation to the conservation of biodiversity. After four years the Peruvian government terminated Shell's rights to the concessions and the project ended before the pipeline was developed.

In relation to the issue of hunting, SPDP's concession was in an extremely remote area with limited access for local indigenous communities. Company employees were strictly prohibited from hunting. No access roads were planned for the project. Instead, SPDP intended to bring in all supplies and equipment by air or water transport.

We direct readers to the *Journal of Environmental Monitoring and Assessment*, Volume 76, Number 1 (May 2002), which is devoted to a comprehensive discussion of this complex, multi-year project.

1.1.1.2.2.5 The Gamba Complex Biodiversity Project

In 2000, Shell Gabon and Smithsonian teams developed The Gamba Complex Biodiversity Project. In Gabon's Gamba Complex, Shell and Smithsonian are putting the lessons of the Camisea project to use and expanding the model for conservation of biodiversity in sensitive areas that was developed in Camisea (F Dallmeier pers. comm.). Campbell et al. (2002) list the objectives:

- Increase knowledge of biodiversity within Gabon through biodiversity research, assessment and monitoring;
- Promote links among stakeholders in Gabon, researchers, conservation scientists and resource developers;
- Increase in-country capacity for continued biodiversity work through technical training in established protocols;
- Disseminate the scientific information generated from the biodiversity assessments to a wide range of audiences; and
- Advance the model of conservation and sustainable development through successful partnerships among local stakeholders, scientists and industry.

1.1.1.2.2.6 Project Funding

The project is funded by Smithsonian, Shell International, and Shell Gabon (F. Dallmeier pers. comm.).

1.1.1.2.2.7 Stakeholder Responsibilities

Shell Gabon

- Special security personnel are responsible for managing access to Shell Gabon's areas of operation. All security measures are standard industrial practices designed to minimize potential accidents; and
- As part of overall management of Shell Gabon's concessions, hunting is not permitted within operational areas.

Smithsonian MAB

- Smithsonian MAB teams assess biodiversity in the region and provide technical advice on issues related to biodiversity; and
- The teams are also involved in numerous local, national, and international education and outreach efforts.

1.1.1.2.2.8 Project Implementation

- **Guards** There are no official ecoguards on the concessions. Rabi/Toucan areas are remote and tightly controlled by Shell Gabon security (F. Dallmeier, pers. comm.). Access is fully controlled and for the most part only industrial employees and other local stakeholders are allowed access. (F. Dallmeier, pers. comm.).
- **Access** The Rabi-Toucan concession is very remote. There is only one road leading into the Rabi-Toucan field, and the few access points into the Rabi concession are gated and closed at night. Driving between 6:00 am and 6:00 pm is allowed only by special permit. The company's well-organized Health, Safety and Environment Department helps ensure a safe operation. Access in the Gamba concession is more difficult to control. There are more roads than in the Rabi Toucan concession, and some in and near the concession are on government land. However, the area surrounding the oil refinery is very tightly controlled.
- **Anti-hunting company regulations** As noted earlier, the company does not allow hunting in its concessions. Shell Gabon also prohibits the use of company vehicles for hunting.
- **Food provisions for the employees** working at Rabi. All services including food have to be provided due to the remoteness of the area. (F. Dallmeier, pers. comm.).
- **Biodiversity assessments** Extensive biodiversity assessments are being conducted to help inform management decisions for company operations. Four areas within the Gamba complex had been surveyed by January, 2002 (F. Dallmeier, pers. comm.). Formal results have been and will continue to be published in a number of venues including technical reports and international journals.
- **Education programs** Educational and outreach programs are led by SI/MAB staff to inform local residents about their region's ecological values and the importance of biodiversity.

1.1.1.2.2.9 Benefits and Successes

Shell Gabon has been effective in controlling access to the Rabi-Toucan area; therefore, hunters have generally been kept out of the concessions. Smithsonian research teams have not observed any hunting in the Rabi area, although researchers have noted evidence of snare trapping north of Rabi outside Shell Gabon's concession and in the vicinity of the Gamba concession.

Company regulations that limit access to the concessions primarily for the purposes of promoting safety and preventing accidents also work to the benefit of wildlife in the areas.

1.1.1.2.2.10 Struggles

Concessions not operated by Shell Gabon in the Gamba Complex are fairly open to hunting and gathering, which are common subsistence practices.

1.1.1.2.2.11 Replication

Oil extraction complexes require workers with highly technical training, such that oil companies need to import workers from cities or other countries. As a result, they work long shifts and their families are not with them. Even without strict regulations in place, hunting may be minimal. They are also more likely to provide food to their employees to attract skilled workers (M. Bass, pers. observation). This is not the same on logging concessions because not as many skills are necessary for logging employees and people are more likely to bring their families with them to logging camps. Also, companies are less likely to provide food to their employees.

Just as in the regions surrounding CIB concessions, In the Rabi-Toucan region human populations density is relatively small in relation to the area and access to hunting-grounds is limited because there are few roads.

Company regulations that limit access onto the concession are in place to promote safety, prevent accidents, and prevent access to industrial complexes. It is fortunate that they prevent hunters from entering concessions as well. Therefore, without added effort Shell is protecting the wildlife on their concessions from hunters. Logging operations will also benefit from limiting access to their concessions, for example preventing theft of timber and equipment and preventing settlers who convert forest stands to agricultural areas (D. Rumiz, pers. comm.)

1.1.1.3 Cameroon

1.1.1.3.1 Chad Cameroon Pipeline

1.1.1.3.1.1 Overview

The Chad-Cameroon pipeline, a 1,070 km pipeline that will transport oil from fields in Chad to the Atlantic coast of Cameroon, is currently under construction. Most of the costs for this project have been provided by a consortium of companies including; ExxonMobile, Petronas, and ChevronTexaco. The World Bank has also lent funds to the governments of Chad and Cameroon for their holdings in the pipeline. As a result of World Bank participation the project has followed World Bank operating standards, including the requirements for Environmental Impact Assessments, management plans that mitigate environmental impacts, and Induced Access measures to limit human access to cleared areas along the pipeline. Employee hunting is prohibited and vulnerable areas along the pipeline are guarded from poachers. To compensate for habitat losses in ecologically unique areas Environmental Enhancement Programs have led to the protection of two areas in Cameroon, one in Mbam Djerem and one in the Campo Ma'an Reserve. Although there were extensive plans to protect the environment (including wildlife) it is not clear to what degree these efforts have been implemented.

1.1.1.3.1.2 Investors, Donors and Operators

A pipeline is currently being built that will transport oil from Doba, Chad to Cameroon's coast. The total length of the pipeline will be 1, 070 km (WB 1 n.d.). The construction phase began in 2000 and is anticipated to be completed by the end of 2003 (USAID n.d.). Oil field development and pipeline construction is estimated to cost $3.7 billion in total. The pipeline has been sponsored by a consortium of companies including; ExxonMobil (40%), Petronas of Malaysia (35%) and ChevronTexaco (25%) (WB (1) n.d.). Esso Exploration and Production Chad, an affiliate of ExxonMobile, is the consortium's operator of the oil fields. Tchad Oil Transportation Company (TOTCO) and Cameroon Oil Transportation Company (COTCO) will own, operate, maintain and construct the pipeline oil transport system in their respective countries (ESSO (1) n.d.pg.2-6).

1.1.1.3.1.3 Project Funding

Company sponsors have provided 81% of the total funds for this project. The World Bank has lent Chad $92.9 million and $53.4 million to Cameroon for equity investments in COTCO and TOTCO, 3% of the total project. Financing has also come from export credit agencies, commercial banks, The International Finance Corporation (IFC), US and French credit agencies, and The European Investment Bank (EIB) (WB (1) n.d.). It should be noted that Royal Dutch/Shell and Elf Aquitaine withdrew from the project (Rainforest Action Network n.d.).

1.1.1.3.1.4 Environmental Standards

Since the Chad and Cameroonian governments depended on loans from the World Bank, they were required to operate the project based on the Bank's Operational Directives and Operational Policies, Policy Notes and Bank Procedures (ESSO (1) n.d. 4-3). Exxon operating standards, called Operations Integrity Management System (OIMS) similar to those of the International Standards Organization, have also governed the project's design and implementation. These standards address environmental, health and safety issues (ESSO (1) n.d. 4-2).

1.1.1.3.1.5 Stakeholder Responsibilities

Project implementation has mostly been the responsibility of COTCO/TOTCO and their respective governments. The following list outlines some of their responsibilities that are relevant to wildlife protection:

Governments of Chad and Cameroon

- Required to fund an Environmental assessment of the project. However, since the governments of Chad and Cameroon could not adequately perform the assessment the consortium of oil companies financed the work (ESSO (1) n.d. 4-5).

COTCO and the Government of Cameroon, jointly

- Responsible for carrying out and enforcing Induced Access control measures (ESSO (2)n.d. D-14).

COTCO

- Must provide initial funding for the Environmental Enhancement Programs Environmental Management Plans; and
- Provide funds for Environmental Enhancement Program's park protection for the long-term. COTCO contributed $3.5 million to FEDEC, to provide long- term financial support to the park and indigenous communities living there (ECMG (1) 2001).

FEDEC (The Foundation for Development and Environment)

- Assigned the role of supervising conservation activities in M'bam and Djerem and Campo Ma'an National Parks in Cameroon (WB (1) n.d.).

Monitoring consultants

- D'Appolonia, were hired as consultants by the Bank to monitor the implementation of the environmental management plans, to make quarterly assessments (forests.org n.d.);
- A Pipeline steering and monitoring committee (PSMC) was also developed, entrusted to the National Petroleum Company (SNH) to monitor environmental and social issues related to the project (forests.org n.d.); and
- IAG (International Advisory Group) was also hired by the Bank to monitor the project in response to NGO pressure and donor agency pressure, such as the German government (forests.org n.d.) They are to conduct site assessments twice annually (forests.org n.d.).

1.1.1.3.1.6 Project Implementation

This project was deemed a World Bank category A project. "…A proposed project is classified as category A if it is likely to have significant adverse environmental impacts that are sensitive, diverse or unprecedented " (WB 1999). The following measures were taken, or were planned to be taken, to reduce wildlife impacts;

- **Environmental Assessment** One aspect of the Bank's Operational Policy for category A projects includes preparing Environmental Assessment Reports (ESSO (1)n.d.pg 4-5). These reports assess environmental, health and safety issues related to the proposed project. One of these issues is the impact the project will have on biological diversity.
- **Management plans** To comply with Bank policies, a management plan was developed, including mitigation and protection efforts to be carried out by contractors (WB 1999). On the ground contractor environmental action plans are also to be created and approved by project management. Engineers, environmental experts and local people were consulted on project plans. Village meetings, public information campaign meetings, visits to Pygmy settlements, and visits to households were to be carried out. International and local NGO's were also to be consulted on project plans (ESSO (1) n.d.).
- **Government capacity building** A capacity building grant for Cameroon and Chad was proposed to establish "national capacity for managing and monitoring the Chad-Cameroon pipeline". Financial support for this grant has come from the World Bank affiliate, International Development Association (IDA). Construction began however before government capacity was in place (WB 2002).
- **Limit access to pipeline** To comply with the Bank's regulations an Induced Access Management Plan (IAP) was created to discourage settlement, hunting and timber harvesting in areas that were inaccessible previously, or in areas where wildlife was abundant. Three areas required an IAP. In these areas measures were to be taken to limit the number of access roads and temporary roads were to be re-vegetated (ESSO (1) n.d.7-25). IAP control measures are as follows, as stated in the project plan (ESSO (1) n.d. 7-25);
    - Restoration or creation of natural obstructions following construction;
    - Barriers, such as locked gates, are to be left in place following pipeline construction;
    - Removal of temporary access structures such as temporary bridges; and
    - Education and monitoring programs for workers and local residents.

  There is to be monitoring of the implementation of these measures, as well as review of their effectiveness, at periods not exceeding one year during the construction phase (ESSO (2) n.d. D-14). These measures were not to be carried out in previously disturbed regions of the pipeline.
- **Employee Hunting Restrictions** Employees are to be restricted from hunting during working hours, while residing in company housing or on project areas. Possession of hunting equipment is to be strictly forbidden while residing in company housing or along the pipeline, project vehicles are prohibited from transporting bushmeat. Inspection stations are to be established at entrances to construction sites (ESSO (1)n.d.pg. 7-24-25).
- **Food Provisions** Food is to be provided to non-local workers (ESSO (3)n.d.pg 2-1).
- **Environmental Compensation** The Bank's operational Policy requires that if a project will "significantly convert or degrade natural habitats, mitigation efforts will do their best to avoid sensitive areas, restore sites or establish "ecologically similar protected areas" (ESSO (1)n.d. 4-10). This is called an, Off-Site Environmental Enhancement Program.
    - Three areas were determined to be ecologically sensitive and unique areas along the pipeline. To mitigate for impacts to the Atlantic Littoral Forest an off-site Environmental Enhancement Program partially funded the development of new national park, Mbam Djerem. A fund was also established to "revitalize management and protection of the Campo Reserve" in the Atlantic littoral forest. Baseline surveys were planned to help develop management plans. NGOs were invited to help with the protection of the

sites (ESSO (1)n.d. 7-14, 7-15). Traditional rights of the pygmy populations are to be considered in the formal gazettement of the park (WB 2002)

- WWF-Cameroon was chosen to implement the conservation, research, monitoring and education mission within the Campo Ma'an National Park. WWF is to help the Cameroonian government manage the park to protect against poaching. WCS will be implementing a conservation program in M'bam and Djerem National Park to work with communities to protect the park's wildlife (WB (1) n.d.).

- **Project Monitoring** The construction and operation of the pipeline has been monitored throughout the project. Project monitors, contractors and government trained inspectors are required to monitor the project and report anything that does not comply with management plans (ESSO 2002. 19-20). Everyday monitoring is the responsibility of COTCO. Written reports are submitted to project management.

Indigenous people compensation plans are not discussed here, but were developed by project managers.

1.1.1.3.1.7 Benefits and Successes

Whether or not these plans were carried out has not been confirmed. In their June 2002 report the External Compliance monitoring Group (ECMG) D'Appolonia reported that, "the project is placing considerable emphasis on the issue of Induced Access control" (ECMG (2) 2002). D'Appolonia produced three reports in 2001, two in 2002. There was not much mention of violations to Induced Access agreements. There was mention of improvements in isolating camps from third-parties. Also, a temporary bridge was removed to prevent pipeline access (even though the government requested that it be left in place) (ECMG (3) 2002).

In terms of daily monitors of the project's implementation, COTCO has "competent and committed teams in place with whom the experts were very impressed" (forests.org. n.d.)

1.1.1.3.1.8 Struggles

It must be noted that watchdog agencies helped ensure the project's compliance with its proposed objectives. There have been many claims that project operators violated their plans to protect the environment and local community rights.

Korrina Horta, an advocate with Environmental Defense, and colleagues, described the World Bank's attempts to safeguard the environment and local communities as "idle exercises in paper-work". (Horta, K et al. 2002). Horta and colleagues criticize World Bank policies for not ensuring accountability for damages to the population and the environment. Their report outlines a list of risks and failed promises ranging from inadequate consideration of government corruption, to inadequate compensation for indigenous and local people who suffered losses from pipeline construction (resettlement…), the poor public health situation, and not enough mitigation for loss of water supplies, pollution, and the disappearance of forests and wildlife (Horta, K et al. 2002). They claim that there has been increased poaching along the pipeline (Horta, K et al. 2002). They assert that military escorts were present during public consultations which did not allow for real insights into community concerns. Also, they claim that there was not enough NGO consultation (Horta, K et al. 2002).

USAID (USAID n.d.) noted that the World Bank must verify that funds for monitoring and supervision are available before assigning responsibilities. A Canadian group investigating the pipeline project, The Halifax Initiative, reported that the potential indirect effects of this project were also not considered, such as future oil exploration and development as a result of this project (Halifax Initiative n.d.). Another complaint was that the traditional rights of the indigenous communities were not considered in the development of the compensation projects. CIFOR interviewed local indigenous residents within compensation sites and found

that the consultation process was questionable. "The women and children…can no longer catch fish and crabs…nor can their menfolk hunt duiker and other bushmeat in areas of the forest that they consider to be theirs" (CIFOR 2001)

Prior to construction, hunting pressures were great in the region the pipeline passes through, therefore changes in hunting rates post-construction are difficult to assess. WCS staff have been monitoring villages to record the amount of meat they see coming through. Roger Fotso, of WCS's Cameroon Biodiversity Project, reported that although there was a lot of poaching going on in the region before the pipeline project "...it is obvious that the activities along the pipeline have contributed to the development of the local bushmeat market…" (R. Fotso pers. comm.). Fotso reports that there has not been consistent monitoring of bushmeat along the construction road. COTCO/EXXON do have strict internal regulations to prevent bushmeat trade and uses in their working station, however these regulations largely apply to staff in and around work places, they have limited impact on local markets in the area. Fotso reports that the consortium did, however, fund WCS biological surveys to assess the potential impact of the pipeline on gorill populations along the pipeline, a population in the Deng Deng forest reserve south of the Lom river, and in a patch of forest just out side of Naga Eboko. The project is also sponsoring an environmental education program focusing on hunting and bushmeat in some areas along the pipeline route (R. Fotso, pers. comm.).

Although the list of complaints with this project exceed those for other projects we have reviewed, it may only be a reflection of the level of scrutiny Bank projects receive. It is not necessarily a reflection of this projects successes as compared to other models we have discussed.

1.1.1.3.1.9 Replication

In Latin America, World Bank environmental and indigenous community safeguarding standards are considered some of the best and are used as standards to guide project development (A. Telesca, pers. comm.). NGO's have contributed greatly to the development of these World Bank policies. If carried out fully, projects using World Bank guidelines should be effective at limiting negative outcomes for wildlife. Much time, technical expertise, oversight and funding is required for these measures.

1.1.1.3.2 HFC and Campo Ma'an

1.1.1.3.2.1 Overview

As a result of the Global Environment Facility's (GEF) conservation and biodiversity management program, World Bank guidelines and a partnership with WWF, the logging company *La Forestiere de Campo* (HFC) has committed to protecting the wildlife living on its concessions. HFC concessions are located in the Campo Ma'an Reserve, in coastal Cameroon. Management plans have been developed with the help of MINEF to protect wildlife from hunters and to implement sustainable forestry on HFC concessions. HFC is one of a few logging concessions in Cameroon that has employed eco-guards to enforce anti-poaching regulations (P. Auzel, pers. comm.). We were not able to confirm whether or not HFC and MINEF anti-poaching measures have reduced the level of hunting in HFC's concessions.

1.1.1.3.2.2 Company Statistics

HFC, *La Forestiere de Campo,* is a subsidiary of the French Bollore group, which also owns Societe Industrielle des Bois Africains (SIBAF) in the eastern province of Cameroon (forests.org n.d.). The Bollore group is a French, publicly traded company. Bollore owns

many small companies including those that specialize in freight, timber, agro-industry, and cigarette manufacturing and marketing (Forests Monitor 2001). HFC has two concessions on two sides of the Campo Ma'an reserve in coastal Cameroon, totaling 162, 790 hectares (Forests Monitor 2001). HFC's UFA 024 (76, 002 hectares) is located within the reserve (Forests Monitor 2001). Forests Monitor reports that for, "decades HFC has been the only concessionaire of consequence around Campo" (Forests Monitor 2001).

1.1.1.3.2.3 Project History and Funding

Although the Campo reserve has been protected since 1932 it was not being managed effectively for biodiversity conservation and logging, hunting, and mining operations had compromised the area (WB 2000). The conservation and biodiversity management program of the Global Environment Facility (GEF) began funding a Campo Ma'an Project in the mid-1990's. Funding was to be used for managing the area's natural resources to promote sustainable economic development while considering biodiversity conservation and community rights. The area covered by the Camp Ma'an project is 771, 000 hectares (WB (1) n.d., Foahom, B 2001). A national park for conservation and tourism was established, as was a forest management unit for sustainable timber extraction. Biodiversity conservation and agro-forestry areas were also created. The forestry unit comprises 235,485 hectares of previously degraded forest. This forestry unit is 31% of the Campo Ma'an Reserve area, as compared to the National Park's 260,830 hectares, 33.5% of the area (Foahom 2001) HFC was granted rights to log in this region, but was required to conduct wildlife management and sustainable forestry on their concession to be granted logging permission within the Campo Ma'an Reserve (P. Auzel, pers. comm.). A Camp Ma'an management group convened (including MINEF, COTCO representatives and three senior scientists) to discuss bushmeat related issues for the Campo Ma'an reserve in early 2001 (ECMG (1) 2001, ECMG (2) 2002)

In the interim, The World Bank dictated that the Chad-Cameroon Environmental Enhancement contribute funds for the protection of the Campo Ma'an Reserve. COTCO's financial contribution to the park is to be used for biodiversity and habitat protection (ESSO (4)n.d.pg 3-4) specifically endangered species protection, which was not sufficiently funded by GEF funds. The progress of Campo Ma'an protection efforts have been monitored by Chad-Cameroon pipeline project monitors. World Bank pressure should be in place as long as pipeline is operating (P. Auzel, pers. comm.).

By October 23, 2001 WWF Cameroon signed an agreement with HFC and Societe Industrielle des Bois Africans (SIBAF) to develop management plans for sustainable forest management, " with special focus on the environmental and social [issues]". This is a result of the Sustainable Forest Management/Certification Project, started by WWF-Belgium and funded by the European Union (WWF Cameroon 2002). We have not been able to confirm the progress of this partnership.

1.1.1.3.2.4 Stakeholder Responsibilities

The following organizations and government agencies are responsible for the implementation of responsible forestry and wildlife management in HFC's concessions (ECMG (1-5), WWF Cameroon 2002).

MINEF (Cameroonian Ministry of the Environment)

- Responsible for managing poaching and logging within the Campo Ma'an park (including HFC concessions). This includes providing staff, supplies and equipment (ECMG (4) 2001); and
- Responsible for creating a development plan for Campo Ma'an *Unite Technique Operationnelle* (UTO), including the national park, and several UFAs (ECMG (2) 2002).

HFC

- Operate in an environmentally sustainable manner with the aid of international conservation organizations;
- Recruit and post guards at gate entrances alongside MINEF guards to prohibit bushmeat transport (ECMG (2) 2002); and
- Endorse external monitoring and environmental impact assessments of their operations.

The World Bank

- Fund community consultations to include surrounding community's input into poaching control plans.

WWF

- Help HFC develop practices that could lead to FSC certification; draw up a wildlife management plan, advise on technical matters, develop socieconomic features of a management plan including alternative protein sources and community gardening (WWF Cameroon 2002).

1.1.1.3.2.5 Project Implementation

The following measures taken within Campo-Ma'an and HFC concessions have been dictated by WWF-HFC agreements, World Bank and GEF policies, and subsequently a Campo Ma'an development plan, created by MINEF.

- **Environmental Impact assessment** was carried out to ensure HFC operations would not impact protected areas, as dictated by World Bank guidelines. TECSULT conducted an EIA of the HFC concession, considering HFC equipment passage through the park between concessions (P. Auzel, pers. comm., ECMG (4) 2001).
- **Community consultations** were held to incorporate input from the surrounding community into anti-poaching plans. (ECMG (3) 2002). It is not clear to what degree these have been implemented.
- **Partnership** A partnership was established between HFC and WWF to develop standards for certification, following FSC, in October, 2001 (WWF Cameroon 2002).
- **Company regulations** Either formal or informal regulations prohibit hunting and transport of bushmeat on HFC's concessions.
- **Guards** Ten guards were recruited by HFC by May 2002. Their salaries are paid for by the company (P. Auzel, pers. comm.). Guards are posted at gate entrances alongside MINEF guards. They have equipment, including motorcycles and a 4WD car (ECMG (2) 2002).
- **External monitors** of HFC sustainable forestry practices are not in place as of yet, but external monitoring is expected on a permanent basis. Several groups have applied to do the monitoring on the concession under World Bank auspices, but there have been no results as of yet (P. Auzel, pers. comm.). Monitors of the pipeline project have been reporting on HFC's compliance with World Bank objectives.

1.1.1.3.2.6 Benefits and Successes

We were not able to interview HFC officials to determine whether or not the above mentioned measures have been successful for protecting wildlife on HFC concessions. It is important to note however that the World Bank and GEF have been important in the development of wildlife protection standards on HFC's concessions. HFC officially acknowledged its commitment to implementing sustainable forestry measures, including wildlife protection.

Both HFC and MINEF have dedicated guards to enforcing anti-poaching regulations and have developed management plans, as they agreed to.

1.1.1.3.2.7 Struggles

HFC's agreements to protect the environment are complicated by the fact that their concessions are located on two sides of the Campo Ma'an Reserve and therefore equipment needs to pass through protected areas (P. Auzel, pers. comm.). The environmental impact assessment by Tescult was not deemed sufficient by Bank standards (P. Auzel, pers. comm.). The Bank recommended improvements, including more stringent poaching measures (ECMG (4) 2001). A revised EIA was submitted by August 2001 (ECMG (3) 2002).

Guards were eventually hired by HFC and MINEF provided equipment and staff by early 2002, but this came with a delay after recurrent recommendations from pipleline monitors (ECMG (1-5)).

Indigenous communities have complained that they were not consulted in the development of wildlife protection measures in Campo Ma'an (Owono, J. 2001). It was reported that there have been clashes with wildlife guards that have restricted subsistence hunting in the region. Therefore, community consultation, as required by MINEF and the World Bank may not have taken place. This does however indicate that wildlife guards have enforced anti-poaching regulations in the Campo Ma'an region.

1.1.1.3.2.8 Replication

Wildlife protection measures that have been taken on HFC concessions are the result of World Bank requirements, a WWF partnership and GEF funding. It may not be possible to attain this degree of funding and World Bank involvement on other concessions. Nevertheless, similar efforts, such as developing environmental impact assessments and management plans, hiring guards, community consultations, and external monitoring may be possible without as much guidance.

1.1.1.3.2.9 Comments from Director General of SIBAF/HFC

The Director General of SIBAF/HFC, Nicolas Jamet, described his company as a "pacesetter" in Cameroonian sustainable forest management. In a press release from WWF he admitted that "… it will not be easy working things out in the field..but we are determined to succeed", in response to the preliminary partnership agreement with WWF (WWF Cameroon n.d.).

1.1.1.3.2.10 Additional comments

WWF also signed a sustainable forestry agreement with SIBAF, operating in southeastern Cameroon. This project has reportedly been successful in terms of its anti-poaching controls. SIBAF has been providing materials and financial assistance for anti-poaching measures on their concessions. They are constructing a freezer to sell bushmeat alternatives on their concessions, including beef. They have also constructed a control post on a road heading to Congo-Brazzaville from a forest area surrounding the Lobeke National Park (L. Usongo, pers. comm.).

1.1.1.3.3 R. Pallisco

1.1.1.3.3.1 Overview

R. Pallisco, a French logging operation in Southeastern Cameroon, has developed internal regulations to reduce hunting and consumption of bushmeat on its concessions. Possibly in response to publicized reports of hunting on their concessions, or to increase their access to markets, they have become regarded as a logging company that is committed to wildlife

protection. Their approach to wildlife protection has been simple and inexpensive. Company employees are responsible for enforcing regulations that prohibit wildlife hunting and bushmeat transport. Environmental awareness meetings have been held with local community members and protein alternatives have been promoted in regions within the concession.

1.1.1.3.3.2 Regional Issues

The Dja Reserve, adjacent to R. Pallisco concessions, is Cameroon's largest nature reserve. It was listed as a World Heritage Site in 1987 to acknowledge and protect its populations of mammals including chimpanzees, gorillas, elephants and buffalos. Significant problems with bushmeat hunting have been reported in the region (P. Auzel, pers. comm.). Most logging companies around the Dja Reserve do not take precautions to protect their wildlife. This has made it difficult to prohibit illegal hunting on Pallisco concessions (P. Auzel, pers. comm.).

1.1.1.3.3.3 Company Background

R. Pallisco is a logging subsidiary of Pasquet, a French building material manufacturer (Forest Monitor 2001). Their concessions are in the Southeastern region of Cameroon north and adjacent to the Dja Reserve (Forests Monitor 2001, Auzel & Hardin 2001,WSPA n.d.) Pallisco has been operating in the region for over 30 years (FORM 2000). In total they operate on nearly 300,000 ha of forest-land (P. Auzel, Pers.comm.). Pallisco currently has two UFA's of 79,757 and 64,961 hectares. They also work with two partners Assene Nkou and SODETRANCAM. Pallisco has two sawmills, one in Mindourou (the newest town) the other in Eboumetoum (the oldest town), where most logging operations are centered (FORM 2000). In 2000, a total of 385 workers were employed with the company (FORM 2000). The majority of Pallisco's timber is exported from Cameroon to Europe (FORM Ecology).

In their company guidelines Pallisco has proposed to make improvements to forest management and to develop conservation awareness in the local population (FORM 2000). In the past they have received negative press related to poaching and hunting on their concessions (P. Auzel, pers. comm.). It has been suggested that markets may be less accessible for companies that are not operating to protect the environment, which may have been an incentive that led Pallisco to take wildlife protection measures on their concessions (P. Auzel, pers. comm., Forests Monitor 2001).

1.1.1.3.3.4 Partnerships

Pallisco has collaborated with researchers and consultants to develop environmentally sound management plans (FORM 2000). An NGO called Nature+ (P. Auzel/W. Delvingt, FUSAGx, University of Gembloux, Belgium) is helping R. Pallisco develop their management plans. Partnerships with ECOFAC and University of Gembloux have concentrated on importing meat to villages/camps and supporting neighboring community forest areas (FORM 2000). Pallisco has also collaborated with the FORM Ecology consulting group (FORM 2000). The extent and progress of these collaborations has not been confirmed.

Philippe Auzel from the Jane Goodall Institute and the University of Gembloux, has worked with the Pallisco management to find substitutes for bushmeat consumption on their concessions and to improve their regulations to prohibit hunting.

1.1.1.3.3.5 Funding/Responsibilities

Most wildlife protection efforts on Pallisco's concessions are company funded (P. Auzel, pers. comm.). Pallisco also contributed funds to the development of a chicken-rearing program. We were not able to interview personnel from Pallisco to determine the degree to which Pallisco's partners are contributing funds to wildlife management and community

development efforts. It is not clear how much management control Pallisco has in concessions they operate with Assene Nkou and SODETRANCAM.

1.1.1.3.3.6 Project Implementation

The following measures have been carried out on Pallisco concessions to reduce hunting and consumption of bushmeat:

- **Guards** There are no official wildlife guards on Pallisco concessions. Employees enforce company regulations to prohibit hunting and bushmeat transport on concessions (P. Auzel, pers. comm.).
- **Company regulations** prohibit transport of hunters, arms, ammunition and meat of protected species. Employees are fired for transporting bushmeat (P. Auzel, pers. comm.).
- **Protein alternatives** A chicken farm was established in Mindourou in 2000 (P. Auzel, pers.comm.). Frozen meats such as fish, chicken and turkey are sold as private initiatives in Ebomatowma (P. Auzel, pers. comm.). Pallisco intended to create pig and goat farms as well, however the degree to which this has been implemented has not been confirmed (FORM 2000). The company does not pay for its employees food.
- **Conservation awareness** meetings were held with employees, local villages, and local authorities to develop a conservation ethic in the local community (FORM 2000).

1.1.1.3.3.7 Benefits and successes

Philippe Auzel reported that Pallisco has strictly enforced their policies on hunting. For example, an employee was recently fired for carrying small pieces of bushmeat. Philippe Auzel described Pallisco as one of the only companies in Cameroon that is trying to manage their concession well (P. Auzel, pers. comm.). The degree to which hunting has diminished as a result of these efforts is not clear, however the company has demonstrated a commitment to protecting wildlife on its concession.

Depleted wildlife populations near Pallisco camps have increased the demand for alternative sources of protein. Although frozen meats are more expensive than bushmeat, they are more accessible (P. Auzel, pers.comm.).

1.1.1.3.3.8 Struggles

Although Pallisco has made more significant attempts to protect wildlife on their concessions than other logging concessions in its periphery it has been reported that Pallisco concessions are a “point of origin” for bushmeat hunts (Hardin & Auzel 2001). In 1999 the World Society for the Protection of Animals interviewed hunters and found that Pallisco employees were renting weapons and were purchasing bushmeat (WSPA n.d.). Considering the diets of workers from logging camps, wildlife consumption was 20.6% of their diet before 1999 (Hardin & Auzel, 2001).

The chicken farm was established in 2000, after these reports were made. The chicken farm has not been completely effective at replacing bushmeat consumption on Pallisco concessions. Studies show that Mindourou residents still eat bushmeat. It is not clear if this is because not enough chicken is provided to them, it may not be available to everyone in logging camps or it may be that preferences are driving this trend.

The companies in Pallisco's vicinity that do not prohibit bushmeat hunting are a problem since hunters may travel between logging concessions. It is therefore important to consider working with several concessions in a region as is done at Minkebe, and possibly soon CIB. This in effect would protect a larger region, so as not to allow hunters to move between concessions.

1.1.1.3.3.9 Replication

Philippe Auzel commented that the efforts Pallisco has taken to reduce hunting on their concessions have not come at a great expense to the company. Their efforts, including strict regulations and enforcement of hunting, promotion of bushmeat substitutes and conservation awareness meetings are not as elaborate as other models we have highlighted but may present a first step for companies interested in minimizing their impacts on wildlife. Auzel suggested that for Pallisco's efforts to be more effective at hunting more guards would need to enforce regulations and the company would need to provide more frozen food to employees (P. Auzel, pers. comm.).

1.1.1.4 Democratic Republic of Congo

1.1.1.4.1 Coltan

We have highlighted this model to illustrate the influence the far end of the supply chain can have on reducing mining impacts on wildlife.

1.1.1.4.1.1 Background

Coltan, short for columbo-tantalite, is a mineral ore that is used in electrical capacitors. The market for this mineral has increased dramatically in recent years to meet demands for mobile phones and portable computers (Hayes, K n.d.). Coltan is found in many countries throughout the world but when demands escalated in the late 1990's, miners in the Democratic Republic of Congo and Rwanda increasingly entered national parks to harvest coltan (Hayes, K. n.d.). The effects were devastating for wildlife in the Kahuzi-Biega National Park and the Okapi Wildlife reserve in eastern DRC because miners have relied on bushmeat for subsistence. This has led to considerable losses in elephant and gorilla populations in the region (Hayes, K. n.d., Sheppard & Peard, 2001).

In DRC there are very few fixed coltan mining concessions with secure tenure. Individuals generally mine Coltan with shovels along rivers (K. Hayes, pers. comm.). This is somewhat unique to DRC (K. Hayes, pers. comm.). Since miners move often, it is difficult to find a strategy to work with miners to prevent environmental threats (K. Hayes, pers. comm.).

In light of coltan's economic value, rebel groups have fought over coltan rich regions, often leading to civil rights violations (Africa Faith and Justice Network 2001). This issue is of such international importance that it is being debated by Security Council and many political circles (K. Hayes, pers. comm.).

Action committees in Europe have led effective advocacy campaigns to stop companies from purchasing coltan from areas where the bushmeat trade has escalated (K. Hayes, pers. comm.). Many companies have claimed that they are not purchasing coltan from war-torn countries. However markets are such that when demand is high, spot markets develop where there is no chain of custody and no way to confirm coltan's origin (K. Hayes, pers. comm.).

1.1.1.4.1.2 Project Implementation

Karen Hayes of Flora and Fauna is working with the Global Compact Group, the corporate wing of the UN, to develop markets for ethically sourced coltan as an investment for peace in DRC. The goal of the project is to get support from large western companies that use coltan, such as Microsoft, Hewlett Packard and Nokia, to buy the mineral from environmentally and socially responisible operations in DRC. The scale and nature of production in these areas will be monitored, and coltan's origin will be tagged. By transparent price-matching, the best legal prices from legitimate dealers will be available to companies (K. Hayes, pers. comm.).

These measures may be followed by agricultural development programs, health benefits, and education initiatives. As part of this peace initiative, mechanisms will be put in place for UN officials to monitor war-civilian regimes and the progress of the initiative (K. Hayes, pers. comm.). Hunting regulations will be enforced in mining areas (K. Hayes, pers. comm).

1.1.1.4.1.3 Benefits and Successes

The above mentioned initiatives will create ethical mining markets that can support communities, create stability and reduce miners' dependence on bushmeat (K. Hayes, pers. comm.). The current political situation in DRC is based on economics. Therefore, "any peace will be short lived unless there are economic incentives" (K. Hayes, pers. comm.). Political stability will allow guards to resume control of parks, and protect wildlife.

The telecom industry, including Vodafone, ATT and Bell Canada, has been very supportive of these efforts and has been contributing funds for this initiative (K. Hayes, pers. comm.). They have agreed to unite their efforts to pressure their suppliers. Karen Hayes reported that coltan processors are also showing support and are putting pressure on producers (pers. comm.). Aerospace and medical industries will be targeted to join these efforts as well. Officials are therefore optimistic that there will be adequate financial incentive to implement these plans (K. Hayes, pers. comm.).

1.1.1.4.1.4 Replication

There are obviously differences between the coltan industry and the logging industry in that coltan mining areas are transient and do not have defined boundaries. However there are aspects of this model that lend lessons for the timber industry.

It is interesting to note that the collective influence of the telecom, aerospace, medical and coltan processing industry have been enlisted to implement the abovementioned initiative. Consumers generalize issues, and therefore positive measures taken by one company may not be sufficient to encourage consumer support. It may be important to consider this in terms of logging. Collective logging industry efforts to improve environmental standards may be a powerful way to attract consumers attention.

Losses of charasmatic megafauna in DRC as a result of coltan mining, and the resulting negative press and consumer pressure, have been major driving forces behind these initiatives. PR and consumer attention have been important incentives for improving logging operations, as they are for coltan mining. It is important to consider the impact the far end of the supply chain can have on industry practices. Efforts to track wood from environmentally responsible operations, such as the Forest Stewardship Council's chain of custody, can help promote the sale of wood from environmentally sound logging operations, similar to what is planned for the coltan industry.

The issues surrounding coltan mining are political, economic and social. The political strife in DRC has peaked the international community's involvement and the support of influential organizations such as the UN. This is not nessessarily the case for logging, however

international NGO support has been and should continue to be important in improving logging operations in Central Africa.

1.1.1.4.1.5 Perspectives

"Bushmeat in DRC is part of peace….without peace we can not re-establish the national parks, and without parks [there will be] no bushmeat species" (K. Hayes, pers. comm.).

1.1.2 South American Projects

1.1.2.1 Bolivia

1.1.2.1.1 Bolivia-Brazil Pipeline

1.1.2.1.1.1 Overview

The Bolivia-Brazil pipeline has been noted as a large development project that held to high environmental and social standards. There have been multiple stakeholders, including the World Bank, and international oil companies as well as indigenous groups living in areas along the pipeline. World Bank environmental standards were adopted for this project. Employees were paid well, food was available to them, and hunting and weapons possession was prohibited for employees. The pipeline project is discussed here as it relates to wildlife protection.

1.1.2.1.1.2 Background of Project

The Bolivia-Brazil pipeline now extends over 3000 km from Santa Cruz in eastern Bolivia to Porto-Allegre, Brazil (Hamerschlag 1999). The pipeline is owned by a consortium of companies. In Brazil the owner of the pipeline is TGB (Transportadora Brasileira Gasoduto) whose investors include Petrobras, Transredes, Enron, Shell and BTB. The Bolivian portion of the pipeline is owned by Gas Transboliviano a consortium made up of Transredes, Enron, Shell and Petrobras (Hamerschlag 1999).

The pipeline passes through three unique and rare ecosystems including the Gran Chaco (dry tropical forest), the Pantanal (the largest wetland in the world), and the Mata Atlantica Rainforest in Brazil. The pipeline also passes through indigenous communities in the Gran Chaco National Park and the integrated management area of the Park Kaa-iya. Gran Chaco National Park is an initiative by a Native American organization, co-administered by the government of Bolivia and by Capitania del Alto y Bajo Izozog (CABI), representing Izozeno Guarani indigenous groups. CABI is responsible for co-managing the Integrated Management Area of the Park, Kaa-iya, Gran Chaco National Park. WCS provides technical assistance to CABI.

Due to the value of the natural areas and the native people living within them, the project was given much attention by the international community (Environmental Media Services. n.d.). Michael Painter, Regional Coordinator for the WCS Bolivia, Paraguay and Peru Program, provided on-the-ground insights on the impacts and successes of the pipeline project.

1.1.2.1.1.3 Project Funding

The Bolivia-Brazil pipeline project was financed by the World Bank, The Andean Development Corporation (CAF), and the Inter-American Development Bank (IADB), as well as by private sector investors (EIR n.d.) The cost of the project was $1.8 billion. The World Bank's contribution to this was a $310 million dollar loan to Petrobras, a state owned

Brazilian company and a chief operator of the pipeline. Petrobras also received a $240 million loan from IADB (Hamerschlag 1999).

1.1.2.1.1.4 Environmental Standards

To qualify for World Bank loans, an environmental assessment is normally conducted to assess the potential environmental impact of the proposed project. Although there were three lending agencies the World Bank's standards for environmental protection were adopted for the project.

1.1.2.1.1.5 Stakeholder's and Co-administrators Responsibilities

Petrobras

- Responsible for construction of the pipeline and enforcing regulations that prohibit hunting by employees who were involved in the pipeline construction (M. Painter, pers. comm.).

Capitania de Alto y Bajo Izozog (CABI), SERNAP and WCS

- "As co-administrator (with Bolivia's National Park Service, or SERNAP), of the Kaa-Iya del Gran Chaco National Park, the indigenous organization, the Capitania de Alto y Bajo Izozog (CABI) was responsible for supervising the construction of the pipeline inside the park and ensuring that the work was done in accordance with the project's Environmental Management Plan. WCS provided technical support to CABI in this endeavor. Later, WCS also provided technical support to the Executive Committee of the Indigenous People's Development Plan (IPDP) as it oversaw the design and implementation of the program. The pipeline project paid salaries of park guards who were involved in monitoring construction activities inside the park" (M. Painter, pers. comm.).

Local populations and indigenous groups

- Two programs addressed the socioeconomic impacts of the pipeline project: one for indigenous people (the IPDP) mentioned above, the other for non-indigenous people, which centered on municipalities. In the case of the IPDP, indigenous organizations along with the pipeline sponsors were responsible for overseeing the planning and implementation of the IPDP through their participation on the IPDP Executive Committee (3 company reps. + 3 reps of indigenous orgs. + 1 independent member) and its Funding Committee (1 company rep. + 1 indigenous org. rep. + 1 independent member). Indigenous representation was led by CABI, the local group with the most area affected by pipeline, and by CIDOB, the national indigenous organization, who represented other organizations affected by the pipeline." (M. Painter, pers. comm.).

External monitors

- Compliance with management plans was monitored by a firm contracted by the pipeline sponsors, a World Bank funded independent auditor (World Bank Group: Extractive Industries Review: The Bolivia-Brazil Gas Pipeline Project (EIR n.d.) and Bolivian government monitors from the Ministry of Energy and Hydrocarbons and the Vice Ministry of the Environment and Natural Resources SERNAP and CABI had monitoring responsibilities in the Kaa-Iya Park. (M. Painter, pers. comm.).

1.1.2.1.1.6 Project Implementation

The Bolivia-Brazil pipeline was deemed a category A project, since it was anticipated to have significant environmental impacts.

- **Environmental Impact Assessments (EIA)** are required for World Bank Category A projects. An EIA is conducted to assess a projects negative and positive impacts, compare them to conditions pre-existing conditions, and recommend options to "prevent, minimize, mitigate or compensate for adverse impacts" (WB n.d., EIR, n.d.). Due to the scale of the project and the public concern, efforts extended beyond normal assessments. As stated by the Extractive Industries Review of the World Bank Group (n.d) the following measures were taken in the environmental assessment to protect the natural areas along the pipeline:
    - Examination and suggestions for alternatives;
    - Environmental Management Plans;
    - Environmental Construction Plans;
    - Consultations on local and national levels;
    - Assessment of upstream and downstream impacts stemming from increased gas exploration and exploitation in Bolivia and gas utilization in Brazil.
- **EIA in ecologically sensitive areas** Additional action beyond the EIA was warranted in the Gran Chaco, Pantanal, and the Atlantic forests in Brazil. Agreements were signed between indigenous organizations in charge of managing protected areas and pipeline sponsors (M. Painter, pers. comm.).
- **Hunting and weapons regulations** Hunting and firearms have been prohibited by employees and along the pipeline (M. Painter, pers. comm.).
- **Employee access to food** Workers were paid adequately, and had access to food. Therefore, they were not reliant on hunting for subsistence (M. Painter, pers. comm.).
- **Guards in protected areas** Within the Gran Chaco National Park pipeline workers were accompanied by park guards while working.
- **Project Monitoring** Compliance with management plans was monitored on areas along the pipeline during construction.

Indigenous Peoples Development Plans and Socio-economic compensation plans for non-indigenous communities were also developed but not discussed here. For information please consult: (Hamerschlag 1999)

1.1.2.1.1.7 Benefits and Successes

This project has been given the Corporate Award from the International Association for Impact Assessment (IAIA) as a model for social and environmental accountability (EIR n.d.).

In general, Michael Painter (pers. comm.) reported that working with the construction companies was a positive experience. Although there were points of disagreement, agreements were generally honored and hunting was controlled. "The companies produced, disseminated and enforced a code of conduct fairly well, that covered hunting as well as other issues" (Michael Painter, pers. comm.). In general wildlife populations within the park are healthy. "There have been some lapses in control that has allowed sport hunters into the park along the Bolivia-Brazil pipeline right of way…Hunting is not a large problem in the specific context of the Bolivia-Brazil pipeline" (M. Painter, pers. comm.). Within the Gran Chaco on the whole, most hunting has been subsistence hunting however, there is significant threat posed to some species by illegal sport hunting, the most dramatic example being the Chacoan guanaco (M. Painter, pers. comm.).

Michael Painter of WCS-Bolivia reported (pers. comm.) that there were a few violations of regulations that prohibited hunting and firearm possession along the pipeline. Companies

were responsive to complaints about violations of the code of conduct (M. Painter, pers. comm.).

1.1.2.1.1.8 Struggles

"A restoration/revegetation program was implemented, which focused on replanting native species. However, the area has not been restored to its original state, primarily because the right-of-way continues to be used in connection with the construction of compression stations inside the Kaa-Iya-Park, one near the Bañados de Izozog wetlands and another on the eastern edge of the park. The pipeline owners will maintain a portion of the right of way as a road to permit them to do maintenance, and there are plans for the construction of a second pipeline in the right-of-way via the addition of a series of loops. So, while the program was implemented, the right-of-way is unlikely to return to its original state. Some culverts have been put in (M. Painter, pers. comm.).

The criticisms with the project are that although the Bank's project teams were receptive to local and NGO concerns, significant public pressure and monitoring were needed to ensure the policies of the bank were carried out. The Bank Information Center reports that, "Public pressure directed towards the bank and sponsors led to improvements in the projects monitoring system, stronger bank oversight and better communication between stakeholders and project sponsors" (Hamerschlag 1999).

The Bank Information Center found the following problems with the Bolivia-Brazil project implementation in regard to wildlife and environmental protection (Hamerschlag 1999):

- *Failure of the auditor to act independently and impartially and respond effectively to NGOs;*
- *Lack of commitment of project sponsors to implementation of the EMPs…;*
- *Opening of multiple construction fronts in Bolivia and the subsequent failure…to hire sufficient number of inspectors; …*
- *Failure to include NGOs and local communities in the monitoring program;*
- *Failure of the Bolivian government to adequately supervise and monitor the project; and*
- *Failure of the system to address broader impacts that may not have been explicitly included in the Environmental Management Plan.*

1.1.2.1.1.9 Replication

This project is relatively unique in that it spanned two countries and that it had multiple owners and supervisors. World Bank guidelines were important for the protection of wildlife along the pipeline. The pipeline passes through rare ecosystems (EIR n.d) and because of the potential threats to natural areas and indigeneous communities this project received a high degree of attention, which promoted adherance to management plans. The ability of project guards to control hunting may largely be due to the fact that hunting was not a significant problem, at least in the Gran Chaco National Park, before the pipeline was developed. These features may not be present on logging concessions in Central Africa, however, the need for environmental impact assesments, regulations on employee hunting, access to food and the need for project monitoring are reflected in this project's design.

1.1.2.1.1.10 Perspectives

The Bank Information Center, a World Bank watch-dog organization reported that," …the pipeline does represent a positive model in Bank responsiveness and commitment to addressing myriad social and environmental impacts. It is important to keep in mind, however that many project improvements came about in response to on-going pressure by groups at the local, national and international levels, rather than by virtue of a proactive approach on the part of the Banks" (BIC (1) 1999).

1.1.3 Central American Projects

1.1.3.1 Panama

1.1.3.1.1 Ecoforest

1.1.3.1.1.1 Overview

Ecoforest is a young forestry operation in Panama. Their name demonstrates their commitment to sustainable development through environmentally and socially responsible operations. They have set aside a portion of their concession as a conservation area, and actively patrol their property to discourage poaching. Ecoforest has worked with Smithsonian Tropical Research Institute (STRI) and local authorities to ensure protection of wildlife on their concession.

1.1.3.1.1.2 Company Statistics

Ecoforest Panama, an FSC certified operation, is the largest tropical teak plantation in Panama, located on the west shore of the Panama Canal. Ecoforest's concession comprises approximately 7,090 hectares and abuts Smithsonian Tropical Research Institute (STRI) protected areas. Their concession lease extends for forty years with the option of renewal (Ecos 2001). Logging takes place on a plantation portion of the concession. This region was previously degraded and composed of invasive species. In 1991, 291 permanent employees and 300 seasonal employees were employed with the company (Ecos 2001).

Ecoforest is one of a consortium of companies of whom the Ecos Group is a major investor. Ecos controls the management of Ecoforest Panama, and sister concession in Guatemala (Ecos 2001). There are five companies that Ecos is a major investor in and key player in management decisions. The Ecos Group was founded in 1991 to, "identify and invest in sustainable businesses in Latin America". They maintain environmentally sound practices because one of their main investors feels that there is a "moral imperative" to do so. Richard Delvalle is the General Manager of Ecoforest.

1.1.3.1.1.3 Partnerships

Ecoforest has developed partnerships with major research organizations including STRI. STRI scientists serve as independent assessors of the sustainability of Ecoforest's operations. They also help patrol Ecoforest's concessions for poachers. Local authorities also help enforce the company's regulations to prevent hunting (Richard Delvalle, pers.comm.).

1.1.3.1.1.4 Project Implementation

The following measures have been taken on the Ecoforest Panama concession to prevent illegal hunting:

- **Guards** Ecoforest guards (guardarrecursos) protect the area from illegal activities such as illegal logging and hunting (Ted Gullison, pers.comm.). Guardarrecursos have radio communication and report illegal activities to local authorities and Conservation Mangers (Richard Delvalle, pers.comm.). Many of guardarrecursos were previously hunters. They have to submit daily written reports on their duties, abnormal situations, animal footptints, etc. (Richard Delvalle, pers.comm.). Ecoforest and STRI coordinate guard patrols and monitor eachother's land (Ted Gullison, pers.comm.). Guardarrecursos are escorted by police officers at times because they do not have the authority to transport guns (Ted Gullison, pers.comm.). STRI guards also carry guns (Ted Gullison, pers.comm.).
- **Signs** Signs have been posted throughout the concession to prohibit hunting. Often hunters will shoot at these signs, prodiving evidence of their presence in the area (R. Delvalle, pers.comm.).
- **Education** Educational programs that cover local conservation issues and anti-poaching company regulations have been led by Ecoforest, with the help of NGO's and local authorities (Richard Delvalle, pers.comm.). These programs are geared towards employees and local students.
- **Reforestation and conservation areas** Ecoforest planted native species in a portion its concession's degraded area. They have also retained half of their concession as a conservation area. This region was relatively intact, mature secondary native growth forest when Ecoforest was given rights to the concession (Ecos 2001)

1.1.3.1.1.5 Benefits and Successes

Ecoforest Panama successfully completed its initial FSC audit and verification. This entails field assessment to verify that a company is meeting FSC criteria, principles and indicators for environmentally and socially sound forestry (Ecos 2001).

Ecoforest has developed a mutually beneficial relationship with STRI. Guardarrecursos help protect buffer regions around STRI protected areas from hunters, as STRI guards help protect Ecoforest concessions.

1.1.3.1.1.6 Struggles

Several of Ecoforest's wildlife guards were previously hunters, and therefore their activities need to be monitored closely. It is not clear if there have been any incidents of guards that violated company regulations prohibiting hunting on the concession.

1.1.3.1.1.7 Replication

It is the commitment of Ecoforest, and its parent company, Ecos, to environmentally sound practices that has driven the company to be environmentally responsible. They fund wildlife patrols and have set aside half of their concession for conservation. Without this level of commitment this approach may not be possible.

1.1.3.1.1.8 Ecoforest's Mission

Ecos's stated vision is, "to be recognized as a leading industrial group in Latin America, operating in a framework of ethics, eco-efficiency, and social responsibility, that generates economic value and improves our neighbor's and our regions quality of life" (Ecos 2001).

1.1.4 Conservation Concessions

The conservation concession is a new conservation approach that has been pioneered by the Center for Applied Biodiversity Science of Conservation International (CI) and Hardner and Gullison Associates (Rice 2001). With conservation concessions, conservationists

compensate governments and local resource users for not using their natural resources (Rice 2001). Therefore, there are equal economic incentives for conservation as there would be for natural resource extraction. These concessions have been modeled as logging concessions in that the governments are paid for the use, or non-use of its land. Conservationists therefore bid on land as a logging company would for a concession. Agreements are created that specify the amount of payment, the duration of tenure and guidelines for ensuring environmental protection (Rice 2001). The price of the concession should represent opportunity costs such as fewer jobs or tax revenue losses (Rice 2001). Payments are to benefit individuals who may depend on development for subsistence (Rice 2001). The allure of the conservation concession for governments is that payments for conservation concessions do not fluctuate with the market, they are constant and reliable (Rice 2001). Rice of CI asserts that when long-term protection is crucial or when payments are not secure the conservation concession may not be appropriate. CI is currently pursuing this approach in several ecologically valuable regions globally, including logging concessions near the Dja Reserve in Cameroon.

1.2 MODELS OF FUNDING OPTIONS

1.2.1 Congo

In Congo companies are fully responsible for funding ecoguards on their concessions. This is a newly implemented requirement. We have had limited access to Congolese logging industry representatives, therefore we can not report on the advantages/disadvantages of this model.

1.2.2 Conservation International/Center for Environmental Leadership in Business-Energy and Biodiversity initiative

The Center for Environmental Leadership in Business (CELB) has been noted as leading effective programs with industry to address their impacts on biodiversity. CELB works on projects concerning agriculture and fisheries, forestry, energy and mining, and travel and leisure. The Energy and Biodiversity Initiative (EBI) established in January 2001, has joined four oil companies with five nongovernmental organizations (NGOs) to promote practices to protect biodiversity in oil and gas development. The following companies and organizations are involved; BP, ChevronTexaco, Conservation International, Fauna & Flora International, Shell International, Smithsonian Institution, Statoil, The Nature Conservancy, and The World Conservation Union (IUCN) (Socialfunds 2002, CELB n.d.). These organizations have committed funds and resources to reach the initiative's goals.

CI, along with CELB, has been instrumental in setting up precedents for the establishment of trust funds to protect areas in and around concessions for perpetuity and to take on activities such as wildlife management and park guard controls. They have negotiated these trust funds by pushing for changes in national laws of Andean countries, changes in the regulations governing contracts that are developed by the Ministry of Mining in Andean countries and/or pushing for specific contracts between the Ministry of Mining and individual extractive companies (including companies that are partners with the center and other extractive companies). For example, CI and its partners have been instrumental in getting 16,930,000 dollars for an ECOFONDO or Ecological Fund from the Heavy Crude Pipeline enterprise (OCP) pipeline in Ecuador (A. Telesca, pers. comm.). These trust funds have been managed either as part of national trust funds for conservation areas and activities or as individual trust funds for specific areas for protection around the concession. They are managed by a Board including all or some of the following members; government representatives, local and international NGO members, local community, donor agencies,

and company officials. These trust funds have became such a standard part of operations for extractive industries in Latin America that companies have been approaching CI before they even commence operations to discuss establishment of the trust fund and its uses. In particular, these international NGO's have leverage over extractive industry companies in situations where A: the company is a multi-national company B: national company with multi-national and international investors C: where the extractive industry site is within or near pristine areas of high conservation or social value. The fund does not clear OCP of its responsibilities to prevent environmental damages in the development of the pipeline.

This is a model that clearly lends itself for adaptation in African logging concessions. African logging companies can include trust funds as part of their bid for the concession and governments can negotiate it as a standard part of logging concession contracts. Part of these funds can be used for wildlife management and wildlife protection within concessions or for protected areas near concessions in order to address the secondary impacts of logging on wildlife species. It appears that Africa is 20-30 years behind Latin America in using these tools to address extractive industry impacts (A. Telesca, pers.comm.).

1.2.3 Debt-for-Nature Swap

In a debt-for-nature swap a country's debt may be cancelled for its commitment to allocate equivalent funds to nature preservation. The indebted country is also responsible for creating alternate economic opportunities for population's that rely on the economic benefits of natural resource extraction. Therefore, this type of debt relief addresses the pressures of poverty and promotes the protection of natural resources (Profor 2001). For example, in 2002, the United States allocated $5.5 million dollars to forgive a portion of Peru's debt. This deal was finalized with a contribution of $1.1 million to the US government from conservation groups including: WWF, CI and Nature Conservancy. The Peruvian government in return committed $10.6 million dollars over the next twelve years to local NGOs for the creation, restoration and management of protected areas in Peru. By June 2002, WWF had contributed to sixteen debt-for-nature swaps around the world (WWF 2002)

This deal was legitimized under the US Tropical Forest Conservation Act (TFCA) of 1998 (US Dept. of State 2002). TFCA funds programs that will protect tropical forests in developing countries through debt relief. President Bush's proposed budget allocated over $30 million for the TFCA in 2002. Bush committed to promoting the TFCA as it proves to be successful (US Dept. of State 2001).

1.3 LESSONS LEARNED

1.3.1 Summary of Results

The reviewed projects vary in many regards, however there are several similarities between them in terms of the strategies they have taken to protect wildlife (See table 4.1, coltan and conservation concessions are omitted from this analysis because they are not site-specific). All of these model projects are located near or within protected natural areas (8/8). All of these projects have banned employees from carrying weapons, hunting and/or transporting bushmeat in company vehicles (8/8). All of these projects have included (or planned to include) local communities into their wildlife protection efforts, either through consultations when developing management plans, through conservation education efforts, or by hiring local community members to enforce wildlife protection regulations (8/8). In all eight models industry has worked with representatives of NGOs in some capacity to develop plans, fund or implement wildlife management programs (8/8). Rather than simply having regulations but no enforcement mechanism, each of the models we have highlighted has

allocated enforcement responsibilities to company employees, specific ecoguards/wildlife managers, and/or government/NGO representatives (8/8). In one model, company employees, newly hired staff (ecoguards) and government/NGO officials are responsible for protecting wildlife on concessions (PROGEPP). Four projects have two of the three in charge of enforcing wildlife regulations. In at least five case studies companies are providing food to their employees or making food accessible to reduce employee's dependence on bushmeat. For seven of these models, companies have contributed some amount of funding for wildlife protection. At most five of these models rely on NGO funding. Six of these models are having independent monitors confirm the projects' successes and efforts. Also, at least six of the eight models we have described are taking place in regions where high levels of hunting were depleting local wildlife populations. It is also interesting to note that all of these models involve international companies.

The degree to which each one of the above mentioned wildlife protection measures has been implemented varies. In one model ecoguards are trained on-site, live on-site and work alongside government officials and company employees to protect wildlife on logging concessions (PROGEPP). This strategy has reportedly been successful in terms of limiting illegal hunting within the concessions. The Minkebe project also relies on NGO/Government wildlife patrols and company enforcement of internal regulations, however patrollers are not permanent residents on-site. They concentrate on guarding access points and lead limited patrols within the concession. They travel to several concessions and therefore their presence is not as constant as on CIB concessions. This strategy however has also been reported to be successful at limiting hunting on logging concessions. On the Rabi/Toucan Shell oil concessions in Gabon, company employees alone limit access to the concessions to those associated with the company. These strict measures have been effective at denying hunters access to the concession. On R. Pallisco concessions, company employees are also solely responsible for enforcing company regulations. In this case however, bushmeat consumption is still significant (P. Auzel, pers. comm.).

The amount and origin of funding for each one of these projects also differs. In some cases companies are solely or mostly funding wildlife protection measures, as in the case of Ecoforest and Gamba. In one case, an NGO and bilateral donors solely provide funds (Minkebe). PROGEPP relies on funds from the logging company, NGO and donor agencies.

The pipeline projects differ from the other models because pre-existing company practices did not have to be altered since they are new, one-time-only projects. The other models we have discussed concern existing companies changing their practices. The pipeline projects reflect existing World Bank standards.

The driving factors behind the establishment of these models are; sales/stocks may be affected by bad press, access to concessions and markets may be dependent on operating procedures, the degree of NGO watchdog presence, government/donor agency requirements, established relationships between business and NGO representatives, pressure from far end of supply chain (coltan processing, timber processing company pressure) and/or moral imperative of company leaders.

Table 1.1 Summary Table of all projects and measures taken to control hunting

Coltan and conservation concessions have been omitted because they are not site specific projects. This table is based on the best of our knowledge. Zoning refers to hunting/no-hunting/community zone/protected area designations within industry concessions. Enforcement/guards: company employees, indicates that company employees are responsible for enforcing wildlife protection regulations, however this is not necessarily their sole responsibility. Roads: obstacle/block refers to access points that are not guarded but have been blocked or obstructed as a form of deterrence. Food provided by company: checked if companies are providing food to their employees or making food accessible to reduce employee's dependence on bushmeat. **?**-If it was not explicitly stated by interviewees that a measure was taken. v?- if this is a measure that is most likely taken

	PROGEPP	Minkebe	Gamba Biodiversity Project	Chad-Cam. pipeline	HFC	R. Pallisco	Bolivia-Brazil pipeline	Ecoforest
Partnership,association, or consultation with international NGO/university	v	v	v	v	v	v	v	v
Regulations								
No hunting/weapons	v	v	v	v	v?	v	v	v
No bushmeat transport	v	v	v	v	v?	v	v	v?
Roads								
Obstacle/Block	?	v		v				
Guarded	v	v	v	?	v	?	v	
Enforcement/Guards								
Company Employees	v	v	v	v		v	v	
Newly hired staff (ecoguards)	v				v			v
Government or NGO officials	v	v		v	v			v
Food provided by company	v	v	v	v		v		?
Education Programs/community involvement	v	v	v	v	v	v	v	v
Zoning	v	v						v
Biodiversity assessments and/or monitoring	v		v					
Funding								
Provided by company	v		v	v	v	v	v	v
Provided by NGOs	v	v	v		v?	v?		
Provided by other donor/funding agency	v	v		v	v		v	
High Hunting pressure prior to project	v	v	?	v	v	v	v (species specific)	?
Third-party Project Monitoring	v	v		v	v		v	v
Near protected nature areas	v	v	v	v	v	v	v	v

1.3.2 Discussion

"The best corporate models among extractive industries of efforts to reduce illegal hunting in tropical forest concessions make very clear policy, have it as part of supervisory staff performance evaluation, provide food, limit arms and patrol for outsiders. It is not hard" (J. Nittler, pers. comm.).

Although the nature of operations for oil, gas, mining and logging industries is not necessarily analogous, there are several lessons from these case studies that can be applied to logging concessions. The potential for any of these projects (or aspects of these projects) to be replicated will depend on the degree of hunting in the region, access to hunting areas, human population density, species that are being threatened and therefore potential funding, size of concessions and length of tenure, capacity of government to participate and possibly enforce laws, and the proximity of the concession to protected areas.

Based on a review of the measures taken to protect wildlife in each of the projects we recommend, at a minimum, the following set of measures be taken to reduce hunting pressures on logging concessions.

The first step is developing a management plan for a concessions based on the results of an environmental impact assessment (as in the Chad-Cameroon pipeline project, Bolivia-Brazil pipeline project, and Gabon Biodiversity project). The management plan should rely on an adaptive management approach so that it can be adjusted with experience (as in the Gabon Biodiversity Project).

Companies need to commit to very clear regulations to protect wildlife (as in CIB-PROGEPP, Minkebe, Shell-Gabon, R. Pallisco, Bolivia-Brazil and Chad-Cameroon pipeline projects) including:

- No hunting, within no-hunting zones;
- No weapons can be carried within concessions;
- No access to the concession is allowed by anyone not affiliated with company operations; and
- No transport of bushmeat within company vehicles.

Basic education on company policies and regulations needs to be carried out for employees and local villagers. It needs to be made clear to employees that violations of these regulations will be strictly enforced (as in Chad-Cameroon pipeline, CIB-PROGEPP, Minkebe project, Gabon Biodiversity Project, HFC).

It is important that employees are either provided with food, or are paid sufficiently and have access to bushmeat substitutes (as in R. Pallisco, CIB-PROGEPP, Chad-Cameroon and Bolivia-Brazil pipeline projects, Shell-Gabon projects, Minkebe Project).

It is important that communities be consulted in developing management plans, particularly if there are historical wildlife use areas, such as for indigenous groups (as in Chad-Cameroon and Bolivia-Brazil pipeline projects, Minkebe, CIB-PROGEPP projects).

In order for the adaptive management approach to be useful, periodic monitoring of populations and surveys of bushmeat consumption will be important to evaluate the project.

These measures represent the bare minimum requirements that companies should take to reduce hunting pressures on their concessions. Beyond this projects can introduce animal

husbandry on concessions (as in R. Pallisco, CIB-PROGEPP), lead education initiatives to foster conservation awareness with local communities (as in PROGEPP, Shell-Gabon, Chad-Cameroon pipeline project), and establish community hunting zones to establish ownership and value to wildlife (CIB-PROGEPP).

Measures to protect wildlife based on short and long term objectives

Short-term objectives

The most immediate goal on concessions where a high level of hunting is taking place is to reduce hunting pressure. All of the models we reviewed have worked to develop company regulations that restrict hunting on concessions. These measures need to be enforced by either company employees or ecoguards/wildlife managers or government officials. Barricades and obstructions may also be effective at reducing access depending on the accessibility of the site and the hunting pressure in the area. The effectiveness of regulations and enforcement should be monitored through species population studies and surveys of bushmeat consumption in local villages (Elkan, P. et al. 2001).

In considering enforcement there is a question of who should be doing the enforcement, and how much time needs to be dedicated to enforcing wildlife protection efforts. PROGEPP and the Minkebe project rely on government officials and company employees to enforce regulations. PROGEPP also hires local community residents as ecoguards. Minkebe project staff patrol several concessions and only temporarily reside on Bordamur concessions, in contrast to PROGEPP ecoguards that reside on site. Pauwel De Wachter (pers. comm.). considers this an important feature of the Minkebe project since rotating patrol teams prevent friendships from developing between patrol teams and logging company employees, and patrol teams maintain a high level of authority (P. De Wachter, pers. comm.). However, PROGEPP staff find that hiring local ecoguards contributes to local populations' investment in protection efforts.

Assessing the conditions on the concession, through an environmental impact assessment is important for determining the number of guards required, placement of guards and the time that should be dedicated to patrols. This assessment should include information on the level of hunting taking place on the concession, the species that are in threat, proximity of the concession to source populations or protected areas, and the number of access points for hunters.

Philippe Auzel remarked that there is no reason to enforce anti-poaching regulations if there are no alternative food sources for employees or locals (pers. comm.). Providing food to employees or making food available to employees is clearly important for reducing employee hunting. Promoting animal husbandry or the importation of frozen meat may also be a viable option for reducing a community's dependence on bushmeat. If the price of bushmeat is more than that of other protein sources it stands to reason that people will be motivated to purchase bushmeat substitutes (M. Fay, pers. comm., P. Elkan, pers. comm.). These approaches have been taken by PROGEPP and have been deemed effective. R. Pallisco is taking these measures to reduce hunting on their concessions also, but has not been effective at significantly reducing hunting on their concessions. Therefore, it is important to assess the proper amount of enforcement and alternative food availability that is necessary.

Coltan and PROGEPP models demonstrate that it is important to attribute ownership to a region, and its resources (minerals, wildlife) for those resources to have value. Without ownership and clear property rights, it is a classic case of "tragedy of the commons". The PROGEPP model has used community zoning effectively, to avoid these problems and it has been a successful approach for involving local communities into wildlife protection efforts.

Also, consultations with local community members may be an important way of developing practical management plans that will incorporate community members needs and therefore will respected. This has been shown to be the case in the Minkebe project. Community consultations were also planned to be a significant part of the World Bank pipeline projects. (It should be acknowledged that concession systems inherently alienate local people from control over resources that they and/or their ancestors were responsible for, for years before concessions were granted (R. Hardin, pers. comm.)).

Another short-term step is to get companies to commit to developing operations that comply with national laws on hunting. If national laws are not strict on hunting, it may become urgent for BCTF members to work with governments to develop more rigorous laws.

Long-term objectives

Long term objectives are to develop companies' capacity to enforce regulations and prohibit hunting, develop national laws and standards for wildlife protection on concessions, foster a conservation ethic in local communities, and pursue sustainable forestry and certification for logging operations.

NGO participation may be important to help companies develop wildlife management plans, provide technical expertise, and possibly to provide funding. NGOs have been very influential in the projects we have highlighted. However, NGO resources are limited (For example: WCS and WWF have been asked to expand their wildlife protection efforts to other concessions but have not been able to for logistical reasons). Therefore, it may be important to strengthen internal company enforcement and regulations, local community involvement, and involvement of government officials so that a project can be left to these participants after a given period of time. These measures have been the goal of the Minkebe project, the Gabon Biodiversity Project as well as for PROGEPP.

Government participation is regarded as an essential component of wildlife protection efforts by Minkebe Project and PROGEPP officials. The following quote from Paul Elkan's report to US Fish and Wildlife addresses the long-term needs for policy change (P. Elkan 2002):

> "While the controlling of protected species (elephant in particular) and commercial bushmeat traffic in multiple-use forests and along key transport axes was found to be socially very contentious and practically prone to fluctuations in enforcement efficiency (increased risk due to contact with commercial meat traffickers, increased pressures for corruption and coercion by local authorities, etc…), these actions have shown that some of the most serious poaching problems and networks in Central Africa can be addressed and/or even eliminated in some areas in the short-term. However, medium and long-term interventions and sustained controls require the development of new policy and monitoring to support field managers and reduce the political-economic pressures of the bushmeat trade."

Pauwel De Wachter, when discussing wildlife protection regulations remarked, "Ideally these rules should be enshrined in the law, a task for ongoing national policy development on bushmeat" (P. De Wachter, pers. comm.). The Government in Congo has already adopted lessons learned from PROGEPP on a national level, and has required logging concessions in Northern Congo to fund ecoguards on logging concessions. Pauwel De Wachter shared that in Gabon the Ministry of Water and Forests "has the will to extend this approach all around

protected areas in Gabon" (P. De Wachter, pers. comm.). Since government participation is viewed as essential, in places where government has been receptive to these efforts BCTF may be able to push for extensions and enforcement of these laws, or build government capacity in this manner.

Government involvement is also necessary for ensuring that national industrial operational standards are uniform. It is important to consider the importance of "level playing fields" to businesses. Willing companies may be discouraged from adopting wildlife protection efforts without their competitors adopting similar measures, since their competitors would have an unfair business advantage. The way to get around this is to develop national laws that require wildlife protection measures, to ensure that business costs are uniform for all logging companies in a given country.

PROGEPP has emphasized education as an important aspect for protecting wildlife on CIB concessions. Without an appreciation for nature, and an awareness to the threats hunting poses, hunters may not be willing to accept restrictions and prohibitions on hunting, and villagers may not be interested in cooperating with wildlife management officials.

Protecting wildlife from hunting is important in the immediate and long-term, however protecting their habitat is also essential for long-term protection. Certification may be a powerful incentive or promoting sustainable forestry on logging concessions. Certification may be also powerful in promoting short-term objectives, in terms of requirements that prohibit illegal and unsustainable hunting on concessions. (For a discussion on certification principles, criteria and indicators for wildlife see Bass 2003).

Costs of wildlife protection strategies

Cost is a significant factor in choosing a wildlife protection approach on logging concessions. The Minkebe project and PROGEPP are both using a variety of approaches to control hunting on their respective logging concessions. PROGEPP set up constant protection and wildlife patrols while the Minkebe project relies on temporary, rotating patrols. The costs for these projects may be significantly different. A project such as PROGEPP is estimated to cost 1$US/hectare for one year for concessions under 300, 000 hectares. The direct Minkebe project cost is estimated to be approximately 100,000$US annually to patrol 2-3 concessions like Bordamur (total area around 300,000 ha) (cost is not directly related to area covered but rather to the number of companies and number of access roads as well as the degree of need for patrolling). Projects need to be tailored to regional needs. If concessions are small, close together, and are not requiring constant surveillance a project such as Minkebe may be more suitable than PROGEPP. We were not given estimates on the costs of Pallisco's program to reduce hunting on its concessions, however they appear to require the least amount of investment of any of the models we have examined. It appears that allocating employee time to enforcing anti-poaching regulations and developing animal husbandry on its concessions, although cost effective, may not be sufficient in areas where the demand for bushmeat is great.

Funding

There are varying opinions on how wildlife protection should be funded on logging concessions. The pipeline projects rely on company and donor agency funding to protect wildlife on project sites. Ecoforest and the Gabon Biodiversity Project rely on a significant amount of company funding for their wildlife management programs. For the Minkebe Project, the majority of funding has come from WWF and bilateral donors (with new funding coming in from the EU). PROGEPP relies on a combination of funding from donor agencies, governments, NGOs and the logging company. The possibility of attaining funding for wildlife management in terms of personnel or money from NGOs, companies and/or donor agencies

may depend on a number of factors, particularly, the proximity of the concession to pristine areas and therefore international interest in the area and presence of international companies doing the extraction. These factors will need to be assessed in making funding decisions. Trust funds and/or debt-for-nature swaps may also be important means for attaining funds for wildlife management on logging concessions.

World Bank funding may be important for promoting wildlife management on logging concessions, especially given the Bank's new forest policy that permits funding to logging concessions. However, BCTF should enter with great care in promoting World Bank funding for projects that could have environmental impacts. There is a long history of World Bank projects leading to major negative environmental impacts (Rainforest Action Network, n.d.). The plans that we have described for the pipeline projects have been developed with the help and pressure of the international community. Most of the pressure on the Bank has come from Friend's of the Earth, Environmental Defense, WWF, Center for International and Environmental Law (CIEL) and Bank Information Center (BIC). The following recommendations have been made by the Bank Information Center (1999) for future World Bank projects:

"*All projects with significant social and environmental impacts must:*

1. *Establish effective mechanisms to ensure civil society participation throughout the project cycle ;*
2. *Sequence loan disbursements and condition them upon achievement of benchmarks which ensure that direct and indirect impacts are mitigated before project implementation;*
3. *Address indirect impacts through country assistance strategies and other Bank lending instruments; and*
4. *Establish an Independent Monitoring and Compliance Mechanism* "

It is of our opinion that the impacts of logging practices on wildlife are externalities of business operations, and that environmental costs should be incorporated into business costs. Companies should therefore be responsible for funding wildlife protection operations.

Industry Incentives

Negative press as a result of company impacts on the environment and wildlife is a significant risk factor for industry sales, stocks and company image. This is particularly true for international companies whose consumer or purchasing base is sensitive and aware of such issues. As in the case of coltan, negative press from losses of "charismatic mega-fauna" as a result of coltan mining in DRC has been a major impetus in developing economic, social and environmental programs to reduce these impacts. European markets tend to be more sensitive to such problems than US markets. Asian markets do not appear to be sensitive to this at this juncture. Implementing wildlife protection measures may benefit companies who are having problems with environmental or wildlife losses. This may not be true for national companies that are not exporting timber to European markets and do not have international donors.

Pressure is also coming from other companies such as timber and coltan processing companies that are putting pressure on producers to act more responsibly in terms of the environment (R. Ridder, pers. comm., K. Hayes, pers. comm., M. Brink, pers. comm.). This is

an angle that BCTF can consider because processing companies are a focal point to exert leverage over the entire logging industry, since there are fewer processing companies than consumers.

In order for consumer pressure to be an incentive for wildlife management on logging concessions, there needs to be a way to identify timber coming from environmentally responsible companies. Forest Stewardship Council's chain of custody tracks lumber from certified operations (Bass 2003). In this way consumers are able to identify operations they wish to support. CIB has not seen increased profits in response to the wildlife protection measures they have adopted. A reason for this may be that consumers have not been able to identify CIB timber to support it.

Oil vs. logging

Although it is interesting to explore the protection measures that are being taken by extractive industries other than the logging industry, there are some significant differences that should be noted. Oil company employees are usually skilled laborers that are paid high wages, work long shifts and leave their families for a period of time to work for oil/gas companies. Often logging employees are not "skilled"/highly trained, paid lower wages than oil workers, work for companies for long-terms and families travel with logging employees (F. Dallmeier, pers. comm.).

Proximity to protected areas

To limit BCTF's efforts to the most pressing cases, it may be important to work with logging companies in the periphery of protected areas. It is interesting that all of the model projects we have highlighted are taking place in or near protected areas. WWF has just published a report on a collaborative project that assesses biological hotspots in Central Africa, and has overlayed Global Forest Watch data on logging concessions in the region. This information may be useful in targeting companies that should become involved in wildlife protection efforts (Kamdem-Toham, et al. 2003, see contacts list: Jennifer D'Amico-WWF-USA).

There are several lessons to be learned about wildlife management from extractive industries working in tropical forests. In our research we have found that:

- Few extractive companies in tropical forests focus on wildlife concerns;
- Government enforcement of wildlife laws may be minimal to non-existent;
- Where companies do focus on wildlife concerns, they can be successful;
- Industry-NGO partnerships may be viable when they occur; and
- NGOs have been slow to take risks and to attempt new projects on wildlife management where there are extractive operations going on.

There is however much work is being done to prevent anthropogenic impacts on wildlife in isolated locations. We are hopeful that the momentum for protecting wildlife on logging concessions is building and will be effective at abating the bushmeat crisis in Central Africa.

1.4 INTERVIEW LIST

The research for this document was done in concert with research for “Timber certification: Prospects and Progress in Addressing Wildlife Issues in Central Africa” and “Resources to Guide the Bushmeat Crisis Task Force's Engagment With the CEOs Africa Working Group”, also produced by the University of Maryland Problem Solving Team. The dominant method used to compile research for these documents was through interviews with representatives from conservation NGOs, donor agencies such as the World Bank, Industry and independent consultants who specialize in forestry, monitoring, and certification.

We interviewed the following individuals between September 2002 and January 2003:

Wade Adeleke	WWF-Cameroon
Jennifer D’Amico	WWF-US
Phillipe Auzel	University of Gembloux
Natalie Bailey	BCTF
Mohammed Bakarr	CI
Didier Bastin	ONFi
James Beck	University of Maryland
Elizabeth Bennett	WCS
Henriette Bikie	WWF/CARPE
Jurgen Blaser	InterCo-operation
Kees Bosdijk	Stichting Keurhout
Michal Brink	SGS Qualifor
Bryan Carroll	Bristol Zoo Gardens
JG Collomb	WCS
Naig Cozennet	Proforest-UK
Christophe Creppin	The World Bank
Fransisco Dallmeier	Smithsonian
Richard Delvalle	Ecoforest
Pauwel De Wachter	WWF-Gabon/Minkebe Project
Barney Dickson	Flora & Fauna Int’l
Richard Donovan	Smartwood
Paul Elkan	WCS
Sarah Elkan	WCS
Joanna Elliot	Livestock & Advisory Group, DfID
Christina Ellis	JGI
Heather Eves	BCTF
Michael Fay	WCS/National Geographic Society
Roger Fotso	WCS
Nancy Gelman	CI
Ted Gullison	Consultant
Rebecca Hardin	McGill University
James Harkness	WWF-China
Matthew Hatchwell	WCS
Karen Hayes	Flora & Fauna Int’l
Emmanuelle Heuse	WWF-Belgium
Karina Horta	EDF
Robert Hunink	tt Timber Int’l
Neil Maddison	Bristol Zoo Gardens
E.J. Milner-Gulland	Imperial College
Tony Mokombo	WWF-US
Bihini Won Musiti	IUCN

Robert Nazi	CIFOR
Roger Ngoufo	CEW
Samuel Nguiffo	CED
John Nittler	Chemonics
Rose Ondo	FSC-Gabon
Michael Painter	WCS
Ian Redmond	Ape Alliance
Simon Rietbergen	IUCN
Ralph Ridder	WRI-GFW
Meriel Robson	Woodmark Soil Association
Richard Ruggiero	USFWS
Damian Rumiz	WCS
Markku Simula	Indufor OY
Andrew Taber	WCS
Antonio Telesca	CI
Jane Thornback	Tropical Forest Forum and Natural Resources Institute-UK
Guiseppe Topa	The World Bank
Leonard Usongo	WWF-Jengi/South East
Matthew Wenban-Smith	FSC
David Wilke	WCS
Christine Wolf	Fund for Animals

1.5 CONTACT LIST

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D'Amico, Jennifer	WWF-US	Jennifer.damico@wwfus.org	Contact for Congo Basin collaborative project
Auzel, Philippe	University of Gembloux Jane Goodall Institute	auzelip@aol.com	An expert on Central African wildlife issues
Collomb , Jean-Gael	WRI	JGCollomb@navai.com	Currently in Gabon, formerly with WRI
Dallmeier, Francisco	Smithsonian	fdallmeier@si.edu	Director of Smithsonian Gamba Project
Pauwel De Wachter	WWF	dewachter.p@internetgabon.com	Director of Minkebe Project
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	Program		
Nittler, John	Chemonics Consultant	Jnittler@chemonics.net bolfor@bibosi.scz.entelnet.bo	Referred by Richard Donovan Worked on the BOLFOR certification scheme in Bolivia

Painter, Michael	WCS Regional Coordinator for Peru, Bolivia, & Paraguay	mpainter@wcs.org 591-2 278 6642	
Ruggiero, Richard	USFWS	Richard_Ruggiero@fws.org	
Dr. Damian I. Rumiz	Museo HNNKM - WCS	confauna@scbbs-bo.com tel (591-3) 336 6574 / 337 Santa Cruz Bolivia	Expert on logging/wildlife interactions in Bolivia
Laurent Some	WWF Central Africa Program Regional Representative	lsome@wwf.cm	Referred by Wale Adeleke-Contact for HFC project
Telesca, Antonio	CI Andean Program	a.telesca@conservation.org	
Topa, Giuseppe	The World Bank Lead Forestry Specialist Africa Region	gtopa@worldbank.org 202-473-4532	AWG World Bank representative
Usongo, Leonard	WWF Jengi/South East Forest Program Coordinator	lusongo@wwf.cm	Referred by Wale Adeleke

Wilke, David	WCS	dwilkie@rcn.com	BCTF Steering Committee
Jamet,Nicolas	HFC	nicolas.jamet@cm	General Director

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1.7 LAST MINUTE ADDENDUM

In Southeast Cameroon (as of December 2001) the WWF Jengi project, working with technical partners; GTZ, Ministry of Environment (MINEF) and logging companies operating within the project area, signed an anti-poaching agreement, whereby several logging companies have commited to fighting against poaching and the bushmeat trade. Generally, most of the companies have made efforts to fulfill their commitments, although much is still left to be done.

WWF Jengi is also working with Grp Decolvenaere on certification issues. This company has constructed a cold store for selling beef to employees and has enforced policies to prevent poaching and the commercial trade of bush meat by employees (L. Usongo pers.comm)