Biodiversity Conservation at the Landscape Scale

A Program of the Wildlife Conservation Society
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Ndoki-Likouala Landscape Conservation Area, Republic of Congo Annual Report October 2002 - September 2003

I. Summary of Activity Status and Progress

a. Introduction/Summary:

The Ndoki-Likouala Landscape Conservation Area, extending over approximately 30,000 km^2, comprises a vast stretch of lowland Guineo-Congolian forest, rich in African mahoganies and large mammals. Within the area, forest type varies from semi-deciduous forest in the northwest to swamp forest in the southeast. It is home to important populations of some of the continent's most endangered species: forest elephants, western lowland gorillas, chimpanzees and bongo. The region has an extremely low human population density, and has until recently been isolated from modern human influence. Biodiversity of the region is partially protected in two reserves: the Nouabalé-Ndoki National Park (NNNP) and the Lac Télé Community Reserve (LTCR). Yet these reserves alone do not provide sufficient habitat for wide-ranging or low-density species, nor is the capacity of the Ministry of Forest Economy and Environment (MFEE) strong enough to effectively manage these areas. Consequently, the unique and extraordinary biological values of the region are threatened by the rapid development of logging throughout northern Congo, the export of massive volumes of bushmeat that follows in its wake, and the creation of logging communities who increase pressure on forest resources.

The principle goal of the BCLS program in Ndoki-Likouala is to conserve biodiversity through application of a landscape approach. **To accomplish this goal, the program assesses the ecological status and requirements of landscape species (elephant, chimpanzee, bongo, buffalo and dwarf crocodile), develops management strategies across a mosaic of land-use zones that integrate their conservation, and helps to establish effective systems for this management.** WCS works closely with staff from MFEE charged with both wildlife protection and forest management, managers of logging companies that work around the reserves of northern Congo, and communities located in the region. In addition to upgrading the status and effectiveness of protected areas, the BCLS program is helping to design and establish systems of wildlife conservation and management on forestry concession lands under the auspices of the Projet de Gestion des Ecoystemes Peripheriques au Parcs (PROGEPP). This includes consultation to reduce the ecological impacts of logging operations (e.g., road placement, no-cut zones), prohibit the hunting of endangered species and the export of any bushmeat from the concession, control logging-based demographic growth and impacts, establish wildlife management systems for sustainable subsistence use by communities, and develop alternative sources of protein for community consumption.

NNNP management support continues to be provided by several partners (CARPE, USFWS, and WCS, among others). During this reporting period funds from the BCLS/USAID program contributed to the operating costs for the National Park, with a focus on training Congolese nationals, law enforcement activities, and continued research and monitoring of landscape (and other) species.

b. Highlights

- The official public meeting required for the adoption of the NNNP management plan and the annexation of the Goualougo Triangle to the park was held in June 2003. The plan was adopted and the Goualougo Triangle annexation was officially signed.
- The MIKE (Monitoring the Illegal Killing of Elephants) CITES (Convention on International Trade in Endangered Species) program began surveys in 2003 in the Nouabalé-Ndoki site with the aim of providing information needed for elephant population management and to make appropriate enforcement decisions, as well as build institutional capacity in the long-term.
- A five-week training course on wildlife survey techniques along forestry transects was held in Mokabi in January-February 2003 for personnel from four forestry companies.
- An additional two Global Positioning System (GPS) telemetry collars were placed on elephants. The data from these collars will provide vital information on elephant movement patterns and their habitat requirements.
- A pilot survey of crocodilians in the Kabo and Pokola Forestry Management Units (FMUs), Lac Tele-Likouala Aux Herbes area, and surrounding zones was undertaken in May 2003 to develop research and monitoring methods.
- A socio-economic consultancy took place mid-February to early April to synthesize existing socio-economic data and identify the legal requirements for the community component of the Congolaise Industrielle de Bois (CIB) logging company management plan.
- The LTCR project began a second phase of socio-economic surveys in March. The results of these surveys will provide baseline information on the number of Reserve inhabitants successfully engaged in animal husbandry, how much income is currently being generated through these activities, and the problems encountered.
- The draft biological and human landscape models developed in August 2002 were refined and initial conservation landscapes were produced.
- MFEE and BCLS staff from both the Bomassa and Makao bases conducted regular patrols within NNNP. Four illegal hunting camps were destroyed in the western sector of the park, close to the border with the Central African Republic (CAR). Twelve binational or trinational protection patrols were conducted with seizures including over 2,000 cable snares, with sixteen arrests. PROGEPP field patrol efforts resulted in seizure of 7,431 wire snares, 62 shotguns, two elephant rifles, and ten ivory tusks (four of which were found in the forest). With the aid of USFWS funding, the LTCR project began an anti-poaching program in February 2003, which resulted in the voluntary relinquishing of ten military weapons by five villages.
- Two PROGEPP educators implemented the conservation awareness campaign working actively with the numerous communities. A total of 1,001 people participated.
- The LTCR project gave presentations and seminars in 22 villages, to approximately 2,100 attendees. The reports indicated that the attendees had favorable attitudes to conservation, and that all were interested in engaging in alternative activities to commercial hunting for revenue generation.
- An Ebola education component was quickly developed in collaboration with the WCS Field Vet Program for raising awareness in the region.
- During this period CIB continued with the importation of domestic protein to feed its employees: over 88 tons of frozen fish and chicken to feed the local population at a rate of 18-20 metric tons every two months.
- Technical and material assistance were provided to traditional farmers with the vaccination of 2,729 chickens in the Kabo and Pokola concessions and distribution of 275 meters of wire fencing to promote improved poultry farming as an alternative to bushmeat consumption.
- A workshop was held in Bomassa in June 2003 for national researchers, on methodological issues of estimating animal population densities using line transect sampling and the DISTANCE software.
- The intensive ecoguard training program during September-October 2002 was followed up by a five-week refresher training course in April-May 2003.
- A write-up of the feasibility study for the conservation of the Lac Tele Community Reserve was completed, translated into French and distributed to all relevant Republic of Congo government institutions.

II. Detailed Description of Progress

a. Key program objectives for reporting period (October 2002 – September 2003)

BCLS goals in the Ndoki-Likouala landscape during this period included continued baseline data surveys and monitoring the landscape species and human influences in the landscape. We continued to work with neighboring logging companies in the Pokola, Kabo, Loundougou and Mokabi concessions for sound management of wildlife resources. Our goal was to integrate local communities, government and logging companies in the management of natural resources across the landscape, and influence national policy in the forestry and protected areas sectors. We furthered the process of the elaboration of an integrated landscape conservation action plan through adoption of the Nouabalé-Ndoki National Park Management Plan (under separate funding this year), and drafting of chapters for CIB concession management plans for Kabo, Pokola and Loundougou concessions. Finally, we pursued negotiation of an agreement between WCS, Rougier and the Government of Congo on management of the Mokabi concession.

b. Activity Description

OBJECTIVE 1: Establish baselines and monitor landscape species and the landscape context in which they are found.

Ecological reconnaissance surveys and forest clearing monitoring techniques have established baseline information and a monitoring system for large mammal relative abundance and human-use trends within the NNNP, LTCR and surrounding forestry concessions. Studies on the impact of logging activities on large mammal abundance and distribution have been initiated in the NNNP and surrounding zones, and specific ecological studies of bongo, elephant, gorilla and chimpanzee are conducted across the entire Ndoki-Likouala landscape. Resultant information led to the choice of five landscape species (elephant, bongo, chimpanzee, forest buffalo, dwarf crocodile). These form the basis for determining the focal conservation landscape, key areas of human-wildlife conflict and the basis for monitoring the impacts of conservation efforts. Socio-economic and demographic surveys and monitoring are conducted in the Kabo, Pokola, Loundougou, and Mokabi concessions to complete and update earlier survey work and establish a baseline for evaluation of the effects of project activities on human-use patterns, perceptions, and demographics.

Activity 1.1. Landscape Species Monitoring
On track

MIKE-CITES forest inventories:
The MIKE program, was endorsed by the CITES Standing Committee in March 1999, with the broad aim of providing information needed for states within elephant range to make appropriate management and enforcement decisions, and to build institutional capacity for the long-term management of their elephant populations. There are two major monitoring components: elephant population density and distribution, and law enforcement. Following a pilot study of three sites in 1999, a methodology was drawn up for implementing forest elephant population surveys in designated MIKE sites, of which Nouabalé-Ndoki National Park and adjacent timber concessions of Mokabi and Loundougou to the north and east of the Park are one.

The second round of MIKE surveys began in 2003. Survey design is based on a series of line transects juxtaposed with adjoining 1-kilometre reconnaissance sections (recces) at each end (see Figure 1). All elephant, human and great ape signs are recorded. Patrick Boudjan (NNNP) and Calixte Makoumbou (PROGEPP) were identified as the MIKE team leaders for the surveys in the Park and surrounding concessions, respectively.

During this reporting period, Patrick Boudjan successfully completed a pilot study of six transects in the south of the NNNP. This pilot study provided training of the survey team and established information for the final study design. The first phase of the main NNNP survey was also completed during this reporting period: a total of 115 km of transect were surveyed. The final two survey phases within the two timber concessions are due for completion in October 2003.

Mokabi concession:
A five-week training course on wildlife survey techniques along forestry transects was held in Mokabi in January-February 2003. A total of ten technicians from Rougier, Bitar, and Industrie de Transformation des bois de Likoula (ITBL) logging companies participated under the instruction of Alain Ampolo and Calixte Makoumbou (PROGEPP). Line transect wildlife survey techniques were adapted to forest inventory methods as already applied in the CIB and Industrie Forestier de Ouesso (IFO) concessions (methods adapted from White and Edwards 2000 and the MIKE program). As part of the training course, a series of line transects were surveyed in the southern Mokabi FMU, revealing a high density of ape nests and marking the importance of this part of Mokabi for large mammal conservation. Rougier Mokabi subsequently began surveys of wildlife and human activity along forestry transects. These data will be examined to complete a detailed baseline for development of wildlife conservation and management components of the Mokabi concession management plan.

Reconnaissance surveys in the Kabo and Pokola Concessions:
Dry season reconnaissance surveys were undertaken along 277 km of forest routes traversing nine village hunting and protected zones of the Kabo and Pokola concessions. Results of these surveys were similar to observations noted

during the wet season of 2002, with a high level of elephant sign in the Ikelemba and Djaka areas despite human activity in these zones. Low human sign was registered in the Ndoki 1-Ndoki 2, Niangui and Safari zone surveys with high encounter rates of chimp, elephant and duikers. Ndoki-East zone currently under exploitation by CIB showed a decrease in large mammal sign. A remarkable level of gorilla signs was noted in the Ikelemba and Leme areas. Human activity was lower relative to observations in the wet season of 2002 in the majority of zones. These and other reconnaissance surveys are being spatially analyzed and integrated with CIB management plan wildlife transect data to provide a high- resolution assessment of large mammal distribution and abundance.

LTCR Transect Monitoring:
During the second half of this reporting period, the LTCR team began monitoring large mammal and human use in the LTCR. Over 46 km of transects were surveyed within the terra firma forest. The team encountered only four elephant dung piles and no sign of forest buffalo during their surveys, probably due to seasonal movements. In contrast, they encountered 77 ape groups and 397 ape nests. The latter results are of particular interest in that the number of ape groups and nests were double what was encountered during the previous year's survey in the terra firma habitat (November 2001). These monitoring efforts are important in that they will serve to identify areas of conservation priority, in addition to monitoring population changes, as the LTCR project moves forward.

Wali Bai monitoring:
Regular monitoring of large mammal visitation and presence around Wali Bai continued throughout this reporting period. During 2002, a total of 123 observation days were spent at the bai, during which buffalo were the most commonly observed species. Figure 2 compares frequency of buffalo (45.5%), elephant (35.3%) and bongo (1.5%) bai-use with data from 2000-2001. In 2002, most sign was accounted for by elephant (44.2%), buffalo (32.4%) and bongo (15.9%). Figures 3 and 4 compare 2002 large mammals track data around Wali Bai and on the Bomassa-Wali trail with results from 2000-2001. There was no significant difference in the presence of any of these three species between 2002 and 2001. However, there appears to be a steady increase over the three years in the presence of bongo around the bai.

Elephant Monitoring in bais:
During this reporting period, Clement Inkamba-Nkulu completed his second year of elephant monitoring in the Mabale, Mingingi and Bonye bais in the north of the NNNP. Mr Inkamba-Nkulu has thus far identified a total of 687 elephants using the three clearings, with a total of 43 individuals observed to use more than one bai. In May 2003, Mr Inkamba-Nkulu visited Dzanga Bai in the Central African Republic to compare elephant identification cards from the Mabale/Bonye/Mingingi complex with Dr Andrea Turkalo's database of ~2,800 individuals that visit Dzanga Bai. Comparison of individual identification cards from the three bais in the north of NNNP, Mbeli Bai in the south-west of NNNP and Dzanga Bai in CAR is ongoing. Elephant monitoring in the bai complex to the north and west of the NNNP is becoming increasingly important in the face of increasing incursions across the northern and western borders by poachers.

Aerial Videography:
Using aerial videography, 24 bais are being monitored to note changes in their physical structure as an indicator of large mammal use. Bais are monitored in the protected areas of Nouabalé-Ndoki (Congo) and Dzanga-Sangha (Central African Republic) and in the peripheral zone around NNNP (Kabo and Pokola concessions). Two cycles of monitoring were completed during this reporting period (October 2002 and January 2003). Mosaic images were produced for the third annual cycle and digital versions distributed to the three participating projects: NNNP, PROGEPP and the Dzanga-Sangha project (WWF-Central African Republic).

Activity 1.2. Focal Ecological Studies on Landscape Species
On track

Elephants:
GPS telemetry on elephants: Given our previous success with GPS telemetry to study the movement patterns of forest elephants, an effort was made to increase sample sizes by collaring an additonal two adult males, we increased our sample size from four in 2002 to six in 2003 (see Figure 5). Knowledge of elephant

migration patterns outside of protected areas is vital in assessing their conservation status in the region and in developing their long-term protection strategies. Data collection is ongoing and the collars are envisaged to function for two to three years. An additional two elephants will be collared in the Kabo concession in January/February 2004.

Elephant-human conflict: The third phase of the experimental field project in Bomassa and Bon Coin villages to understand and deter elephant crop raiding in the area was completed during this reporting period. The third phase involved two important new aspects; first, heavy wire cable surrounding the fields was smeared with a mixture of grease and hot chili pepper, and secondly, the fields were divided into plots that were assigned to individual families. These families were responsible for tending the plots, maintaining field defenses, and in turn reaping the rewards of successfully harvested crops. A total of 2.8 tons of manioc was harvested and only 13.4% of the total planted area was damaged by elephants (compared to 100% and 48.6% in phase one and two, respectively). Furthermore, the third phase proved economically more viable than previous phases, with expenses limited to the cost of materials. However, incentives to individual households will have to be maintained and cheaper materials will need to be sought if these measures are to remain cost effective in the long term.

Ecology of chimpanzees in the Goualougo Triangle:
During this reporting period the Goualougo Triangle Chimpanzee Study completed its third field season investigating the ecology and behavior of the "innocent chimps" of the Goualougo. A total of 173 individuals have now been reliably identified, comprising seven communities, of which the Moto community is best characterized. A total of 54 individuals have been identified in the Moto community and the accumulation curve of new individuals has reached asymptote. The age-sex structure of the community has been characterized and this group forms the basis of comparative density estimates using direct observations (see Activity 1.1 and 1.4). Home range of the Moto community has been characterized in terms of size and habitat utilization. During this reporting period, comparative data on habitat utilization from direct observations, and ape and nest encounters on standing crop survey transects were analyzed (see Figure 6). The diet and feeding behavior of chimpanzees continued to be documented during this reporting period.

In September 2003, Peter Walsh and Hjalmar Kuhl will conduct further testing of ape survey methods in the area as part of a joint project between Dr Walsh and the Max Planck Institute for Evolutionary Anthropology in Leipzig. Ape dung counts will be investigated as a possible survey technique using a two-visit method to measure dung decay rate that is a variant of the marked-nest survey technique.

Activity 1.3. Safari Target Landscape Species
On track

Buffalo:
Information on forest buffalo social organization and demographics continued to be collected through direct observations at Wali bai and from Mbeli Bai in the NNNP under the direction of Thomas Breuer. During this reporting period, a short-term study on buffalo activity patterns was conducted at Wali Bai by Lena Ofunguini as part of an undergraduate dissertation at the Institute of Rural Development, University of Brazzaville. Buffalo, bongo and other large mammal presence continue to be monitored on reconnaissance surveys in the Bomassa hunting zone (see Activity 1.1) and during road surveys.

Richard Malonga began analyses of data on buffalo distribution collected in the CIB wildlife inventories in the Kabo, Pokola, and Loundougou concessions. Richard is working with experts at the University of Minnesota and the LLP at WCS-NY to assess factors affecting the distribution and abundance of buffalo in the Landscape as part of his Master's degree at the Conservation Biology Program of the University of Minnesota (with support from the Bieneke Foundation). Empirical data from line-transects and reconnaissance surveys will be used to test the biological landscape projections (see Activity 1.6).

Bongo:

The bongo monitoring program in the Kabo FMU was reassessed based on the results of analyses of data collected 1996-2001. A new camera survey design was developed for application in 2004. Reconnaissance surveys and road surveys, tracking of bongo to collect information on foods habits, patrolling of the Mombongo area, and improving camp infrastructure for protection of the Mombongo area were undertaken during this period. Two GPS/VHF units were refurbished at Advanced Telemetry Systems (ATS) for potential deployment during the second semester of 2003. A combination of radio collaring and camera trapping is planned to address questions of ranging and to build on existing databases and understanding developed in the first phase of the research program.

Paul Elkan completed his Ph.D. dissertation on Ecology and Conservation of Bongo Antelope in Lowland Forest, Republic of Congo in May 2003. A working session has been planned with trinational managers to present findings and methods to improve surveys and monitoring in Cameroon and CAR where safari exploitation of bongo continues.

Dwarf Crocodile:
Dr. John Thorbjarnarson, WCS Herpetological program, and Mr. Mitch Eaton, graduate researcher, undertook a pilot survey of crocodilians in the Kabo and Pokola FMUs, Lac Tele-Likouala Aux Herbes area, and surrounding zones in May 2003. The objective of the pilot trip was to develop the research design for an in-depth investigation of the population ecology and management of dwarf crocodile (*Ostaeolaemus tetraspis*). The team surveyed habitats and markets noting dwarf and African slender snouted (*Crocodylus cataphractus*) crocodiles in the Kabo and Pokola regions. Nile crocodile (*Crocodylus niloticus)* was confirmed in the LTCR area in addition to the other two species. WCS researcher assistants in Kabo and Epena were trained in specimen assessment techniques to be applied in the ongoing market monitoring programs. Mr. Eaton is in the process of developing a proposal to pursue dwarf crocodile research as part of a graduate research program.

Activity 1.4. Hunting and Forestry Impacts
On track

NNNP:
Monitoring of species composition, age/sex structure in hunting off-take and hunter effort in Bomassa-Bon Coin continues in an ongoing assessment of the sustainability of hunting in this area. 2003 data will be analyzed and compared with previous years in the next reporting period. Monitoring of hunting in Makao was suspended between July and December 2002. Considerable immigration into the area as a whole has intensified pressure on the wildlife resources, notably from hunters operating from the new logging camp at Sombo, approximately 6 km north of Makao. Monitoring of hunting in Makao was adjusted and resumed in January 2003, although this data excludes off-take by hunters based out of Sombo who are exploiting the same hunting zones as the indigenous populations in Makao. Preliminary analysis indicates that the Makao community has shifted its hunting activities to the southern sector of the Motaba River (in the neighboring Loundougou concession) in response to reduced rates of return in the northern zones.

Peripheral Zone:
The PROGEPP team continued monitoring of hunting practices and demographic trends in the logging concessions through bushmeat market, household, and demographic surveys at the major camps and towns. These data provide information on the effects of management interventions on hunting practices, information necessary to assess the impact of hunting on game populations, and insight into the nature and cause of demographic growth and expansion in the concession areas. Information from these surveys is immediately communicated to inform and adjust management interventions as well as to influence planners and decision makers regarding land-use and management planning needs.

Surveys of household consumption of protein collected information on meals during this period. Efforts to import domestic protein to feed the large population center were assessed in part using these surveys. During this period bushmeat made up 30-40% of meals in Pokola with fish in 40-60%. A five-fold increase was registered in domestic meat consumption in diets in Pokola from 2% in earlier surveys to 15-25%. Increases in domestic meat at the large towns corresponded with efforts by the company to import large quantities of domestic meat to substitute for bushmeat.

Human demography censuses at the Pokola and Kabo town sites showed annual increases of 16% and 21% respectively. Ndoki 2 and Ndoki 1 camps showed 8% and 13% growth. The difference in growth between industrial sites and camps is explained by the sawmills that offer more employment opportunities such as wood recuperation,

charcoal, and secondary activities to feed the growing populations. 71% of growth at these sites was due to in-migration from other areas.

Socio-economic expert Jean-Michel Pierre undertook a consultancy with PROGEPP mid-February to April to compile the existing socio-economic information, complete these datasets with additional information, and outline the socio-economic chapter of the CIB management plan for the Kabo, Pokola, and Loundougou FMUs. Working with PROGEPP researchers Antoine Moukassa, Kimbembe Bienvenue, and Germaine Mavah, Mr. Pierre performed a gap analysis of the existing information and undertook a thorough assessment of the Congolese legislation regarding management planning and land and natural resource tenure. A preliminary report is now available and will be completed by Antoine Moukassa as additional surveys add to information on agricultural production and economic factors affecting livelihoods. This assessment will serve as a template for socio-economic program guidelines in the CIB management plan being drafted in late 2003 and early 2004.

Activity 1.5. Timber Exploitation and Impacts on Wildlife
On track

Impact of logging on ape populations in the Goualougo Triangle:
The Goualougo triangle covers an area of approximately 280 km² of intact forest that was officially annexed to the south of the Nouabalé-Ndoki National Park in June 2003. In spite of its elevated protected status, the Goualougo Triangle is adjacent to a logging concession that is scheduled for timber extraction in the near future. In 2001, David Morgan, Crickette Sanz and Jean-Robert Onononga initiated the first of two phases of line transect surveys that intend to generate density estimates of gorillas and chimpanzees before and after timber extraction. The surveys form part of a larger study that aims to quantify the impact of logging through changes in ape densities, behavior and endocrine levels (as a measure of stress).

The survey design was stratified according to anticipated levels of logging impact and identified three zones within the study area: a zone scheduled for logging (outside the NNNP), a zone immediately adjacent to the logging area (inside the NNNP), and a zone geographically separated from logging activities (also inside the NNNP). The study design also incorporated the potential role of natural barriers in displacement of chimpanzee communities during logging activities. The first survey phase was completed in February 2002 using the standing crop method, and results were analyzed during this reporting period. These data, together with estimates of abundance from marked-nest survey techniques, will provide baseline density estimates for apes in the Goualougo Triangle prior to logging.

Direct and Indirect Impacts of Logging on Wildlife:
John Poulsen and Connie Clark undertook a pilot study in May-July 2003 based out of the Bonyo research camp in the center of the Kabo FMU. Methods were tested and refined to adjust the research design for a long-term comprehensive investigation of the direct and indirect impact of forestry exploitation on wildlife populations. A full research proposal was produced for circulation to potential donors (i.e. United States Forest Service, and others). A research presence was established at the Bonyo camp area located in the center of the safari zone of the Kabo concession lending further protection in complement to ecoguard patrols.

John Poulsen and Richard Malonga analyzed the data collected by the wildlife inventory teams of the CIB management plan for the Kabo concession using a Geographic Information System (GIS) and the DISTANCE software. Data sets from Loundougou and Pokola were organized and analyses will be completed by October 2003 for integration into the CIB management plan. Density estimates confirm trends in reconnaissance data demonstrating the critical importance of the Kabo FMU for large mammal conservation in the landscape. These data sets will be further analyzed to test and refine the biological landscapes and conservation landscape models developed for landscape species (Activity 1.6).

Large mammal use of timber roads:
The 30 km road between Park Headquarters in Bomassa and the Ndoki Research Station was monitored between October 2002 and February 2003 of this reporting period, completing four circuits. Monthly surveys of large mammal sign along two secondary roads (16 km Mombongo and 15 km Bonyo) in the Kabo concession were continued during this period to improve understanding of the effects of timber road networks on large mammal populations. High levels of elephant and buffalo activity were registered in the Mombongo area. The road surveys from the safari zone

demonstrated a high level of elephant, buffalo, and leopards. Datasets are being compiled for a comparative analysis of the roads.

A spotted hyena was killed in the Makao area and its skin and skull delivered to the project. Like in Kabo, the people of the Motaba indicate that this animal is not known to historically occur in the area. No further hyena sign was recorded in the Kabo FMU during this period.

Activity 1.6. Physical Landscape and Habitat Types
On track

Land cover mapping:
GIS data are continually collected throughout the Ndoki-Likouala landscape, using satellite imagery, aerial photographs and ground truthing. This creates accurate land cover maps of the area that allow the projects to keep track of threats and react accordingly, as well as to develop a more complete picture of the various habitat types important to each of the landscape species. Nadine Laporte and Tiffany Lin visited the CIB concessions in March 2003 to further refine land cover mapping of the Kabo, Pokola, and Loundougou concessions (see also Activity 2.6).

Landscape models for the landscape species:
During this reporting period, the draft biological and human landscape models developed in August 2002 were further refined and, in addition, initial conservation landscapes were produced. Drs. Samantha Strindberg, Fiona Maisels, and Karl Didier updated the biological landscapes for the five landscape species: elephant, chimpanzee, forest buffalo, bongo, and dwarf crocodile. These revised and improved models take into account the vegetation preferences of each species, its use of different types of forest clearing and the impact of access to water on its behavior.

The human landscape models were updated and adapted to reflect changes in the level of those threats that impact the landscape species most severely. Separate models were developed for each of the landscape species. The same threats that went into the landscape species selection process were made spatially explicit: population pressure, access (via navigable rivers and large roads), cable snares, automatic weapons, commercial hunting and unsustainable safari hunting.

The biological and human landscapes were overlaid to produce the conservation landscapes. This allows us to prioritize areas that will receive monitoring and conservation efforts (interventions). These conservation landscapes contrast areas of different biological value (high, medium and low) against the different levels of threat (high, medium and low). The conservation landscapes form the basis for (a) determining key areas of human-wildlife conflict and (b) monitoring the impacts of conservation efforts (see Appendix 1).

Biochemistry and zoogeomorphology of forest clearings (bais and yangas):
Sarah Elkan (WCS PROGEPP coordinator) analyzed data from the results of soil and rock sample chemical analyses at the University of Minnesota Department of Water, Soils and Atmospheric Science. She further examined forest clearing formation and distribution questions using GIS techniques and refined the Ndoki-Likouala landscape cover for forest clearings separating yangas from bais. By employing remote sensing, aerial photographs and GIS tools in spatial investigation of clearings this investigation aims to determine the origin of yanga and bai forest clearings, develop understanding of their importance in the landscape, and produce recommendations for monitoring and conservation of key habitat areas.

Activity 1.7. Large Mammals and Human Use Patterns in the LTCR
On track

Building upon the theme of working with communities to promote sustainable natural resource use practices, the LTCR project began a second phase of socio-economic surveys in October. The first survey involved the collection of baseline information on the number of Reserve inhabitants successfully engaged in various types of animal husbandry; on the amount of income that is being generated from this type of engagement; and the problems encountered in the process of engagement. Results from this survey will provide needed information to increase the probability of income generation through the implementation of alternative activities.

OBJECTIVE 2: Strengthen local, on-site protection and management of biological resources across the landscape.

Effective and sustained protection of nature reserves and management of biological resources in the region require critical assessments of threats, actions directed to addressing those threats, and the capacity of on-site stakeholders to manage both protection and sustainable use. The BCLS uses threats assessments to guide program actions, continually strengthen local technical and managerial capacity, develop motivation to monitor resources, adapt to threats, and adopt alternative production systems where appropriate. This component focuses on protected area management and financing (NNNP, LTCR), wildlife management within forestry concessions (MFEE, community and CIB and Rougier staff), safari hunting concessions (in the case where safari is re-opened by the Government of Congo), and adoption of ecologically sound practices to improve forest management (in collaboration with CIB and Rougier).

Activity 2.1. Law Enforcement
On track

NNNP:
Regular patrols within NNNP were conducted by MFEE and BCLS staff from both the Bomassa and Makao bases. Bomassa protection teams completed eight patrols during this reporting period, seizing three elephant tusks and discovering two elephant carcasses. In addition, four illegal hunting camps were destroyed in the western sector of the park, close to the border with CAR. During the same period, Makao ecoguards completed eight patrols in the northern and eastern sectors of the park, with some patrols crossing the park boundaries to operate in the neighboring logging concessions located to the north. The first five patrols resulted in five arrests, the discovery of one hunting camp and the seizure of a gun, with several patrols finding no signs of human incursion inside the Park. However, three patrols in July 2003 resulted in the discovery of five gorilla and one elephant carcass, the destruction of 28 hunting camps, the seizure of three guns and 41 cables, and three arrests.

Although these figures include seizures made on both sides of the northern boundary of the Park, they still constitute an alarming increase in poaching activity. In response, two fixed ecoguard posts have been constructed within the park, and the frequency of patrols increased so that both posts are permanently manned. This means that at any given moment there are at least two ecoguard teams operating in the northern and western sectors of the park, with an additional mobile team operating along the northeastern border of the park. It is thought that the dramatic increase in illegal activity in the northern sector of the park is perpetrated by immigrants from the Central African Republic who have established illegal camps on the northern banks of the Lopio and Mokala rivers, which form the northern and eastern limits of the Park. During the same period Bomassa ecoguards took part in twelve binational or trinational protection patrols. Seizures included over 2,000 cable snares, with sixteen arrests made.

LTCR:
Funding from the US Fish and Wildlife Service enabled the implementation of a conservation education and anti-poaching program. These programs were designed to increase awareness that hunting of protected species is illegal and will not be tolerated by the government of Congo and to assist with the enforcement of Congolese conservation laws. They are also intended as a forum for discussing strategies that can be used to reduce and/or eliminate illegal hunting and the transport of protected species, and to educate the community about the source and spread of the Ebola virus. Of note is that a series of meetings with village elders and notables resulted in the voluntary relinquishing of nine military weapons by five villages. The residents of these villages worked closely with the Reserves' Conservator to convince those in possession of illegal weapons to relinquish them voluntarily, with the understanding that they would remain anonymous and not subject to arrest. The village elders who worked towards this goal also felt that it would demonstrate their commitment to conserving and wisely managing their natural resources.

Activity 2.2. Law Enforcement and Wildlife Management in Forestry Concessions
On track

During this reporting period, PROGEPP field patrol efforts by 4-6 MFEE officers working with 38 ecoguards in the CIB concessions entailed: 966 patrol days at fixed posts controlling vehicles, 134 on mobile patrols in the forest, and 22 trinational patrol days. These efforts (not including trinational patrols) resulted in seizure of 7,431 wire snares, 62

shotguns (involved in wildlife law violations), two elephant rifles, and ten ivory tusks (four of which were found in the forest). A total of 68 legal charges were addressed against violators during this period including 27 against CIB employees and 41 for non-CIB employees. Six charges were for protected species poaching violations.

Compared to the previous reporting period there has been a marked increase in seized items and patrol effort. These increases reflect the expanded zone of action to southern Pokola and Loundougou and an increased number of ecoguards. A high level of discipline and intensive instruction resulting from the October 2002 training has been generally maintained. A control post was established on the Ndoki River in the Pokola FMU where CIB has opened a road with a ferry crossing to the north of Ikelemba village.

Activity 2.3. Conservation Awareness and Education Initiative
On track

Peripheral Zone:
Two PROGEPP educators implemented the ongoing conservation awareness campaign working actively with the communities of Kabo, Pokola, Ndoki 1, Ndoki 2, Gatongo, Leme, Konda, Ngandzikolo, Gatongo, Djaka, Mbirou, Mbouamboua, Mboua, Mobangui, Bène, Toukoulaka, Dzèlo, Attention, Minganga, Mbili, Mossombo and Ouesso. A total of 1001 people participated in different meetings including CIB employees, non-CIB local community members, hunters, and Bendjele pygmies. Objectives of these sessions were to provide information on and discuss protected species, hunting techniques, hunting regulations, conservation and management principles, and relations between the project, the logging company, the Government, and local communities.

Following the outbreak of the Ebola virus registered in the Cuvette area in and around Odzala National Park in early 2003, an Ebola education component was quickly developed in collaboration with the WCS Field Vet Program to raise awareness and inform the population in the region. Local NGO partner Association pour la Protection des Ecosystemes Tropicaux et du Developpement de la Region de la Sangha (APETDS) used the Ebola education module to promote understanding amongst the communities in and around Ouesso. Ouesso receives bushmeat from high-risk areas such as Liouesso and Sembe in the periphery of the Odzala National Park. Several meetings were held under the auspices of the Prefecture of the Sangha to publicize the Ebola issue, calm the local population, and introduce directives such as banning of primate hunting to reduce risk.

During this period conservation education lessons continued at Kabo and Ndoki 2 nature clubs with a 30% increase in participation level overall. The protected species education manual was further edited and graphics added for publication. Chapters will be under expert review in September and the manual should be published shortly thereafter. Connie Clark has been asked to take the lead in the final edits of the manual.

NNNP:
A BBC team spent three weeks filming in and around the NNNP during March 2003, producing a documentary examining the ecosystem of the forest floor. The NNNP has also benefited from increased exposure on local television and media during the reporting period. A film team sent by the Office of the President of Congo visited the Park in June 2003 as part of an effort to produce a promotional video of the country's national parks, while a film team from Congo Television is due to visit in September 2003 to film a documentary in the Goualougo Triangle and two bais in the park. The official meeting to adopt the NNNP management plan in June 2003 also received widespread media coverage on both television and radio, increasing the profile of the Park with national audiences. BCLS staff also continued to update the WCS-congo web site, with French translations ensuring that the site is accessible to people within Congo as well as internationally.

LTCR:
The LTCR staff prepared a series of presentations and seminars of the results of the WCS feasibility study. In total, they succeeded in giving presentations and seminars in 22 villages, to approximately 2,100 attendees. The reports indicate that the attendees are favorable to conservation. The attendees also expressed an interest in learning more about how to conserve and sustainably manage resources within their territories. All were interested in engaging in alternative activities; and most felt it was the governments' responsibility to compensate them when they experienced

wildlife-related crop damage or animal losses. The LTCR team used these meetings to continue their campaign to raise awareness of protected species laws and how these laws affect the local population.

Activity 2.4. Alternative Resource Provision
On track

Peripheral Zone:
The alternative activity program aims to decrease pressures on wildlife populations by: promotion of alternative income sources for local traditional people in place of commercial bushmeat hunting and promotion of local community managed activities that increase alternative animal protein availability (beef, chicken, fish, etc.) in the forestry concessions. Three national alternative activity technicians under the supervision of the CIB management plan coordinator and PROGEPP coordinator worked extensively at CIB sites and in the traditional villages of the concessions.

Highlights of progress during this period included: During this period CIB imported over 88 metric tons of frozen fish and chicken to feed the local population at a rate of 18-20 tons every two months. CIB has established links with local private merchants and agreed on price ceilings in exchange for electricity and cold room use at the Kabo and Pokola sites. Technical and material assistance to traditional farmers with the vaccination of 2,729 chickens in the Kabo and Pokola concessions and distribution of 275 m of wire fencing. Material assistance to local fishermen consisted of small loans to fishermen in the form of 3,300 m of fish net, eighteen rolls of line, and 69 boxes of fishhooks. Ninety beef cattle were imported and consumed during this period as a result of efforts to promote domestic consumption in Kabo and Pokola. Assistance to vegetable farmers consisted of the sale, at cost price, of 27 kg of seeds to farmers in the region.

Activity 2.5. Reduced-Impact Logging
On track

A remote sensing and GIS mission was undertaken by Nadine Laporte, Tiffany Lin (Woods Hole Research Center) and Patrice Gouala (MFEE) 22 March through 15 April 2003. In an effort to promote improved forest management and monitoring the following have been addressed by the WHRC team in collaboration with CIB and WCS: A landcover stratification map for the Pokola, Kabo and Loundougou FMUs has been created using a mosaic LANDSAT image 2000-2001; Description and comparison of forest cover types using results from CIB forestry inventories; Ground truthing verification of forestry maps using tree composition data and vegetation classing from CIB inventory data; Spatial analysis of the agriculture clearings around large population centers in the area (Pokola, Ngombé, Ouesso, Kabo); Estimation and monitoring of forest canopy loss over the period 1986-2001; Assistance to CIB's tracking of road progression and density; Development of indicators of exploitation intensity; Forestry and wildlife data basing. These tools are part of an ongoing process to monitor CIB exploitation activities and promote improved forestry planning.

In November 2002 CIB began to put in place a new pre-exploitation inventory to reduce direct damage by roads and felling. Two teams have been trained in new tree inventory methods and a GIS database system has been established in Pokola. CIB has developed a draft reduced impact forestry protocol with specific decision rules regarding exploitation techniques, road construction, etc.. WCS is in the process of reviewing this protocol to make recommendations to further integrate biodiversity conservation concerns.

Activity 2.6. Research Methods Training
On track

All research projects (See Activities 1.1 - 1.8) that occur within the NNNP and the Peripheral Zone include the participation of Congolese, either as lead researchers or as assistants. Monthly research meetings are held in Bomassa, to which all researchers and research assistants are invited to attend (and to give presentations). In addition, WCS technical staff are able to provide mentoring and on-the-job training to researchers at each of the three project bases.

Patrick Boudjan and Calixte Makoumbou attended the MIKE methods training course held in Somalomo in Cameroon between February and March 2003. Mustapha Mahmadu and Brice Mowawa are both receiving training from elephant research staff Patrick Boudjan and Clement Inkambu-Nkulu respectively. Training in plant identification and paleaoecological soil sample collection was received by Mireille Hockemba, during a visit by David Harris and Terry Brncic from the University of Oxford. Jean-Robert Onononga received training in marked-nest survey methods from David Morgan and Crickette Sanz. Between March and July 2003, two students from the Institute of Rural Development at the University of Brazzaville were hosted at Bomassa to complete their undergraduate project. Lena Ofunguini conducted a study of buffalo behavior and frequentation of Wali Bai, and Jacques Dhozi conducted a survey of termite mound abundance in different forest types, in relation to chimpanzee tool use.

John Poulsen held a workshop in Bomassa in June 2003 for national researchers, on methodological issues of estimating animal population densities using line transect sampling and the DISTANCE software. A total of seven participants attended the seminar, including five researchers from PROGEPP, and two from NNNP.

In August/September 2003, a research methods training course was held at Bomassa in NNNP. This training given by Dr Emma Stokes and consisted of a three-week course on conservation research methodology based on the WCS training manual developed by Lee White and Ann Edwards. Course participants included five recent graduates from the Institute of Rural Development of the University of Brazzaville, together with five WCS researchers from PROGEPP, LCTR and the Makao base of NNNP. The five WCS researchers received a refresher course on research methodology. In addition, given the difficulties of transportation between NNNP and LTCR, this provided an opportunity for the two LTCR researchers to discuss ideas with researchers from different projects.

Activity 2.7. Technical Training
On track

In addition to mentoring in scientific research (Activity 2.7) daily project operation at NNNP also includes long-term mentoring of Park administrative and management staff. There has been particular focus during the reporting period on increasing the involvement of national staff and MFEE officers for the preparation of activity budgets and workplans, as well as the development of funding proposals.

- Djoni Bourges-Djimbi, National Park conservator, was increasingly involved in the preparation of workplans, budgets and proposal development for project activities during the reporting period, developing a detailed strategy and budget for the increased level of protection patrols within the park. In April 2003, Mr Bourges attended a 3-week workshop in the USA on the environment and sustainable development, as part of the US State Department's 'International Visitor Program'. This included a series of lectures and seminars on different aspects of national park management, funding and themes such as environmental education, as well as visits to different US parks to see how management systems are implemented.
- Christian Somnte-Mapo, head of personnel, took on additional responsibilities for project accounting, and continued to receive training in the use of Access database management.
- Rolland Abegouo, logistics coordinator, took over responsibility for the daily coordination of project logistics, particularly concerning the Park's ecoguard missions and satellite research projects, and continued to receive training in the use of Access databases.

Bomassa ecoguards took part in a training session at the Kabo Law Enforcement Centre in April/May 2003. The ecoguards received three weeks of training at the Kabo base followed by two weeks of field operations training in the forest concession. Trainers from WCS, MFEE, Regional Direction of Forestry Economy (RDFE), and the Likouala and Sangha Armed Forces instructed the ecoguards on wildlife laws, CIB interior regulations for wildlife management, sports, arms training and discipline, logistic, patrol techniques, GPS and forest navigation.

The PROGEPP project director, project coordinator, and project administrator mentored MFEE officers, ecoguards, educators, administrators, and national researchers in project management, education, forest/wildlife management, research/monitoring and GIS data-basing. All staff team leaders and researchers are trained in use of computers (Excel, Word) and mentored in work plan development, budgeting and reporting on weekly, monthly, six month and annual cycles. GIS and English language skill development are encouraged particularly for researchers.

PROGEPP national staff development highlights (in addition to the training of new young researchers Activity 2.7) included:

- Marcel Ngangoue, PROGEPP brigade leader was awarded a scholarship to pursue advanced degree study in protected area management at the Garou Wildlife College in Cameroon. Mr. Ngangoue has been integral to PROGEPP's success over recent years. Mr. Dieudonne Mozika took up temporary oversight of the mobile brigade after Mr. Ngangoue's departure in August, awaiting designation of an official replacement.
- Antoine Moukassa, continued to oversee socio-economic research activities, participated in a Wildlife Hunting and Trade meeting at Lope Reserve in Gabon in January and presented his work at the World Parks Congress in Durban in September.
- Richard Malonga, ecological researcher, attended a three-month English language training course in London. He will began study at the University of Minnesota in September.
- Michel Sienzo, education team leader, has played an active role in developing the Ebola education component and continues to expand his responsibilities.
- The intensive ecoguard training program of September-October 2002 was followed up by a five-week refresher training course in April-May 2003 in Kabo. Military experts from the Sangha and Likouala assisted this refresher training along with Ministry experts in wildlife law. This training helped contribute to the maintenance of a high level of discipline and moral overall during this period.

Activity 2.8. Development of Ecotourism Activities
On track

The government of Congo has expressed a keen interest in developing ecotourism within its protected areas. Despite the difficulties associated at present with travel in Congo, which limits the number of potential tourists, the NNNP team has begun to slowly develop a strategy for welcoming visitors to the Park. During the first half of the reporting period the Park received several groups of tourists and other visitors, including visits from two tour companies who have subsequently contacted Park management with a view to sending regular groups of visitors to the park. Along with existing contacts in the UK, Japan and Gabon, there are now several tour companies who have expressed an interest in sending regular groups of visitors to the park. During the second half of the reporting period the number of visitors was reduced to allow for redevelopment of the tourist facilities, and this redevelopment will continue over the coming months.

Activities 2.9. Integration of Forest Peoples Communities into Management
On track

An expert consultancy on forest peoples in the peripheral zone was undertaken by Dr. Christian LeClerc in March-April 2003. Dr. LeClerc worked closely with PROGEPP researchers Antoine Moukassa and Kimbembe Bienvenue to assess existing information and undertake a comparative assessment between the Bendjele populations around the town of Pokola and those in the Mbandza area that has not yet been touched by logging exploitation. Dr. LeClerc produced a draft report providing recommendations for consideration in management planning in the CIB concessions.

BCLS socio-economic databases were expanded during this period with information on Bendjele communities and other peoples living in the Mokabi concession and updating of demographic databases for the Kabo, Pokola, and Loundougou concessions. Antoine Moukassa and Kimbembe Bienvenue undertook surveys of traditional land tenure zones in the Loundougou FMU in order to propose wildlife management zoning and identify sacred areas to be taken into consideration by the CIB management plan. Surveys will be completed in collaboration with the Motaba population in October –November 2003. Zoning identified through these studies has been used to develop a template for discussion with local populations and eventual adoption for wildlife management in the Loundougou FMU.

OBJECTIVE 3: Promote the development of national policies that support the landscape conservation approach.

While successful landscape conservation requires building local constituencies, effectively protecting reserves and defining and implementing alternative production options, it also requires policy support in many areas. The BCLS project aims to integrate - conservation interests in national policy initiatives. Specifically, the BCLS team emphasizes the development of participatory policy initiatives focused on conserving critical habitat for landscape species, both inside reserves and outside protected areas (Peripheral zone recognition, incentive structures for low-impact forestry, regulation of forestry practices, community wildlife management, safari hunting policy). We use the NNNP and CIB forestry programs as models to promote the concept and legal standing for effective protected areas, buffer zones compatible with conservation objectives, and improved management of forestry on ecological and social grounds.

Activity 3.1. Wildlife Law
Delayed

The wildlife law has been sent by the Ministry of Forestry Economy and the Environment to Parliament for finalization and adoption. Once adopted the Ministry will design and finalize an application decree in consultation with national and international partners. WCS will work through this forum to assist the Government of Congo in Brazzaville with this process.

Activity 3.2. Wildlife Management Workshops
On track

A proceedings document was drafted on the results of the late July 2002 US Department of State sponsored workshop on "Wildlife Management and Conservation in Forestry Concessions in the Republic of Congo." The proceedings will be translated into French in the coming months and published for circulation.

Activity 3.3. Safari Regulations
On track

WCS has continued to consult with the MFEE on safari issues and monitor safari interest in Congo. No safari lobby activity was observed in Congo during this period.

Activity 3.4. Wildlife within Forestry Concessions
On track

Over this period the PROGEPP director, coordinator and other staff worked to influence policy on wildlife management and conservation in timber concessions on national, and international levels through a variety of fora. A paper entitled "Wildlife management in forestry concessions in northern Republic of Congo." Elkan *et al.* was submitted for publication in a book: Emerging Threats to Tropical Forests (editors William Laurence and Carlos Peres). The book will bring together significant pieces of work on the most critical threats to tropical forests in the world today.

Antoine Moukassa presented two talks at the World Parks Congress in Durban South Africa in September:

- "Hunting management in a timber concession in the Republic of Congo"
- "Building private sector support for conservation: the case of CIB in the Republic of Congo"

The World Bank CEO Forum was suspended due to discord between private sector representatives and the World Bank regarding new fiscal developments in the forestry sector in Congo and Gabon. Significant increases and expansion of the taxation systems by these governments, following some recommendations from the World Bank, have had an important impact on the private companies in the region.

OBJECTIVE 4: Elaborate a participative, integrated landscape conservation action plan.

The elaboration of a landscape conservation plan will provide an adaptive management framework for the area, permitting the application of results of project studies and other partner experiences. The development of such a plan involves careful assessment of threats to landscape species and biodiversity more generally, assessment of land-use patterns and categories as well as resource use, institutional assessments to determine appropriate implementing agents, and the construction of a co-management system among relevant organizations and partners. The plan will facilitate development of a consensus-based landscape conservation strategy, with subsequent monitoring of changes in the quality and quantity of landscape habitat. BCLS work in the Ndoki-Likouala region is framed in the landscape perspective, integrating park protection and surrounding resource management across the boundaries of land-use categories. However, the action plan activities proceeds on the ground in stages: management plans are being derived for each major land-use zone (two protected areas, four forestry concessions). As such, each plan is designed collaboratively with stakeholders specific to the site (government agency, forestry operator, and communities), and will be executed by these parties. Project staff (MFEE and WCS) continually promote integration of these plans across the entire landscape.

Activity 4.1. Coordination Meetings
On track

During this reporting period, two BCLS Ndoki-Likouala meetings took place (NNNP-PROGEPP-LTCR teams) to discuss landscape conservation coordination and prepare proposals for submission to CARPE under the Congo Basin Initiative. Regular contact is facilitated by daily radio communications among the three sites.

Bi-annual meetings regarding the Kabo-Pokola-Loundougou forest management plan provide a formal context for interaction of the Ndoki-Likouala partners, MFEE and RDFE representatives, private timber companies, donors and other stakeholders. Upon adoption of the NNNP management plan (Activity 4.4) a similar formal steering meeting system will be established, further promoting information exchange and collaboration on issues particularly related to the Park's management.

The annual PROGEPP steering committee meeting was held in May in Pokola involving the participation of Dr. Eva Mueller, ITTO, Jean-Laurent Pfund, Swiss Government, Dr. Hinrich Stoll, CIB, and various CIB, WCS and Ministry representatives. The progress made by the project has been significant in addressing threats to wildlife in the CIB concessions and promoting improved management measures. Recommendations were made to assess the future financial situation of the project given that the ITTO grant will be coming to an end in June 2004.

In May 2003 a trinational technical coordination committee meeting was held in Kabo. Representatives from GTZ, WWF, WCS, and the Governments of Cameroon, Congo, and CAR took part in discussions and definition of joint activities to improve conservation management in the region and address cross-border threats.

Activity 4.2. Kabo-Pokola-Loundougou Management Plan
On track

PROGEPP continued to contribute to the development of the CIB concession management plan during this period through analysis and reporting on the CIB wildlife inventories, support of Dr. Laporte's work on monitoring and land cover mapping, wildlife management programs, socio-economic and ecological studies, alternative activity program development, and conservation education in the concessions. Mr. Pierre's work on socio-economics contributed to the outlining of that chapter of the management plan.

PROGEPP representatives participated in the CIB management plan steering committee meeting in November 2002. These meetings reviewed reports, work plans, and budgets and oriented strategies for the CIB management planning process. PROGEPP staff and CIB management plan team have established a schedule to work with consultants and other experts to draft wildlife management/conservation, socio-economic, and monitoring chapters for the management plan for the Kabo, Pokola, and Loundougou concessions. A first draft of the various chapters will be due in December 2003. Given this schedule, the plan is likely to be adopted in mid-2004.

Activity 4.3. Mokabi Concession Management
Partially Delayed

The new fiscal constraints being imposed by the Government of Congo has affected the private timber companies significantly. These changes disrupted discussions with Rougier–Mokabi regarding collaboration on wildlife management in the concession. A draft agreement was submitted by WCS to Rougier and the Government of Congo. The Government of Congo has indicated that it would like to sign the agreement as soon as possible, however Rougier has not yet responded.

PROGEPP staff drafted preliminary wildlife management guidelines for the Mokabi concession based on the findings of BCLS ecological and socio-economic research and the lessons learned from the CIB concessions. WCS-PROGEPP provided training for the Rougier wildlife survey teams and other Likouala based companies in early 2003. These data will be used to design and develop an adaptive approach to wildlife management and conservation in the Mokabi concession.

Activity 4.4. Protected Area Management
On track

NNNP:
The official public meeting required for the adoption of the NNNP management plan and the annexation of the Goualougo Triangle to the park was held in June 2003. The meeting was chaired by Henri Djombo, Minister of Forestry Economy and the Environment, and brought together all stakeholders in the NNNP, including representatives of the local populations living near the park borders, local, regional and national officials, and representatives of partner organizations such as local NGOs. The plan was adopted and the Goualougo Triangle annexation was officially signed.

LTCR:
Recommendations from the WCS feasibility study outlined the need to evaluate the Reserve borders with the goal of including swamp forest that lies between the CIB logging concessions and the current Reserve borders (west and north of the Reserve). The recommendation to do so was made with the stipulation that these areas needed to be surveyed and gorilla densities verified before any changes were officially proposed. Additional information on the value of this possible inclusion, to elephants as they migrate, was also deemed essential. Collection of baseline information in the proposed addition will be a priority over the next project period.

New co-directors for the LTCR project were recruited during this reporting period. They have been active in meeting the Reserve's communities in addition to project management. The team received very warm and friendly greetings by the local populace, and an understanding that the population is fully behind LTCR project efforts in the Reserve.

c. Key management issues

- The placement of the sawmill and camp, which will soon be constructed in the Loundougou logging concession, is a matter of extreme importance for the future integrity of NNNP. CIB, has selected a site which is just 15 km from the park boundary for the sawmill and 19 km for the camp. The area currently has no human population and lies within the catchment area of the Loundougou river. By relocating the sawmill another 10 kilometers further to the north, to an existing settlement on the Motaba river, CIB could avoid the massive increase in population pressure associated with locating a settlement so close to the NNNP boundary, as well as the high risk of polluting the ecologically important headwaters of the Loundougou river. Additionally, the alternative site would bring a much-needed economic boost to an important population center. Discussions are currently ongoing between WCS, CIB and the government concerning this issue but progress has been limited.
- It is hoped that an expanded ecoguard program from both Bomassa and Makao bases will help to reduce the growing number of illegal incursions into NNNP that have been recorded over the last two months. Two fixed patrol posts have been constructed within the park to ensure that there is a permanent ecoguard presence in those areas that are judged most susceptible to the threat of poaching; in the short term this permanent presence should

mean that the park boundaries are once again respected. However, in the longer term, this task will become increasingly difficult as the population around the park continues to expand, particularly in the northern and western sectors. It is also probable that pressures on the eastern boundaries will increase once the Loundougou logging road has been opened.

- The issue of the management status of the Djeke and Bomassa Triangles will be discussed in the coming months with the Government and CIB. CIB has been informed of the importance of the Djeke area for gorilla populations and received technical reports from the Djeke gorilla research program. CIB has formally stated that it does not plan to exploit the area before 2004 and that the issue will be treated under the concession management planning process during the course of 2003 in consultation with the Government, WCS and other parties.

III. Success Stories

- The official public meeting required for the adoption of the NNNP management plan and the annexation of the Goualougo Triangle to the park was held in Ouesso in June 2003. The meeting was chaired by Henri Djombo, Minister of Forestry Economy and the Environment, and brought together all stakeholders in the NNNP, including representatives of the local populations living near the park borders, local, regional and national officials, and representatives of partner organizations such as local NGOs. The plan was adopted and the Goualougo Triangle annexation was officially signed.

Appendix

1. Preliminary Biological, Human & Conservation Landscapes for the Ndoki-Likouala Conservation Area

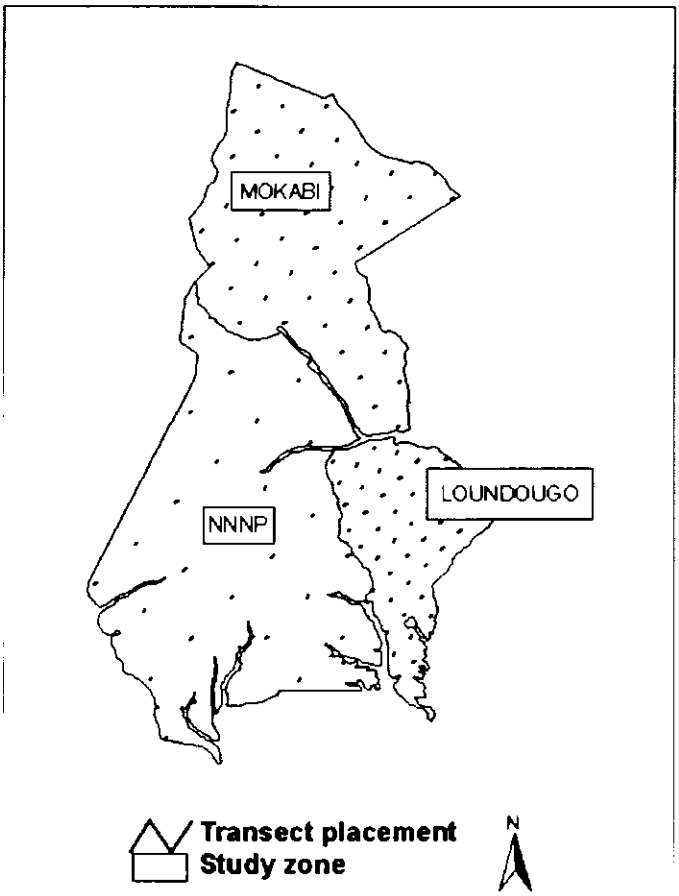

Figure 1. Final MIKE survey design for NNNP and buffer zone.

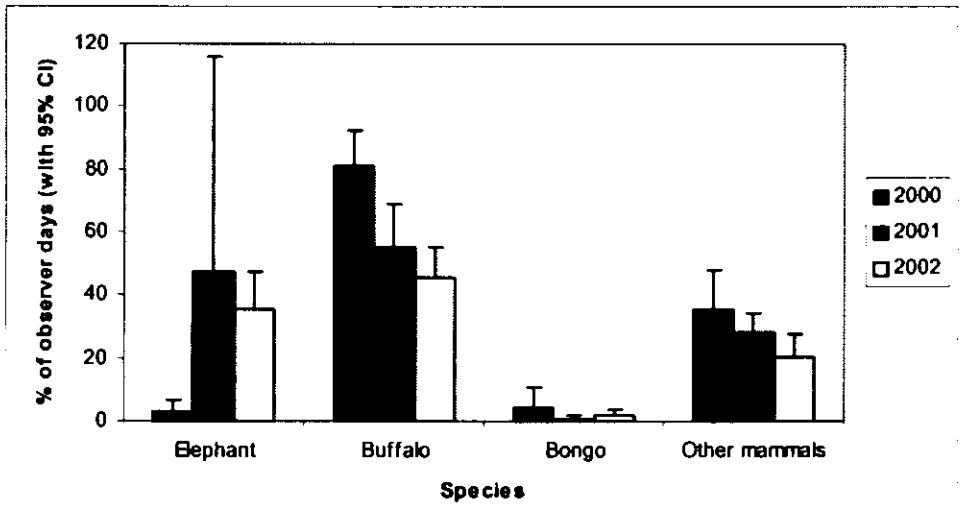

Figure 2. Presence of large mammals in Wali Bai (2000-2002).

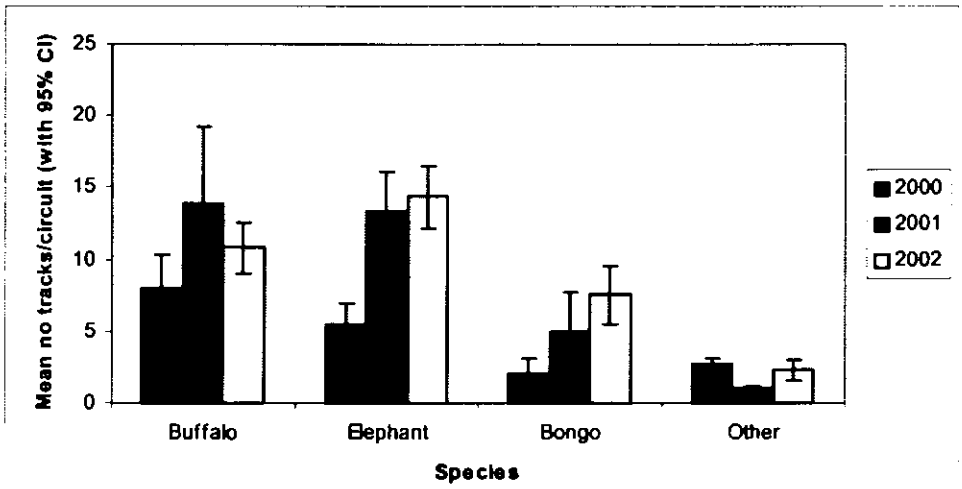

Figure 3. Presence of tracks of large mammals around Wali Bai (2000-2002).

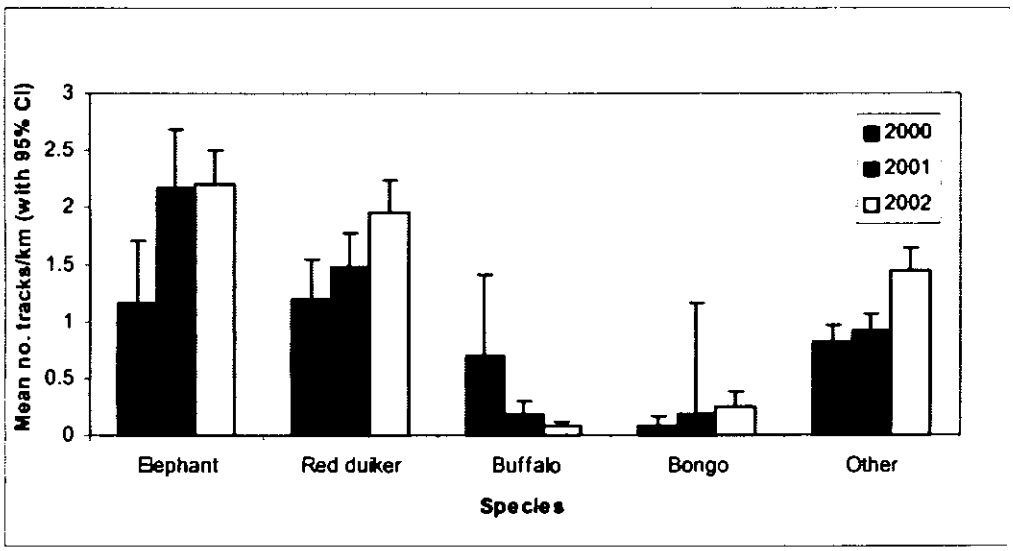

Figure 4. Presence of tracks of large mammals on the Bomassa-Wali trail (2000-2002).