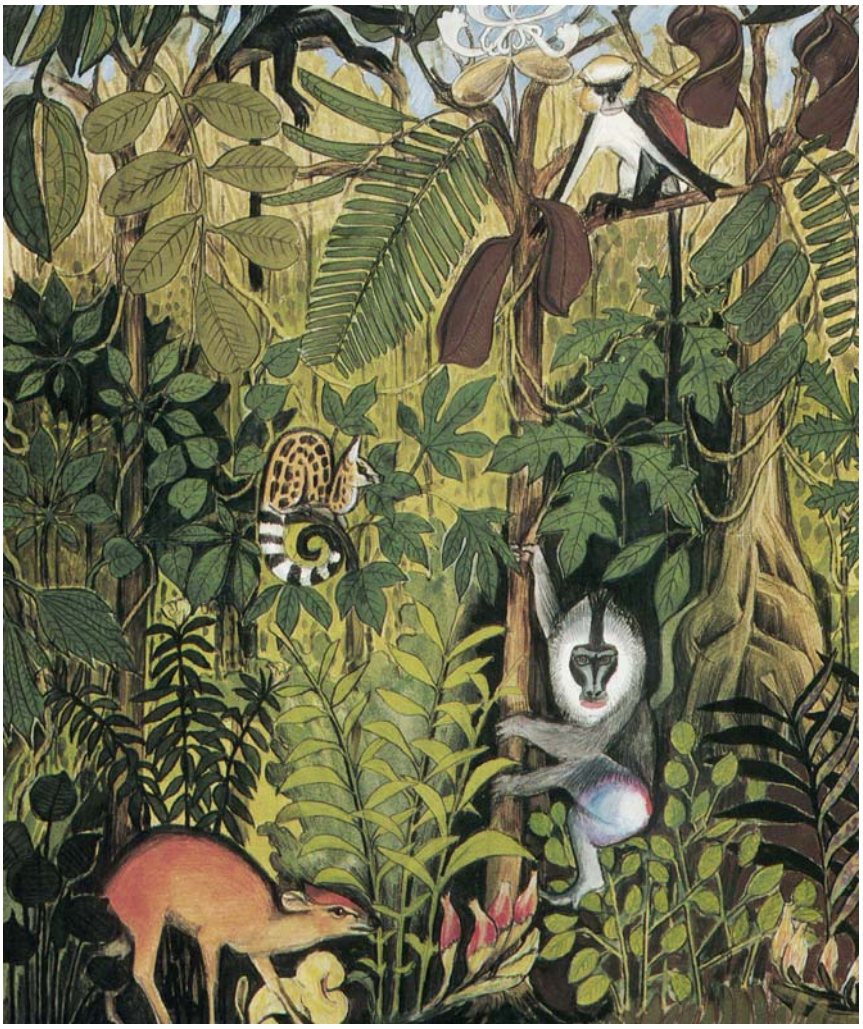
Devising solutions to bushmeat exploitation in the Sanaga-Cross region, W. Africa.



Annual Report 2002

Darwin Initiative for the Survival of Species

Annual Report

1. DARWIN PROJECT INFORMATION

Project title	Devising solutions to bushmeat exploitation in the Sanaga-Cross region, W. Africa.
Country(ies)	Nigeria, Cameroon, Equatorial Guinea.
Contractor	Durrell Wildlife Conservation Trust/WildCRU University of Oxford
Project Reference No.	162/10/004
Grant Value	£216,018
Start/Finishing dates	Oct 2001 – Sept. 2003
Reporting period	Oct. 2001 – Jan. 2003

2. PROJECT BACKGROUND

The loss of tropical forest wildlife through the bushmeat trade is in some areas a threat even greater than deforestation. The problem is multi-disciplinary, since there are linkages between the socio-economics of consumers and hunters, and the ecology of the hunted species. Bushmeat is utilised by a wide range of rural and urban communities throughout Africa. Peoples of a wide range of socio-economic backgrounds and levels of access to wildlife are involved. Although the extent of use differs according to communities and countries, a clear trend exists in that demand is high and increasing. Bushmeat is crucial as a source of cheap protein for malnourished people throughout the continent. Inadequate diets and lack of purchasing power has resulted in malnourished peoples that are relying further on what naturally occurs to supplement their agricultural or livestock livelihoods. Human populations are increasing and standards of living are generally falling, thus pushing the demand for bushmeat to rise. Depletion of wildlife valued as a source of meat will have a negative impact not only on many species, but also importantly on food security. As such, this currently represents the most serious challenge in conservation in Africa. As this resource declines not only are a larger and more diverse range of species being targeted, but commercial trade is now an important supply mechanism that is gradually replacing subsistence hunting.

There is an urgent need to integrate wildlife research with studies on the critical socio-economic and cultural role that bushmeat plays to many people in Africa. The bushmeat crisis epitomises the need to balance protection against such factors as poverty, health, and food security. Key issues such as nutritional status of the human populations, standards of living, stakeholder interrelationships, provision of alternative sources of protein, as well as biological questions such as the viability of hunted species populations and their habitats are pivotal to deciphering the dynamics and parameters of the bushmeat crisis.

The few studies on bushmeat hunting in Africa are scattered, are generally not spatially explicit and have focussed primarily on biological questions. There is an urgent need for an integrated approach. Our project concentrated on an area of significant biodiversity in tropical Africa - the Sanaga-Cross Rivers region (Cameroon and Nigeria), and including Bioko Island (Equatorial Guinea). We gathered information on amounts of bushmeat extracted, and use of bushmeat by inhabitants of the region. All data will be integrated into a Geographic Information System (GIS). Our study has field-tested a methodology that can be applied elsewhere in West and Central Africa.

The following is a list of all persons participating in the project:

Project Team

Project Leaders:	*Dr. John E. Fa, Durrell Wildlife Conservation Trust, Jersey, UK.* *Prof. David MacDonald, WildCRU, University of Oxford, Oxford, UK.*
Project In-Country Coordinators:	*Ms. Sarah Seymour, Nigeria Project Coordinator.* *Mr. Jef Dupain, Cameroon Project Coordinator.*
Project Statistician:	*Dr. Paul Johnson, WildCRU, University of Oxford, Oxford, UK.*
Project Economist:	*Ms. Lise Albrechtsen, WildCRU, University of Oxford, Oxford, UK.*

Collaborators

GIS Modelling Team:	*Dr. Rajan Amin, Institute of Zoology, Zoological Society of London, London, UK.* *Dr. Guy Cowlishaw, Institute of Zoology, Zoological Society of London, London, UK.* *Dr. Marcus Rowcliffe, Institute of Zoology, Zoological Society of London, London, UK.* *Mr. Keith Thomas, Institute of Zoology, Zoological Society of London, London, UK.* *Prof. John Oates, Hunter College, University of New York, New York, USA.* *Mr. Richard Bergl, Hunter College, University of New York, New York, USA.*

Human Nutrition Team: *Dr. Janet Cade, Nuffield Institute of Human Nutrition, University of Leeds, Leeds, UK.*
Dr. Darren Greenwood, Nuffield Institute of Human Nutrition, University of Leeds, Leeds, UK.

Bushmeat/Food Security Team: *Dr. Diana J. Bell, Centre for Ecology, Evolution and Conservation, School of Environmental Sciences, University of East Anglia, Norwich, UK.*
Ms. Sarah Ryan, Centre for Ecology, Evolution and Conservation, School of Environmental Sciences, University of East Anglia, Norwich, UK.
Dr. Jessica Meeuwig, Department of Biology, University of Montreal, Montreal, Canada.
Mr. Dominic Currie, Durrell Wildlife Conservation Trust, Jersey

3. PROJECT OBJECTIVES

	Verifiable indicators of Success:	**Means of verification:**	**Assumptions:**
Goals *To assist countries rich in biodiversity but poor in resources with the conservation of biological diversity and implementation of the biodiversity convention*			
Purpose			
For the study to provide a model of the bushmeat problem in general. To develop an integrated solution to the over-exploitation of wildlife in lowland forest areas in Africa	Multi-layered databases assembled that describe succinctly the current situation of habitats and hunted species in a region, the level of over-exploitation and assesses the critical socio-economic role that bushmeat plays in Africa.	Publications in the form of immediately available working documents for decision-makers and papers in peer-reviewed journals.	The provision of written materials and electronic databases is pivotal to understanding the dynamics and parameters of the bushmeat crisis, and will be crucial to the resolution of the problem.
Outputs			
1) Landscape Ecology			
a. Inventories of extent and condition of forest areas in the Sanaga-Cross region. (12A)	Habitat classification system established. Protected areas, forestry concessions, industrial areas, extent of urbanisation mapped. Deforestation extent and trends determined.	Vegetation maps and other cartographic data (e.g. loss of forests) will be produced. Forest loss to be determined from historical remote sensing imagery.	Political support for the use of currently available cartography. Support from relevant institutions in Cameroon, Nigeria and Bioko Island. Full GIS support implemented.
b. Distribution and abundance of main hunted species within region. (12A)	Knowledge of condition of prey populations throughout the study region. Possibility of identifying source or sink areas of bushmeat species.	Deforestation information to be used in conjunction with hunting data below.	Availability of sufficient and realistic baseline information to predict distribution, abundance and hunting sustainability of prey species.

c. Assessment of actual and potential human impact on habitats. (12A)	Information available on human population densities and socio-economic conditions in the study region. Models developed to predict likely demand of meat. Spatial predictions of hunting impact on prey populations.	Published habitat suitability and abundance maps for prey species. Publication of sustainability maps. Determination of cost-effective, scientifically sound survey design to determine current population status of species in all habitat types within the region.	Access to topographic, road and fluvial maps for the region, and population census data. Development of realistic model assumptions on decline in prey densities relative to distance from hunter aggregations.
d. Risk assessment of high-priority prey species. (11A)	Predictions of the risk of extinction of chimpanzee, gorilla, drill, Preuss's guenon, russet-eared guenon, Ogilbyi's duiker, buffalo and elephant within the study region.	Database of human population status and extent of impact on environment in the region. Spatial extrapolation maps of potential demand for bushmeat based on accessibility to areas, and human population densities. Published information on linkages between landscape data and population viability analyses of the target species. Sensitivity analyses using VORTEX or RAMAS/GIS models. Detection of lacunae in data necessary for current and future predictions of species viability.	Availability of extraction rates for target species or understanding of realistic hunting scenarios to incorporate in a metapopulation modelling approach to assess risk.
2.) Understanding Supply and Demand Issues			
a. Assessment of value and limitations of using bushmeat markets as hunting barometers. (11A)	Ethnological and socio-economic understanding of function and workings of markets in west Africa, particularly in the study region. Statistical analyses of bushmeat market dynamics.	Published information on how markets perform by using empirical data collected in Bioko Island and Rio Muni in 1996-1997 (NB: although Rio Muni is not within the study region, it will serve as an example of a continental market site).	Data for Bioko Island and Rio Muni is representative of other market sites in the study area.
b. Understanding stakeholders in the bushmeat trade in the study region. (11A,12A)	Gross definitions of stakeholders in the bushmeat issue for the region: community stakeholders, external stakeholders, institutions etc.	Published review of stakeholders in the bushmeat trade within the study area.	There is enough information on stakeholder groups and their activities for the region.
3.) Seeking Alternatives			
a. Assessment of the protein deficiency issue in the region. (11A, 12A)	Advancement of understanding whether bushmeat is largely motivated by protein needs of low-income sectors of the population or whether it is a commodity product for high-income ones. Study of health and nutritional status of human population in the study region. Analyses of supply and demand of food and commodity products for the human population in the region.	Published review of household consumption patterns, dependency on bushmeat as a source of protein.	Public health studies carried out by non-biologists may be available for analyses.
b. Food production alternatives	Understanding of current agricultural production within the region.	Published analyses of agricultural production and potential for the study area.	Existing statistics of current agricultural practices and production are available and accessible.
4.) Consensus Building			
a. Identification of technological inputs and know-how required to better contribute to biodiversity planning in successive phases of the project.	Desk study and debriefing discussions with project team members and relevant organisations.	Final reports on inventory data, socio-economic conditions in the region circulated to relevant authorities for discussion.	Links with Cameroonian, Nigerian and Equato-Guinean authorities established.

None of the objectives have been modified over the last year.

4. PROGRESS

Timeline of Main Activities

2001

30 Aug.: Planning Meeting in the Durrell Wildlife Conservation Trust, Jersey. Workshops and presentations by Project Leader (Dr. John Fa) with in-country coordinators (Ms. Sarah Seymour, Mr. Jef Dupain) and Project Statistician (Dr. Paul Johnson).

Oct.: In-country co-ordinators travel to Nigeria and Cameroon for start of operations.

Nov.: Project Leader (Dr. John Fa) travels to Nigeria for planning meetings.

Planning meetings with Zoological Society of London staff (Dr. Guy Cowlishaw, Dr. Raj Amin, Dr. Marcus Rowcliffe)/Hunter College University of New York (Mr. Richard Bergl), on GIS.

2002

Jan.-Feb.: Project Leaders travel to Cameroon for planning meetings with in-country co-ordinators and project economist (Lise Albrechtsen).

Feb. – Apr.: Field trials and training of assistants in Cameroon and Nigeria start. Testing of nutrition surveys. Collection of socio-economic data for region.

May 2002 Project Leader (John Fa) travels to Bioko Island, Equatorial Guinea as part of biodiversity meeting organised by Conservation International. Discussions with University of Equatorial Guinea and EG nature conservation departments.

Aug.–Dec. Intensive field data collection – bushmeat market surveys, hunter interviews, alternative foods, and nutrition surveys.

There has been no major deviation of the agreed baseline timetable. Data collection was postponed from Nov 2002 until April 2003 until later in the year (2003) Aug. – Dec. 2003, to allow the purchase of vehicles and other equipment and training of personnel.

5. PROJECT'S RESEARCH, TRAINING, AND/OR TECHNICAL WORK

Overview

Our project differs from previous initiatives, not just in its wider geographical focus, but in its innovative "high-intensity short time-period" approach to data collection. We have used and trained a significant number of nationals to collect data in close to 100 different sites spread throughout the region. Data has been gathered systematically, simultaneously, in the same manner, throughout the study period. Inventories of the extent and condition of forest areas have been obtained from satellite imagery and cartography, and data on deforestation rates calculated using historical images. To determine human impact on habitats and threatened prey species we collected information on distribution and abundance of selected prey species within the region. We have also documented extraction levels, status of hunted species and importance of bushmeat (through explicit nutritional studies) to the different social sectors in the region. The study is novel because we have simultaneously deployed a number of key personnel throughout the region, to gather data in the same manner for the study period. From this information, an accurate and spatially explicit picture of the problem in a short space of time can emerge, and corrective actions to be taken suggested. During the process, much emphasis has been placed in training nationals and an end of project final workshop will be organised.

All data collected will be sent to publication by the end of 2003. GIS data in the form of thematic maps (vegetation, river systems, road networks, human settlements, protected areas), and those generated for use in prioritising areas of importance for conservation planning will be made available to the relevant organisations and government bodies.

Selection of Project Participants

The in-country co-ordinators were selected on the basis of their experience in the study area. Ms. Sarah Seymour was made responsible for the Nigeria project region and Mr. Jef Dupain for the Cameroon counterpart. Both have extensive experience in wildlife conservation in Africa and in particular in the countries of their responsibility.

Within each country, in-country coordinators were responsible for recruiting local participants. The project selected young Nigerians and Cameroonians to work as data collectors in the field. Because of the large area to cover, local participants were distributed throughout 90 different sites, from which information were collected. A total of 8 local researchers were employed by the project in Nigeria and another 9 researchers were used in Cameroon. All participants were trained in data collection, entry and analysis, and regular workshops were organised to track progress. The Assistants were also trained in report-writing and use of computers.

Data Collection

Estimates of Bushmeat Volume Extracted

Based on an initial period of prospecting undertaken within each country in the study area, a number of sites (villages) were selected for monitoring. These sites were spread out throughout the region, in line with the distribution of forest habitat and human population densities. Sites were selected as far as possible randomly for those identified from initial reconnaissance trips conducted throughout the sampling areas. However, the number of sites and the number of months monitored was affected by the cost of placing field assistants within an adequate number of representative sites. Discussions in planning meetings held in Cameroon in Jan. 2002 with all project members revealed that the most cost effective approach to gathering the required information was to undertake a more intensive data collection period, since it was economically impossible to cover all study sites for a 12-month period. The conclusion was that data on bushmeat extraction would be collected for the same months in the same year in Nigeria and Cameroon. Budgeting allowed for five complete months in around 100 sites to be monitored. Field data collection commenced in July 2002.

In Nigeria, three field assistants who logged all markets within the Cross River State conducted the initial reconnaissance. The area stretches from Calabar along the coast to the town of Ikom in the north. Information on availability of foodstuffs in general and bushmeat in particular also investigated the associated trade routes. Village selection was determined in order to ensure the greatest coverage of the area. We selected and employed seven nationals in the data collection phase; each was responsible for an area with between 4 and 9 data collection points. Each village or market had a local collaborator who collected information for 6 days per week on availability in markets of domestic meat, bushmeat and fish. The local collaborators worked in their home village only to decrease the suspicion of an 'outsider' collecting information on their community. There was one assistant specifically trained to undertake the nutrition interviews. He linked up with research assistants' areas to cover the same villages. In Nigeria there were 45 data collection points of a range of habitats and locations, from urban markets, to rural villages close to forest and rural areas close to rivers. Data on the village infrastructure was also collected for each study village.

During a period of one month, a total of twelve regions within the Cameroon side of the study area were prospected by 8 field assistants (all university level). The objective was to: a) identify major markets and source villages for bushmeat, and b) try out methodologies for quantification of available animal protein sources. During the initial trips, field assistants were asked to identify potential local collaborators (people living in the potential data collection localities) for daily data collection in selected localities. In February 2002, a first month data collection was tried out. Seven field assistants, assisted by 33 local collaborators, gathered data on bushmeat availability on almost 70 localities. Based on these results and on the decisions taken after the January 2002 meeting (with regards to financial

limits and optimization data collection throughout the study area), 45 localities were selected to be covered by 30 local collaborators supervised by 5 field assistants. Additionally, two field assistants (university level) were hired for the household questionnaires and species absence/presence data.

In both countries field assistants monitored the selected study villages for a period of five whole months. Each assistant travelled between villages for the total data collection period and were responsible for three village monitors who would in turn collect information on three other villages. A total of about 90 villages (45 in Nigeria and 45 in Cameroon) were studied. Data were collected on species, age and sex, condition (whether smoked, fresh and alive), price, and locality of origin and destination. Where possible tissue samples and body mass were taken. Information on over 100,000 carcasses has been collected. From these data, we shall analyse: a) species composition of bushmeat; b) number of animals per species extracted; c) estimated biomass extracted per unit area; and d) main trade routes for bushmeat in the area.

Development of Sampling Techniques Using Bushmeat Markets

We used six relatively long-term datasets collected from bushmeat markets to explore how different sampling strategies perform in terms of representing known attributes of the entire sample. These markets are in parts of West Africa known to be internationally important for a variety of mammal species. We assessed the efficiency of each method in measuring the volume of bushmeat extracted (mean carcasses per day), their economic impact (the mean value of bushmeat offered per day), and the proportion of total species traded in the full series that are recorded by the strategy in question. We varied both the number of days sampled, and their temporal distribution with respect to each other, and how they are allocated with respect to the 'wet' and 'dry' seasons. We used a variant of Monte Carlo methodology to achieve this aim and we also compared how this empirical approach compared with estimates of required sample sizes derived from standard sampling theory.

While there is no guarantee that observations on a small number of markets can be extrapolated to other sites, these observations may provide some guidance for sample planning where no other data are available.

Household Nutrition Surveys

Household food consumption surveys provide a powerful yet economical tool for obtaining information about food consumption characteristics of a wide-cross section of the population. The nutrition assessment was field-tested as part of a more comprehensive baseline survey. The survey team (1 dedicated nutrition assistant in Nigeria and 2 in Cameroon- project staff) completed a sample of 850 household surveys after a period of intensive training and fieldwork. The surveys were field-tested in 2 villages of different ethnic origin, in Nigeria. The questionnaire was adapted and retested several times in order to increase the information derived from the interview, and to make the questions as understandable as possible.

Road conditions greatly complicated the fieldwork, although well-planned logistical support mitigated some of these difficulties. Research assistants travelled to each of their data collection sites in order to check on progress, and the limitations of public transport on bad roads in rainy season made straightforward travelling impossible. Some sites were impassable by vehicle during the rainy season, and in these cases walking was the only option.

Results of the household surveys in conjunction with anthropometric measurements taken of school children in villages will confirm whether chronic malnutrition is a serious concern in the project area. Our data will allow us to examine the spectrum of foods consumed by people in the area, their nutritional intake and the important of wild meat to their diets. Noteworthy features of the work in Nigeria and Cameroon were the excellent level of cooperation between villagers and the Project. The initial introduction by the research assistants to the Village Chiefs and Councils ensured that the community was aware of the aims and objectives of the project and to give permission for the study to proceed.

There are three indicators of nutrition status based on anthropometry (physical measurements):

- Chronic malnutrition (also called “stunting”) is a measure of height relative to age. It is perhaps the most relevant indicator for IFAD-assisted projects and for the overall well-being of a community. High levels of chronic malnutrition reflect deprivation over a period of months or years. Children who are chronically malnourished may suffer irreversible disability in mental and physical development, causing poor performance in school and reduced physical productivity for the rest of their lives.
- Acute malnutrition (or “wasting”) is a measure of weight relative to height. It is associated with temporary shocks, such as famine or episodes of illness.
- Underweight is a measure of weight relative to age. It is most often used to monitor the nutrition status of individual children.

Distribution and Abundance of Main Hunted Species.

From the village and household nutrition surveys it is possible to obtain data on species presence/absence, which will subsequently be used for the spatial modelling of species viability. We will have data on a selected number of key species presence-absence for a subset of cells in the study area (in which the villages are located). We will then use a variety of techniques (including logistic regression, non-linear classification and/or decision trees) to predict presence-absence on a variety of variables describing conditions in this cell and/or surrounding it (drawn from the GIS databases). These variables might include the following. Note that the phrase “in locality” refers to the area around the village cell, not just the village cell itself (since it is likely to be the former, rather than the latter, where the species was actually

extracted from). This area is likely to be best defined as within a 10km radius of the village, since this is the typical penetration distance from access points.

Table 1. Variables and importance in analyses.

variable	index of…..
surrounding vegetation type in locality	carrying capacity
number of competitor species present	carrying capacity
average mass of other species in locality	relative profitability
distance to nearest large forest block	sources/sinks?
human population density in locality	local demand
human population density within 100km of cell	regional demand
average household consumption in village	current offtake
average price in village	demand
% of locality accessible from roads	accessibility
% of locality accessible from rail track	accessibility
% of locality accessible from river	accessibility
other variables of conservation interest might include:	
distance to nearest national park	
distance to nearest active logging concession	

Ideally, all variables will be entered into the analysis in two ways: as the current conditions, and as the prevalent conditions over a preceding specified time period (e.g. 10 years, depending on the availability of the data). This is because human demand over the last decade may be more important than current demand, at least for the larger species, which may be mostly absent now.

The reliability of the predictive models obtained will be carried out using a sub-sampling cross-validation method. With this method, the logistic regression analyses are based on only a sub-sample of the full dataset, e.g. 75% of all data. The predictions are then matched to the remaining 25% of the data. If the match is good, we can be confident that our regression equations are reasonably reliable. An iterative element to this, such that we repeat this exercise using different combinations of subsets.

Possible problems for consideration include (1) identifying the natural distribution limits of particular species, and (2) the non-independence of spatial data.

Extent and Condition of Forest Areas.

Key maps were collected for vegetation type, human population density, access (specifically roads/rivers/railways), land use type (location of National Parks, Reserves etc), and including logging concessions. All of these maps will allow our analyses to be conducted at the 1km grid-cell scale, and all are roughly coincident in date, ranging from 1997-2001.

The study area was stratified according to vegetation type, and human population density. These two variables capture most of the variation in bushmeat harvest and will facilitate more detailed analyses with additional variables subsequently.

Habitat type was defined for each 1km cell (each a potential village location). Since we were interested in habitat type with respect to local hunting and bushmeat supply, and this can occur within 10km of a village, we defined the habitat type for each cell (village) according to the overall habitat type within a 10km radius of that cell.

Initially, four basic habitat types were recognised within any given individual cell of the existing vegetation map (source: TREES Project, Joint Research Centre of the European Commission, 2000). According to the original map classification, these were lowland forest, secondary forest and forest-savanna mosaic (all of which we considered forest habitat), plus non-forest (including mangroves). Since we are only interested in the forest zone, we excluded those cells that were surrounded by predominantly non-forest areas (i.e. >75% nonforest cells).

We then classified the forest cells (villages) into four new habitat categories, described in the following table.

Table 2. Stratification of the study area by habitat type.

Habitat type around cell (village)	% of forest area	Pattern of habitat in cells in surrounding 10km radius
Primary forest	40	>75% lowland forest (CLASS 1)
Secondary forest	15	>75% secondary forest alone or in Combination with lowland forest (CLASS 2, 5)
Forest-savanna mosaic	19	>75% forest-savanna mosaic alone, or in combination with lowland forest, secondary forest, or both (CLASS 3, 6, 8, 11)
Forest-nonforest matrix	26	>75% non-forest in combination with other forest types (note: >75% non-forest alone is excluded) (CLASS 7, 9, 10, 12, 13, 14)

An existing map provides figures for human population density (to the nearest individual) at a 1km grid-cell scale for this region (source: Africa GIS Database, United States Geological Survey, 2000). We simplified this map so that population density was described according to three different categories: low density (<=15 people per km^2), medium density (<=100 people per km^2) and highdensity (>100 people per km^2) populations. The latter category includes dense urban areas.

We then overlaid the vegetation map with the population density map, to identify the final stratification according to habitat and population density. A colour map has been produced showing this scheme (Fig. 1).

Further analysis of the level of deforestation of the forest areas is currently being undertaken. Satellite images will be purchased and examined to estimate the rates of forest loss in the study area.

Risk Assessment of High-Priority Prey Species.

From the preceding analysis, we will be able to predict the current distribution patterns of each species for which we have presence-absence data on a cell-by-cell basis. This should be possible for all cells, since vegetation and socioeconomic GIS data are available countrywide. First, we will [?] establish how the key predictor variables are likely to change over the next 10-20 years, on the basis of existing models of socio-economic development. For example, where are new roads planned, and how will human populations change?

Then, we will project how prey species distributions are likely to change as a result of these socioeconomic changes, using the regression equations that relate these two factors. This will result in maps identifying where bushmeat overexploitation problems are most likely to occur over this future time period, and also identify the likely reasons for this problem. This will then facilitate guidance and recommendations to the relevant local and national authorities.

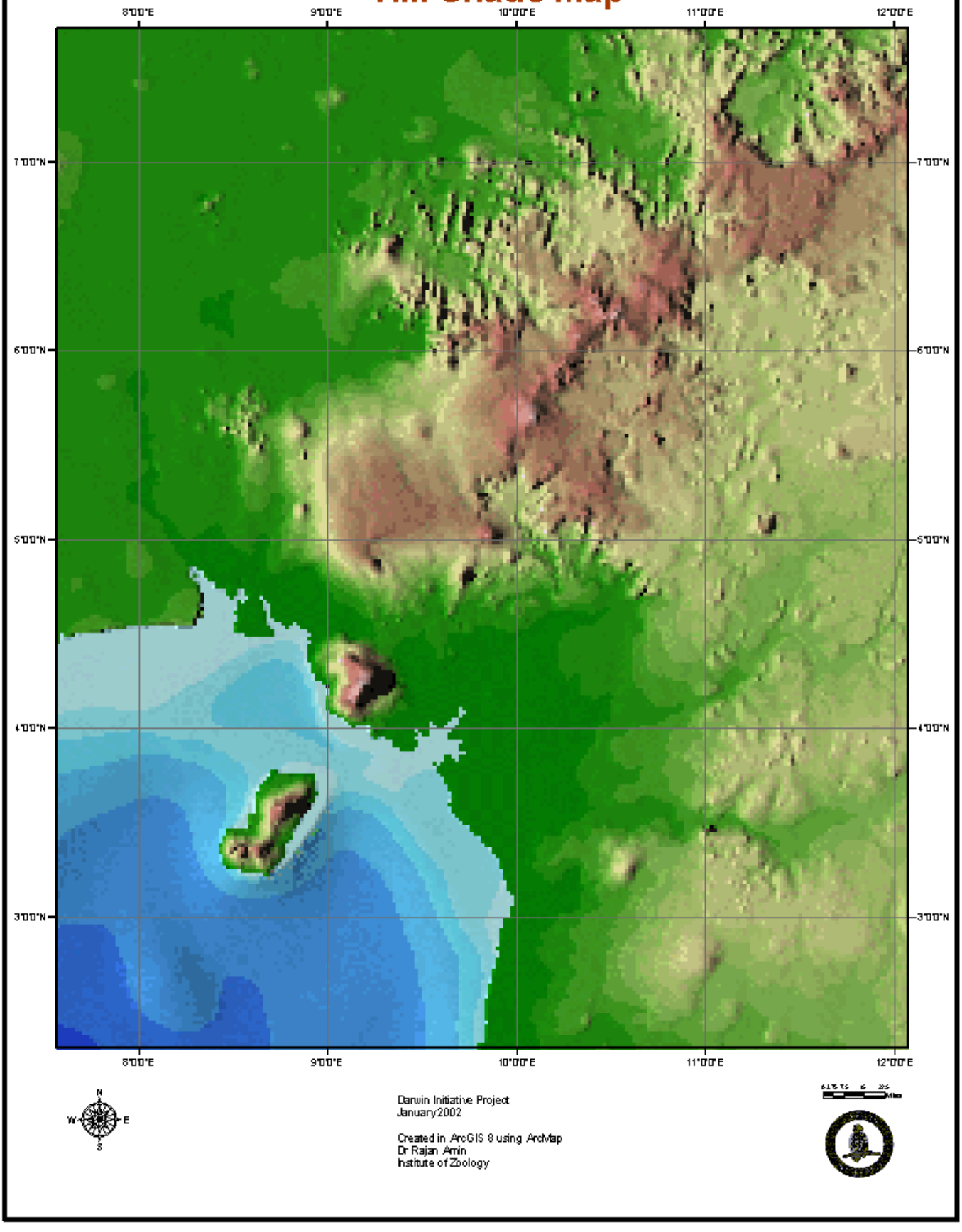
Hunter Surveys

Hunters identified as operating within the surveyed villages in the study region were interviewed to determine presence/absence of species and to establish hunter attitudes and information regarding background to animals in this region.

Presence-absence data for species were collected primarily during specific interviews in villages. The list for key species is given in the Annex below. A short protocol for the collection of presence/absence data during interviews was developed from already published information. Each respondent interviewed was asked to identify the source of all bushmeat eaten during the survey period, giving the locality to the nearest village (including their own). In addition, we ensured that all the villages cited in this response were on the maps used for GIS analyses or if not, that the enumerators conducting the survey establish the location of such villages on the maps.

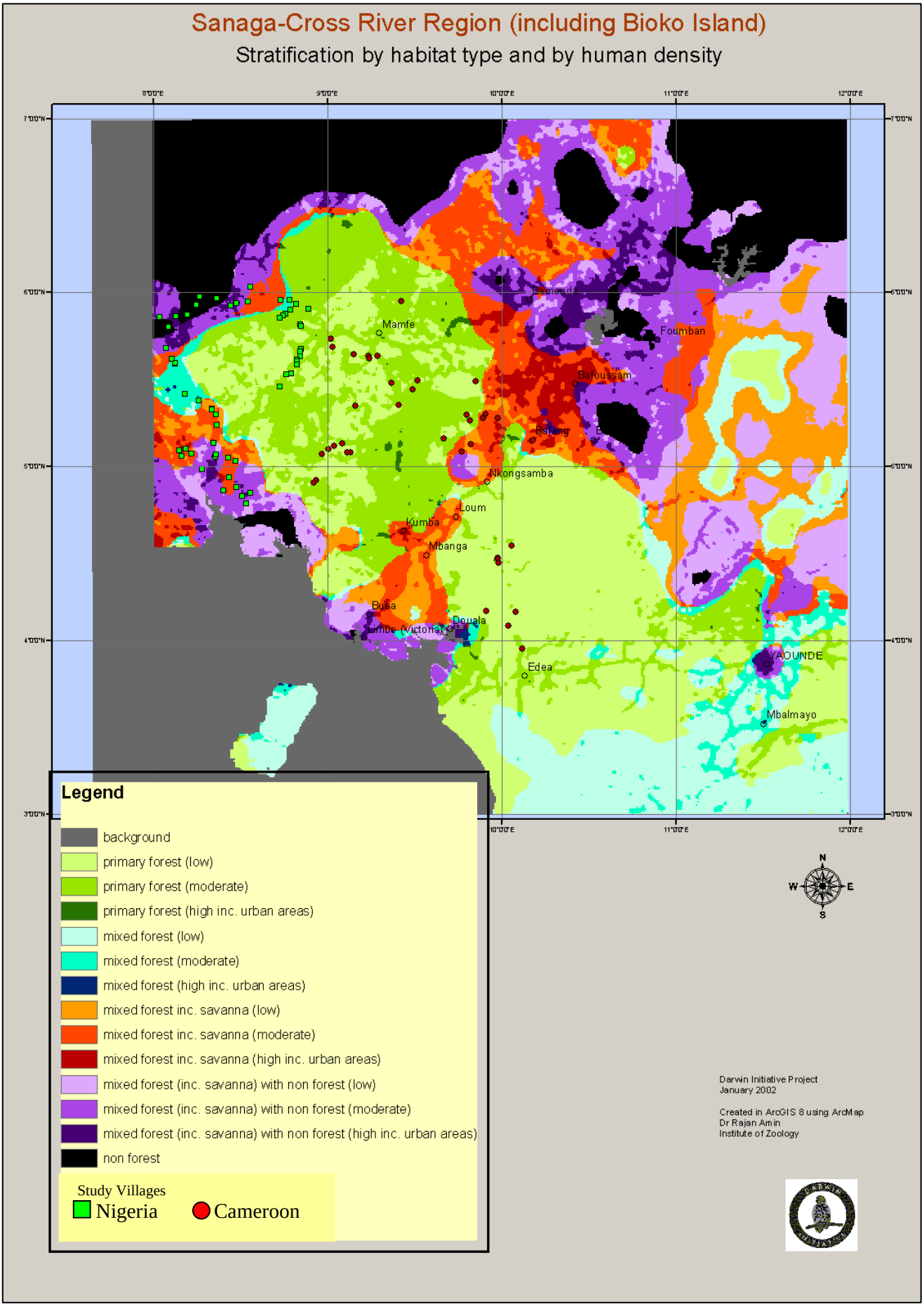
Sanaga-Cross River Region (Including Bioko Island)

Hill Shade Map



Darwin Initiative Project
January 2002

Created in ArcGIS 8 using ArcMap
Dr Rajan Amin
Institute of Zoology


Sanaga-Cross River Region (including Bioko Island)
Stratification by habitat type and by human density
8°00'E
9°00'E
10°00'E
11°00'E
12°00'E
7°00'N
6°00'N
5°00'N
4°00'N
3°00'N
Mamfe
Foumban
Bafoussam
Bafang
Nkongsamba
Loum
Kumba
Mbanga
Buea
Limbe (Victoria)
Douala
Edea
YAOUNDE
Mbalmayo
Legend
background
primary forest (low)
primary forest (moderate)
primary forest (high inc. urban areas)
mixed forest (low)
mixed forest (moderate)
mixed forest (high inc. urban areas)
mixed forest inc. savanna (low)
mixed forest inc. savanna (moderate)
mixed forest inc. savanna (high inc. urban areas)
mixed forest (inc. savanna) with non forest (low)
mixed forest (inc. savanna) with non forest (moderate)
mixed forest (inc. savanna) with non forest (high inc. urban areas)
non forest
Study Villages
Nigeria
Cameroon
N
W
E
S
Darwin Initiative Project
January 2002
Created in ArcGIS 8 using ArcMap
Dr Rajan Amin
Institute of Zoology

Food Production Alternatives

Food resources available within all study villages were investigated in order to assess the potential for alternative sources of protein to bushmeat. Information on the agricultural potential of the different regions in the study area was obtained from databases in the two countries, and accessible from the United Nations Food and Agriculture Organisation (FAO) in Rome.

Additional Information gathered in Project

a) Tissue samples from over 400 specimens from Nigeria, Cameroon and Equatorial Guinea for genetic analyses to determine relationships between prey populations and phylogeographic studies.
b) Data on diet and gastronomic practices (including a catalogue of recipes for the region), ancillary to the more quantitative information from human nutrition surveys.
c) Over 600 photographs taken by field assistants whilst completing data collection. All field assistants were given disposable cameras for them to take a pictorial record of bushmeat in the region.
d) Reports on socio-economic studies in Cameroon were collected at the Ministry of Statistics. Additionally, information on confiscation of bushmeat throughout the study area was obtained from Ministry of Environment and Forests. Data in collected reports will be used in the corresponding layer of analysis or for interpretation of the results.
e) In Nigeria reports from Government organisations and local NGOs was collated.

6. DFFICULTIES ENCOUNTERED

Safety Issues

Whilst Calabar is a relatively safe area to work, the fact that there is an awareness of the illegality of some parts of the bushmeat trade can make the collection of data problematic and sometimes dangerous. The research assistants encountered aggressive behaviour towards them on occasions, for instance when in sensitive areas, such as near the National Park boundary. It was not advisable for me to enter some markets whilst the data collection was in progress. However, I had already visited most of these markets or villages after the initial reconnaissance was completed. This enabled me to gather knowledge of the areas we were to cover and to also experience first hand the traders and the problems associated with data collection.

No real problems were experienced in Cameroon. However, this was most probably also due to the good team, expertise of the in-country coordinator and the excellent collaboration between all members. Strategies for introduction into villages were well discussed in advance. But, even the best precautions could not prevent eventual problems. These experiences however are quite common in Cameroon and given the fact that also the in country coordinator got these kind of experiences before, it was not considered as a danger, but more as a Methodological Problem to deal with.

Buying of Vehicle

The process of buying a vehicle in Calabar was not straightforward. The initial budget for a new vehicle was too low and the problems associated with buying a second hand car manifold, due to the fact that the funds were not allowed to pass through my bank account but had to go directly to the vendor. Eventually, after some negotiation and delays due to communication difficulties between the vendor in Port Harcourt, Oxford and the in-country coordinator in Calabar, the vehicle was purchased in May. The 7 months prior to this meant that the in-country coordinator had to use local transport – mainly motorcycle taxis Motorcycle taxis are a cheap and efficient method of transport in Calabar. However, intrinsically these motorcycles and their riders are not safe, and this period using this transport was not ideal. In general, the cost for vehicle purchase in both countries was underestimated.

Money Transfers

A major problem for money transfer between the UK and both Nigeria and Cameroon occurred during two different periods. The worst period in Cameroon was September-October, after the first month of long-term data collection. This caused operational difficulties at all levels. Credibility was lost towards the field assistants and towards the local collaborators. Surplus expenses were needed to solve the problem in the end. This problem also caused a delay in household surveys. This caused undesirable time pressure for this work, and the presence/absence surveys. I feel that this aspect of the work was not done optimally. In addition, as I had used all the money from another project (and personal money) to cover delay in money transfer, major problems arose on this other level. In Nigeria, after an initial transfer of a 'float' in December, there were no transfers until mid-July. This meant that it was all personal money used in order to start the data collection process, and that this was not the best organisational method. Subsequent transfers were fine once it was realised that transfers to West Africa take substantially longer than previously envisaged.

These problems with money transfers arose from two sources, both of which were dealt with as the project progressed. First, the legal requirements surrounding the correct procedures for advances did not initially make any allowances for the practicalities of work in West Africa. As a result of discussions between one of the PIs (DWM) and senior University accountants, these conditions were relaxed. Second, the time elapsing between an advance being triggered and its arrival in the African bank was frequently much longer than expected, as a result of problems at all points in the transfer. Increased vigilance by university accountants solved this as far as was possible.

7. TIMETABLE (WORKPLAN) FOR THE NEXT REPORTING PERIOD

2003

Jan.	Data entry and de-briefing workshops with field assistants in Nigeria and Cameroon, undertaken by in-country coordinators.
Feb.-Mar.	In-country coordinators in Jersey analysing data and preparation of results.
Apr. – Aug.:	Completion of analyses and finalising publications.
Sept.:	Final workshop in Cameroon.
19 September	House of Commons meeting – to be hosted by the UK Bushmeat Campaign to present main results of project.
Sept.-Dec.:	Preparation of final report.

2004

Mar.:	Grand Launch of final report.

8. PARTNERSHIPS

Nigerian Counterparts:	*Ms. Zena Tooze, CERCOPAN, Calabar, Nigeria.* *Mr. Tony Bassey, Nigerian Conservation Foundation, Calabar, Nigeria.* *Dr. Chris Agbor, Forestry Commission, Calabar, Nigeria.* *Mr. Clement Ebin, General Manager, Cross River National Park (CRNP), Calabar, Nigeria.* *Mr. Gabriel Ogar, Living Earth Foundation,Calabar, Nigeria.*
Cameroon Counterparts:	*Ministry of Scientific Research and Technology, Yaounde* *Cameroonian Wildlife Aid Fund, Yaounde* *Mount Cameroon Project, Limbe* *Royal Zoological Society of Antwerp, Belgium*

No difficulties were experienced in Cameroon. There is a general interest in the Darwin Initiative. The In Country coordinator has been invited to meetings with other parties involved in the complexity of bushmeat trade and food security. Potentials for future collaborations exist. This will depend on the output of this first phase. The same is true of Nigeria, there is great interest in the results of this project.

9. COLLABORATION WITH PROJECTS IN THE HOST COUNTRIES

In Nigeria, the initial collaboration intended with the Cross River Forestry Commission was not possible in the long-term, due to the fact that the FC was unable to put forward a staff member of sufficient aptitude and education level to fit in with the Research assistants budget. However, the FC has been kept appraised of all developments and kept updated on progress of all data collection including being invited to the wrap-up workshop in January 2003. Whilst in the field the assistants also briefed the FC field assistants as to the progress of the data collection.

The Cross River National Park seconded one of their Research officers to work as a research assistant on the project from the initial reconnaissance of markets through to the 5-month data collection. Cercopan acted as our In-country collaborating organisation due to their nterest in the objectives of the Darwin project. Cercopan has an ongoing research and education programme into biodiversity conservation and links with most conservation programmes in Cross River State.

Similar projects in Cameroon were identified during the initial prospection period and organizations involved were contacted. All these organizations showed interest, however, no official collaborations were set up. In case of presentations or the organization of workshop in Cameroon, each of these organizations will be interested to be present or participate. Organizations: WWF-CPO, ECOFAC, WCS, CERUT, MCBCC and of course the concerned committees, departments of MINREST and MINEF. The Darwin Initiative is also closely followed up by the “CelluleEnvironnement” of the European Community.

10. OUTPUTS, OUTCOMES AND DISSEMINATION

Table 1. Project Outputs (According to Standard Output Measures)

Code No.	***Quantity***	***Description***
4d, 5		Training of locally recruited field assistants (beginning of project and ongoing). Comprising non-formal training of recruits to wildlife departments in monitoring of markets, and in survey techniques generally
8	*2*	UK project staff coordinating fieldwork full time
8	*4*	Database concerning the daily bushmeat trade in surveyed markets to be supplied to host countries
14	*1*	Workshop in Nigeria November 2001 Training of Forestry Department personnel in Jersey. Dr. Chris Agbor attended Population and Habitat Viability Analysis Facilitators Workshop.
16	*2*	Dissemination of material advertising the importance of the work
18,19	*1*	Radio.TV coverage in host countries and the UK
20	*2*	Physical assets (vehicles, computers, surplus

		literature) to be donated to local wildlife department and participating NGOs at the end of the project
9	*1*	Action plans for the conservation of species urgently threatened by the bushmeat trade
7, 10	*2*	Production of training literature in collaboration with the wildlife departments
11	*3(+5)*	Academic manuscripts for refereed journals

Table 2: Publications

Type * *(e.g. journals, manual, CDs)*	*Detail (title, author, year)*	*Publishers (name, city)*	*Available from* (e.g. contact address, website)	*Cost £*
Journal	Food Security and Bushmeat in Congo Basin: Wildlife and People'Fa, J.E., Currie, D. & Meeuwig, J. (in press)	*Environmental Conservation*	John Fa	-
Journal	Fa, J.E., Ryan, S. & Bell, D.J.(in press)	*Conservation Biology*	John Fa	-
Journal	Sampling Effort and the Dynamics of Bushmeat Markets Fa, J, Johnson, P.J., Dupain, J., Lapuent, J. & MacDonald, D.W. (In preparation)	*Animal Conservation*	John Fa	-
Journal	S. Ling, N. Kumpel & L. Albrechtsen	Oryx 2002 4, p330	Lise Albrechtsen	

11. Project Expenditure (October 2001-Sept 2002)

Table 3: Project expenditure during the reporting period

Item	*Budget*	*Expenditure*