

Darwin Initiative – Final Report

(To be completed with reference to the Reporting Guidance Notes for Project Leaders
(<http://darwin.defra.gov.uk/resources/reporting/>)
it is expected that this report will be a maximum of 20 pages in length, excluding annexes)

Darwin project information

Project Reference	16-010
Project Title	Wildlife Wood Project
Host country(ies)	Ghana and Cameroon
UK Contract Holder Institution	Zoological Society of London
UK Partner Institution(s)	Timbmet
Host Country Partner Institution(s)	<u>Ghana</u> : timber companies John Bitar & Co. Ltd (JCM), Samartex Timber and Plywood Co. Ltd (SAX), and Logs & Lumber Ltd (LLL), Resource Management Support Centre of Forestry Commission, Bio-monitoring Unit of Wildlife Division, University of Ghana (Legon), Kwame Nkrumah University of Science and Technology <u>Cameroon</u> : SFID and Pallisco timber companies, MINFOF, University of Yaoundé I, CRESA, CIRAD and ASTEVI.
Darwin Grant Value	
Start/End dates of Project	1 st April 2007 / 30 th June 2010
Project Leader Name	Dr. Noelle Kumpel / Mr Chris Ransom
Project Website	www.zsl.org/wildlifewoodproject
Report Author(s) and date	Mr Chris Ransom, Dr Noelle Kumpel, Dr Eric Arnhem, Dr Nico Dauphiné, 31 st July 2010.

1 Project Background

Only around 50% of original forest cover remains in Africa today of which half is allocated to timber exploitation. A major threat to African biodiversity is the unsustainable harvesting of bushmeat often exacerbated by logging activities which open access to new forest areas and bring in workers and commercial hunters who hunt for food and trade. Sustainable forest management and timber certification initiatives have the potential to provide incentives to companies to control this through market access and price premiums.

The Wildlife Wood Project (WWP) was established to improve wildlife management in timber production forests of West and Central Africa, by: determining robust indicators for wildlife that can be integrated into timber certification procedures; developing cost-effective and scientifically rigorous wildlife monitored systems; and building capacity of government, timber companies and research and local communities.

WWP was established in 2 pilot countries, Ghana to represent the West African forests (Fig. 1), and Cameroon to represent the Central African forests (Fig. 2) and has established productive partnerships with several companies which have resulted in the identification of impacts of logging on wildlife communities and the implementation of wildlife management strategies in target logging concessions, providing a model for the sector as a whole.

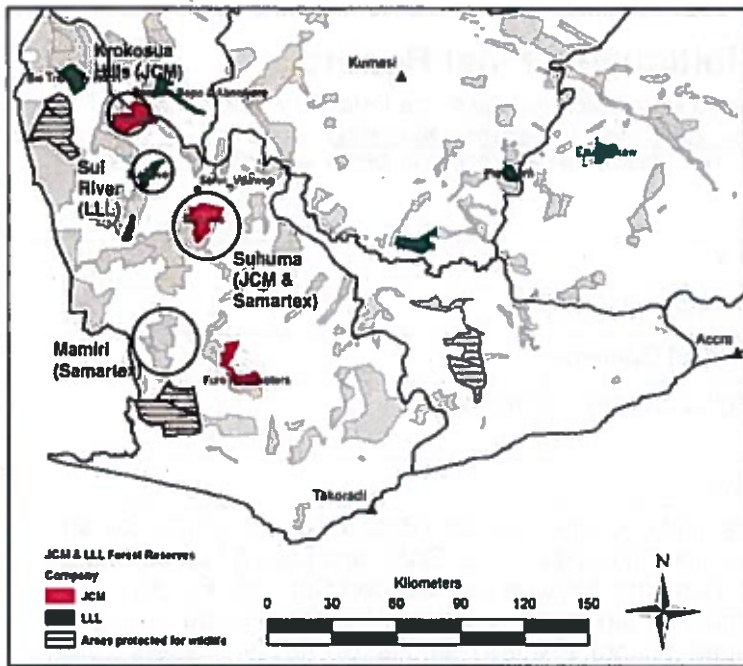


Figure 1. Forest reserves in South West Ghana where WWP-Ghana has been working active

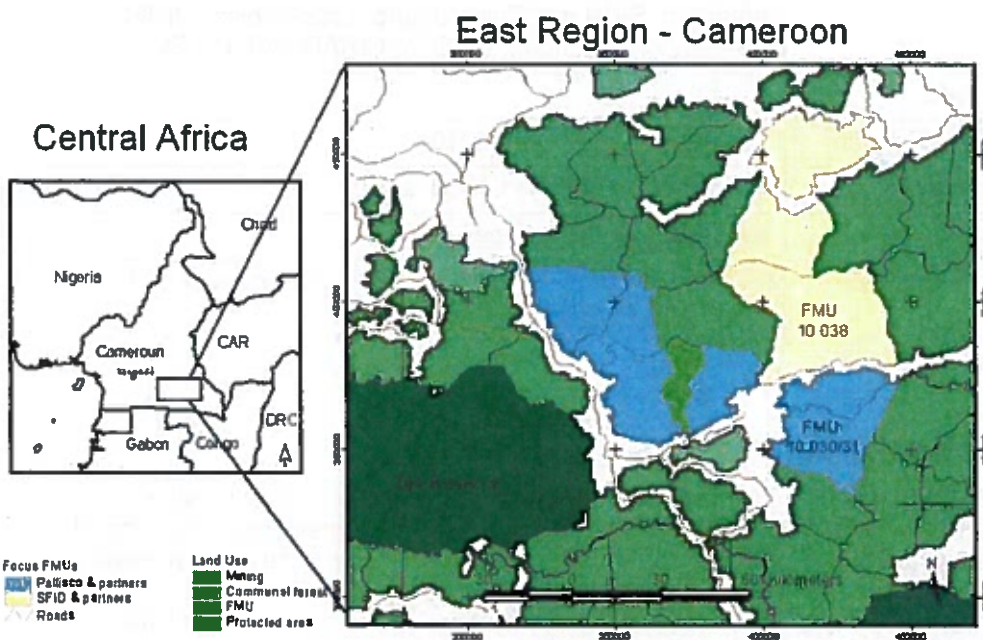


Figure 2. WWP-Cameroon sites in South East Cameroon (FMU 10.038 and FMU 10.030/031)

2 Project support to the Convention on Biological Diversity (CBD)

The Wildlife Wood Project has supported articles 7, 8, 10, 11, 12, 13, 14 and 18 of the CBD through the programme of work on forest biological diversity and a number of the cross-cutting issues including those on identification, monitoring, indicators and assessment and sustainable use of biodiversity.

The project addresses the sustainable use of biodiversity in the context of sustainable forest management, which includes all forest ecosystem goods and services including wildlife. By assisting the timber industry to avoid and minimise adverse impacts on wildlife within timber production forests and monitor wildlife indicators the project will ensure that this resource is managed sustainably. Through an assessment of the direct and indirect impacts of logging activities on wildlife the project attempts to identify those species that are most at threat from

these activities and determine cost-effective methodologies for monitoring these wildlife indicators. This directly addresses COP Decision VII/30 which asks for the work programme on forest biological diversity to *develop regional and international criteria and indicators for Sustainable Forest Management*. These indicators are an important information tool as they will allow for the assessment of the status and trends of wildlife resources, an assessment of effectiveness of sustainable forest management practices and enable these to be continually improved. These indicators and monitoring tools also enable the 2010 Biodiversity Targets to be assessed.

CBD COP Decision VI/22 calls for *an assessment of the unauthorised harvesting of bushmeat* and its impacts on fauna and indigenous and local communities. The project has sought to support this through socio-economic research in communities living around logging concessions in both Ghana and Cameroon, providing information on the potential impacts of these activities on both biodiversity and livelihoods which forest managers can take into account when designing management interventions in order to minimise illegal offtakes whilst ensuring that the livelihoods of local people are not adversely affected.

The project has worked with timber company partners, local NGOs, universities, local communities and the authorities to: reduce the threats to wildlife in timber production forests, raise awareness of biodiversity, conservation and sustainable forest management; improve knowledge on and methods for the assessment of the status and trends of forest biodiversity; and carry out important research and training to identify, monitor, manage and conserve wildlife. All of which are objectives of the CBD's programme of work in forest biological diversity.

3 Project Partnerships

The Wildlife Wood Project has worked with a diverse range of partners in both Ghana and Cameroon, including logging companies, universities and the government authorities with whom MoUs have been established. WWP was initially established as a collaboration between the Zoological Society of London (ZSL), Timbmet, the largest UK importer of tropical hardwoods, who contributed matched funding for the start up of the project, and two of their suppliers in Ghana, John Bitar & Co. Ltd (JCM) and Logs and Lumber Ltd (LLL) both of whom had stated an interest in sustainable logging and timber certification. The initial success of the project in Ghana led to a third company, Samartex Timber and Plywood Ltd (SAX), one of the major timber exporters in Ghana, expressing a desire to collaborate with WWP and a MoU was signed with them in early 2009. In Cameroon, a number of companies were approached and, although all were interested in collaborating, partnerships were established with only two of these with concessions close together in SE Cameroon, SFID (Rougier Group) and Pallisco, to avoid overstressing project staff. SFID and Pallisco are both committed to responsibly managing their forest concessions and are engaged in the advanced certification process. In October 2008 Pallisco achieved FSC certification for all of its concessions (6 FMUs and one sawmill).

Over the duration of the project these partnerships have developed in different ways. In Cameroon, where there is a significant move towards sustainable forest management by the sector, both Pallisco and SFID have embraced the project and invested in it through the recruitment of technical staff to conduct bio-monitoring surveys and monitor the occurrence of illegal hunting activities in their respective concessions, as well as the purchase of field equipment and in kind support through the provision of accommodation and office space to project staff. Similarly the partnership with SAX has strengthened over the period they have been involved in Ghana, assigning personnel from their enumeration teams who have shown interest in and/or aptitude for wildlife research to wildlife research teams and engaging fully in the project's activities.

The global financial crisis has had a significant impact on the logging sector over the timeframe of this project and as a result all the partners have had to take steps to reduce their costs. This has particularly been the case for JCM and LLL who, whilst continuing to support the project through provision of accommodation and other in kind contributions, have focussed their attention on the FLEGT VPA process and the issue of illegal logging which is a major challenge to the industry in Ghana and results in significant loss of revenues, whilst certification has yet to

provide the financial incentives companies had hoped for. In Cameroon, SFID initially created two wildlife teams, one for each sawmill site (Mbang and Djoum), but due to cut backs within the company resulting in a cessation of activities in the Djoum sawmill site had to disband the team working there.

In addition to these partnerships with the logging companies, MoUs have been established with two academic institutions in each country to assist with the building of national capacity. These partnerships have enabled the project to support national MPhil and MSc students to carryout research with the project and receive training from international experts involved with the project. One MPhil student from the University of Ghana (Legon) and an MSc student from the Kwame Nkrumah University of Science and Technology (KNUST) in Ghana have been supported by the project to carryout their dissertation projects with WWP and have received training from project staff. These students have looked at the effects of logging on bird communities in moist semi-deciduous forest and the effects of logging on amphibian communities in moist semi-deciduous forest respectively. In addition University of Ghana lecturer, Dr. Lars Holbech, a wildlife expert with nearly two decades' experience conducting research in Ghana's forest reserves, conducted a study with WWP to conduct rapid assessments of designated 'critical wildlife', or wildlife targeted by hunters that appear to have undergone declines but for which little quantitative data has been published on long-term population trends.

In Cameroon WWP has partnerships with the Department of Biology and Plant Physiology of the University of Yaoundé I (UYI) and the University of Dshang's *Centre Régional d'Enseignement Spécialisé en Agriculture* (CRESA). WWP has supported and supervised the fieldwork of two MSc students from UYI looking at the effect of linear transect network design on wildlife survey results and a socio-economic study of the dependence of a rural village in the periphery of SFID and Pallisco's concessions on forest resources. Two MSc students from CRESA have also been supervised carrying out projects testing camera traps as a wildlife monitoring tool in timber concessions; and Identification of core chimpanzee areas as areas of High Conservation Value (HCV).

ZSL have also maintained partnerships with the Resource Management Support Centre of Forestry Commission and the Bio-monitoring Unit of the Wildlife Division in Ghana through the exchanging of information and collaborative field work. A number of different Wildlife Division personnel have taken part in this and have received training in survey methodologies such as the use of camera traps and mist nets. These partners were heavily involved in the final project workshop at which results were presented and recommendations for action made.

In Cameroon, ZSL works closely with the Ministry of Forestry and Wildlife (MINFOF). The signing of a formal MoU had been delayed by multiple changes in personnel at MINFOF, but a draft MoU was submitted to MINFOF in December 2008 through its *Département de la Coopération Internationale et de la Programmation* and we have received confirmation that this has been received and, although not yet signed, MINFOF are aware and supportive of the project. The purpose of this partnership is to contribute to the reinforcement of national expertise in bio-monitoring and assure co-operation and information sharing between ZSL and MINFOF. Under the framework of the drafted MoU, WWP has agreed to train ecoguards in wildlife monitoring techniques, the analysis of survey data, the basics of cartography, and scientific reporting whilst the results of WWP research work will contribute to national discussion regarding wildlife monitoring and management methods in logging concessions.

WWP has also worked with CIRAD in Cameroon through scientific partnership agreements for specific studies, including conducting socio-economic surveys in communities living around the timber concessions and carrying out a comparison of linear and recce transect techniques for wildlife surveying.

Finally, in Cameroon, WWP has established a partnership with ASTEVI (*l'Association Terre et Vie*) to carryout awareness raising activities in communities around logging concessions. ASTEVI are a national organisation working in SE Cameroon with experience in education and awareness. ZSL have purchased a projector and the logging companies have purchased a generator to enable ASTEVI to give presentations and show short films to villagers.

4 Project Achievements

4.1 Impact: achievement of positive impact on biodiversity, sustainable use or equitable sharing of biodiversity benefits

The project foresaw a positive impact on biodiversity conservation through the improvement of wildlife management in timber production forests in West and Central Africa and ensuring that forests and all the natural resources associated with forests are managed sustainably. Over the duration of the project we have already seen our partner logging companies taking positive management actions to conserve wildlife in their concessions, through the implementation of actions such as the blocking of old logging roads, preventing all but their own vehicles from using logging roads, preventing their workers from hunting and providing alternatives to bushmeat through stores for the workers, working with the authorities to prevent illegal hunting and logging, raising awareness of wildlife and hunting laws in local communities and adapting their felling activities to minimise the impacts on species such as great apes. The establishing of wildlife and illegal activity monitoring teams mean there is now a permanent presence in the field to deter illegal activities and to collect data that can be used for adaptive management. We expect this to have a positive impact on the status of large and medium sized mammals in these concessions as illegal exploitation is reduced. Having also conducted extensive socio-economic studies to determine the dependence of communities on these resources we will ensure that these approaches take this into account and that there is no negative impact on community livelihoods. Several other companies in Cameroon and neighbouring countries as well as their governments have expressed an interest in the project and using this as a model to reduce unsustainable bushmeat hunting and support wildlife management so the impacts of the project are likely to be scaled up over a wider area in the future. The project has also raised awareness of the issue of wildlife management within the framework of 'sustainable forest management' and that wildlife is an integral component of any forest system that must be considered when talking about sustainable forest management in the future.

The fact that one of the project partners in Cameroon, Pallisco, has already gained FSC certification in all its concessions, and both SFID in Cameroon and Samartex in Ghana have committed to achieving FSC certification further demonstrates that the partners are committed to sustainable forest management. In addition, the WWP has had input into the development of the FSC's national and regional standards and participated in several other meetings and workshops focussed on aspects of sustainable wildlife management in production forests. This engagement from both the timber industry and its certification bodies bodes well for improving the sustainability of wildlife management in African timber concessions in the long term.

Research carried out by the project provides insights into the usefulness of different indicators, methodologies and impacts of logging and associated activities on wildlife. This information and these tools will assist the logging sector and their partners to ensure sustainable wildlife management in the context of sustainable forest management.

4.2 Outcomes: achievement of the project purpose and outcomes

The overall purpose of the Wildlife Wood Project is to improve wildlife management in timber production forests in West and Central Africa, by determining robust indicators for wildlife that can be integrated into timber certification procedures, monitored, reported upon and inform concession management. Significant progress has been made in achieving this outcome with all the project's corporate partners demonstrating willingness be leaders in the forest sector and pushing the sector towards concrete improvements in wildlife management in timber production forests. To this end considerable improvements in wildlife management have been made in the concessions of these companies and the partners are pushing other companies to follow suit. Whilst this goes some way to achieving the project's purpose the project also set out to have wildlife indicators accepted by timber certification authorities by the end of the project. This was an ambitious outcome and it has not proved possible to carryout the required research to identify these indicators and work with these various groups to have them adopted in this time frame. The project has begun this process through participation in FSC consultation meetings and workshops and reviewing the national and regional standards that are in development and it is hoped that this outcome will be achieved under the next phase of the project.

The success of this project and progress towards its purpose has been possible through the unique network of institutions that has been established comprising timber companies, NGOs, universities and other research groups, certification bodies, civil society, governments and donors who are all collaborating to achieve the common objective of sustainable forest management. It is unlikely that any single group of stakeholders would be able to achieve this alone and each partner has its own role to play so it is essential that networks and collaborations such as this exist and the lessons from this are shared. This network has enabled the different stakeholders to access resources not available to them previously such as study sites, scientific data, training opportunities, funds and technical expertise. Through this project the knowledge of sustainable forest management, in particular the understanding of direct and indirect logging impacts on wildlife and human livelihoods, has been expanded and it provides a model for future such collaborations. The strength of these relationships and the trust between the partners will be a major contributing factor in achieving improved wildlife management in timber production forests.

4.3 Outputs (and activities)

1. Wildlife indicators identified and dynamics of bushmeat trade documented in 2 rainforest regions (west and central Africa), which can be used to verify timber certification systems

A large amount of research has been carried out by the project in both Ghana and Cameroon to determine the impacts of logging activities on different wildlife species and document the dynamics of the bushmeat offtake and trade in and around target logging concessions (See section 4.5 for more details on this research).

In Ghana research has been carried out on a range of different taxa including mammals, hornbills, understory birds and amphibians in a number of logging concessions belonging to timber company partners in the Western region of Ghana and a PhD study has been carried out to assess the importance of bushmeat for livelihoods of cocoa farmers within a timber concession in Sui Forest Reserve, Western Region of Ghana, one of the project's target timber concessions.

In Cameroon the focus of the project has been on two concessions in Eastern Cameroon where both wildlife and socio-economic studies have been carried out as well as testing different wildlife survey methods. This has included a 1-year study using fixed line transects in logged and unlogged forests, camera trapping studies, comparisons between recce surveys, line transects and camera traps and an assessment of bushmeat offtake by communities living on the edge of forest concessions.

All this research was completed in the third year of the project and analysed to identify potential wildlife indicators and to understand the dynamics of the bushmeat trade. The results have provided important information on the impacts of logging on different taxa and species indicating which of these are likely to be most heavily impacted upon by unsustainable logging practices and which are most readily monitored. However the complexities of the direct and indirect impacts of logging mean that the indicators identified by the project are preliminary and there is a need for further research in sites where, for example, hunting levels and tree offtakes vary. Due to the situation in both Ghana and Cameroon where hunting is widespread and there are few, if any, sites where hunting is absent, further research is needed into the applicability of these indicators in other sites with different levels of hunting. Further research is also needed in areas with different timber offtake quotas to determine the degree to which this impacts upon these different species and taxa.

The socio-economic studies have provided an important insight into the utilisation by communities living in and around timber concessions of the wildlife resources within the concession which will enable the companies to design appropriate management actions to ensure that this resource is managed sustainably by working with the local communities to control illegal exploitation and implement initiatives that have minimum impact on the livelihoods of these people as required by timber certification schemes. This baseline data will enable the companies to monitor any changes in offtakes and trade and the impacts of these on the wellbeing of the communities.

2. Wildlife management plans developed and impacts monitored through cost-effective and scientifically rigorous wildlife monitoring systems in 2 case study forests (1 per country), to ensure best practice and monitor impacts

All the research carried out by the project has been written up into technical reports for the logging companies with recommendations for improvements to the current wildlife management plans. Some of these recommendations are already being implemented and others are being assessed by the companies. These recommendations included the creation of wildlife and illegal activity monitoring teams to carry out monitoring activities in the company's concessions. SFID and Pallisco recruited staff for these teams and Samartex assigned personnel from their enumeration teams to carry this out. The project has trained these staff, designed the monitoring programme and provides ongoing supervision and technical support to the work of these teams. The team is responsible for conducting bio-monitoring surveys and patrolling timber concessions in search of illegal activities such as poaching, illegal sawing and unauthorised settlement. The monitoring programmes have been designed to assess the impacts of the introduction of logging activities on mammal abundances and to assess any changes in levels of human activities associated with the logging activities. In this way data collected by the teams is used to assess impacts of ongoing management and target law enforcement and other management. Systems for recording and reporting the results from these surveys have also been established to ensure that the information is fed back to the senior forest managers in the companies and appropriate actions can be taken to improve the current concession management plans and guide wildlife conservation efforts.

Other management actions developed with the companies are targeted at reducing bushmeat hunting in the concessions. These include the creation of stores in the workers camps to supply domestic meat and other foodstuffs, prevention of the transport of bushmeat in company vehicles, a ban on hunting by workers, gates or barriers on active logging roads to prevent other vehicles accessing concessions, the blocking of old logging roads, awareness activities in communities and amongst workers to inform them of hunting laws and company policy, patrols by the monitoring teams and occasional joint anti-poaching missions with government rangers to destroy hunting camps, confiscate bushmeat and arrest poachers.

Further actions are designed to avoid or minimise the impacts of the logging activities directly on wildlife, particularly those known to be most sensitive like chimpanzees. For example, the project has helped the companies in Cameroon identify areas of forest where chimpanzee communities have their core ranges. Chimpanzees are especially sensitive to the noise and other disturbance associated with felling and removal of the timber and have been found to flee from areas where this is taking place. Therefore, once these areas have been identified the company can adapt its logging activities to ensure that only a small section of the range is being logged at one time enabling the chimpanzee community to move to another part of its range whilst this is going on. The chimpanzees are then able to move back into this area once the logging activities cease and begin in another part of the range. This prevents them being forced out of their whole range and into that of another chimpanzee community which will result in conflict.

Other similar actions are based around the identification of 'high conservation values' and ensuring that these are not damaged for example by setting aside certain areas of forest as 'protected areas', only logging at certain times of year, for example, not logging in elephant corridors when elephants are known to move through that area or leaving old trees important for nesting endangered bird species.

A large amount of the research carried out has been to test different wildlife survey and monitoring methods to determine those most suitable for monitoring different taxa and to be used by logging companies (see section 4.5). Emphasis has been on finding the most cost-effective methods which provide scientifically robust data whilst also being possible for teams of company workers without a background in biodiversity research to carry out. To this end methods such as mist netting and acoustic sampling have been tested for birds and camera trapping, recce surveys and line transects for mammals. The results from this allow us to design monitoring programmes to address the technical skills of the personnel carrying it out, the species/taxa they want to monitor, the kind of information they require (presence/absence, relative abundance, absolute abundance etc) and the financial and human resources available.

3. Capacity building and awareness of timber certification and wildlife management increased among government, private sector, research and local communities, and timber consumers

Capacity for wildlife identification and surveying has been strengthened amongst all the partners of this project through their involvement in the designing and carrying out of the research and training provided by ZSL project personnel. Timber company workers have received intensive training in wildlife monitoring and were able to conduct a year's bio-monitoring study with minimal supervision and continue to carry on this monitoring. Government rangers have been trained in survey methods new to them such as camera trapping and mist netting and a total of 6 host-country postgraduate students have received support and training to carry out their research projects (See Section 4.4 Training measures and Section 4.6 for more details).

In order to establish the project and ensure all the partners were aware of the purpose of the project it was essential for them to understand the issues being addressed especially regarding unsustainable bushmeat hunting and the need for wildlife management in the context of sustainable forest management and its relevance to timber certification. Therefore much time was spent in the first months of the project discussing these issues with potential partners and explaining what the project hoped to achieve. The production of a report on 'wildlife conservation and tropical timber certification' prior to the DI funding period provided us with a useful document to help explain this and to disseminate to a wider audience (<http://www.zsl.org/conservation/regions/africa/wildlife-wood-project/wildlife-conservation-and-tropical-timber-certification,558.AR.html>). This has meant that the partners have been able to share this information with other members of their sector and we believe this has contributed to an increase in interest in wildlife management in timber concessions from the NGO, government and industry sectors that we have observed.

As the results of the project have been compiled they have been shared with the partners and a wider audience through participation in scientific conferences and symposia, technical meetings and workshop and through the national media in radio shows and newspaper articles. Final project workshops were held in Ghana and Cameroon and a scientific meeting in London to further raise awareness of these topics to different stakeholders. These were attended by government representatives, the timber industry, consumer groups, certification bodies, conservation and development NGOs and members of the public. Furthermore through a partnership with a local NGO in Cameroon, ASTEVI, the project has attempted to raise the awareness and understanding of local communities of wildlife and sustainable forest management issues. (See section 5 for more information on dissemination).

4.4 Project standard measures and publications

Training Measures

- 1a 1 UK PhD student, Bjorn Sculte-Herbruggen, carrying out his PhD with ZSL's Institute of Zoology and University College London is due to submit his thesis titled '*Assessing the Importance of Bushmeat for Livelihoods of Cocoa Farmers within timber concessions in Sui Forest Reserve, Western Region, Ghana*' in mid 2010.
- 2 1 Ghanaian MPhil student, Nathaniel Annorbah, obtained his qualification in 2009 from the University of Ghana. His dissertation was titled '*Implications of Selective Logging for Avifaunal Species in a Moist Semi-Deciduous Forest of Ghana*'.
- 1 Cameroonian MSc student, Parfait Devis Biloa, from the University of Yaoundé I was awarded a second class honour. His thesis was on '*Influence the Sampling Design on Wildlife Survey Results in Makalaya Forests (FMU 10.030)*'.
- In addition, 1 Ghanaian MSc student from the Kwame Nkrumah University of Science and Technology in Kumasi and 4 Cameroonian MSc students, 3 from the University of Yaounde 1 and 1 from CRESA have submitted their final theses and are awaiting their qualification.
- 2 UK MSc students from Imperial College London and ZSL's Institute of Zoology are also awaiting their results.

- 5 10 timber company wildlife team workers trained in Cameroon, 4 Ghanaian timber company workers trained in Ghana and 4 Ghanaian community bio-monitoring research assistants trained in survey techniques and data collection. Total of 18.
- 6a 5 Ghana Wildlife Division workers trained in wildlife survey techniques during a series of short (5-10 day) field visits.
4 community research assistants trained in socio-economic data collection, 2 Ghanaian and 2 Cameroonian.
- 6b 26 weeks in total for people listed in 6a.

Research Measures

- 8 332 weeks over the 3-year project period. Three weeks per year by the two project leaders (Noelle Kumpel and Chris Ransom); 60 weeks for PhD student in Ghana; total of 130 weeks over 3 years for ZSL's Ghana project manager and 124 weeks over 3 years for Cameroon project manager.
- 9 Reports on wildlife in logging concessions and management recommendations (wildlife management plans) for each partner in Cameroon (2) and Samartex in Ghana.
- 11a 4 papers of results from project in draft for submissions to peer reviewed journals.
- 12a Database established for SFID, Pallisco and Samartex to collate data collected by wildlife and illegal activity monitoring teams.

Dissemination Measures

- 14a Two-day workshops were held in both Ghana and Cameroon at the end of the project to disseminate and discuss project results. A scientific meeting was held at ZSL in London at the end of the project to publicise and disseminate the results.
- 14b Presentations given by project staff at the Society for Conservation Biology (SCB) first Africa Section meeting in Accra, Ghana (January 2009), the Student Conference for Conservation Science (SCCS) in Cambridge, UK (March 2009), ATIBT (*Association Technique Internationale des Bois Tropicaux*) meeting about *Biodiversity and HCVF* in Douala (February 2009), UK Bushmeat Working Group (June 2009), the American Ornithologists' Union annual meeting (August 2009), a WWF/FSC workshop in Yaounde (September 2009), TRAFFIC meeting on wildlife management in timber concessions (June 2010).
- 15b An article on the project was published in the Cameroon Tribune (19/03/10)
- 15d A press release was sent out in the UK at the launch of the project
- 16a Monthly newsletters were produced in both Cameroon and Ghana for the last 24 months of the project.
- 16b Newsletters were circulated to approximately 20 people in each host country, including government, NGOs, and industry representatives
- 16c Approximately 10 people in the UK received all newsletters
- 19c 2 radio programmes about the project and related issues were produced by the project for awareness purposes and an additional 5 features/interviews were aired on national radio to publicise the project and disseminate the results

Physical Measures

- 20 Equipment totalling approximately £25,000 was handed over to host country partners at the end of the project. This included mist nets, laptops and GPS units to Universities in Ghana and 1 project vehicle to partner in Ghana.
- 22 Networks of permanent transects were established in the concessions of both partner companies in Cameroon for use by bio-monitoring teams to collect long-term monitoring data.
- 23 A total of £219,040 in additional resources was raised for the project. This was comprised of £60,000 from Timbmet, £60,000 NERC/ ESRC for PhD student in Ghana,

£44,040 from the Rufford Maurice Laing Foundation, £5000 from CIRAD and approximately £50,000 in kind contribution from partners.

Other

- Nine MoUs have been signed with other institutions involved in the project including 6 in Cameroon with Pallisco, SFID, Association Terre et Vie (ASTEVI), University of Yaounde 1, Centre Régional d'Enseignement Spécialisé en Agriculture Forêt-Bois (CRESA) and the Centre de Coopération Internationale en Recherche Agronomique pour le Développement (CIRAD) and 3 in Ghana with John Bitar & Co. Ltd (JCM), Samartex Timber and Plywood Co. Ltd (SAX), and Logs & Lumber Ltd (LLL).
- A project blog has been set up on ZSL's website to give updates on the project - <http://www.zslblogs.org/?cat=47>

4.5 Technical and Scientific achievements and co-operation

Cameroon

Research in Cameroon can be divided into 3 areas:

Immediate effects of logging on mammals.

Dr. Eric Arnhem (Project Manager), Oliver Fankem (Assistant Project Manager), SFID and Pallisco's wildlife monitoring teams, Benoit Tasse (MSc student).

In order to assess the response of animal populations and therefore their vulnerability to the introduction of logging activities in the habitat, wildlife monitoring programmes were designed and implemented in 2 concessions. Data was collected by the timber companies' wildlife monitoring teams using cyber trackers to record data. Monthly surveys were carried out over a whole year at permanent biomonitoring stations located in both concessions. An *Asymmetrical Multi Control* sampling design was used allowing *Before-After Control Impact* analysis (Underwood, 1994). In each concession 4 permanent biomonitoring stations were established, including one *impact station* where logging operations occurred during the time of the study (allowing an assessment before and after the introduction of mechanized operations) and three *control stations* where no logging ever took place in their immediate surroundings (>2km). In one concession, a fifth station in a forest compartment logged 5 years earlier was included to provide data on the level of recovery 5 years after the end of logging operations. Each biomonitoring station was composed of a total of 8km (4 x 2km) of line transects per station and both diurnal and nocturnal surveys were carried out. Totals of 355km and 352 km of transects were surveyed in the two concessions.

The selected study species were all large or medium-sized mammals either legally protected such as the forest elephant (*Loxodonta africana cyclotis*), the western lowland gorillas (*G. g. gorilla*), the common chimpanzee (*Pan t. troglodytes*), the sitatunga (*Tragelaphus spekei*) and the yellow-backed duiker (*Cephalophus sylvicultor*), or considered as socio-economically important species as in the case of the red river hog (*Potamochoerus porcus*), the "red" duikers (*Cephalophus dorsalis*, *C. callipygus*, *C. will nigrifrons*) and the blue duiker (*C. monticola*).

The results of this study allowed us to detect the immediate effects of logging on the study species and several rainforest mammals. However, the study did not identify and significant changes in populations of each species due to logging operations. Although a longer-term impact of logging remains possible, most of these species seem to have been able to cope with selective logging of valuable timber species as it occur in Pallisco's and SFID's FMUs. This is likely due to the low extraction rates of 1 stump per hectare and therefore low levels of disturbance in these concessions. Hunting is therefore likely to have more of an impact on wildlife in forests where extraction rates are low and therefore management should focus on controlling illegal hunting.

Wildlife monitoring methods.

Dr. Eric Arnhem (Project Manager), Oliver Fankem (Assistant Project Manager), Parfait Devis Biloa (MSc student), Patrick Armel Mbosso (MSc student), Nkwetaketu Nembongwe Isaiah (MSc student).

This research was focussed on identifying the most suitable and cost-effective methods for monitoring wildlife in timber concessions in order to detect any uncontrolled impact of forestry activities and react accordingly. Studies were therefore carried out to compare line transects, recce transects and camera trapping, as well as develop and test new methods for the identification of chimpanzee territories. In order to compare recces and line transects, mammal surveys were carried out on a series of 30 pairs of 2km-long transects, each pair being composed of both a recce and a linear transect, in order to be able to compare the performance of the two transect types under the same conditions. Vegetation data and a gross measure of the undergrowth density (the visibility at eye-level) were recorded on transects every 100m. A mean sign encounter rate for our studied species was calculated based on the indirect signs of their presence found along linear transects.

The results show that there is a great similarity between survey data from recces and linear transects. At the methodological level, wildlife surveys using recces seem to provide the concessionaires with reliable information on relative abundances of large and medium-sized mammals, even though biases exist and may occur under specific circumstances. From a logistical point of view, this technique is however particularly well-adapted for monitoring wildlife over vast timber production forests where it is crucial to use a technique as simple and cost-effective as it can be. The easiness of the walk on recces allow one to survey a larger area at a constant speed, while linear transect cutting often slows down in dense habitats. Finally, from an economic perspective, it seems like recce transect sampling for wildlife monitoring survey might be advantageous because the number of personnel required to carry out recce surveys are limited to trackers and researchers and transect-cutting teams are not required because the relative easiness of the recce walks. Survey costs are thus reduced approximately by half. As a result, this technique appears particularly useful to assess the abundance and the spatial distribution of mammals and to monitor demographic trends over time in vast timber production forests of Central Africa.

The use of camera traps was also tested using a network of 39 cameras set out on a grid of 1km x 1km cells covering a logging compartment prior being disturbed. The cameras were left in the field for 36 days in order to obtain a minimum of 1400 camera trap days. A total of 149 camera trap events were recorded and 18 different animal species identified.

Camera trapping provides similar information to line transect surveys but have the additional benefits of being able to identify the species with certainty, eliminating observer bias, and not relying on signs. It is therefore a very efficient tool to survey animal biodiversity. Camera trapping allows not only the species identification but also a classification in age or sex- groups which may useful in some cases to monitor demographic trends. This method also allows us to monitor rare and illusive species and those which leave few signs of presence, or for closely related species producing similar kind of signs such as duikers. Camera traps also provide images that can be used for publicity purposes. However, camera traps are more costly than more traditional methods which may be prohibitive to their use.

Finally, we developed a technique to identify the location of chimpanzee communities (*Pan t. troglodytes*) and to map their territories in timber production forests. The technique is a variant of the Adaptive Linear Transect Sampling method consisting in increasing survey effort in areas where more signs of presence are found. Core areas of chimp territories act as refuge zones for this species (especially during habitat disturbances) and therefore should be clearly identified/mapped as High Conservation Values by forest managers. This methodology needs further testing and refining but initial results indicate its potential for identifying areas with a high abundance of chimpanzees.

Socio-economic studies.

Dr Julius Tieguhong (consultant), Mapon Rikiatou (MSc student), Sven Lumsden (MSc student)

Socio-economic studies were carried out to investigate the exploitation of bushmeat by communities living around timber concessions and by timber company workers and their families. Six villages along the road running between the concessions belonging to Pallisco and SFID were surveyed during this work and a further study was carried out in a logging camp where company staff live.

These studies were carried out using household and user-group surveys, conducted with the use of structured questionnaires and informal interviews. Results of the community household study estimate the annual number of animals captured per hunter in the five villages varied from a minimum of 24 animals to a maximum of 960 animals with a mean of 212 animals. The total number of animals captured per year by all the hunters interviewed was 23,088 of which 61% was sold, 34% consumed by the household and 5% decayed in the forest. Of the 22 species hunted, blue duikers, brush-tailed porcupines, red duikers, pangolins and giant pouched rats were the top five most hunted. It was estimated that this offtake was equivalent to 88 tonnes of bushmeat annually in the five villages, with an estimated market value of 51,204,685fcfa (78,000€).

Survey data calculated the annual hunters' income to range from 9,600fcfa to 1,752,000fcfa, with a mean income for all hunters interviewed of 379,009fcfa. Annual total income from sources other than hunting had a mean of 144,711fcfa which indicates that hunting is a major source of income for people in this area. In terms of identifying possible acceptable alternative protein sources; chicken was ranked top (82%) followed by pork (62%), cow meat (61%), goat meat (51%) and mutton (51%). Irrespective of the ethnic background of the hunters, the incentives for hunting were both economic and nutritional. This study highlighted the importance of hunting for bushmeat for the local communities and of the consequent need to develop more realistic strategies that take into consideration the basic needs and aspirations of local forest stakeholders.

Data from the study in the logging camp is still being analysed but once completed it will provide useful information on bushmeat consumption by company workers as well as the success of initiatives implemented by the company to reduce this consumption such as provision of alternative sources of proteins through camp stores.

Ghana

During the course of the project, extensive research has been carried out on direct/indirect impacts of logging on three wildlife taxa (birds, mammals, and amphibians) and on forest vegetation structure and composition through cooperative efforts of ZSL and timber company staff, contractors, master's students, and Wildlife Division officers. In order to examine both short and longer term wildlife responses to logging activities, research focused on a replicated study design comparing wildlife status in unlogged forest with regenerating forest in three post-logging age-classes: recently logged (e.g., 1-3 years post-logging), 10 years post-logging, and 20+ years post-logging. Poaching activity signs (e.g., snare traps, rifle cartridges, encounters with hunters, etc.) were also being quantified at each study site. Ghana has two major moist tropical forest types where logging is taking place: Moist Evergreen and Moist Semi-deciduous forest; research was implemented in both forest types and has progressed along seven main themes:

Bird community responses to logging activities via aural detections/Distance sampling.

Nathaniel Annorbah (MPhil student, University of Ghana, Legon)

This has been the focus of an MPhil thesis study by Nathaniel Annorbah at the University of Ghana (Legon). Field work was carried out in 2008 and the thesis entitled "Implications of Selective Logging for Avifaunal Species in a Moist Semi-Deciduous Forest of Ghana" submitted in June 2009. Fieldwork took place in Moist Semi-deciduous forest in Suhuma Forest Reserve concessions managed by JCM. A total 102 km of survey effort was carried out on 16 x 500-meter-long fixed-width line-transects, Distance Sampling data analysis was performed on 19 avian study species to determine bird density estimates, and indicator taxa were recommended based on this analysis. Logging intensities at study sites were 5.50, 5.75 and 2.25 trees per ha for the 1-, 10- and 20-year old sites, respectively; in other words, logging activity during the past 10 years has been occurring at more than twice the intensity of past logging activities. Population densities of forest interior species tended to decrease 10 years after logging but recovered reasonably about 20 years on. Forest generalists on the contrary showed post-logging density augmentations. Ghana's avifauna seem to have high recoverability and are resilient to moderate levels of logging disturbance.

Hornbill (Aves: Bucerotidae) responses to logging activities via playback surveys.

Dr. Lars H. Holbech (University of Ghana consultant) and Dr. Nico Dauphiné (Project Manager)

A field team comprised of ZSL team members, University of Ghana contractor Dr. Lars H. Holbech and Wildlife Division staff conducted 150 hours of field surveys for hornbills. Hornbills were selected as excellent potential indicators of forest logging and hunting damage due to their high detectability and vulnerability to both direct (habitat damage) and indirect (poaching) effects of logging activities. Surveys were carried out in multiple forest reserves (FRs) and protected areas in both Moist Evergreen and Semi-deciduous forest. Playback surveys (wherein recorded vocalizations of target bird species are played in order to solicit a response) were conducted for the 9 forest hornbill species known in Ghana. Surveys indicated that playback is an effective and reliable method to increase detection probabilities for hornbills as indicators to logging/hunting damage, and that hornbills may serve as reliable indicators of hunting pressure in forest reserves. Unfortunately, due to overwhelming poaching in combination with habitat loss, large hornbill populations have plummeted in Ghana and research suggests that some species may be on the verge of national extinction or may indeed already be nationally extinct.

Mammal community responses to logging activities via reconnaissance surveys and camera trap sampling.

Dr. Sylvain Gatti (West African Primate Conservation Action consultant), ZSL project staff, Wildlife Division staff and Samartex wildlife survey team.

200 hours of field surveys and camera trap surveys were conducted in multiple forest reserves in Moist Evergreen and Moist Semi-deciduous forest collaboration with ZSL team members, Samartex staff, and Wildlife Division staff. Mamiri FR was selected as a focal area because of reports of endangered chimpanzees (*Pan troglodytes*) in the reserve and the interest of Samartex in potentially sparing it from logging as a protected area. Reconnaissance (e.g., non-linear transect) surveys on existing forest trails were carried out and signs of all mammals recorded during surveys. These were quantified as Kilometric Indices of Abundance (KIA). Results showed that the abundance of hunting signs (e.g., snare traps, rifle cartridges, hunter encounters) was very high overall, approximately 10 times the KIA of mammals. Camera traps likewise recorded many more images of hunters than of animals, suggesting that while they may be a means of documenting illegal activities in Ghana's forest reserves, they probably cannot be recommended as a cost-effective wildlife monitoring tool in Ghana due to high cost input relative to low mammal data output. Results suggest that the relatively small sizes of forest reserves in Ghana combined with the extremely high intensity of hunting makes it very likely that many of the forest wildlife species in Ghana will be extirpated from forest reserves, if they have not been already, if effective interventions are not swiftly implemented.

Amphibian community responses to logging activities via direct searches/sampling.

Adum Gilbert Baase (MSc student, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana).

This has been the focus of KNUST master's student Adum Gilbert Baase, who has led amphibian surveys in three Moist Semi-deciduous FRs using trained teams of three individuals to search a total of 16, 100x200m plots and four 50m-stream-transects. Sixteen, 11, and 8 anuran species respectively were recorded in the three FRs totalling 23 different species representing five taxonomic families; these include both forest specialists that can be used as indicators of intact forests, including five IUCN-designated species of conservation concern, and invasive species considered to be negative indicators showing serious habitat degradation. Nearly 70% of the species in two of the three FRs surveyed were savanna species. One unknown species may be a hybrid of an endangered species and an invasive species; tissue has been submitted for testing to confirm this. An exciting discovery was a new location for the endemic amphibian *Arthroleptis krokosua*. Amphibians are excellent indicators of ecosystem health; the presence of a majority of savanna species in two out of the three forest reserves surveyed indicates that the effects of recent logging activities are causing Ghana's forests to become degraded, quite apart from their association with hunting activities that appear to be driving target mammal and bird declines.

Understorey bird community responses to logging activities via mist net sampling.

Dr. Nico Dauphiné (Project Manager).

This has been the focus of ongoing research by Project Manager Dr. Nico Dauphiné and a team of trained community assistants. More than 20,000 net-meter-hours of bird sampling was completed in replicates of the four above-described treatments in Moist Evergreen forest in concessions managed by Samartex. A total of 31 bird species and 374 individuals were captured, all of which are forest obligate species, including one IUCN-listed globally threatened species. Preliminary results show a continuous negative trend of bird species richness and abundance over time. Although logging intensity in SAX concessions (~1 tree/ha) is substantially lower than in JCM concessions (~6 trees/ha), understory birds declined in both areas and did not show signs of recovery within the sampling time-period. This response suggests that current logging protocols, in combination with high disturbance in most forest reserves due to wildlife poaching, illegal logging, and other resource extraction, may not allow sufficient time for many or perhaps most forest species to recover and persist in Ghana's forest reserves.

Vegetation structure and composition responses to logging activities via direct sampling.

In each site used for mist net sampling, the ZSL team has also systematically collected data on vegetation structure (e.g., canopy cover, understory cover, basal tree area, etc.) and composition, in order to determine if particular changes in wildlife communities or populations are associated with changes in vegetation structure and/or composition. Vegetation surveys were carried out with timber company enumeration or Wildlife Division staff, and equipment used are equivalent to tools used by enumeration teams

Assessing the Importance of Bushmeat for Livelihoods of Cocoa Farmers within a timber concession in Sui Forest Reserve, Western Region.

Björn Schulte-Herbrüggen (PhD student, Institute of Zoology at the Zoological Society of London & Department of Anthropology at University College London)

This research project aimed to assess the potential impact of wildlife management on livelihoods and provide recommendations for mitigating the resulting conflict. Household interviews were carried out in 64 households at 2-3 week intervals over a period of 6 months recording all monetary and non-monetary incomes and expenditures using 24 hour recall periods. All households were grouped into four wealth categories using participatory wealth ranking. Results indicate that the two bottom wealth groups derived between 20 to 30% of their production from natural resources and the top two groups about 12%. During the cocoa season, the importance of bushmeat and other NTFPs showed a strong negative correlation with wealth. The wealthiest households harvested very little bushmeat and the poorest derived about 20% of their production value from NTFPs. Throughout the seasons, bushmeat is the single most important NTFP for households in the community. The most frequently killed bushmeat species was rat which comprised 41% of the total value of bushmeat harvest recorded. The vast majority of bushmeat value was derived from the forest reserve surrounding the community. The bushmeat harvest rates and species profile indicate that wildlife populations are depleted. All species recorded were small-bodied and only two of the species recorded are considered endangered in Ghana, ie black & white flying squirrel and giant forest squirrel. Hence, endangered species are likely to be already extinct in the vicinity of the community and current hunting may not present a further threat to endangered species. Despite the depletion of wildlife populations, bushmeat appears to be of economic importance to households across all wealth groups during the hungry season and to the poorest households during the cocoa season. Especially interesting is the shift in bushmeat use pattern between seasons, where all wealth groups sell bushmeat during the hungry season to compensate income shortages but only the poorest continue selling bushmeat during the cocoa season. When cocoa income is not available bushmeat increases in importance, both for consumption and as source of income.

These results suggest that bushmeat management strategies need to take into account seasonal variations in the importance of bushmeat to different wealth groups and recognise that households rely to different extent on bushmeat depending on their access to alternative protein sources.

4.6 Capacity building

The capacity of host country partners has been increased for conservation research and management as a result of this project. The partnerships with universities, logging companies and government authorities have ensured that students and staff from these institutions have been involved in every aspect of the work (as described in Section 3).

The project has successfully trained, supported and supervised 9 postgraduate students who have participated in the project including 1 PhD student, 2 Ghanaian MPhil/MSc students, 5 Cameroonian and 1 UK MSc student. Two of these have received their qualifications and the rest have, or are due to submit their dissertations. Both those that have completed their courses have already found employment in the conservation sector, one initially as a research officer with the project and now with the Ghana Wildlife Society and the other with the Ministry for Forests and Wildlife (MINFOF) in Cameroon. Through the project all the students have had the opportunity to present their research at workshops or conferences, including the final project workshops or the Student Conference for Conservation Science (SCCS) in Cambridge.

Staff from partner companies have received extensive training in wildlife monitoring methods, data collection, use of cyber trackers and GPS units data, analysis and reporting. In addition to training, databases have been established for each company to compile and collate data, standardised reporting systems have been developed and permanent monitoring stations established to enable the companies to conduct their own monitoring. As a result of this both companies in Cameroon have their own wildlife and illegal activity monitoring teams who have completed a year's bio-monitoring survey and are continuing to carry this out with minimal supervision. The information collected through the project and still being collected by the trained field personnel provides information to the companies to increased their knowledge and understanding of the situation within their concessions and changes taking place over time which has strengthened their capacity to make informed management decisions and adapt these based on robust scientific data.

Similarly government field staff have received this field training by participating in research activities and learnt new survey techniques they had no previous experience of. This will enable these personnel, not only to conduct their own research but also to train others within their departments and to assess the results being reported by companies.

The final project report and recommendations will assist the logging sector to achieve 'sustainable forest management' by proving them with information on the potential impacts of their activities and approaches to mitigate this whilst also providing them with the tools to be able to monitor their wildlife.

Finally, the project has been an invaluable experience for ZSL and the project staff. Working with a diverse range of partners, from academic institutions and local NGOs to governments and industry and reconciling the interests and requirements of each has at times been challenging but has left the team with an understanding of these different interests and how best to manage them in order to achieve the objectives of both the organisation and the partners. In particular this has resulted in a much better understanding of the requirements of industry and how an organisation such as ZSL can engage with industry. A new Business and Biodiversity programme has now been established at ZSL and the experience gained from the Wildlife Wood Project will be play a major part in guiding this area of work.

4.7 Sustainability and Legacy

The approach of this project has been to work with host country partners to build their capacity to continue activities implemented by the project beyond the end of the DI funding. The wildlife and illegal activity monitoring teams recruited by the timber companies and trained through the project, the permanent bio-monitoring stations established and the commitment of the companies to wildlife monitoring will ensure that these activities are maintained and wildlife management within these concessions will continue.

Although it has not been possible to have the projects results and recommendations adopted by national institutions and FSC guidelines within the timeframe of the project we now understand more fully the processes involved and we will continue to engage with these bodies and attend relevant meetings and workshops to present our recommendations. In this way we

will ensure that there will be a legacy of the project ensuring responsible wildlife management within timber production forests in West and Central Africa. As more companies in West and Central Africa strive for timber certification, the indicators and monitoring methods developed through this project will be used in concessions other than those of the current project partners', and we hope that the students and officials trained through the WWP will play their part in the management and monitoring of these efforts. The national workshops and project report produced at the end of the project will be useful sources of information for all stakeholders and will be freely available.

Through the Wildlife Wood Project strong partnerships have been developed between ZSL and in-country partners, especially in Cameroon. Both Pallisco and SFID have agreed to 3 year extensions to their MoUs and have committed further resources to future activities including Pallisco recruiting further personnel. As a direct result of the success of the project further funding has been awarded by both the United States Fish and Wildlife Service and the Arcus Foundation to continue to work in Cameroon. The project has developed a reputation in Cameroon and increasingly in other countries in Central Africa which has resulted in interest from other companies in working with the project to improve their wildlife management. We intend therefore to develop strategic partnerships with further companies who show a commitment to sustainable forest management to assist them in improving their wildlife management practices. Meanwhile we intend to continue working with our current partners to implement best practices and carry out further research into the impacts of logging activities and management practices in order to continue to improve knowledge on impacts and best-practice, making these 'model' concessions.

In addition the project has helped build relationships between logging companies and communities so we intend to extend the community element of the project to ensure that communities are more involved in the management of wildlife in concessions and take responsibility for this.

5 Lessons learned, dissemination and communication

Information regarding the project has been disseminated to a wide range of target audiences, including the general public, the scientific community, policy makers and the timber industry both in the UK and the host countries.

Project news is disseminated to partners in monthly email newsletters as well as via regular meetings. A WWP information sheet has been produced, printed and distributed to project stakeholders, and is available for download from the WWP website (www.zsl.org/wildlifewoodproject). The website itself has information on the project and is accessible to the public and a project blog was started in 2009 to allow the public to find out more about ongoing project activities from the teams in the field (<http://www.zslblogs.org/?cat=47>). Information on the project is also provided on the websites of timber company partners Timbmet, Pallisco and Rougier.

Presentations on the project and its achievements have been given to partners and to wider audiences at workshops, meetings and conferences and this dissemination is continuing beyond the DI funding period. WWP-Ghana project affiliates have given presentations at three international scientific meetings: the Society for Conservation Biology (SCB) first Africa Section meeting in Accra, Ghana in January 2009 ("Using birds as indicators for wildlife conservation in Upper Guinea Forests of Ghana" by Nico Dauphiné and "Cocoa farming and bushmeat hunting in a forest-farm mosaic in southwest Ghana" by Bjorn Schulte Herbruggen), the Student Conference for Conservation Science (SCCS) in Cambridge, UK in March 2009 ("Implications of selective logging for birds in a moist semi-deciduous forest of Ghana" by Nathaniel Annorbah), the American Ornithologists' Union annual meeting in August 2009 ("Death by chocolate or by bullet? Threats to bird conservation in West Africa" by Nico Dauphiné, Daniel Kolani and Lars Holbech). WWP-Cam project manager Eric Arnhem has given talks to COMIFAC representatives at a meeting in February 2010, at an ATIBT (Association Technique Internationale des Bois Tropicaux) meeting about Biodiversity and HCVF in Douala in February 2009. The report of this meeting is available on ATIBT's website (www.atibt.com), a WWF/FSC workshop in Yaoundé in September 2009, meetings of the UK Bushmeat Working Group in London in June 2009 and March 2010 and a TRAFFIC meeting on wildlife management in

timber concessions in June 2010. A further presentation will be given in August 2010 at the International Union of Forest Research Organisations' (IUFRO) World Congress in Seoul, Korea and we will continue to present the project at other relevant fora.

In March 2010 final project workshops were held in Ghana and Cameroon as well as a public event in London to share the results of the project with all relevant stakeholders. Approximately 30 people attended the workshop in Ghana, including representatives from the Forestry Commission and Wildlife Division, academic institutions, NGOs, FSC and several logging companies. The Cameroon national workshop was attended by over 45 people, including representatives from 10 NGOs, 3 academic institutions, 3 African governments (Cameroon, Gabon and Equatorial Guinea), the US Fish and Wildlife Service, 5 logging companies, FSC and certification auditing bodies. Reports from both these workshops are in preparation and will be sent to all interested stakeholders as well as being available to the public as pdfs on the project's website. The Cameroon workshop achieved a considerable amount of media attention with an article published in the national newspaper, the Cameroon Tribune, and a series of eight 2-minute 'newsflashes' on the national radio talking about the project and the workshop.

The meeting in London followed the format of ZSL's Communicating Science series and was attended by over 60 members of the public.

Technical reports on all the project activities and research have also been produced and provided to partners and a final report on wildlife management in timber concessions with a focus on great apes as indicators is also in preparation. This report will be targeted at policy makers, certification bodies, NGOs and industry and be available in both French and English from the project's website and hard copies will be available from ZSL.

Peer reviewed scientific publications on the research carried out by the project are being prepared for submission to relevant journals to disseminate them to the scientific community.

In Cameroon a community awareness programme led by a local NGO, ASTEVI, visited all the villages around our project sites presenting information on the project and the wider issues of conservation and sustainable wildlife management and forestry. As part of this 2 radio shows were produced and aired on local radio (copies on enclosed CD).

5.1 Darwin Identity

Although the start up of the project in Ghana was made possible with seed funding from Timbmet, the support from the Darwin Initiative enabled the project to commence activities on a larger scale in Ghana and to establish in Cameroon. As a result the Wildlife Wood Project has been recognised, branded and publicised as a 'Darwin Initiative' project within ZSL and to partner organisations and the wider community. The project has made every effort to promote and publicise the Darwin Initiative and its support for the project through use of the publicity materials received from the DI and the DI logo. All equipment had the Darwin logo attached, including the project vehicles, computers, bikes etc. Signs for the project's offices in Cameroon and Ghana had the Darwin logo alongside ZSL's. Folders produced for participants of the final workshops had the DI logo on them and DI pens were distributed to the participants. The project's website and information sheets have the DI logo and monthly newsletters produced in each country also acknowledge DI's support. All power point presentations given by project staff acknowledge the DI's support for the project (see final project presentations on enclosed CD). Whenever project staff were interviewed by press or media the DI was mentioned.

As a result of this all the partners of the project are aware of the Darwin Initiative, including local NGOs, the government and logging companies.

6 Monitoring and evaluation

There were no changes made to the project design, however the project's first annual review did suggest that the project's logframe be revised and tightened. As a result the purpose was made more concise and the original 6 outputs with only one activity under each were restructured and reduced to 3 outputs each with 2 activities. The indicators at the purpose and output levels were also revised.

We found this advice and the other pertinent comments from the annual reviewer(s) to be very helpful and at times thought provoking. We also appreciated the supportive and understanding comments which recognised the challenges associated with working with the forestry sector in these countries.

The logframe has proved a valuable tool in the monitoring and evaluation of the project. It enabled the project managers to establish workplans and targets based on the indicators and required outputs. It also enabled the project leaders to review the monthly technical reports on project activities and progress sent to ZSL's London office against the indicators. This system proved useful in planning with partners and enabling them to monitor the progress of the project from reports sent to them and the regular meetings held by the project managers with host country partners to review progress and workplans. These were then discussed during annual field visits by the ZSL London team to Ghana and Cameroon and visits to London by the Ghana and Cameroon project managers.

6.1 Actions taken in response to annual report reviews

All issues raised in annual report reviews have been addressed in previous annual and half-year reports. These include revising and enhancing the projects logframe, including the DI logo on the project's website and responding to queries regarding post-project plans.

7 Finance and administration

7.1 Project expenditure

Total expenditure

	Budget Year 1	Spend Year 1	Budget Year 2	Spend Year 2	Budget Year 3	Spend Year 3	Budget Year 4	Spend Year 4	Total budget	Total Spend	Var ⁿ
Rents, rates, heating, cleaning, overheads	8715 ¹	8715	10838	9918	13238	12620	0	0	32792	31253	-4.7%
Office costs											
Travel and Subsistence											
Printing											
Conferences, seminars, etc.											
Capital items / equipment											
Field equipment											
IT equipment											
Vehicle Cameroon											
Other costs											
Cargo											
Visas											
Permits											
Contingency											
Salaries											
Total											

¹ The original budget was £11,015 but £2,300 was reallocated to the 'capital items' line.

² The original budget was £18,763 but this was increased by £23,000 to purchase a vehicle and camera traps. The additional funds came from the 'rents, rates etc' line (£2,300), 'other costs' (£4,200) and salary line (£16,500).

³ The original budget was £4,500 but £4,200 was reallocated to the 'capital items' line.

⁴ The original budget was £44,104 but £16,500 of this was reallocated to contribute to the 'capital items' line

⁵ The original budget was £44,104 but £8,000 was carried over to year 3.

⁶ The original budget was £10,000 but this was carried over to Year 4 when the project was extended for 3 months.

⁷ The original budget was £38,104 but £8000 was carried over from Year 2 which increased the budget to £46,104 and then £1,500 was carried over to Year 4 when the project was extended.

⁸ This was carried over from Year 3 and reallocated from the 'printing' line.

⁹ £10,000 was carried over from Year 3 and £3,000 of this reallocated to 'salaries' (£2,718) and 'travel and subsistence' (£282).

¹⁰ £1,500 was carried over from Year 3 and an additional £2,718 reallocated from the 'printing line'

*Outstanding costs for printing yet to be paid for.

Salary Breakdown

Staff employed	Budget Year 1	Spend Year 1	Budget Year 2	Spend Year 2	Budget Year 3	Spend Year 3	Budget Year 4	Spend Year 4	Total budget	Total spend
Project Coordinators										
In-country co-leaders										
Community research assistants										
Forestry Department rangers										
MSc students										
Cooks										
Drivers										
Total										

¹Original budget £4,320 but £3,890 reallocated to 'capital items' line

²Original budget £6,840 but all reallocated to 'capital items'

³Original budget £6,000 but £5,770 reallocated to 'capital items'

⁴Original budget £6,840 but £4,500 carried over to year 3

⁵Original budget £6,000 but £3,500 carried over to year 3

⁶Original budget £5,000 but £1,000 reallocated from 'forest department rangers'

⁷Original budget £4,320 but £3,000 reallocated from 'forest department rangers'

⁸Original budget £6,840 but £4,500 carried over from year 2 and then £8,500 reallocated to other salary lines

⁹ Original budget £0 but £3,500 carried over from year 2

¹⁰ Original budget £792 but £300 reallocated from 'forest department rangers'

¹¹ Original budget £1152 but £4200 reallocated from 'forest department rangers'

¹² Carried over from year 3 salary line (£1,500) and £2718 reallocated from printing line

7.2 Additional funds or in-kind contributions secured

In addition to the award from the Darwin Initiative, a total of £169,040 of funding was secured for the project. This comprised £60,000 from Timbmet, £60,000 NERC/ ESRC for PhD student in Ghana, £44,040 from the Rufford Maurice Laing Foundation and £5000 from CIRAD. This was complemented by an in-kind contribution from partners estimated to be equivalent to approximately £50,000.

The in-kind contributions to the project from partners included the provision of office space and accommodation by the timber companies in their sawmill sites, the recruitment of wildlife teams to carry out the year of wildlife monitoring by Pallisco and SFID in Cameroon, the purchase of a generator for use in villages for awareness activities, provision of mechanics to service project vehicles and discounted fuel from their supplies.

7.3 Value of DI funding

The DI funding enabled ZSL to start up the Wildlife Wood Project and establish itself in both Ghana and Cameroon. The financial stability of a 3 year grant has enabled ZSL and partners to focus on achieving the ambitious objectives of the project which may not have been possible with smaller short term grants. It has provided co-funding to leverage significant additional resources over the duration of the project and for continuation work for which £95,000 has so far been secured.

The funding has also enabled us to purchase equipment including a project vehicle and set of camera traps which were essential to the completion of the project but we would have been unable to purchase with smaller grants. Equipment has also been provided to host-country partners, especially universities, who otherwise would not have had access to these materials.

Annex 1 Report of progress and achievements against final project logframe for the life of the project

Project summary	Measurable Indicators	Progress and Achievements April 2007 – June 2010	Actions required/planned for next period
<p>Goal: To draw on expertise relevant to biodiversity from within the United Kingdom to work with local partners in countries rich in biodiversity but constrained in resources to achieve</p> <ul style="list-style-type: none"> The conservation of biological diversity, The sustainable use of its components, and The fair and equitable sharing of the benefits arising out of the utilisation of genetic resources 	<p>Wildlife indicators accepted by timber certification authorities</p> <p>Best practice wildlife management protocols developed by timber producers</p> <p>Timber importers and consumers support Sustainable Forest Management in key areas.</p>	<p>(report on any contribution towards positive impact on biodiversity or positive changes in the conditions of human communities associated with biodiversity eg steps towards sustainable use or equitable sharing of costs or benefits)</p>	<p>(do not fill not applicable)</p>
<p>Purpose</p> <p>To improve wildlife management in timber production forests of West and Central Africa, by determining robust indicators for wildlife that can be integrated into timber certification procedures, monitored, reported upon and inform concession management.</p>	<p>Wildlife indicators accepted by timber certification authorities</p> <p>Best practice wildlife management protocols developed by timber producers</p> <p>Timber importers and consumers support Sustainable Forest Management in key areas.</p>	<p>Project personnel have participated in the current development of a sub-regional FSC standard for the Congo Basin and a national standard for Ghana and submitted comments and recommendations based on project results.</p> <p>5 logging companies are partners on the project and have signed formal MoUs to implement bio-monitoring programmes and wildlife management practices in their timber concessions.</p>	<p>Completed write up of technical reports, peer-reviewed papers and a ZSL conservation report based on research work carried out by the WWP.</p>
<p>Output 1.</p> <p>Wildlife indicators identified and dynamics of bushmeat trade documented in 2 rainforest regions (west and central Africa), which can be used to verify timber certification systems</p>	<p>Biological survey results show impact of logging and hunting on species by Year 2.5</p> <p>Socio-economic surveys completed in 2 – 3 case study areas (per country) by Year 2.5.</p>	<p>All wildlife research has been completed and analysed to determine impacts of logging on different wildlife taxa and identify indicators.</p> <p>Research into bushmeat offtake and consumption in rural villages around target timber concessions has been completed in both Cameroon and Ghana.</p>	
<p>Activity 1.1</p> <p>Field surveys in forest areas with varying hunting and logging impact.</p>		<p>Ghana: Research comparing forests recently logged (e.g., 1-3 years post-logging), 10 years post-logging, and 20+ years post-logging carried out</p>	

	<p>on:</p> <ol style="list-style-type: none"> 1) impacts of logging on Bird communities (via aural detections/Distance sampling) 2) Understory bird communities (via mist net sampling) 3) Hornbills (via playback surveys) 4) Mammal communities (via reconnaissance surveys and camera trap sampling) 5) Amphibians (via direct searches/sampling) 6) Vegetation structure and composition (via direct sampling) <p>Cameroon: Monthly wildlife monitoring surveys have been carried out in two concessions in the East Province of Cameroon by logging company staff over a 12 month period. This study has been designed to compare results from unlogged forest with forest actively being logged to identify mammal species that are vulnerable to logging activities.</p>
<p>Activity 1.2 Hunter, h'hold and market surveys to assess off-take and local trade impact</p>	<p>Ghana: Bjorn Schulte-Herbruggen's PhD fieldwork on dependence of villagers in Sui River Forest Reserve on hunting has been completed and a preliminary report submitted to partners. PhD thesis due by end of 2010.</p> <p>Cameroon: Studies were carried out looking at: bushmeat harvest volume, consumption, trade and dependency in villages along the road separating Pallisco and SFID's concessions; the consumption of bushmeat in Pallisco's worker camp and the effectiveness of the company's supply of alternative sources of protein and attempts to limit its impact on local wildlife; and a detailed inventory of forest products utilised by villagers was carried out by an MSc student working in a rural village of the periphery of SFID and Pallisco's concessions.</p>
<p>Output 2. Wildlife management plans developed and impacts monitored through cost-effective and scientifically rigorous wildlife monitoring systems in 2 case study forests (1 per country), to ensure best practice and monitor impacts.</p>	<p>Wildlife Management Plans developed and being implemented in two case study forests by end Year 3. Regular monitoring reports produced by Ghanaian and Cameroonian researchers and timber company workers.</p> <p>Results of wildlife research and monitoring have been written up and provided with recommendations to partner companies for incorporation into wildlife management plans. Some management actions were being implemented by the end of year 3, including the identification of chimpanzee HCVs, awareness raising amongst company workers and communities, check points on logging roads, blocking off of old logging roads, adapting logging systems to minimise impacts on wildlife. SFID and Pallisco and Samartex have recruited staff to create wildlife and</p>

		<p>illegal activity monitoring teams to respond to all wildlife-related matters. The WWP supervises the work of these teams and trains their members. The teams are producing regular monitoring reports.</p>
<p>Activity 2.1. Review forest management plans in case study forests and develop wildlife management actions with the timber companies and local communities.</p>		<p>Cameroon: Wildlife and illegal activity monitoring teams have been established by each company and carrying out bio-monitoring and monitoring the occurrence of illegal activities in timber concessions. Data collected by these teams, alongside the WWP's socio-economic research with local communities and company workers, has been compiled and used to make recommendations to the companies to improve current management plans.</p> <p>Ghana: Recommendations have been made to the logging companies and Forestry Commission based on the wildlife and socio-economic data collected and gaps identified in current forest management plans.</p>
<p>Activity 2.2. Cost-effective forest monitoring.</p>		<p>Wildlife surveys have been conducted using a suite of different recognised methodologies including linear transect surveys, 'recce' transect surveys, camera trapping, mist netting and acoustic surveys (for birds) and their results compared in order to propose the most cost-effective and scientifically rigorous bio-monitoring protocols to corporate partners. In addition new innovative techniques have been developed and tested.</p>
<p>Output 3. Capacity building and awareness of timber certification and wildlife management increased among government, private sector, research and local communities, and timber consumers.</p>	<p>MSc students, timber company workers and wildlife rangers trained in wildlife indicator surveys and socio-economic surveys Participation in two national workshops (Yaounde, Accra) and one international workshop (Brussels) International / national newspaper and radio coverage</p>	<p>In both countries, MSc students, timber company workers and wildlife rangers have all taken part in field work and been trained in wildlife surveys and some in socio-economic surveys.</p> <p>Workshops were held in Accra, Ghana, Yaoundé in Cameroon and at ZSL in London in March 2010 to disseminate and discuss results and recommendations from all research work carried out during the tenure of the project.</p> <p>The workshops were used to disseminate the results of WWP through the press and radio. A series of short radio shows were aired on Cameroon national radio and an article was published in the national newspaper, the Cameroon Tribune.</p>

	<p>In Cameroon, in partnership with ASTEVI, a roadshow has been conducted in villages surrounding SFID and Pallisco's concessions to familiarise local populations with wildlife conservation and management.</p>
<p>Activity 3.1. Capacity-building through training.</p>	<p>Cameroon: A total of 6 MSc students have been supported and supervised by the project, 3 from the University of Yaoundé I, 2 from CRESA and 1 from ZSL's Institute of Zoology and Imperial College London carrying out research projects on: the effect of the linear transect network design on wildlife surveys; the dependence of a rural village on forest resources, and specifically bushmeat; the suitability of camera traps as a wildlife monitoring tool in timber concessions; and Identification of core chimpanzee areas as areas of High Conservation Value (HCV). Students have been trained in field data collection and analysis, the use of specific software packages and scientific reporting. One of these students has already been recruited by MINFOF.</p> <p>The wildlife teams of Pallisco and SFID timber companies have undergone training in bio-monitoring, including the use of GPS' and cybertrackers for data collection, carrying out different survey techniques, report writing. More senior management personnel have been trained in the analysis and interpretation of data, compiling this into reports and utilising it for management decision making.</p> <p>Ghana: An MPhil student from the University of Ghana and an MSc student from KNUST have been supervised by the project to carryout research projects on the impacts of logging on birds and amphibians respectively and the appropriateness of these taxa as indicators. One of these students, Nathaniel Annorbah, was taken on as assistant manager to the project and trained in a variety of additional survey methods. Following completion of the project he has been employed by the Ghana Wildlife Society.</p> <p>The Samartex timber company's wildlife team was trained in wildlife monitoring techniques and data collection.</p> <p>Personnel from the Wildlife Division in Ghana participated in field work and were trained in methodologies that they were not familiar with such as camera trapping and mist netting.</p>
<p>Activity 3.2.</p>	

<p>Awareness raising of wildlife management in timber production forests.</p>	<p>Ghana and Cameroon: Through participation in several workshops aiming at reviewing/developing certification standards, discussing management of wildlife in timber concessions and identifying HCV and presentations at international conferences the WWP has promoted the need to integrate wildlife indicators in timber certification schemes and for stronger guidelines regarding wildlife management in timber concessions.</p> <p>WWP's own workshops carried out in March 2010 further raised this issue amongst stakeholders in the respective regions.</p> <p>In Cameroon, in partnership with ASTEVI, a roadshow has been conducted in villages surrounding SFID and Pallisco's concessions to familiarise local populations with wildlife conservation and management.</p>
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Annex 2 Project's final logframe, including criteria and indicators

Project summary	Measurable Indicators	Means of verification	Important Assumptions
<p>Goal:</p> <p>To draw on expertise relevant to biodiversity from within the United Kingdom to work with local partners in countries rich in biodiversity but poor in resources to achieve</p> <ul style="list-style-type: none"> • the conservation of biological diversity, • the sustainable use of its components, and • the fair and equitable sharing of benefits arising out of the utilisation of genetic resources 			
<p>Purpose</p> <p>To improve wildlife management in timber production forests of West and Central Africa, by determining robust indicators for wildlife that can be integrated into timber certification procedures, monitored, reported upon and inform concession management.</p>	<p>Wildlife indicators accepted by timber certification authorities</p> <p>Best practice wildlife management protocols developed by timber producers</p> <p>Timber importers and consumers support Sustainable Forest Management in key areas.</p>	<p>Timber certification guidelines</p> <p>National forest regulations and timber certification guidelines</p> <p>Price premiums or consumer preference or procurement regulations</p>	<p>Wildlife laws included in criteria for production of "legal timber"</p> <p>Political priority given to changing forest regulations</p> <p>Markets are sensitive to price mark-up for certified timber.</p>
<p>Outputs</p>	<p>Biological survey results show impact</p>		

<p>1. Wildlife indicators identified and dynamics of bushmeat trade documented in 2 rainforest regions (west and central Africa), which can be used to verify timber certification systems</p>	<p>of logging and hunting on species by Year 2.5</p> <p>Socio-economic surveys completed in 2 – 3 case study areas (per country) by Year 2.5.</p>	<p>Technical reports and peer-reviewed papers</p> <p>Technical reports and peer-reviewed papers</p>	<p>Suitable study sites can be found and timber companies are supportive</p>
<p>2. Wildlife management plans developed and impacts monitored through cost-effective and scientifically rigorous wildlife monitoring systems in 2 case study forests (1 per country), to ensure best practice and monitor impacts.</p>	<p>Wildlife Management Plans developed and being implemented in two case study forests by end Year 3</p> <p>Regular monitoring reports produced by Ghanaian and Cameroonian researchers and timber company workers</p>	<p>Wildlife management plans signed off by government and timber companies, with support of local communities</p> <p>Monitoring reports</p> <p>Best Practice Guidelines report</p>	<p>Permissions are granted by local administration (national permission has already been agreed)</p>
<p>3. Capacity building and awareness of timber certification and wildlife management increased among government, private sector, research and local communities, and timber consumers.</p>	<p>MSc students, timber company workers and wildlife rangers trained in wildlife indicator surveys and socio-economic surveys</p> <p>Participation in two national workshops (Yaounde, Accra) and one international workshop (Brussels)]</p> <p>International / national newspaper and radio coverage</p>	<p>MSc theses</p> <p>Training certificates</p> <p>Workshop reports</p>	<p>Timber companies have resources and government support to pilot new approaches to wildlife management in production forests</p> <p>Local communities and commercial hunters support, and engage with, wildlife management plans</p>
		<p>Press and radio articles (international & local)</p>	<p>Suitable students and timber company workers can be recruited; suitable government rangers are made available</p>

Activities	Activity Milestones	Assumptions
<p>1.1 Field surveys in forest areas with varying hunting and logging impact.</p> <p>1.2 Hunter, h'hold and market surveys to assess off-take and local trade impact</p>	<p>Yr 1: identify forests with 3 levels of hunting pressure (per country) and establish transects for baseline surveys</p> <p>Yrs 1-2: identify key hunters and users, and establish surveys (incl PRA & focal groups) of household and hunter use and trade</p> <p>Yr 2 (Jan 2009): biological and socio-economic surveys and results analysis completed (12 months data) and wildlife indicators identified.</p> <p>Yr 3 (Jan 2010): 2 technical reports (Ghana and Cameroon) completed and paper for scientific journal submitted</p>	<p>Sufficient records of different species to allow rigorous assessment of appropriate wildlife indicators</p> <p>Socio-economic data sufficiently robust to verify appropriate wildlife indicators</p>
<p>2.1 Review forest management plans in case study forests and develop wildlife management actions with the timber companies and local communities</p>	<p>Yr 3: take preliminary results from socio-economic and biological surveys and integrate with forest management plans in 2 case study forests.</p> <p>Yr 3 (Sept 2008): specific wildlife management actions to be implemented in particular forest blocks</p>	<p>As above</p>
<p>2.2 Cost-effective forest monitoring</p>	<p>Yr 2: local teams of government and timber company rangers monitor different forest blocks using standard survey methods for wildlife indicators.</p> <p>Yr 3 (Dec 2009): best practice guidelines drawn up for wildlife management in production forests.</p>	
<p>3.1 Capacity-building through training</p>	<p>Yrs 1 and 2: MSc students receive field training and carry out projects (2 per country per year)</p> <p>All years: Wildlife Dep rangers, timber company surveyors and community research assistants receive training in monitoring</p> <p>Yr 2: Ghana-Cameroon exchange field visits</p>	
<p>3.2 Awareness raising of wildlife management in timber production forests</p>	<p>Yr 1: press release of project launch in UK, Ghana and Cameroon.</p> <p>Yr 2: newspaper and radio articles: Ghana and Cameroon</p> <p>Yr 3: National workshops: Ghana & Cameroon</p> <p>[Yr 3: International workshop to launch Wildlife Indicators and Wildlife Management Guidelines].</p>	

Annex 3 Project contribution to Articles under the CBD

Project Contribution to Articles under the Convention on Biological Diversity

Article No./Title	Project %	Article Description
6. General Measures for Conservation & Sustainable Use		Develop national strategies that integrate conservation and sustainable use.
7. Identification and Monitoring	25	Identify and monitor components of biological diversity, particularly those requiring urgent conservation; identify processes and activities that have adverse effects; maintain and organise relevant data.
8. In-situ Conservation		Establish systems of protected areas with guidelines for selection and management; regulate biological resources, promote protection of habitats; manage areas adjacent to protected areas; restore degraded ecosystems and recovery of threatened species; control risks associated with organisms modified by biotechnology; control spread of alien species; ensure compatibility between sustainable use of resources and their conservation; protect traditional lifestyles and knowledge on biological resources.
9. Ex-situ Conservation		Adopt ex-situ measures to conserve and research components of biological diversity, preferably in country of origin; facilitate recovery of threatened species; regulate and manage collection of biological resources.
10. Sustainable Use of Components of Biological Diversity	30	Integrate conservation and sustainable use in national decisions; protect sustainable customary uses; support local populations to implement remedial actions; encourage co-operation between governments and the private sector.
11. Incentive Measures		Establish economically and socially sound incentives to conserve and promote sustainable use of biological diversity.
12. Research and Training	35	Establish programmes for scientific and technical education in identification, conservation and sustainable use of biodiversity components; promote research contributing to the conservation and sustainable use of biological diversity, particularly in developing countries (in accordance with SBSTTA recommendations).
13. Public Education and Awareness		Promote understanding of the importance of measures to conserve biological diversity and propagate these measures through the media; cooperate with other states and organisations in developing awareness programmes.
14. Impact Assessment and Minimizing Adverse Impacts		Introduce EIAs of appropriate projects and allow public participation; take into account environmental consequences of policies; exchange information on impacts beyond State boundaries and work to reduce hazards; promote emergency responses to hazards; examine mechanisms for re-dress of international damage.
15. Access to Genetic Resources		Whilst governments control access to their genetic resources they should also facilitate access of environmentally sound uses on mutually agreed terms; scientific research based on a country's genetic resources should ensure sharing in a fair and equitable way of results and benefits.

Article No./Title	Project %	Article Description
16. Access to and Transfer of Technology		Countries shall ensure access to technologies relevant to conservation and sustainable use of biodiversity under fair and most favourable terms to the source countries (subject to patents and intellectual property rights) and ensure the private sector facilitates such assess and joint development of technologies.
17. Exchange of Information		Countries shall facilitate information exchange and repatriation including technical scientific and socio-economic research, information on training and surveying programmes and local knowledge
19. Bio-safety Protocol		Countries shall take legislative, administrative or policy measures to provide for the effective participation in biotechnological research activities and to ensure all practicable measures to promote and advance priority access on a fair and equitable basis, especially where they provide the genetic resources for such research.
Other Contribution	10	Smaller contributions (eg of 5%) or less should be summed and included here.
Total %	100%	Check % = total 100

Annex 4 Standard Measures

Code	Description	Totals (plus additional detail as required)
Training Measures		
1a	Number of people to submit PhD thesis	1
1b	Number of PhD qualifications obtained	
2	Number of Masters qualifications obtained	2 (+7 yet to obtain qualification)
3	Number of other qualifications obtained	
4a	Number of undergraduate students receiving training	
4b	Number of training weeks provided to undergraduate students	
4c	Number of postgraduate students receiving training (not 1-3 above)	
4d	Number of training weeks for postgraduate students	
5	Number of people receiving other forms of long-term (>1yr) training not leading to formal qualification(ie not categories 1-4 above)	18
6a	Number of people receiving other forms of short-term education/training (ie not categories 1-5 above)	9
6b	Number of training weeks not leading to formal qualification	26
7	Number of types of training materials produced for use by host country(s)	
Research Measures		
8	Number of weeks spent by UK project staff on project work in host country(s)	332 weeks over the 3-year project period.
9	Number of species/habitat management plans (or action plans) produced for Governments, public authorities or other implementing agencies in the host country (s)	3 wildlife management plans.
10	Number of formal documents produced to assist work related to species identification, classification and recording.	
11a	Number of papers published or accepted for publication in peer reviewed journals	(4 drafted but not yet submitted)
11b	Number of papers published or accepted for publication elsewhere	
12a	Number of computer-based databases established (containing species/generic information) and handed over to host country	3
12b	Number of computer-based databases enhanced (containing species/genetic	

Code	Description	Totals (plus additional detail as required)
	information) and handed over to host country	
13a	Number of species reference collections established and handed over to host country(s)	
13b	Number of species reference collections enhanced and handed over to host country(s)	
Dissemination Measures		
14a	Number of conferences/seminars/workshops organised to present/disseminate findings from Darwin project work	3 workshops/meetings held in Ghana, Cameroon and UK.
14b	Number of conferences/seminars/ workshops attended at which findings from Darwin project work will be presented/ disseminated.	7
15a	Number of national press releases or publicity articles in host country(s)	
15b	Number of local press releases or publicity articles in host country(s)	1
15c	Number of national press releases or publicity articles in UK	
15d	Number of local press releases or publicity articles in UK	1
16a	Number of issues of newsletters produced in the host country(s)	48 (monthly newsletters to partners in each country for 2 years)
16b	Estimated circulation of each newsletter in the host country(s)	40 people (20 in each country)
16c	Estimated circulation of each newsletter in the UK	10
17a	Number of dissemination networks established	
17b	Number of dissemination networks enhanced or extended	
18a	Number of national TV programmes/features in host country(s)	
18b	Number of national TV programme/features in the UK	
18c	Number of local TV programme/features in host country	
18d	Number of local TV programme features in the UK	
19a	Number of national radio interviews/features in host country(s)	
19b	Number of national radio interviews/features in the UK	
19c	Number of local radio interviews/features in host country (s)	8
19d	Number of local radio interviews/features in the	

Code	Description	Totals (plus additional detail as required)
	UK	
Physical Measures		
20	Estimated value (£s) of physical assets handed over to host country(s)	£25,000 (value when purchased)
21	Number of permanent educational/training/research facilities or organisation established	
22	Number of permanent field plots established	2 sets of transects established in timber concessions
23	Value of additional resources raised for project	£219,040.
Other Measures used by the project and not currently including in DI standard measures		
	MoUs signed with partners	9
	Website blogs	1

Annex 5 Publications

Type * (eg journals, manual, CDs)	Detail (title, author, year)	Publishers (name, city)	Available from (eg contact address, website)	Cost £
Project information sheet *	Wildlife Wood Project: sustainable wildlife management in timber concessions. ZSL 2008. (French and English versions available).	Witherbys, London		Free
ZSL Conservation report	Wildlife Management in Timber concessions: a focus on Great Apes. Arnhem, E., Fankem, O., de Ornellas, P., Kumpel, N. & Ransom, C. 2010. <i>DRAFT</i>	Witherbys, London		Free
Workshop report	Wildlife Management in the timber concessions of Ghana. A report from ZSL's Wildlife Wood Project-Ghana final workshop. Dauphiné, N. 2010. <i>DRAFT</i>			Free
Workshop report*	Gestion de la faune et techniques de suivi des populations animales dans les forêts de production du Cameroun / Management of wildlife and techniques for monitoring animal populations in the production forests of Cameroon. Vautravers, E. & Arnhem, E. 2010. A report from ZSL's Wildlife Wood Project -Cameroon final workshop. <i>DRAFT</i>			Free
Journal	<i>Income portfolios of hunters in villages surrounding two forest concessions in Cameroon.</i> Tieguhong J.C., Arnhem E., Nkamgnia E., Fankem O., and Eyebe J.P. & Ransom C	In preparation – due to be submitted in 2010 to <i>Conservation & Society</i>		
Technical report*	<i>Analyse économique des dispositifs de conservation de la biodiversité forestière au Cameroun.</i> Arnhem, E. & Fankem, O. 2010.			
Technical report*	<i>Evaluation du Piégeage Photographique en tant que</i>			

	<i>methode d'inventaire et de suivi des population animals dans l'UFA 10.038, Est-Cameroon.</i> Fankem, O., Vautravers, E. & Arnhem, E., 2010		
Technical report*	<i>Mammal Surveys in the Western Region of Ghana for the Wildlife Wood Project.</i> Gatti, S. 2009.		
MSc thesis*	<i>Influence of Sampling Design on Wildlife Survey Results in Makalaya Forests (FMU 10.030).</i> Parfait Devis Biloa 2010	University of Yaoundé I, Cameroon	
MPhil thesis*	<i>Implications of Selective Logging for Avifaunal Species in a Moist Semi-Deciduous Forest of Ghana.</i> Nathaniel Annorbah 2009	University of Ghana	
PhD thesis	<i>Assessing the Importance of Bushmeat for Livelihoods of Cocoa Farmers within timber concessions in Sui Forest Reserve, Western Region, Ghana.</i> Bjorn Sculte-Herbruggen 2010.	Department of Anthropology, University College London and, Institute of Zoology, Zoological Society of London	
MSc thesis*	<i>A study of the dependence of Baka and Bantou people on the forest: A socio-economic study of the use of natural resources by Baka and Bantou villages in Eastern Cameroon.</i> Mapon Rikiatou 2010.	University of Yaoundé I, Cameroon	
MSc thesis*	<i>Gestion durables des Grands Singes dans les unités forestières d'aménagement: Contribution a l'amélioration des méthodes d'inventaires des chimpanzés dans l'Est Cameroun.</i> Patrick Armel Mbosso 2010.	The Centre Régional d'Enseignement Spécialisé en Agriculture Forêt-Bois (CRESA), Cameroon	
MSc thesis*	<i>A comparative evaluation of camera traps and line transect biomonitoring as methods of inventorying large and medium sized mammals in an active logging concession in East Cameroon.</i> Nkwetaketu Nembongwe Isaiah 2010.	University of Yaoundé I, Cameroon	

MSc thesis	<i>'The impacts of logging activities on movements of animal populations'</i> . Benoit Tasse 2010.	The Centre Régional d'Enseignement Spécialisé en Agriculture Forêt-Bois (CRESA), Cameroon		
MSc thesis	<i>Amphibian community responses to logging activities via direct searches/sampling</i> . Adum Gilbert Baase 2010.	Kwame Nkrumah University of Science and Technology, Kumasi, Ghana		
Presentation*	<i>What monitoring wildlife tells us about timber production forest management: forest policies, realities and impacts on wildlife in Ghana, West Africa</i> . Dauphiné, N. 2010 Presentation at final project workshop in London, 30 th March 2010.			
Presentation*	<i>Overview of the Wildlife Wood Project's main achievements in Cameroon</i> . Arnhem, E. 2010 Presentation at final project workshop in London, 30 th March 2010.			

Annex 6 Darwin Contacts

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