#### 1. Darwin Project Information

Project Reference No.	162 / 09 / 020
Project title	Development of a monitoring and training unit for the World
	Heritage Sites of Democratic Republic of Congo (DRC)
Country	Democratic Republic of Congo
UK Contractor	Institute of Zoology, Zoological Society of London (ZSL)
Partner Organisation (s)	Institut Congolais pour la Conservation de la Nature (ICCN)
Darwin Grant Value	£ 132,000
Start/End date	1 Jan 2001 – 31 Dec 2002, extended until 30 Mar 2004
Project website	n/a
Author(s), date	Guy Cowlishaw, 22 June 2004

#### 2. Project Background/Rationale

The Democratic Republic of Congo DRC (formerly Zaire) is one of the most biologically rich countries in the world. It is one of only six 'megadiversity' countries worldwide possessing exceptionally high levels of species richness and endemism (including over half of Africa's tropical closed broad-leaved forests). Much of this exceptional value is represented in DRC's five World Heritage Sites, where the Darwin Initiative Project was based. The characteristics of these five protected areas are described in Box 1. Their location is shown in Figure 1.

Yet despite these biological riches, conservation management has been almost entirely neglected due to four successive decades of dictatorial rule, economic collapse, and, more recently, armed conflict. The management capacity of DRC's state wildlife authorities, Institut Congolais pour la Conservation de la Nature (ICCN), has been severely damaged, and as a result the biological resources within these protected areas are being depleted and the integrity of the park boundaries are being eroded by illegal poaching and unregulated agriculture and logging.

Despite the considerable hardships and mounting constraints over this period, ICCN has remained committed to the conservation of these sites by deploying and maintaining over 900 wildlife protection staff within the five World Heritage Sites. The human cost of this commitment has, however, been substantial, with a significant increase in the number of service deaths among park rangers since the beginning of the war in 1996. In spite of these hardships, desertions have been relatively few. However, most of the guards are constrained in their ability to protect the site due to a lack of technical support and training. Further site-specific details are provided in Box 1.

In response to this situation, the Darwin Initiative Project was established in conjunction with ICCN to undertake key training and research activities that would play a significant role in capacity building for ICCN, thereby improving their ability to protect and manage DRC's protected areas and World Heritage Sites.

In this role the Darwin Initiative Project also became a fundamental component of a major new conservation programme established by UNESCO (the United Nations Educational, Scientific

#### Box 1: The World Heritage Sites of Democratic Republic of Congo

Virunga National Park is Africa's oldest national park. Covering a significant proportion of the Albertine Rift, this site probably has the highest level of species endemism for any protected area in Africa. The park represents the most important proportion of the remaining range of the mountain gorilla (Gorilla gorilla beringei), and also includes chimpanzees, elephants and, before the war, held the highest density of hippos in the World. The park has an exceptional landscape diversity spanning the Rwenzori mountains at 17,000 feet with its alpine habitats and glaciers, tropical moist forest in the north, the central savannas and lakes (Lake Edward), an important river system (the Semliki Valley), and the Virunga Volcanoes in the south. The park is managed by a division of just under five hundred park rangers. The efforts of the park authorities, in collaboration with supporting partners, have met with some success, notably the successful protection of the mountain gorillas before and since the beginning of the conflict. The human cost of this success is reflected by the 80 quards that have died on patrol since the beginning of the instability in 1991.

Garamba National Park is situated on the species-rich forest/savanna boundary on the border between DRC and Sudan. It is noted for containing the last known wild population of the northern white rhinoceros (Ceratotherium simum cottoni) and the only population of northern savanna giraffe (Giraffa camelopardalis congoensis). This National Park has experienced a period of armed conflict since 1991, when the civil war of southern Sudan intensified and spilt over the border into DRC. Nevertheless the site, which has been a National Park since 1938, has been actively managed as a protected area through a partnership of project and ICCN personnel continuously since 1984. This has been met with success in meeting conservation objectives: rhinoceros and elephant populations had more than doubled by 1995. In the first war there were major elephant, buffalo and hippo losses, but the rhinos survived and reproduced well and all populations are recovering. The Park also has well-established research and monitoring programmes, which provided a model for the Darwin Project, especially in patrol-based monitoring techniques. The experience of the Darwin Project staff members was largely drawn from this site (KHS has worked at this site since 1983 and EdM since 1993).

Okapi Faunal Reserve represents the central block of the Ituri Forest Massif, one of the last remaining representations of intact tropical moist forest of the Congo Basin. This protected area was recently gazetted both to manage the area's biodiversity, including the endemic Okapi (Okapia johnstoni) and forest elephants, and to protect the resource base of the Bambuti pygmies. An important development at this site has been the establishment of the Centre de Formation de Recherche et de Conservation Forestière (CEFRECOF), consisting of a team of national conservation researchers and practitioners. The Darwin Project staff has a history of collaboration with the CEFRECOF team.

Kahuzi-Biega National Park covers a range of upland and lowland forest as well as savanna habitats and contains an important population of eastern lowland gorillas (Gorilla gorilla graueri). This park has been severely impacted by the war. Settlement and exploitation within the park has been substantial since the beginning of the war, caused primarily by the insecurity and by the growth of artisanal coltan mining (colombo tantalum deposits required for the high-technology industries), agricultural encroachment in the corridor, and a significant presence of military factions. This has led to a catastrophic collapse of elephant and gorilla populations in the lowland forest areas.

Salonga National Park is the biggest protected area in DRC and is also the most remote. Salonga was the only World Heritage Site in Government-held territory. It is a vast expanse of lowland moist tropical forest, home to the endemic pygmy chimpanzee or bonobo (Pan paniscus). Much of the forest is seasonally inundated and access is mainly by river. While the need for effective management of this site is a matter of some concern (the park is understaffed and under-resourced), the threats are currently less acute than for the other World Heritage Sites, due to the remote location and the low human population densities in the locality.



**Figure 1.** The Five World Heritage Sites of Democratic Republic of Congo: the Darwin Project Sites.

and Cultural Organisation) and UNF (the United Nations Foundation). The UNESCO/UNF "Conservation in Crisis" programme, a US\$2.9 million programme, began in June 2000 and embraced the activities of a range of conservation organisations, including the Wildlife Conservation Society, Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH, the International Rhino Foundation, Gilman International Conservation, the World Wide Fund for Nature, the Milwaukee Zoological Society, and, following the establishment of the Darwin Project, the Zoological Society of London. In essence, the UNESCO/UNF Conservation in Crisis programme was established to cover the basic costs of conservation during the current conflict in DRC and to use the neutral political support of the United Nations to facilitate a better climate for continued work, plus monitoring and capacity building for a sustainable future, in DRC. As such, it represents both a "holding action" and a strengthening for the future of the key aspects necessary to maintain the integrity of DRC's five World Heritage Sites, with a special emphasis on capacity building for ICCN personnel. The programme funding therefore covers basic needs such as salary supplements, patrol rations, medical supplies, uniforms, basic equipment, and core funding to help develop training, management and biodiversity monitoring, and community activities. However, the programme funding is insufficient to cover technical assistance. The training and research activities of the Darwin Project have therefore played a crucial and complementary role in this wider programme.

#### 3. Project Summary

The Project Purpose was to help secure the long-term biological integrity of DRC's five World Heritage Sites by reinforcing the conservation management capacity of DRC's state wildlife authority, ICCN. There were three specific Objectives:

- (1) To train ICCN Congolese postgraduate employees at DRC World Heritage Sites in research, monitoring and training skills (including two MSc qualifications);
- (2) to train ICCN Congolese Patrol Leaders at DRC World Heritage Sites in basic standardised data-recording skills; and
- (3) to analyse existing long-term national park datasets to address key issues in management and conservation biology.

A fundamental theme that runs through the Project Purpose and Objectives is Law-Enforcement Monitoring (LEM). LEM is a standardised method to register and report what is seen and done during anti-poaching patrols in protected areas. During LEM, the patrol effort, illegal activities encountered, and the measures taken, are all recorded. The types, intensities and distributions of threats to the park can therefore be monitored, along with the efficiency of the park resources used to control them. LEM is therefore an invaluable tool for protected area management. A complete overview of the theory and practice of LEM is provided in the Darwin Project's Training Manual for Law-Enforcement Monitoring in Protected Areas (Section 4). The Monitoring and Training Unit in the title of this Darwin Project refers to an LEM Unit. Similarly, the ICCN staff training activities outlined in Objectives 1 and 2 revolve primarily around the theory and practice of LEM. Finally, the research described in Objective 3 focuses on issues relating to LEM and those factors that influence illegal poaching pressure (e.g. bushmeat hunting).

Four articles under the Convention of Biological Diversity best describe the Project activities. Foremost among these is *In-situ Conservation* (article 8), through our work on rebuilding the conservation management capacity of ICCN at five World Heritage Sites. We have also made significant contributions under the heading of *Research and Training* (article 12). In the first case, we have carried out research into the use of wildlife in the bushmeat trade around DRC's protected areas, its economic value, and the best ways in which this trade might be sustainably managed. This work is also described by article 10: *Sustainable use of Components of Biological Diversity*. In the second case, we have carried out an extensive training programme in Law-Enforcement Monitoring, a procedure that allows the wildlife authorities to monitor and thus respond to illegal poaching activities in protected areas. This work is also relevant to article 20: *Identification and Monitoring*.

The activities of the Darwin Project have necessitated ongoing fieldwork in an exceptionally difficult working environment of political instability and armed conflict. At the time the Darwin Project began (January 2001), DRC and its World Heritage sites were split into three different territories. Salonga was in Congolese government-held territory, Kahuzi Biega and the Southern and Central sectors of Virunga were in rebel-held territory under Rwandan Influence, and Garamba, the Northern Sector of Virunga, and the Okapi Faunal Reserve were in rebel-held territory under Ugandan influence. Hostilities between these different forces were ongoing at that time, and armed conflict has persisted in this region for the most of the lifetime of this Project. However, a peace deal was finally agreed in December 2002 and signed in April 2003, 11 months before the completion of the Darwin Project in March 2004.

Despite these difficult conditions, the Darwin Project has shown considerable success in not only meeting but exceeding its Objectives, as we will describe in the following pages. Moreover, the development of collaborative activities with other partner organisations in the UNESCO/UNF Conservation in Crisis programme has permitted us to make significant financial savings that we have been able to invest in additional relevant Outputs. Thus, while our project was scheduled to run from Jan 2001 – Dec 2002, a series of no-cost extensions granted by the Darwin Initiative has allowed us to continue our conservation research and training activities in DRC for a further 15 months, up until Mar 2004. The Project Outputs therefore extend significantly beyond those that were initially envisaged in the Final Framework.

Key staff on this Project, who will be referred to subsequently, were as follows: Dr Emmanuel de Merode [EdM] and Dr Kes Hillman Smith [KHS] (Project Fellows), Mr Urbain Ngobobo [UN] (Local Project Supervisor), Dr Glyn Davies (GD), with the assistance of Dr Jakob Bro-Jorgenson [JBJ] (Project Manager), and Dr Guy Cowlishaw [GC] (Project Leader). These staff were

employed directly on the Project or by the Project Contractor, the Zoological Society of London (ZSL). Both EdM and KHS have worked extensively in DRC over the last 12 decades (respectively) with ICCN staff on issues relating to protected area management and the bushmeat trade (primarily at Garamba National Park), in both a research and training capacity. Crucially, both have played a key role in the development of LEM techniques prior to this project.

It is also perhaps useful to note that the Project Purpose and Objectives described above were set-out in the Final Framework agreed with the Darwin Initiative when the grant was awarded in 2000. No changes have been made to these Objectives. However, marginal differences do exist between the Final Framework and the original grant application. These reflect the unusual history of this project. Following our application in late 1998, the Darwin Initiative agreed to fund the project in Spring 1999 but suspended funding for one year due to the ongoing war in DRC at that time. The project therefore only received the final go-head in Spring 2000. By this time, the needs and opportunities for conservation in DRC that had originally guided our 1998 application had changed, particularly with the establishment of the UNESCO/UNF Conservation in Crisis programme. Consequently, our Final Framework incorporated these developments to maximise the value of the Darwin Initiative funding. Note also that the 2000 date of our Final Framework predates the introduction of logframes on Darwin Initiative projects.

#### 4. Scientific, Training and Technical Assessment

The Darwin Project undertook significant research and training programmes, in addition to a variety of other activities, especially in the area of advocacy and institutional development. These are described below.

#### Research

Our research activities can be split between (a) research for management and (b) research for management policy. The former activities represent new applied-research opportunities that arose from our training programme and/or our grant extension, while the latter fulfilled our existing aims under Objective 3.

#### (a) Research for Management

Our research for management had three areas of concern. Our primary focus was the collection of data on both illegal poaching activities and anti-poaching patrol responses at all five of DRC's World Heritage Sites. These data have been collected since March 2002 by park staff using the patrol-based Law-Enforcement Monitoring (LEM) methods that ICCN rangers (Patrol Leaders and Park Guards) were trained in during the Project training workshops (see below). These LEM data are now used on a day-to-day basis to develop and maintain effective management protocols for each protected area. They also contribute to the wider biodiversity monitoring activities carried out under the UNESCO/UNF programme. Further details are provided below.

Our second focus was the collection of data on the bushmeat trade at Virunga National Park. Using trained Congolese students (see below), we conducted a survey of household bushmeat use in and around the Park in March 2003. These data are now being used to assess the scale of the legal and illegal bushmeat trade in and around Virunga National Park, and the most effective ways of tackling this trade and thus improving park protection.

Our third focus was the implementation of aerial surveys of wildlife populations in two of the World Heritage Sites. In Garamba National Park, we conducted two surveys: one intensive survey of the Park's northern white rhinos (March 2001), and another broader survey of all large mammal populations in the Park (May 2002). Similarly, in Virunga National Park, we conducted two aerial surveys (both in March 2003). The first provided a comprehensive survey of the large

mammal populations in the northern sector of Virunga National Park. The second provided a total hippo count for the entire Park (northern, central and southern sectors). The results of these aerial surveys provide important information on the size and distribution of wildlife populations in their respective Parks, and therefore indicate those areas where anti-poaching patrols should focus their activity. These data also contribute to the long-term Park datasets.

#### (b) Research for Management Policy

Our research for management policy took a more strategic perspective. This research was based on the analysis of long-term datasets previously and/or currently collected in and around Garamba National Park, a World Heritage Site in northeastern DRC (Figure 1). Our research activities addressed three specific areas: (1) the impacts of poaching and anti-poaching patrols on protected area management, (2) the economic value of the bushmeat trade in local livelihoods, and (3) the development of management models for a sustainable bushmeat trade. Each of these areas was identified primarily on the basis of ICCN needs for guidance in the development of management policy. Importantly, however, the results of this research also have important lessons learned with a much wider application in tropical Africa and elsewhere. A total of seven research papers and one policy paper have been produced from this research, all of which have been published, or are currently under consideration for publication, in international peer-reviewed journals or policy briefing series. Each of these papers were authored by KHS, EdM, and/or GC, together with a variety of other colleagues representing ICCN, the Institute of Zoology (ZSL), and/or University College London.

First, the impacts of poaching and anti-poaching patrols on protected area management was addressed through three research papers:

Hillman Smith, K. (2001). Status of northern white rhinos and elephants in Garamba National Park, Democratic Republic of Congo, during the wars. *Pachyderm* 31: 79-81.

Hillman Smith, K., Smith, F., Tshikaya, P., Ndey, A. & Watkin, J. (2003). Poaching upsurge in Garamba National Park, Democratic Republic of Congo. *Pachyderm* 35: 146-150.

de Merode, E., Hillman Smith, K., Homewood, K., Pettifor, R.A., Rowcliffe, J.M. & Cowlishaw, G. (submitted). The impact of armed conflict on protected-area efficacy and the bushmeat trade in Central Africa. *Proceedings of the Royal Society Series B: Biological Sciences*.

Hillman Smith (2001) summarises how illegal poaching increased in Garamba during the 1997 and 1999 periods of armed conflict, and the impacts that this poaching had on the Park's unique northern white rhino population. Hillman Smith et al. (2003) provides a broader spatial analysis of illegal poaching of wildlife in Garamba from 1991 until 2003, again with an emphasis on the effects of armed conflict, together with a summary of how this poaching pressure has been managed by the Park authorities. Finally, de Merode et al. (submitted) link the patterns of wildlife poaching in the Park with the sales of bushmeat in neighbouring rural and urban markets. Their analyses indicate that the increase in poaching observed during armed conflict was not driven by a decline in anti-poaching patrols but by changes in the power structures that control the urban bushmeat trade. Since the authors also demonstrate that the increase in patrol effort needed to compensate for this increase in poaching would be fivefold, they recommend that new management models should be developed that complement traditional protected areas but provide a more cost-effective means of reducing poaching pressure. We return to this point below.

Second, the economic value of the bushmeat trade in local livelihoods was explored in our fourth research paper, which also gave rise to a policy paper.

de Merode, E., Homewood, K. & Cowlishaw, G. (2004). The value of bushmeat and other wild foods to rural households living in extreme poverty in Democratic Republic of Congo. *Biological Conservation* 118: 573- 581.

de Merode, E., Homewood, K. & Cowlishaw, G. (2003). Wild resources and livelihoods of poor households in Democratic Republic of Congo. *Overseas Development Institute Wildlife Policy Briefing* 1.

De Merode et al. (2004) investigated the value of bushmeat to households living in extreme poverty (less than US\$1/day per individual) around Garamba National Park. The findings showed that bushmeat was a useful food resource, particularly in the lean season (when agricultural produce is scarce), but that bushmeat was most important to poor households as a source of cash income when it was sold at the market (the proceeds would then be spent to purchase larger quantities of less expensive food). Notably, this is the first study anywhere to investigate systematically the linkages between poverty and bushmeat. Given the importance of these linkages for poverty alleviation and development (e.g. "bushmeat appears to be a key food and livelihood resource for many poor people [although] the scale and strength of poverty linkages is less clear": Department for hternational Development, Wildlife and Poverty Study, 2002), these results have generated a great deal of interest from a variety of international audiences in addition to ICCN. This interest has led the Overseas Development Institute to publish a four-page policy brief based on these findings in their Wildlife Policy Briefing series (de Merode et al. 2003).

Third, the development of management models for a sustainable bushmeat trade was explored in our three remaining papers. The results of these papers provide a crucial link with our previous research outlined above, given our earlier findings that new management models are needed not only to help alleviate the pressure on protected areas but to ensure that the rural poor do not lose a crucial livelihood resource through unsustainable use. These three papers are:

de Merode, E. (2004). Passing the buck: a case for devolving responsibility for wildlife management to local institutions in the Democratic Republic of Congo. In K. Homewood (ed) *Rural resources and local livelihoods in Africa*. James Currey Publishers, London.

de Merode, E. & Cowlishaw, G. (submitted). The impact of war on a bushmeat commodity chain in Democratic Republic of Congo. *Conservation Biology*.

Rowcliffe, J.M., de Merode, E. & Cowlishaw, G. (submitted). Do wildlife laws work? Species protection and the application of a prey choice model to poaching decisions. *Proceedings of the Royal Society Series B: Biological Sciences*.

Rowcliffe et al. (submitted) show that the traditional management model of legislation that bans the exploitation of certain species is currently ignored by hunters and is unlikely to be obeyed in future without a substantial change in the practice of law enforcement. In a related analysis, de Merode and Cowlishaw (submitted) investigate in further detail how the informal power structures that controlled the urban bushmeat trade broke down during armed conflict, but how the traditional administration of the village chiefs meanwhile maintained control over the rural bushmeat markets. Finally, de Merode (2004) draws these strands together by showing that the most effective way of managing bushmeat hunting may be to develop partnerships with the village chiefs who have a proven track record in their ability to manage bushmeat hunting in and around their villages even during periods of armed conflict. This proposal is now in the process of being implemented at Garamba with new grant funding raised over the course of this Project (Section 5).

#### Training

The Darwin Project training activities were threefold: (a) the tuition of two senior ICCN staff members in a Masters degree programme, (b) the training of various ICCN staff from each of the five World Heritage Sites in Law-Enforcement Monitoring (LEM) activities, and (c) the training of Congolese students in household bushmeat use and rural livelihood survey techniques. The first two activities fulfil Objectives 1 and 2 respectively, while the third activity represents new opportunities arising from our no-cost extension period.

#### (a) Training in a Masters Degree Programme

Two ICCN Research and Management Officers of outstanding ability and motivation were selected for a Masters course. Both students have now successfully completed the course work for their Masters degree. The first student, Vital Katembo, from Virunga National Park, began his MSc course in Autumn 2001 in Natural Resources Management at Makerere University, Uganda. He is currently completing his field research on Eastern Lowland Gorilla distribution and susceptibility to poaching in the northern sector of Virunga National Park (Mount Tchiaberimu). The second student, Amube Ndey, from Garamba National Park, recently completed his course work for an MSc in Conservation Science at the University of Nairobi, Kenya. He has begun a research programme on the validation of LEM data at Garamba National Park. Both of the Masters research projects have been designed to complement the larger Darwin Project programme and therefore maximise their value to management policy, particularly LEM activities, in the respective national parks.

#### (b) Training in Law-Enforcement Monitoring

The training of Congolese wildlife staff in patrol-based LEM activities took place through a two-step process. In the first step, the Darwin Project facilitated three working meetings (with ICCN and other project partners) in order to introduce the basic LEM methodology to the Research and Management Officer (RMO) staff at the World Heritage sites. The "Regional Pre-Training of Trainers" LEM Workshop for Okapi Faunal Reserve staff took place in May 2001, while the workshops for Virunga and Kahuzi-Biega National Park staff took place in June 2001. Workshops were not conducted for staff from Garamba National Park (since these staff had already pioneered the methods being applied to the other sites) or from Salonga National Park (due to logistical difficulties for staff attendance), but staff from all five sites attended in the second step.

In the second step, the "Training of Trainers" LEM Workshop was held at Laikipia, Kenya, in November 2001. At this Darwin workshop, 16 RMO staff from across all five World Heritage Sites were able to meet for the first time since the beginning of the war in 1996. During their training, the standard LEM protocols introduced in the previous phase were further developed and presented in the Training Manual for Law-Enforcement Monitoring in Protected Areas. This Training Manual was a core component of the Laikipia workshop and, following a final set of revisions in light of the experiences at the Workshop, has since been completed in its final form and distributed to each of the five World Heritage sites and to ICCN headquarters in the capital, Kinshasa.

Hillman Smith, K., Atalia, M., Beyers, R., Girineza, M., Hart, J., Kalpers, J., de Merode, E., Mesi, M., Mubalama, L., Ndey, A., Smith, F. & Cowlishaw, G. (2002). *Training Manual for Law-Enforcement Monitoring in Protected Areas*. Zoological Society of London: London.

The Workshop RMO Trainers subsequently returned to their sites and carried out the in-situ training of the rangers, i.e. Patrol Leaders and Park Guards, in LEM techniques. A total of 277 ICCN park staff have now been trained through this programme: 107 at Virunga, 96 at Garamba, 47 at the Okapi Faunal Reserve, 16 at Kahusi Biega and 11 at Salonga (the differences in numbers between sites reflects differences in staffing levels). LEM activities are now being routinely implemented in all five World Heritage Sites in DRC, and local training continues under the supervision of a team of four resident ICCN LEM trainers and three assistants at both Garamba and Virunga, and a permanent LEM Officer at Kahuzi-Biega, Salonga, and Okapi Faunal Reserve.

Another important outcome of the Training of Trainers Workshop was the development of a team of six RMO staff, drawn from four of the World Heritage Sites (two from Garamba, two from Virunga, one from Kahuzi-Biega and one from Okapi), to form a mobile LEM Training Unit. This group of individuals constitute an outreach organisation that provides ongoing training to ICCN Congolese wildlife staff in LEM techniques.

The Darwin Project also played a leading collaborative role in two further LEM training activities. First, between May-July 2002, with additional funding from the United Nations Foundation, we ran a 6-week Ranger Training Course for 22 Congolese Patrol Leaders from each of the five World Heritage Sites. This course was carried out in Kruger National Park, South Africa, in collaboration with the African Ranger Training Service of the Game Rangers Association. The course is accredited to the Southern African Wildlife College and covered basic ranger training, including para-military training, first aid, community relations, and law. It also incorporated a significant LEM and ecological monitoring component provided by Darwin Project staff.

Second, supplementary funds were also obtained from the United States Fish and Wildlife Service (US\$58,000) to strengthen the LEM, ecological monitoring, and training programme at Virunga National Park. Under the supervision of Darwin Project staff, these funds were used to build a permanent training centre at Ishango, on the northern shores of Lake Edward, to run regular training courses for ICCN Patrol Leaders and Park Guards. Through a protracted process of negotiation with the rebel authorities in the town of Beni, the centre at Ishango was recovered from the military that had occupied the site at the centre of the park for over ten years. The site was formally handed over to ICCN in February 2003. The centre now has accommodation for thirty rangers and a seminar room. An airstrip was also opened at Ishango and is used by Project staff to gain access to the site and for aerial survey work. Due to the resurgence of armed conflict in the Ituri region further north, rangers from the Okapi Forest Reserve were also brought for training at Ishango, which remains stable.

The Darwin's Project patrol-based LEM techniques have now also become the subject of considerable interest from regional conservation programmes such as the CITES Monitoring of Illegal Killing of Elephants (MIKE) project, and the European Union's ECOFAC programme. This is because they are recognised to provide a timely and cost-effective method of obtaining accurate information on the status and threats of a protected area.

(c) Training in household bushmeat use and rural livelihood survey techniques.

A workshop was held to train Congolese students, 25 undergraduates and three postgraduates, in survey techniques to assess the importance of bushmeat in rural livelihoods. These students came from the Institut Superieur de l'Ingenieurie de Developpement et gestion de l'Environnement (ISIDE) at Kiwanja. The workshop was held for one week in Feb 2004 by Darwin Project staff, led by UN under the supervision of JBJ. Following their training, these students undertook a comprehensive survey of the bushmeat trade in and around Virunga National Park (see above).

#### Other Activities - Advocacy and Institutional Development

The Darwin Project has also played an important role in advocacy and institutional development in DRC. Both Darwin Fellows on this Project have been heavily involved in biodiversity conservation, protected-area management, and capacity building in DRC for the last 10-20 years (EdM and KHS, respectively), and have therefore been in a position to advise and support a wide range of conservation activities beyond the immediate Darwin Project. These opportunities have been further enhanced by the fact that KHS initiated and developed the UNESCO/UNF Conservation in Crisis programme and coordinated it part time throughout the Darwin Project (both Darwin Fellows were only employed half time on the Project). Both Darwin staff have therefore not only been able to maximise the profile of the Darwin Initiative project, and to promote its work through their prior professional engagements, but they have also been active contributors at most of the significant meetings addressing conservation issues in DRC over the course of the Darwin Project. These have included the following:

UNESCO Diplomatic Missions: A high-level diplomatic mission was held in Kinshasa in November 2001 to discuss conservation issues at a ministerial level at each of the three territories of DRC (i.e. government-held, together with the two rebel-held, territories of

DRC). The Diplomatic Mission included the director of the World Heritage Centre of UNESCO.

Core Group Meetings: These are held annually and include the primary implementing partners of the UNESCO/UNF programme. These include conservation NGOs (see Section 1), UNESCO and the ICCN directorate. KHS presides these meetings

Comité de Coordination des Sites Meetings: These meetings bring together the partners involved in funding conservation at the site level for each of the five World Heritage Sites. Darwin staff serve on two of these committees, for Garamba and Virunga National Parks. Darwin staff have also developed close links with the others, for the purpose of coordinating the training and implementation of the Darwin Project's LEM techniques.

Other DRC Conservation Meetings: Darwin staff have also participated in a variety of other meetings concerned with conservation and capacity building in DRC. A meeting in Kinshasa in March 2002 brought together participants from all three regions within DRC. Both Darwin Fellows were able to present their work and consult with partners at this meeting. This was a primarily consultative exercise, to keep ICCN headquarters, sites and partners informed of our ongoing activities and to facilitate further development of a sense of ownership on the Darwin Project. The Darwin Fellows also helped to organise a workshop in Beni in July 2002, that addressed the need for community-level conservation initiatives around protected areas. The project was subsequently funded under the UNESCO programme with ZSL (the Darwin Project contractor) as a collaborator. Finally, our Local Project Supervisor (UN) contributed to a Landscapes Species meeting hosted by WCS in Beni in February 2004.

Other Regional Conservation Meetings: Darwin Project staff (EdM) regularly attended the European Commission's bi-annual meetings in Libreville, Gabon, to discuss its aid interventions in the context of current and future protected area management support. Discussions included the renewal of European Commission funding for the conservation sector in DRC, which have now led to further significant support for conservation activities, including LEM, in DRC (see Section 12). In addition, EdM also contributed to a meeting to discuss transboundary conservation issues between Uganda and DRC in March 2003.

Darwin staff have also made formal presentations at a variety of other meetings on the conservation and research work undertaken on this Project. Seminars related to our practical conservation work have been given at five different meetings by the Darwin Fellows: the Technical Advisory Group meeting for Rhinoceros Conservation, in Dvur Kralove (Czech Republic); the UNESCO/UNF Conservation in Crisis programme meeting, in Kinshasa (DRC); and the European Union ECOFAC Regional Conservation Planning in Libreville (Gabon), all in 2001; and the UNESCO World Heritage Sites Bio-Monitoring Programme meeting and UNESCO/UNF Conservation in Crisis programme meeting, both in Kinshasa (DRC) in 2002. Seminars on our research findings have also been given at a variety of UK venues and organisations including the Bushmeat Working Group of the Tropical Forest Forum, in London 2002 (by collaborator Professor Katherine Homewood); at the Society for Conservation Biology's Annual Meeting, in Canterbury, July 2002 (by KHS); at the British Association for the Advancement of Science's Festival of Science, in Manchester 2003 (by Project Leader, GC), and at five Universities around the country: Bristol (School of Biological Sciences), Durham (Department of Anthropology), and Sheffield (Department of Animal and Plant Sciences) in 2003; together with Cambridge (Department of Anthropology) and University College London (Department of Anthropology) in 2004, all by GC. These seminars, together with a UK press release circulated national (available to the press http://www.zsl.org/press/pr 0000000379.html) in May 2001, and local press releases made through radio stations in Beni and Goma in April and September 2002, have played a crucial role in disseminating the findings and lessons learned from the Darwin Project.

Through these activities, the Darwin Project has played an important role in advocacy and institutional development in DRC. This has allowed the Darwin Fellows to use the Project as

leverage for further funding for research and training in biodiversity conservation in DRC. These activities have not only allowed the Darwin Project to extend its lifetime beyond its original schedule, and thus achieve a substantially greater impact, but have also led to the raising of additional funds to the value of £ (fully described in Section 12).

#### 5. Project Impacts

The Project's broad purpose was to contribute to the safeguarding of DRC's biodiversity by reinforcing the capacity of the state wildlife authority (ICCN) to better manage its World Heritage Sites. The Darwin Project intervened in DRC at a time when ICCN were receiving extremely limited support from international donors, largely because of the civil war. As a consequence, the Darwin Project staff were able to play a pivotal role in the strategy that was established to safeguard these sites through this turbulent period. The Project research activities have provided urgently needed information for park management and policy development, while the Project training activities have helped to build the capacity of ICCN. In addition, the Darwin Project staff have played an extremely active role in the development of new conservation initiatives in DRC and the fundraising associated with those initiatives. The successful implementation of this work has paved the way for major commitments from several international donors to provide future support for the development of the wildlife sector in DRC now that the conflict is drawing to a close and the reunification process is underway. These commitments include a € programme from the European Union, US\$4 World Bank, and a currently unspecified but substantial amount from the Congo Basin Forest Partnership.

The contribution that the Darwin Project has made towards DRC's fulfilment of its obligation under the Biodiversity Convention are threefold. First, through staff training and LEM implementation, there has been a tangible improvement in ICCN's ability to identify and monitor activities that have adverse effects on biodiversity (article 7) and to promote protection of habitats (article 8). The aerial surveys conducted in Garamba and Virunga have also contributed to both articles in the same way. Second, the establishment of a mobile LEM Training Unit represents a new programme in technical education in the conservation of biodiversity (article 12). Third, our research activities, together with our training of ISIDE students in the study of bushmeat and rural livelihoods, has promoted research contributing to the sustainable use of biological diversity (article 12) and the protection of sustainable customary uses (article 10).

Training and capacity building were central themes to this Project, and have made a significant contribution to local capacity for biodiversity protection in DRC. Approximately one third of all DRC's park staff have now received training in LEM theory and implementation through our programme. For many of these rangers, this has been the only significant training that they have received in the past eight years. Indeed, some of these staff were not even provided with training when they were recruited. This training has also been important for morale building in other ways. The payment of monthly salary supplements to over 900 ICCN wildlife rangers in the field by the UNESCO Conservation in Crisis programme for the past 18 months has been facilitated by the individual performance information provided by and through the LEM systems introduced by the Darwin Project. The consequences of this training have been to improve wildlife protection across the five World Heritage Sites. This includes the re-establishment of protection in areas that have previously been abandoned. One such example is the Lubilia area in the Northern Sector of Virunga National Park: a wildlife corridor with Uganda's Queen Elizabeth National Park that was being severely degraded by illegal land sales for agriculture. It has been estimated that the corridor would be lost by the end of 2003, but through negotiation and renewed LEM patrolling, coordinated by the park warden with support from Darwin staff, this 124km<sup>2</sup> area of national park land was recovered. Finally, the two senior conservation staff who undertook Masters degrees (Amube Ndey and Vital Katembo) have now returned to their respective sites (Garamba and Virunga) where they are now actively involved in developing the local field programmes using their new knowledge and skills.

The Darwin Project has also had a major impact on the collaboration between the UK and local partner. ZSL now has a five-year collaborative contract with ICCN, signed by the Minister of the Environment and Land Affairs, together with the Director of ICCN and the Director of Conservation programmes at ZSL. This has paved the way for a long-term collaboration between the British and Congolese institutions that encompasses a number of new projects (Section 12). A team of Congolese conservation staff have been assigned to the ZSL programmes for the duration of the five-year programme. The team includes two project counterparts, Norbert Mushenzi (chief park warden of Virunga National Park) as counterpart to EdM and Amube Ndey (Garamba Research and Monitoring Officer) as counterpart to KHS. Through the Darwin Project, ZSL has substantially increased its reputation and profile in Congo and is now recognised by ICCN as part of the "Core Group" of NGOs advising on donor funding in the DRC.

The Project's research activities have been the main vehicle for achieving a social impact, particularly in the dimensions of the sustainable use of bushmeat in poor rural households. Key policy recommendations arising from this research (de Merode 2004) have led to a successful grant application for a pioneering Community Co-Management Programme of the Hunting Reserves around Garamba National Park (see Section 12). The project is currently being implemented by ZSL and is establishing co-management protocols between the wildlife authority and traditional administrations to regulate the bushmeat trade and generate appropriate benefits for the local communities from the region's natural resources. In addition, the findings of this research have wider impacts in tropical forest systems beyond DRC, and our policy conclusions relating to the linkages between poverty and bushmeat have been presented at various policy meetings (including the DEFRA-funded Bushmeat Working Group of the Tropical Forest Forum), disseminated as an ODI Policy Brief (de Merode et al. 2003), and have already been incorporated into a Forest sector review for the World Bank (David Kaimowitz, Director of the Centre for International Forestry Research, pers comm).

#### 6. Project Outputs

The Darwin Project achieved considerable success in not only meeting but exceeding its planned Outputs. However, some changes to the schedule and means of completion of these Outputs were necessary as a result of the difficult working conditions in DRC. The key changes will be outlined and explained below (our Annual Reports and Half-Year Reports provide further details). A complete list of the Outputs (Section 17) indicates that four basic groups can be identified.

First, those Outputs that were accomplished as planned. These comprise the two ICCN Masters students [2  $\times$  (2)] and the LEM training materials [2  $\times$  (7)]. The only point that requires comment here is the schedule change for one of the two students. Amube Ndey, the student from Garamba National Park, was unable to begin his course in September 2001 as planned due to the conflict in DRC in that region (details provided in our second Annual Report). Following this delay, he began his course at the beginning of the next academic year, in September 2002. His studies have since gone very well, and he is now completing his Masters research dissertation on the LEM system at Garamba. Unfortunately, because of the delay experienced, Amube will not formally graduate until summer 2004. Nevertheless, his studies are sufficiently advanced that the award of his Masters degree is assured, and his graduation is a formality. Vital Katembo, our second Masters student, was awarded his Masters degree in summer 2003.

Second, there are those Outputs that were achieved and exceeded. The enhanced performance of the Project in the production of these Outputs was facilitated by our success in raising supplementary funds and support, both from our partners in the UNESCO/UNF Conservation in Crisis programme and from other organisations (Section 12). This allowed us to accomplish more than previously planned over the original two years of the Project, and also to extend the lifetime of the Project by more than half its original length again (for another 15 months). The Outputs that benefited were as follows: the LEM training for RMOs, Patrol

Leaders and Park Guards, which increased from 220 to 293 trainees [293 x (6a),  $20 \times (6b)$ ]; the number of working weeks by UK Project staff in host region, which increased from to 80 weeks to 110 weeks [110 x (8)]; the production of research papers, which increased from six to eight [5 x (11a),  $3 \times (11b)$ ]; the number of conferences organised and attended, which doubled from eight to 16 [2 x (14a),  $14 \times (14b)$ ]; the number of training facilities/organisations established, which also doubled from one to two [2 x (21)]; and the additional resources raised, which increased from £142,000 to £4.8 million [£4.8 million x (23)].

Third, there are the additional Outputs that were not previously planned. These were made possible for the same reasons that the planned Outputs were exceeded (see above). Such outputs were twofold: the training given to ISIDE undergraduate and postgraduate students [25 x (4a), 1 x (4b), 3 x (4c), 1 x (4d)], and the establishment and enhancement of databases from aerial surveys in Garamba and Virunga National Parks [2 x (12a), 2 x (12b)].

Fourth, there is one Output category in which the Darwin Project did not achieve its original goals. This was under the heading of press releases in host country and UK, under which the host country press-releases declined from four to two, and UK press-releases declined from four to one [2 x (15b), 1 x (15c)]. However, a strategic decision was made to reduce the number of press releases produced because of the political sensitivity in the Project region. The Project activities took place at World Heritage Sites that fell into a combination of government-held and two rebel-held territories, and the publication of press releases would have required us to make a formal recognition, one way or the other, about the sovereignty of those areas when describing the location of the World Heritage Sites. This would have been highly counterproductive, since our ability to work in these sites was dependent on the negotiated goodwill of those authorities currently in power in those localities.

A variety of other outputs have also been achieved, but these are not recognised in the formal system used by the Darwin Initiative. These include the contributions that Darwin Project staff have made to a range of meetings and programmes that concern research and training in biodiversity conservation in DRC (described in Section 4). Perhaps the most notable of these uncounted Outputs are the paper databases in which the LEM data collected at the World Heritage Sites are locally stored. These databases have either been enhanced (at Garamba and Virunga National Parks) or established (Kahuzi-Biega and Salonga National Parks, and Okapi Faunal Reserve) through the course of this Project. These databases have not been computerised (as necessitated to count for a Darwin Output) because the local facilities are not sufficiently advanced to make this practicable or useful at the field sites.

Dissemination of the Project's findings has been an important activity undertaken by the Darwin Project staff and has led to 16 seminars to date in addition to eight publications (see Section 4). The target audience of our presentations has been diverse, including ICCN staff and local conservation NGOs (seminars given at local meetings), international conservation organisations and aid donors (seminars given at regional and international meetings), and international research organisations and policy makers (seminars given at international conferences and universities). The public have also been targeted through the local, national and international press (UK and DRC press releases, and the international conferences). We have submitted our research papers to the best possible international journals to ensure that they reach the widest possible audience, and we have also written an Overseas Development Institute (ODI) policy brief on the basis of our research to increase the accessibility of our findings to policy makers. These activities will continue for the foreseeable future as the Darwin staff continue to work in DRC: all of the staff on this Project continue to be involved with conservation work in DRC. Moreover, as our submitted papers are published there will be further dissemination and publicity. For example, in the immediate future, one of our collaborators (Dr Marcus Rowcliffe) will be presenting findings from the Darwin Project at the Society for Conservation Biology annual meeting in New York in July 2004, and another presentation of this work will be made at the MacArthur Foundation ODI/ZSL Bushmeat Conference in London in September 2004. Both of these presentations will be funded by ZSL.

#### 7. Project Expenditure

The budget breakdown of the original expenditure agreed on the Final Framework for this Project is shown on the following Table, together with information on the final breakdown of expenditure. Over the course of the Project, we saved funds on travel and subsistence (£ and staff salary costs (£ and staf

Expenditure details	Proposed	Actual
Rents, rates, heating, lighting, cleaning		
Postage, stationery, telephone		
Travel, subsistence		
Printing		
Conferences, training programmes, seminars		
Capital items		
Other		
Salaries		
Total		

#### 8. Project Operation and Partnerships

The primary local partner for the Darwin Project has been the national protected area management authority, the Institut Congolais pour la Conservation de la Nature (ICCN). The Darwin Project activities have been developed in consultation with ICCN since the outset, and the ongoing collaboration with ICCN has been extremely positive. ICCN staff have participated fully in the LEM workshops and training programme, and two experienced senior park officers, Amube Ndey (from Garamba National Park) and Vital Katembo (from Virunga National Park), were seconded to undertake Darwin-funded Masters degrees. The Director of ICCN also attended the Programme Collaboration meeting in White Oak, Florida, at the outset of this Project. The success of this partnership is all the more remarkable given that several de-facto administrations existed within the one organisation. The split within ICCN was a consequence of the war, with the headquarters being based in Kinshasa (government-held territory) but the coordination and provincial headquarters operating in the east, which at the time of the Darwin Project was further subdivided into RCD Goma, covering territory under Rwandan influence (Kahuzi Biega and the southern and central sectors of Virunga), and the administration at Beni, in territory under Ugandan influence (Garamba, Okapi and the Northern Sector of Virunga).

The partnership with the UNESCO/UNF Conservation in Crisis programme, which encompassed a broad coalition of ICCN and several experienced NGOs (Section 2), also played a crucial role in the implementation of the Darwin Project under extremely difficult conditions in the field. The role of the Darwin Project in this programme was further enhanced by the fact that one of our two Darwin Fellows (KHS), who work half-time on the Darwin Project, was appointed as the Coordinator of the UNESCO/UNF programme. The other members of the programme became key collaborators in the implementation of LEM training for staff at each of the five World Heritage Sites. These organisations, and their collaborative activities with the Darwin Project, can be summarised for each of the sites as follows:

Virunga National Park: The International Gorilla Conservation Project (IGCP) is the programme partner responsible for the Southern Sector of Virunga. The patrol-based gorilla monitoring programme previously established by IGCP has now been integrated with Darwin Project's LEM techniques into a harmonised reporting system (designed by the Darwin Project staff). In addition, the Virunga Educational Project of WWF is handling part of the guard support money under the UNESCO/UNF programme, and this organisation has worked closely with the Darwin Project to link this with LEM activities.

Okapi Faunal Reserve: The Wildlife Conservation Society (WCS) and Gillman International Conservation (GIC) are the implementing partners for the Okapi Faunal Reserve. WCS also has an important Albertine Rift conservation programme being implemented from Kampala, and a number of activities were undertaken jointly between this programme and the Darwin Project, including a transboundary conservation meeting between Uganda and DRC in March 2003.

Garamba National Park: The International Rhino Foundation (IRF) manages the UNESCO/UNF programme at Garamba. Long-term collaboration between Darwin Project staff and the IRF previously led to the development of a pioneering patrol-based monitoring system at Garamba that provided the model for the LEM system that has been developed and applied more widely by the Darwin Project.

Salonga National Park: Milwaukee Zoological Society manages the UNESCO/UNF programme at Salonga, and have provided support to the Darwin Project activities at that site.

In addition, the United Nations Mission in Congo (MONUC), based in Goma, signed an agreement of principle with the UNESCO/UNF programme, including the Darwin Project, whereby MONUC provided what logistical support it could to reinforce these conservation activities, such as the movement of personnel through conflict areas.

The Darwin Project also contributed to the CITES Monitoring the Illegal Killing of Elephants (MIKE) Programme. Our primary contribution to this regional programme was the provision of data, mainly from the Garamba and the Virunga aerial surveys. In addition, the LEM systems installed by the Darwin Project will continue to provide the MIKE programme with data that are required for CITES.

Finally, the Darwin Project has contributed to the European Commission's plans for the provision of international aid to DRC. Following the recent annulment of its moratorium on aid to DRC (in light of the ongoing peace process), an aid package has now been committed, a proportion of which will be attributed to environmental programmes, implemented through the Conservation et Utilisation Rationel des Ecosystème Forestier d'Afrique Central (ECOFAC) programme (or its successor). One of the Darwin Fellows (EdM) has also been a Project Leader on the ECOFAC programme and attended the planning meetings for ECOFAC's involvement in DRC. To date, €1.8 million have been committed by the European Commission as matching funds for the UNESCO programme.

Although the Darwin Project has now come to an end, the coalition of ICCN and conservation organisations, brought together under the UNESCO/UNF programme and including ZSL, continue to work together and support the work initiated by Darwin funding.

#### 9. Monitoring and Evaluation, Lesson learning

Our internal monitoring and evaluation strategy primarily comprised a variety of measures of research and training success, each in a two-step process that emphasised conservation value and practical application.

Management-related research activities were assessed by (1) the successful collection of data and the production of systematic and reliable datasets, and (2) the use of these datasets for management purposes. Both our LEM and aerial census datasets have

been successfully completed and are used to guide day-to-day decisions about the deployment of anti-poaching patrols in DRC's World Heritage Sites (Section 4); our LEM system has also been used to guide the payment of ranger salary supplements (Section 5).

Policy-related research activities were monitored through (1) the production of scientific papers of sufficient quality for publication in, or submission to, leading international journals, or their equivalent, and (2) the uptake of these research findings in the real world. All publications have been peer-reviewed, and those international journals with high "impact factors" have been preferentially chosen for our manuscript submissions. One paper has already been published in *Biological Conservation*, with three others submitted to *Proceedings B: Biological Sciences* and *Conservation Biology*, while we also have a chapter published in a major new book (on natural resources and livelihoods in Africa), and a policy brief published by the prestigious Overseas Development Institute. The value of this research is further monitored in the application of our research findings in new projects (Sections 5 and 12). For example, one new initiative, for which we have successfully raised funds, will establish a community bushmeat-management scheme based on recommendations from our research.

Training activities were monitored and evaluated by (1) the participation in, and successful completion of, ICCN staff and ISIDE students in our workshops and related training activities, and (2) the implementation of the training by the staff and students concerned in the field. Our training activities had high uptake with a large number of participants, all of whom successfully completed their workshops and courses, and the knowledge and skills acquired by the trainees have since been applied in the field to establish the LEM system across DRC's World Heritage Sites (ICCN staff) and to conduct the bushmeat-and-livelihood surveys in the locality of Virunga National Park (ISIDE students). Further evaluation is carried out through the reporting of ICCN staff to their line managers, and through the monitoring of the LEM data that is collected at each of the five World Heritage Sites.

In addition to our own internal assessments, we have also received external assessments from two different sources. First, the Darwin Project activities were evaluated by ICCN in early 2004. This review, which incorporates information from regular biannual reports from the Chief Park Warden at each World Heritage Site, gave a positive assessment of the Darwin Project activities, particularly highlighting areas where ICCN would like to see our work expanded and developed. Second, the Darwin Project activities were evaluated in a wider external assessment of the UNESCO/UNF Conservation in Crisis Programme. This evaluation, which was completed with the participation of all programme partners at a workshop in Kinshasa in May 2004, gave the Darwin Project an excellent review.

The main problems encountered by the Darwin Project were related to the operation of its work programme in a country experiencing extreme political instability and armed conflict. This led to restrictions on the participation of UK staff in the field (see Section 10) and delays in the production of some Project outputs (see Section 6). The steps taken to overcome these problems are discussed in the appropriate Sections.

Several key lessons can be learnt from this Darwin Project about protected area management and the safeguarding of World Heritage Sites under the challenging conditions associated with political instability and armed conflict. The lessons that can be drawn from the Darwin Project activities also apply to the wider consortium of conservation organisations, operating in DRC under the umbrella of UNESCO, which provide a new model of conservation management for these difficult circumstances.

Adaptive Wildlife Management: The need for flexibility is crucial, and has also been highlighted by other conservation practitioners in DRC. Often the work and spending plans required by donors need to be modified at short notice in response to a rapidly changing political environment. One example was the delay for one of our Congolese Masters students (Section 6) who was unable to start his course because of the renewal

of intense fighting around Garamba National Park. Fortunately, the Darwin Initiative and many other donors have been sensitive to this constraint and responsive to the need to be adaptable to local circumstances. Without this flexibility, conservation activities in DRC over the past few years would not have been possible.

Regional Perspective: While the Darwin Project carried out its work in DRC, we also operated in several other countries in the region, thereby addressing political constraints that could not be tackled in Congo alone. The Coordination Unit of the Conservation in Crisis programme, for example, was based in Nairobi, Kenya, that had a neutral position to the political divisions in DRC at the time of this project. As a consequence it was possible for us to hold meetings, workshops and training courses with conservation wardens and rangers from all three, rebel-held and government-held, territories.

Making Information Available: A surprisingly significant constraint is the lack of availability of accurate information on the conservation activities in DRC's war zones. A consequence is that donors and conservation practitioners lose confidence in the site, not because of an objective assessment of the situation, but because the information isn't available to make a decision. In making the information available, we were extremely surprised at the interest that it catalysed amongst mainstream donors, including the European Commission, who have now committed to building on this work over the next three years.

Focus on Local Human Resources: In DRC, war is characterised by intermittent periods of intense conflict. In between these periods of instability, teams of conservationists on the ground continue their work and are often able to achieve remarkable success, e.g. the re-establishment of the elephant corridor with Uganda in Virunga National Park (Section 5). Even a relatively small investment in local conservation practitioners can therefore pay substantial dividends in the long-term.

Communication and Uninterrupted Support: Although logistically difficult, it is extremely important to maintain communication links with conservation staff on the ground. In placing satellite communication facilities and laptops at three of the more remote sites (Garamba, Okapi, and Virunga North), the Darwin Project made it possible for wildlife staff to communicate even during some of the most difficult periods of armed conflict.

Political Impartiality: Whilst the realities of conflict in DRC made it impossible to remain entirely neutral, it was important to appear neutral and to develop a programme that did not have obvious political ramifications. This was achieved as part of the Darwin Project by participating in the "Tripartite" meetings and decision-making processes, whereby representatives of the Kinshasa Government (Minister of the Environment, or Director of ICCN) and Commissioners from two of the Rebel Governments, were invited to discuss workplans and priorities in a third-party state, a neutral country such as Kenya or Gabon. This was extremely successful and provided a basis for managing DRC's protected areas as part of a single administration throughout the war.

#### 10. Actions Taken in Response to Annual Report Reviews

The only major concern raised by the reviewer/s in response to both of our Annual Reports was the fact that UK Darwin Project staff were restricted in their ability to visit the DRC World Heritage Sites that were the focus of so many of the Project activities. This constraint was imposed by the Darwin Initiative as a condition of our funding, i.e. that no UK Project staff would work in DRC while the UK Foreign and Commonwealth Office advised against travel there due to the prevailing conditions of political instability and armed conflict. Fortunately, we had already planned the key activities of the Project around this possible eventuality (given the unpredictable nature of the war in that region), such that our Masters students were registered on courses in Kenya and Uganda (Objective 1), our main LEM Training of Trainers Workshop took place in

Kenya (Objective 2), and our research activities focussed on existing databases that could be analysed in the UK (Objective 3). In addition, following our established collaboration on the UNESCO/UNF Conservation in Crisis programme, it was possible to arrange for our partner organisations in this coalition to represent us in DRC on those occasions when this was necessary.

However, we were well aware that ultimately the full potential of the Darwin Project would only be realised if the UK Darwin Project staff were able to work directly in DRC. Consequently, following improvements in the local security situation, and given that the partnership developed with the UNESCO/UNF programme allowed our staff to work under the umbrella of the UN (as the staff of other conservation organisations in this programme were already doing), we requested that this restriction on the Darwin Project staff be lifted (see our first Annual Report and first Half-Year report). Unfortunately, we received no response to these requests. Our final solution to this problem took advantage of the fact that our key UK Darwin staff (EdM and KHS) were only employed half-time on the Darwin Project, and spent the rest of their time working on other projects, which frequently necessitated their presence in DRC, e.g. KHS in her position as Coordinator for the UNESCO/UNF programme. Consequently, it was possible for these staff members to represent informally the Darwin Project in DRC during those periods when they were already present there working on other projects.

There were two remaining concerns raised by the reviewers. The first referred to concern over the retention of a clear Darwin Initiative identity for the Project activities given the collaborative partnerships developed by the Project (review from First Annual Report). In response to this concern, we undertook a range of measures to ensure that the Darwin identity remained strong. These are described in Section 11. The second referred to concern that all materials produced by the Project "including the Training Manual, papers and publications" should be provided to the Darwin Secretariat (review from Second Annual Report). All of these materials are included with this Final Report.

#### 11. Darwin Identity

The Darwin Initiative has been publicised at all opportunities throughout the Project. First, the Darwin logo has been placed on all Project reports, including the Training Manual for Law Enforcement Monitoring. The support of the Darwin Initiative has also been highlighted in all our seminars and in the acknowledgements sections of all our research publications. Second, the Darwin sponsorship of our activities has also been made explicit in all our correspondence with partners and donors when describing our activities. Third, business cards used by Project staff included the Darwin Logo with the ZSL logo. Fourth, maps produced for the LEM programme used by staff in the five world Heritage sites specify the Darwin Initiative as the funding institution.

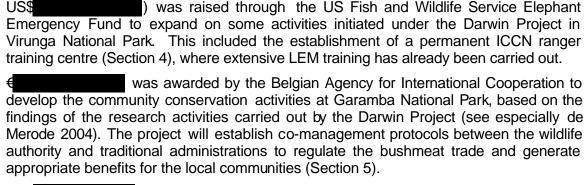
Those most familiar with the Darwin Initiative in DRC would be the staff of the wildlife agency, ICCN. ZSL presented a letter to the Director of ICCN, copied to the Minister of the Environment, explaining the work plan for the two years of the Darwin project's duration at the outset. Park wardens at each of the five sites are familiar with the Darwin initiative from having discussed it with Project staff. Many, though not all, 900 rangers working at the project sites had a good understanding of the Darwin Initiative and its objectives, but it is also expected that this understanding will filter down with time given that there is a strong Darwin legacy with the LEM programmes that are now in place. Evidence for the fact that wildlife staff are familiar with the Darwin Initiative is that they generally refer to the Darwin Initiative in the minutes of formal meetings and on invitations to these meetings.

The Darwin Project worked in partnership with the UNESCO/UNF Conservation in Crisis programme which was substantially larger in financial terms (US\$ As the first significant programme attempting to address the security of World Heritage Sites in times of armed conflict, the UNESCO/UNF programme did receive considerable international attention. However, given that we were largely responsible for the information-management aspects of this

programme, the Darwin Project benefited far more from this relationship, in terms of public awareness of the Darwin Initiative, than if it had been operating on its own. The fact that the Darwin Project was working as part of a consortium of several conservation organisations (Section 2) meant that the other members of the Consortium also became aware of the Darwin Initiative and its activities.

#### 12. Leverage

The Darwin Project has achieved considerable success in its ability to attract additional funds to support our activities and secure continuity beyond the lifetime of the Darwin Initiative funding. These grants include funds captured from international donors. These additional funds and related projects can be summarised as follows:



US\$ was granted in a further award from the US Fish and Wildlife Service to establish a local radio-repeater station and to purchase radio handsets to strengthen the LEM activities in Virunga National Park.

US\$ was given by the World Wide Fund for Nature (WWF) as a contribution towards the aerial survey work in Virunga National Park (Section 4).

US\$25,000 has been committed by UN Foundation to maintain the LEM activities in DRC initiated by the Darwin Initiative.

Of greatest significance has been the contribution of Darwin Staff in the development of a major institutional support programme for ICCN by the European Commission through the 9<sup>th</sup> European Development Fund. Entitled "Renforcement des capacités de gestion et réhabilitation des aires protégées en République Démocratique du Congo", this project is expected to start in the third quarter of 2004 and will be implemented by a partnership between ZSL and WWF over the next three years.

The funding proposals that were written to secure the above mentioned grants were written with Congolese counterparts. Their participation in the process of fundraising and project implementation provides them with the best possible training for independently raising these funds in the future.

#### 13. Sustainability and Legacy

The implementation of the LEM system across DRC's World Heritage Sites should endure by virtue of the large number of ICCN staff that have received training in these techniques, and their successful implementation of this system in the five sites by these staff following their training. Indeed, the LEM system is designed specifically to operate sustainably under remote and difficult conditions with minimum equipment or financial input (see the Training Manual for Law-Enforcement Monitoring: Hillman-Smith et al. 2002). The existence of a mobile LEM Training Unit, and the establishment of a permanent LEM training centre at Ishango, further ensure that there is a long-term provision for the training of new staff and the follow-up training of previous

trainees (where required). All of our trainees, ranging from our senior ICCN staff who undertook a Masters degree, to our rangers (Patrol Leaders and Park Guards), to our ISIDE students, have remained in DRC and are likely to continue to work there indefinitely, with their newly-acquired skills in biodiversity conservation and management. The cessation of hostilities, and the ongoing peace process in DRC, is now creating new opportunities for the people of DRC to develop effective measures for the conservation and sustainable use of their natural resources, and the training that we have provided our Congolese staff and students will make an invaluable contribution to this process over the coming years.

In terms of our research activities, our management-research datasets will inevitably become outdated as the situation on the ground develops over the coming years (poaching pressures will change, as will the size and distribution of large mammal populations in the national parks), but the data that we have provided will always constitute an important component (e.g. as a recent baseline) in the long-term monitoring of these phenomena. Our policy-research activities will have greater durability, in the sense that much of our research did not only explore the present patterns of interest (i.e. the efficacy of protected area management, and related issues such as the bushmeat trade) but also the processes that underpinned them. Consequently, the principles that our research has identified are likely to have wide application for many years to come. The publication of these research findings in international journals, books, and policy briefs, many of which are downloadable from the internet, ensures that they will be widely available to all potential users.

Moreover, the activities initiated under the Darwin Project have received a commitment for substantial future funding from a number of sources that will enable it to strengthen and develop the accomplishments of the Darwin Project. Perhaps most notable among these are (1) the funds awarded by the Belgian Agency for International Cooperation to develop a plan for community conservation activities at Garamba National Park following recommendations based on our research, and (2) the major funds awarded by the European Commission through the 9<sup>th</sup> European Development Fund to continue our LEM programme and associated activities for the improved management of DRC's national parks.

The Project's conclusions and outputs have been widely applied in a variety of ways, as described in Sections 4 and 5. Additional funds have already been successfully obtained for the continuation of the activities initiated by the Darwin Project, as outlined in Section 12.

#### 14. Post-Project Follow up

With the recent cessation in hostilities, and the progress that has already been made with the establishment of a secure peace process, the opportunities to promote research and training in biodiversity conservation in DRC are unparalleled. The activities of the Darwin Project over the last 3.5 years have built a strong foundation on which such new opportunities can be developed. There are four possible priority areas. First, we would like to expand and enhance our training and implementation of patrol-based LEM systems. It is possible that such a programme could be led by Amube Ndey, who has now completed his Darwin-funded MSc in Conservation Science at Nairobi University. Second, we would like to extend the pioneering community comanagement bushmeat scheme implemented at Garamba, that has been developed on the basis of our research and supported with funds raised through the Project. This extension would incorporate lessons learnt from Garamba, and would be implemented around Virunga National Park. Third, we would like to provide more training opportunities for senior ICCN staff at the Masters level. One possible candidate for this would be Urbain Ngobobo, the Darwin Project's Local Supervisor. He has performed extremely well, and his keenness and intelligence renders him a perfect candidate for further postgraduate training. Such training would qualify Mr Ngobobo to manage conservation activities at a high national level. Fourth, we would like to further develop our research into the bushmeat trade around Virunga National Park. Building on our recent surveys in this area, such research would provide a clear picture of those forces that are driving illegal poaching for bushmeat, and thus supply urgently needed information to ICCN

on policy and management for Virunga. ZSL has now opened a country office in Goma, and has an established working relationship with ICCN, which would facilitate this work.

#### 15. Value for Money

The context and implementation of the project offered a number of opportunities for drawing the maximum benefits for biodiversity conservation from the resources made available by the Darwin Initiative. There are five primary areas. First, the Darwin Project has taken place in a country which is remarkably rich biodiversity (one of only six "megadiversity" countries worldwide) but unusually poor in capacity and resources (following four successive decades of economic deterioration and, more recently, armed conflict). Under such conditions, the support provided by the Darwin Initiative has had an exceptional impact per unit of funding on the protection of global biodiversity. This impact has been further enhanced by the Project setting in DRC, where salaries and other costs are relatively low. Second, because the Darwin Project began took place over the closing years of the war and the beginning of the peace process, the investments that the Darwin funding has made in biodiversity conservation in DRC have come at a crucial time, when the potential for development over the coming years is substantial. Third, the Project activities were carefully designed to maximise value for money: (1) by undertaking workshops that accommodated staff from all five World Heritage Sites, rather than just one, we were able to provide the greatest possible training coverage to ICCN staff; and (2) by conducting policy research on the basis of existing datasets, rather than collecting new data for this purpose, our research activities have been more prolific and have produced a greater number of research publications. Fourth, the Darwin Project also played a critical role as part of a much larger programme, thereby facilitating a great deal of conservation work by partner organisations within the UNESCO/UNF Conservation in Crisis programme. Finally, the Darwin project played a catalytic role in raising the funds and launching a variety of other conservation programmes in DRC representing over thirty times the initial Darwin Initiative investment.

# 16. Appendix I: Project Contribution to Articles under the Convention on Biological Diversity (CBD)

Project Contribution to Articles under the Convention on Biological Diversity		
Article No./Title	Project %	Article Description
7. Identification and Monitoring	20	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	40	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.
10. Sustainable Use of Components of Biological Diversity	10	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.
12. Research and Training	30	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).
Total %	100%	

## 17. Appendix II: Project Outputs

Code	Total to date (reduce box)	Detail (← expand box)	
Training	g Outputs		
2	Number of Masters qualifications obtained	Vital Katembo (Virunga), MSc in Natural Resources Management, Makere University, Uganda, 2001-2003; and Amube Ndey (Garamba), MSc in Conservation Science, Nairobi University, Kenya, 2002-2004.	
4a	Number of undergraduate students receiving training	25 Students from the Institut Superieur de l'Ingenieurie de Developpement et gestion de l'Environnement (ISIDE), Kiwanja, trained in basic household livelihoods and bushmeat use survey techniques, 2004.	
4b	Number of training weeks provided to undergraduate students	1 Following 4a above, one week of training was provided to the class of 25 students.	
4c	Number of postgraduate students receiving training (not 1-3 above)	3 Students from the Institut Superieur de l'Ingenieurie de Developpement et gestion de l'Environnement (ISIDE), Kiwanja, trained in advanced household livelihoods and bushmeat use survey techniques, 2004.	
4d	Number of training weeks for postgraduate students	1 Following 4c above, one week of training was provided to the class of 3 students.	
6a	Number of people receiving other forms of <b>short-term</b> education/ training (i.e. not categories 1-5 above)	16 Research and Management Officers (RMOs) from all five World Heritage Sites attend the "Training of Trainers" LEM Workshop, 2001. Several of these RMOs also attended the "Regional Pre-Training of Trainers" LEM Workshops at Okapi Faunal Reserve and Virunga and Kahuzi-Biega National Parks, 2001. 277 Patrol Leaders and Park Guards across the five World Heritage Sites are trained by the returning RMOs from the Training of Trainers Workshop, 2001-2002. These breakdown as 107 at Virunga, 96 at Garamba, 47 at the Okapi Faunal Reserve, 16 at Kahuzi-Biega and 11 at Salonga (the differences in numbers between sites primarily reflects differences in staffing levels). Finally, 22 of these Patrol Leaders from the five World Heritage Sites also attended a Ranger Training Course in South Africa, 2002.	
6b	Number of training weeks not leading to formal qualification	Following 6a above, the training weeks consisted of one week (the Training of Trainers Workshop), plus three (the three Pre-Training of Trainers Workshops), plus ten (two weeks of training at each of the five World Heritage Sites), plus six (six weeks of training on the Ranger Training	

Code	Total to date (reduce box)	Detail (←expand box)
		Course).
7	Number of types of training materials produced for use by host country(s)	The "Training Manual for Law-Enforcement Monitoring in Protected Areas" plus the generic LEM datasheets, which are included in the Manual as an Appendix.
Researc	h Outputs	
8	Number of weeks spent by UK project staff on project work in host country(s)	110  108 weeks by the Darwin Fellows KHS and EdM (each employed half time for 27 months), plus two weeks by the Project Manager JBJ.
11a	Number of papers published or accepted for publication in peer reviewed journals	Four research papers plus one policy brief (all peer-reviewed): Hillman Smith (2001), Hillman Smith et al. (2003), De Merode et al. (2003) (policy brief), De Merode (2004), and De Merode et al. (2004). See Section 18 for reference details.
11b	Number of papers published or accepted for publication elsewhere	Three research papers submitted for publication: De Merode & Cowlishaw (submitted), De Merode et al. (submitted), and Rowcliffe et al. (submitted). See Section 18 for reference details. Note: The inclusion of these outputs under code 11B follows the 11B criteria at the time Darwin funding was awarded.
12a	Number of computer-based databases established (containing species/generic information) and handed over to host country	<b>2</b> Two aerial counts, Virunga National Park: hippo survey (2003), and large mammal population survey (2003).
12b	Number of computer-based databases enhanced (containing species/genetic information) and handed over to host country	<b>2</b> Two aerial counts, Garamba National Park: northern white rhino survey (2001), and large mammal population survey (2002).
Dissemi	nation Outputs	
14a	Number of conferences/seminars/works hops organised to present/disseminate findings from Darwin project work	Consultative and technical workshops held with partner institutions at White Oak, Florida, 2001. Note: Training workshops organised by the Project have already been counted under alternative Output codes above.
14b	Number of conferences/seminars/ workshops <b>attended</b> at which findings from Darwin project work will be presented/ disseminated.	Five seminars on practical conservation work: the Technical Advisory Group meeting for Rhinoceros Conservation (Czech Republic); the UNESCO/UNF Conservation in Crisis programme meeting (DRC); and the European Union ECOFAC Regional Conservation Planning meeting (Gabon),

Code	Total to date (reduce box)	Detail (←expand box)
		all in 2001; plus the UNESCO World Heritage Sites Bio-Monitoring Programme meeting and UNESCO/UNF Conservation in Crisis programme meeting (DRC) in 2002. Nine research seminars (all in UK): the Bushmeat Working Group of the Tropical Forest Forum (2002), the Society for Conservation Biology's Annual Meeting (2002), the British Association for the Advancement of Science's Festival of Science (2003), and five University seminars: Bristol, Durham, and Sheffield (2003); Cambridge and University College London (2004).
15b	Number of local press	2
	releases or publicity articles in host country(s)	Press releases by interview on local radio stations: Radio Candip (Beni), and Radio Grabin (Goma), both in 2002.
15c	Number of national press	1
	releases or publicity articles in UK	Press release in UK announcing project, available at <a href="https://www.zsl.org/press/pr 0000000379.html">www.zsl.org/press/pr 0000000379.html</a> , 2001.
Physical	Outputs	
20	Estimated value (£s) of physical assets handed over to host country(s)	Includes capital items and equipment purchased for Project activities and now permanently installed in DRC, and the Darwin share of the Ishango Training Centre.
21	Number of permanent educational/training/research facilities or organisation established	2
		Establishment of a mobile Law-Enforcement Monitoring Unit in 2001, and establishment of Ishango Training Centre, Virunga National Park, in 2003.
23	Value of additional resources raised for project	Funds raised in six new grant awards that have arisen at least partially though the activities of the Darwin Project and Darwin staff (Section 12).

# 18. Appendix III: Publications

\*All publications marked with an asterisk are included with the submission of this Report.

Type *	Detail	Publishers	Available from	Cost £
(e.g. journals, manuals)	(title, author, year)	(name, city)	(e.g. contact address, website)	
Manual*	Hillman Smith et al. (2002). Training Manual for Law- Enforcement Monitoring in Protected Areas	ZSL, London	Conservation Programmes, ZSL,	Free
Paper*	Hillman Smith (2001). Status of northern white rhinos and elephants in Garamba National Park, DRC. <i>Pachyderm</i> 31: 79-81.	IUCN, Gland, Switzerland	www.iucn.org/themes/ssc/s gs/afesg/pachy/	Free
Paper*	Hillman Smith et al. (2003). Poaching upsurge in Garamba National Park, DRC. <i>Pachyderm</i> 35: 146-150.	IUCN, Gland, Switzerland	www.iucn.org/themes/ssc/s gs/afesg/pachy/	Free
paper (policy brief)*	De Merode et al. (2004) Wild resources and livelihoods of poor households in DRC. Wildlife Policy Briefs, issue 1.	Overseas Development Institute	www.odi- bushmeat.org/#home_resear ch	Free
Paper*	De Merode (2004). Passing the Buck: a case for devolving responsibility for wildlife management to local institutions in DRC. In: Homewood (ed) Rural Resources and Local Livelihoods in Africa.	James Currey, London	http://www.jamescurrey.co.u k/jcurrey/home.asp	£16.95 (book)
Paper*	De Merode et al. (2004). The value of bushmeat and other wild foods to rural households living in extreme poverty in DRC. <i>Biological Conservation</i> 118: 573-581.	Elsevier, London	http://www.elsevier.com/wps /find/journaldescription.cws_ home/405853/description#d escription	US\$30 (£16.50)
Paper*	De Merode & Cowlishaw (submitted) The impact of war on a bushmeat commodity chain in DRC. Conservation Biology	To be confirmed	Guy Cowlishaw, ZSL,	Free
Paper*	De Merode et al. (submitted). The impact of armed conflict on protected area efficacy and the bushmeat trade in central Africa. Proceedings B: Biological Sciences	To be confirmed	Guy Cowlishaw, ZSL,	Free
Paper*	Rowcliffe et al. (submitted). Do wildlife laws work? Species protection and the application of a prey-choice model to poaching decisions. <i>Proceedings B: Biological Sciences</i> .	To be confirmed	Guy Cowlishaw, ZSL,	Free

### 19. Appendix IV: Darwin Contacts

Project Title	Development of a monitoring and training unit for the World Heritage Sites of Democratic Republic of Congo (DRC)	
Ref. No.	162 / 09 / 020	
UK Leader Details		
Name	Dr Guy Cowlishaw	
Role within Darwin Project	Project Leader	
Address		
Other UK Contact (if relevant)		
Name	Dr Glyn Davies	
Role within Darwin Project	Project Manager	
Address		
Partner		
Name	Eulalie Bashige Baliruhya	
Organisation	Institut Congolais pour la Conservation de la Nature (ICCN)	
Role within Darwin Project	Director, ICCN	
Address		