Darwin Initiative for the Survival of Species

Final Report

1. Darwin Project Information

Project Reference No.	*163/11/020*
Project title	Building capacity for biodiversity monitoring and assessment in Nepal
Country	Nepal
UK Contractor	UNEP World Conservation Monitoring Centre
Partner Organisation (s)	King Mahendra Trust for Nature Conservation
Darwin Grant Value	£148,211
Start/End date	*April 2002 – March 2005*
Project website	*http://www.unep-wcmc.org/collaborations/BCBMAN*
Author(s), date	Philip Bubb and Siddhartha Bajracharya, 30 June 2005

2. Project Background/Rationale

The project focused on the Annapurna Conservation Area, which is the largest protected area in Nepal, whilst its results also support the management of all the protected areas of Nepal and other countries. The Annapurna Conservation Area (ACA) covers 7,629 km^2, ranging from 1,000m to 8,091m altitude. It contains 1,140 species of plants, 101 species of mammals and 85 species of birds. Characteristic species of the high Himalayan region include important populations of Snow Leopard *Uncia uncia* and Blue Sheep *Pseudois nayaur*. As well as its biological diversity ACA is home to more than 120,000 people from five major ethnic and tribal groups, living in 55 villages. Most of them are subsistence farmers, depending on natural resources for fuel, food, timber and medicine. ACA is also one of the most popular trekking locations in Nepal, receiving over 70,000 tourists in 2000. An increasing human population and the impacts of tourism led to the ACA being initiated in 1986, to deal with the problems of deforestation, pollution, soil erosion, poverty and loss of cultural values. The designation as a Conservation Area means that the long-term aim is for the management of the area to be conducted by local communities, within a framework of regulations and government support to ensure conservation of the natural resources.

ACA is managed by the King Mahendra Trust for Nature Conservation (KMTNC) under an agreement with the Department of National Parks and Wildlife Conservation. KMTNC staff have worked with the 55 villages in ACA to form a range of village committees and groups. These committees manage issues such as natural resource conservation, electricity generation, mothers' groups, tourism, etc. Much of the funds for the infrastructure development and technical support in ACA comes from the trekking permits.

The ACA Project (ACAP) has been very successful in addressing many of the development needs of the local people and involving them in the management of the protected area. However, there had been no attempt to monitor the effectiveness of ACAP in delivering biodiversity conservation benefits. There was very little information

on even basic subjects such as changes in forest cover, or the populations of key wildlife species. This lack of information and skills to assess and monitor biodiversity limits the effectiveness of management of the protected area. The KMTNC requested the assistance of UNEP-WCMC in building their capacity to gather and use biodiversity-related information in the management of ACA, including assessment of the impact of its conservation activities on both biodiversity and the local communities. The project was designed with their senior staff, including the management of ACAP. KMTNC contributed significant time and material resources throughout the project, including the organisation and allocation of staff for training courses and field monitoring work, and the promotion of the project's results, such as the national workshop on biodiversity monitoring.

3. Project Summary

The overall purpose of the project is to improve the effectiveness of the management of protected area in Nepal, with a focus on building the capacity of managers of protected areas to assess status and trends in biodiversity. The project's intended outputs were:

- Tools for assessing biodiversity developed
- Capacity to undertake biodiversity assessments increased
- Impact of community involvement on biodiversity conservation assessed
- Costs and benefits of participation in protected area management on local communities analysed.

The project developed guidelines on the steps and methods for biodiversity assessment and monitoring to support protected area management in Nepal, with field testing and the provision of training in their use. Field research focused on two aspects: (i) assessment of the status and trends of biodiversity within the Annapurna Protected Area, including methods involving the participation of local people; and (ii) assessment of the impact of protected area designation on the livelihoods of local people, using participatory research techniques. The project also produced recommendations for the management of the ACA on further development of biodiversity assessment and monitoring activities and capacity, based on the outcomes of the field research and discussions with KMTNC management. The logical framework of the project is included in Appendix V, and was unchanged during the project.

The project's outputs and operational plan were not significantly modified during its three years of implementation. with the exception that much of the fieldwork that had started in the southern of the ACA had to be later concentrated in the northern section of the ACA. This was due to the Maoist conflict situation in the southern sector.

The main activities of the project are best described by Article 12 of the CBD on Research and Training, since the central focus of the project is capacity building and gathering improved information and understanding of key biodiversity features of ACA and an assessment of the impact of conservation measures. Articles 7 and 8 (Identification and Monitoring, and In-situ Conservation) also describe the much of the project, since it has started the collection of baseline data for monitoring of selected components of the biodiversity of ACA, and is promoting its in-situ conservation through improved management of ACA and other protected areas. The project also has components supporting Articles 17 (Exchange of Information), with its production and distribution of guidelines for biodiversity monitoring and assessment in protected areas, and the final national project workshop to disseminate the results and promote biodiversity monitoring in Nepal.

Considering the four outputs in the logical framework as the project's objectives, the degree of success in meeting these objectives is assessed as follows:

Tools for assessing biodiversity developed

The project was successful in reaching this objective, having produced a 123 page publication called “Guidelines for Biodiversity Assessment and Monitoring for Protected Areas”, which includes 33 pages of example monitoring protocols and data collection forms developed for the Annapurna Conservation Area. The Guidelines are illustrated with examples from the ACA, including field-tested protocols for Snow Leopard, Blue Sheep, vultures, habitat quality and bird populations of broad-leaved forest, and remote-sensing of habitat extent and quality. The Guidelines were developed from the project’s training courses and tested and co-authored with KMTNC staff, and will be translated into Nepali in 2006. The Guidelines explain the definitions and purpose of biodiversity assessment and monitoring for protected area (PA) management, how to carry out a biodiversity assessment for a PA, and all the stages in developing a PA biodiversity monitoring programme. The Guidelines were launched in April 2004 in Kathmandu at a national workshop for governments, NGOs and researchers involved in PA management. They are available from the UNEP-WCMC website and are being distributed to relevant conservation organisations around the world. The GIS-based information management system of ACAP was also further developed and used in planning and analysing the wildlife monitoring.

Capacity to undertake biodiversity assessments increased

This objective was achieved, in terms of delivery of planned training and the establishment of biodiversity conservation objectives and a monitoring programme by ACAP. In 2003 six staff of KMTNC were trained in the principles and techniques of biodiversity assessment and monitoring in the UK, and they then trained eleven of their colleagues in Nepal. This was followed up by further training and field testing of monitoring techniques in Nepal, including social survey techniques and participatory forest inventories for 25 KMTNC staff. The University of Edinburgh provided training and advice in the design and analysis of the surveys of community involvement in conservation, as well as specialised GIS training for the GIS officer of ACAP. The project promoted the definition of measurable conservation objectives, based on the results of initial biodiversity assessments. These objectives formed the basis for the definition of monitoring protocols and programmes of data collection and analysis. This was a new way of working for ACAP and staff members were assigned to manage the biodiversity monitoring and analysis, which is now incorporated in the Annual Work Plan of ACAP.

Impact of community involvement on biodiversity conservation assessed

This objective has been achieved, with papers accepted in *Environmental Conservation* and *Biodiversity and Conservation* and another in revision for *Oryx*. These papers are the results of participatory surveys and measurement of forest condition conducted in villages in the southern sector of ACA and outside the ACA. This provides baseline data for future monitoring of community perceptions of conservation and ACAP and ecological changes, which has already influenced management decisions regarding human-wildlife conflicts. The papers are entitled, “Effectiveness of community involvement in delivering conservation benefits to the Annapurna Conservation Area, Nepal”, “Impacts of community-based conservation on local communities in the Annapurna Conservation Area, Nepal”, and, “Tourism in the Annapurna Conservation Area of Nepal: an opportunity or a threat to conservation?”.

Costs and benefits of participation in protected area management on local communities analysed

This objective has been achieved, with the results of field surveys analysed and published and the project experience of UNEP-WCMC and KMTNC synthesised in a report to the management of ACAP. This report makes recommendations on the consolidation of the biodiversity assessment and monitoring work now started in ACAP, and how this could be expanded for other protected areas in Nepal.

4. Scientific, Training, and Technical Assessment

Please provide a full account of the project's research, training, and/or technical work.

- **Research** - this should include details of staff, methodology, findings and the extent to which research findings have been subject to peer review.

The project's research work was led by Siddhartha Bajracharya, a former Director of ACAP and now Programme Manager of the King Mahendra Trust for Nature Conservation, based in Katmandu. The research design and supervision was conducted with the guidance of Dr Adrian Newton, Lecturer at the School of Conservation Sciences, Bournemouth University (Head of Forest Programme, UNEP-WCMC until February 2003), and Professor Peter Furley of the Department of Geography, University of Edinburgh.
The research covered two inter-related aspects to support management actions by the Annapurna Conservation Area Project (ACAP), (i) assessment of the status and trends of biodiversity within the ACA, and (ii) assessment of the impact of protected area designation on the livelihoods of local people.

The assessment of the status and trends of biodiversity was first conducted through a combination of reviewing past reports, literature and fieldwork for selected key biodiversity features. Previous biodiversity assessments had produced lists of species recorded in the ACA, such as 101 mammal species and 474 bird species, but there was almost no information on their distribution or conservation status. Only for a few species of special interest, such as Snow Leopard and pheasants did any records exist for some localities. For the preliminary assessment each species was assessed under the Pressure-State-Response framework (see appendix VI). The project also commissioned a report on "Bird Conservation Priorities of the Annapurna Conservation Area" by Carol and Tim Inskipp, who are international experts on the avifauna of the Indian subcontinent. This report found 485 bird species have been recorded from ACA, over half (56%) of the bird species found in Nepal, including eight globally threatened species. The most important sites and forest types for birds are identified, as well as threats, survey methods, recommendations, and annotated check lists with status, threats, abundance and locations in the main forest types. This report led to fieldwork by the project to assess the status of the Cheer Pheasant, which is globally threatened and only regularly recorded in Nepal from the ACA.

The preliminary biodiversity assessment led to the selection of the following features or resources for the area for field survey work to test monitoring methods and the definition of conservation objectives: snow leopard, blue sheep, forest birds as indicators of forest quality, cheer pheasant, vultures, forest inventory in selected villages, and common leopard and barking deer. Fieldwork for the last two species could not be conducted due to the Maoist conflict situation in southern ACA. Examples of the tested monitoring protocols for most of these biodiversity features are included in the "Guidelines" publication.
The survey work for Snow Leopard, Blue Sheep and forest birds was conducted by the following KMTNC staff: Ram Chandra Nepal (Senior Conservation Officer), Kritinath Paudel (Natural Resource Conservation Officer), Bidur Kuinkel (Natural Resource Conservation Assistant), Kamal Thapa (Natural Resource Conservation Assistant) and Shree Krishna Neupane (Natural Resource Conservation Assistant). The Cheer Pheasant survey was led by Raju Acharya, (Natural Resource Conservation Assistant), with the team were Suresh Thapa, Senior NRCA and Lizan Kumar Maskey, Conservation Officer. The forest inventory work was led by Ram Chandra Nepal (Senior Conservation Officer).
The following is summary of the fieldwork results:

Snow Leopard – Surveys in the Phu valley area of Manang in April to May 2004 found 50 animal signs in 13 transects totalling 6.2km. Estimated relative abundance of 3-4 animals per 100 km^2 and approximately 6 animals in the Phu valley area.

Blue Sheep - Surveys in the Phu valley area of Manang in April to May 2004 found a total of 13 blue sheep herds and 256 animals in the survey area of 45 km^2, with a total estimated population of 1,095 animals.

This is the first scientific data on the abundance of these dominant predator and herbivore species in the trans-Himalayan grasslands region of ACA. The ACA Project team now have the capacity and baseline data to monitor changes in the populations of these key species, so as to assess and develop appropriate management actions with local communities. This will include planned trials of closely-regulated eco-tourism activities with local communities to observe snow leopard.

Forest birds - The method of Timed Species Counts was tested and the protocol for locating sample plot sites was adapted as a result of field testing. Permanent plots were established in April 2004 in the Manang district and baseline forest bird data obtained, as well as records of nesting Himalayan Griffon Vulture and Lammergeier.

Himalayan Griffon Vulture – Standardised observation methods were used to obtain baseline counts for this species at Kobang, Lower Mustang and Lomanthang, Upper Mustang in September 2003.

Cheer Pheasant - Significant new localities for the species were identified from surveys in May 2004 and a baseline population estimate was made of 85 to 111 breeding birds in the 22 square kilometres survey area in the Lower Mustang region of ACA. A nest of the species was observed and information gathered on its habitat requirements and pressures from hunting and agricultural practices. These activities have greatly raised the awareness of this species as a priority for conservation measures within the ACA Project, with conservation education and the promotion of bird-watching tourism for the species being planned.

Forest inventory - following training in March 2004, testing of the forest inventory monitoring protocol was conducted from June to September in Mustang district, using a stratified sampling technique and focusing on the forests intensively used by local villages. A total of 193 sample plots of 500 sq. m. were laid out for inventory of trees, with the full participation of villagers in the selection and zoning of forest sites into intensive-use and conservation areas, and the collection of data. Within each sample plot a sub-plot of 100 sq. m. size was used for taking measurements for pole sized plants (dbh range 10 – 29.9 cm); 25 sq. m. size plot for saplings (dbh range 4.9 – 9.9 cm) and 6.25 sq. m. size sub-plot was used for regeneration (less than 4.9 cm dbh) count. This is the standard methodology used for forest inventories in Nepal. All together forest areas of 576 ha in Lete, 594 ha in Kunjo and 567 ha in Kobang VDC were covered. Initial analysis of results indicates good regeneration in the forests. The results will be used by the Conservation Area Management Committees of each village to develop the Operational Plans for their forests.

The results of all the biodiversity monitoring fieldwork have been entered into the ACAP Management Information System (MIS), which is a relational database using MS Access and a linked Geographic Information System (GIS). The MIS includes the results of socio-economic surveys of all the villages in the ACA as well as biodiversity data. The ACAP GIS Officer has prepared base maps (based on the topographic maps) for each Village Development Committee (VDC) of Manang and Jomsom sectors. There are 12 VDCs in Manang and 9 VDCs in Jomsom sector. These maps are used to plan and conduct forest inventories, village-level Conservation Area Management Committee operational plans and biodiversity surveys. The two staff members responsible for the MIS worked closely with the field staff to use the GIS in

the selection of random sample plots, the checking and recording of data in standardised formats, and the statistical analysis and presentation of the results.

The results of the mammal species surveys have been peer-reviewed by experts in these species in Nepal as well as by the biodiversity monitoring expert contracted by the project, Dr Graham Tucker. The Cheer Pheasant survey results were reviewed by Professor Peter Garson of the World Pheasant Association.

The assessment of the impact of protected area designation on the livelihoods of local people was conducted in villages on the southern slopes of the Annapurna range, both within and outside the Conservation Area. The research focused on the effects of the ACA on forest and wildlife resources, the perceptions of villagers on the costs and benefits of conservation, and whether the presence of tourism in the villages influences these aspects. The research was led by Siddhartha Bajracharya, with the assistance of Bhim Poudel, KMTNC.
Study communities were selected to be characteristic of ACA on the basis of ethnic composition, resource use patterns, topography, climate, altitude and vegetation type. The study areas lie within the subtropical to temperate climatic zones, with a mean annual temperature of 16.3 ^{o}C and a mean annual rainfall of approximately 5000 mm. The study sites were divided between two areas surrounding the villages of Ghandruk (Kaski district) and Bhujung (Lamjung district), with 14 villages selected in total. The study villages lie between 820 – 2100 m.a.s.l., and were between 3 - 8 hours walking distance from the nearest road passable to motorised vehicles. The mean number of households per village was 92 + 11.3, with a mean of 6.5 individuals per household. All of these village communities are dependent on wild resources for fuelwood, fodder and timber. Natural forests are a common property resource, accessible to all members of the community. Agricultural land is always privately owned, but may include woodlots of planted trees. Agriculture is practised on terraced hill slopes. The principal crops grown are maize, millet and rice. Livestock farming (principally buffalo and cattle) is also carried out in all of the villages.

To assess the impact of human activity on forest resources, field plots were surveyed along transects from villages located both within and outside ACA. Field surveys were only undertaken in the Ghandruk area because of the security risks caused by the armed Maoist insurgency in the eastern part of the study area. Four plots were surveyed along a single transect from each village, to test the hypothesis that more accessible forest areas are subjected to a higher intensity of human impact.
The forest sites that were surveyed were identified through participatory resource mapping exercises undertaken with the village communities, as the primary areas from which forest products were harvested. Within ACA, these sites primarily lie within the area in which villagers are allowed to collect wild resources for subsistence purposes as defined in the Operational Plan. In each case, linear transects were situated upslope from the villages, orientated along principal harvesting routes. Sample plots were established at different travel times along each transect, rather than distances, as this gives a more precise indication of accessibility, given the highly mountainous terrain. Sample plots were sited at intervals of 45 minutes walking time from the first sample plot, which was established at the edge of the forest area identified in the mapping exercise.
At each forest sample point, a 10 m x 10 m plot was established, within which the diameter at breast height (dbh) of all trees ≥ 10 cm dbh was measured with a diameter tape. The number of stems of each species was recorded. Stems originating as resprouts from cut stumps were counted as individual stems. Each individual tree was identified to species by reference to standard taxonomic works. Within each 10 x 10 m plot, single random sub-plots of 5 m x 5 m and 2 m x 2m were established for assessing tree saplings and seedlings respectively. Saplings were defined as stems less than 10 cm dbh and equal or greater than 30 cm in height to the terminal bud. Seedlings were defined as stems less than 30 cm in height. In each sub-plot, the number of stems of each species was determined.

Direct (e.g. actual sightings) and indirect (e.g. pellets and tracks) evidence of wild animals was recorded along each transect. Evidence of livestock grazing in each sampled plot was recorded by counting grazing animals and/or dung of the animals. Evidence of human disturbances such as cut stumps and logs were counted and recorded in each plot. To verify the fuelwood species harvested within ACA, a sample survey of fuelwood species in stacks of wood collected by 41 households in the four villages was also carried out. Species diversity was estimated using the Shannon-Wiener Index.

The social survey of community perceptions of conservation involved a combination of participatory research methods followed by structured interviews and a questionnaire survey of a sample village from each site. A participatory matrix ranking and scoring with 1 to 5 points was used to discover community perceptions of different fuel sources and changes in wildlife populations. Matrix ranking and scoring techniques were also used to assess changes in wildlife populations, facilitated by the use of wildlife photographs. Semi-structured interviews were undertaken to gather data on conservation awareness, attitudes towards conservation, resource use patterns and relationships with ACA staff. Respondents were asked a series of pre-established questions with pre-set response categories. The questions were presented in an informal way to establish greater trust and dialogue, and increase opportunities for other information to emerge. The interview team consisted of three persons experienced in questionnaire surveys, able to develop an appropriate rapport with the respondent. The interviews were conducted in Nepali, or in local Gurung dialect whenever necessary.

Stratified sampling was carried out at the household level, on the grounds that the household constitutes the basic unit of shared economic production and resource utilisation in the village. Stratification was based on occupation, gender and role within the community. Households within each stratum were selected randomly such that 15% of the total households from each village were interviewed. In each survey village, interviews purposely included at least two chairpersons from among various functional local institutions such as village development committees (local village government), conservation area management committees, mothers' groups, tourism management groups and youth groups, identified during the PRA exercises.

The forest survey found that tree basal area and species diversity were significantly higher inside ACA than in neighbouring areas outside ($P = 0.001$ and $P < 0.01$ respectively, Mann-Whitney test). The mean density of cut tree stumps was significantly lower inside ACA (Mann-Whitney test, $P < 0.001$), associated with a decline in use of fuelwood as an energy source over the past decade. Surveys also indicated that wild animal populations have increased inside ACA since the inception of community-based conservation. A majority of the community respondents (80%, n = 114) in ACA believed that wild animals have significantly increased whereas only a quarter of the respondents (25%, n = 85) outside the area expressed the same view.

The social survey results indicated that local communities have received a number of benefits from conservation, including improvements in access to forest resources, improved basic infrastructure such as drinking water, trails and bridges, and improvements in health, sanitation and social services. Relatively few people (14.9% within ACA) receive direct financial income from tourism. Local communities also experienced a number of costs of being involved in conservation, the most significant of which was increased crop damage by wildlife. 84% of respondents within ACA have experienced problems of crop damage, accounting for 6% (rice) to 23% (maize) of total production. Depredation of livestock by wildlife was also experienced, mean losses per household being the equivalent of £3.9 (Rs. 479.70) each year. However, 66% of respondents within ACA reported that they had never experienced this problem. These results indicate that the socio-economic benefits from conservation activities in ACA can outweigh the costs, even though the latter are significant. The research highlighted the need for more attention on the management of problematic animal species will need to be developed within ACA, if conflict between local communities and ACA management is to be avoided in future. The development of the Conservation Area Management Committee (CAMC) as a village-level management body of natural

resources has been a key aspect of developing the conservation activities and capacity of local communities.

There was no evidence of tourism having had any impact on forest structure or floristic diversity in ACA, with no difference found in mean (+ SE) density of trees, or forest basal area or in seedling or sapling density, between areas with tourism and without. Thus, the research provided no evidence of negative impacts of tourism on forest resources, suggesting that measures to develop energy sources as alternatives to fuelwood have been successful. Residents in villages without tourism have a significantly more positive attitude towards conservation activities than residents with tourism (Mann-Whitney U test P = 0.001), although the reasons for this difference are unclear. No consistent differences could be found in other attitudes of villagers or the benefits they receive in relation to the presence or absence of tourism. This may well be because villages are primarily engaged in subsistence activities, with the majority of the population having little direct access to financial revenues from tourism. The research identified the need for ACA management policy to consider the disbursement of benefits more carefully if it wants to avoid potential conflict in future. The absence of a tourism management plan in ACA indicates that the complexity and opportunity of tourism management in the area has not been fully appreciated. Such problems are likely to be compounded by the decline in tourism resulting from the Maoist insurgency in the region, which is reducing tourist numbers.

Two papers on the assessment of the impact of protected area designation on the livelihoods of local people in ACA have been accepted for publication in peer-reviewed journals and a third paper is in revision:

Bajracharya, S. B., P. A. Furley and A. C. Newton. (in press) Effectiveness of community involvement in delivering conservation benefits to the Annapurna Conservation Area, Nepal. Environmental Conservation.

Bajracharya, S. B., P. A. Furley and A. C. Newton. (in press) Impacts of community-based conservation on local communities in the Annapurna Conservation Area, Nepal. Biodiversity and Conservation

Bajracharya, S. B., P. A. Furley and A. C. Newton. (in revision) Tourism in the Annapurna Conservation Area of Nepal: an opportunity or a threat to conservation? Submitted to Oryx.

- **Training and capacity building activities**.

The project's training activities started with a three week course at UNEP-WCMC and the University of Edinburgh in March 2003 for six staff of the King Mahendra Trust for Nature Conservation (KMTNC). These staff and the detailed objectives of the training were selected in consultation with KMTNC during a visit to Nepal in February 2003. The staff included the Senior Conservation Officer of ACAP, three Conservation Officers of ACAP, the GIS Officer of ACAP, and the GIS Officer of Royal Chitwan National Park. The training course was designed to provide the basic principles and methods for biodiversity assessment and monitoring for the management of protected areas. The course included scientific and participatory approaches, and incorporated the experience of the participants in the management of the ACA. The stages of conducting an assessment of biodiversity to establish conservation objectives and monitor progress towards objectives were explained. The production of monitoring protocols to guide and maintain standards for this work was demonstrated. The role of GIS in biodiversity assessment and monitoring was covered at UNEP-WCMC and the University of Edinburgh. The ACAP GIS Officer also received training in the digital analysis of aerial photographs at the University of Edinburgh. Training also included field practice in bird survey techniques and data analysis. The course concluded with the definition of an action plan for establishing biodiversity monitoring and assessment in ACA, having now formed a core team to start this work The training was assessed by a feedback form, which reported satisfaction with the training and the need to consolidate it with field testing and further training.

The KMTNC staff trained in the UK then organised and delivered a five day course in May 2003 for eleven of their colleagues who are responsible for the nature conservation activities of the field offices of ACA. The course was delivered in Ghandruk village, in the southern sector of ACA. It was designed to continue building the team for the biodiversity assessment and monitoring fieldwork, and to elaborate the action plan for this work. The training covered the principles of biodiversity assessment and monitoring, techniques and field practice for forest inventory, data tabulation and analysis, bird survey theory and field practice, mammal survey techniques and field practice, participatory approaches, and development of the draft monitoring protocols and action plan. The bird and mammal survey training was delivered by Nepalese experts contracted for this work. The project team developed monitoring protocols and planned field survey work for snow leopard, blue sheep, common leopard, barking deer, cheer pheasant, himalayan griffon vulture, and community forest inventory.

In October 2003 a second training course was conducted in Jomsom, in the western section of ACA. This was a seven day programme for thirteen of the staff of KMTNC and a member of the monitoring, evaluation and research programme of the Department of National Parks and Wildlife Conservation. The KMTNC staff included the participants of the previous courses, other ACAP field officers responsible for nature conservation, and a field officer from Bhardia National Park. The training was delivered by Philip Bubb (UNEP-WCMC) and Graham Tucker (consultant, expert in biodiversity monitoring) and Prof. Karan Shah (expert in mammal surveying) and Rajendra Suwal (expert in bird surveying). The aims of the training were to build the fieldwork skills for biodiversity monitoring, improvement of all aspects of the monitoring protocols, obtain feedback on the draft guidelines for biodiversity assessment and monitoring, and plan further fieldwork and testing of the protocols. The training also addressed the use and integration of the results of biodiversity monitoring in the management decisions for the ACA. This included the role of the GIS and other computer applications for recording, analysing and reporting the results. Building on the previous training, the importance of setting measurable conservation objectives as the basis for designing monitoring was emphasised, as well as the requirement for appropriate sampling methods. An introduction was given to vegetation and animal monitoring methods, with trials in the field and practice in data analysis. The results of some preliminary fieldwork and trials during the training were used to further improve the monitoring protocols and data collection forms. A draft monitoring protocol was produced for forest birds as indicators of forest habitat quality. The training concluded with planing of participatory forest inventories with the Conservation Area Management Committees and the timetable for fieldwork for the other biodiversity features. The evaluation of the workshop reported that new knowledge obtained included snow leopard and blue sheep monitoring techniques, the concept of target and sample populations and macro plots for sampling, and analysis using the pressure-state-response framework and setting objectives. It was agreed that the training needed to be consolidated with the experience from actual fieldwork and the analysis of the results, which was planned for 2004.

The species and groups selected in 2003 for field surveys and future monitoring had been chosen on the basis of their importance in the ecology and economy of the ACA for local people and tourism and their conservation status. This, snow leopard and blue sheep are key species for the trans-himalayan rangelands, for example, and the cheer pheasant is a globally vulnerable species in the ACA. The project promoted a more systematic approach to assessment of the species and other biodiversity features of importance for management of the ACA, using the Pressure-State-Response framework to organise the information. A discussion on the features to be included in this assessment was started in the October 2003 training. The results of the subsequent analysis are included in pages 22-30 of the ‘Guidelines’ publication.

In March 2004 twenty-five staff of KMTNC participated in a seven day training course in social survey techniques at the ACAP headquarters in Pokhara. The staff included ACAP field officers with responsibilities for natural resource conservation, community

education, gender development and tourism, as well as community and women development staff from Bardiya and Chitwan National Parks. The programme was delivered by the Organisation Development Centre, Kathmandu. The focus was to enhance the participants' understanding of the social elements at community level which influence development activities. Through the use of different tools/techniques, including PRA, RRA and others, the programme aimed to train the participants to interact with community in a purposeful and systematic manner in identifying and planning development activities. Field level application of the concepts by the participants was an integral part of the training programme.

Also in March 2004, eighteen field staff of ACAP participated in a five day training course in forest inventory at the ACAP headquarters in Pokhara. This enabled staff to determine the growing stock and condition of a particular forest, and develop appropriate management and monitoring plans with the villages. This enabled ACAP to plan forest inventories in the intensive use zone of each Village Development Committee (VDC) within ACA to revise operational plan of Conservation Area Management Committee (CAMC). The training covered:

- the concept of forest management and it's importance in community forestry,
- design and conduct of a forest resource inventory of a Conservation Area Management Committee (CAMC);
- estimation of growing stock and annual allowable cut;
- incorporation of forest inventory information in CAMC operational plans.

The theory classes were followed by practical classes in the nearby Community Forest area in Pokhara. The training was conducted by the Department of Forest and Survey, using the guidelines developed by the Ministry of Forest and Soil Conservation, Nepal.

In April 2004 field training was conducted to test and finalise with ACAP staff field monitoring protocols for forest birds, forest habitat quality, Snow Leopard, Blue Sheep and high altitude grassland/ shrubland condition. This was led by Graham Tucker (consultant, expert in biodiversity monitoring) over a two week period, with six ACAP staff and Rajendra Suwal (expert in bird surveying). Basic training was conducted in forest bird identification and surveys near Pokhara, including timed species counts and forest inventory. A monitoring protocol for forest habitat quality was agreed and field trials planned for the pine forests below Manang, as the southern sector of ACAP is largely under Maoist rebel control. Field trials for the snow leopard, blue sheep and high altitude grassland/ shrubland condition survey techniques were conducted in the Khangsar valley of the upper Manang area. These were successful in training the staff responsible for these surveys and refining the protocols. After discussion with ACAP staff it was decided not to undertake field monitoring of grassland condition, because it was too labour intensive and time consuming to obtain satisfactory results. It wsa agreed that a suitable monitoring strategy would be to monitor livestock numbers and grazing periods (i.e. grassland pressures) through interviews with local communities. If increased pressures were apparent than this would trigger direct monitoring of the state of the grasslands by line point intercept transects.

Siddhartha Bajracharya, former Director of ACAP and now Programme Manager at KMTNC, received technical support and advice from the University of Edinburgh in the design and analysis of the assessment of the impact of protected area designation on the livelihoods of local people.

The joint process by UNEP-WCMC and KMTNC of writing and reviewing the 'Guidelines for Biodiversity Assessment and Monitoring for Protected Areas' had a strong capacity building effect. The Guidelines were developed from materials produced for the training courses, and the discussions on their content and the examples from ACAP deepened the understanding of the issues for all involved. The first complete draft was reviewed at a meeting between UNEP-WCMC and ACAP management in October 2004 in Pokhara. This enabled a good analysis of how biodiversity assessment and monitoring could be integrated into the management of ACAP beyond the completion of the project. The learning and adoption of the content

of the Guidelines by KMTNC staff was clearly demonstrated by their presentations to a diverse audience at the project's concluding workshop in April 2005. This included a clear summary of the Guidelines by the new Project Leader for ACAP, Roshan Sherchan, who returned from completing an MSc at the University of Edinburgh in October 2004. He was actively involved in the finalisation of the Guidelines and will be ensuring that biodiversity monitoring will be included in the future workplan of ACAP.

A booklet titled "Mammals of the Annapurna Conservation Area" has been prepared in Nepali for use in conservation education programmes with local schools and adults. The booklet contains information on the identification, ecology and local and global conservation status of the species.

5. Project Impacts

- What evidence is there that project achievements have led to the accomplishment of the project purpose? Has achievement of objectives/outputs resulted in other, unexpected impacts?

The purpose of the project is "To improve the effectiveness of protected area management in Nepal by improving the capacity of managers of protected areas to assess status and trends in biodiversity" (from the Logical Framework).
In terms of the effectiveness of the management of the Annapurna Conservation Area (ACA), the project has resulted for the first time in the ACA management (ACAP) having biodiversity monitoring included in its annual work plans, with specific conservation objectives, monitoring protocols and baseline data for several key species (snow leopard, blue sheep, cheer pheasant, forest birds, vultures) and 140 forest condition plots established. ACAP now has the capacity to assess and monitor the status and trends of the important biodiversity features of ACA, resulting in prioritisation and modifications of management actions as appropriate. ACAP has trained staff, protocols, guidelines, and an improved computer-based management information system and GIS for producing and using biodiversity information in decision-making. The capacity for obtaining and using biodiversity information is complemented by information on the impact of conservation and development actions in villages within and outside ACA. These participatory social surveys have developed new skills in ACPA and provided a baseline for monitoring of villagers' perceptions of wildlife and conservation issues. The management priorities of ACAP now include seeking means to reduce the conflict from wildlife damaging villager's crops and livestock, and seeking to diversify the benefits of tourism more widely within villages.
The project has contributed to the improved management of protected areas nationally in Nepal. The project achieved a high profile amongst all the major biodiversity-related government agencies, NGOs and universities in Nepal through its "National workshop on biodiversity assessment and monitoring", in Kathmandu on 25 April 2005 (see Appendix VII). The workshop opening and launch of the Guidelines publication was conducted by the Vice-Chairman of the National Planning Commission, who also contributed a Foreword to the Guidelines. The workshop included presentations by eight other leading organisations and individuals working in biodiversity monitoring issues in Nepal, including the Department of National Parks and Wildlife Conservation, WWF, IUCN, ICIMOD, and the Tribhuvan University. Five presentations were made by KMTNC staff on the Darwin project, the contents of the Guidelines, the snow leopard and cheer pheasant surveys, and the ACAP Management Information System. Workshop discussions included the need to promote sharing of data and co-ordination of methods in biodiversity monitoring between conservation organisations, and the overall importance of biodiversity monitoring to improve protected management effectiveness and to build stakeholder support. The Guidelines were considered a milestone in establishing consistent biodiversity monitoring in Nepal. The quality of the

presentations by KMTNC and the results presented from the fieldwork, as well as the professional organisation of the workshop, also raised the profile of KMTNC as a leading institution in Nepal in the management of protected areas. KMTNC has undertaken to publish the 'Guidelines' in Nepali in 2006 using its own resources, which will further increase the impact of the project.
The Guidelines are also available for download in pdf format from the UNEP-WCMC website and will be available for purchase through the IUCN bookstore. The Guidelines were announced on the Mountain Forum listserve and have been distributed in response to requests from South Africa, China, Vietnam, Mexico, Chile, USA, Canada, and the GEF. The Guidelines are in the process of being distributed to all the major conservation NGOs, including the World Commission on Protected Areas of the IUCN.
An additional impact of the project has been the inclusion of plans for biodiversity monitoring in the new management plans for three other major protected areas in Nepal, the management of which is being passed to KMTNC by the Department of National Parks and Wildlife. These sites are Shey Phoksundo, Shivapuri and Rara National Parks, which will bring 55% of the area of protected areas in Nepal under the management of KMTNC. Siddhartha Bajracharya is responsible for the development of the management plans and monitoring for the protected areas managed by KMTNC, and this will ensure an ongoing national impact of the project.
An evaluation of the project was conducted by KMTNC staff in a meeting with Philip Bubb and Professor Peter Furley (University of Edinburgh) after the April 2005 national workshop. As well as the planned outputs of the project unexpected impacts include increased confidence of ACAP staff in planning and promoting their work. This was reported to be particularly the case for the GIS team, who further developed the ACAP Management Information System (MIS) and used this to identify field sites for wildlife monitoring and the reporting of results, and reported on the MIS at the 2005 ESRI User Conference.

- To what extent has the project achieved its purpose, i.e. how has it helped the host country to meet its obligations under the Biodiversity Convention (CBD), or what indication is there that it is likely to do so in the future? Information should be provided on plans, actions or policies by the host institution and government resulting directly from the project that building on new skills and research findings.

The project has helped Nepal meet its obligations under the CBD particularly in the areas of Article 12 (Research and Training), Articles 7 and 8 (Identification and Monitoring, and In-situ Conservation) and Article 17 (Exchange of Information). The project has established new capacity for the King Mahendra Trust for Nature Conservation (KMTNC) to manage the ACA and other protected areas with a focus on specific biodiversity objectives and monitoring. The new management plans for ACA and other protected areas under the responsibility of KMTNC reflect this capacity to design and manage biodiversity monitoring. The publication of Guidelines for this work supports the management of protected areas by all agencies in Nepal. The project has also produced new baseline information on the status of key species in ACA, such as the snow leopard, blue sheep and Cheer pheasant. The project has also strengthened the management of ACA and other PAs in Nepal (Research and In-situ Conservation) through published surveys and analysis of the costs and benefits to local communities of the development and conservation activities of ACA. This has already resulted in greater attention on addressing human-wildlife conflicts in the management of ACA.

- If there were training or capacity building elements to the project, to what extent has this improved local capacity to further biodiversity work in the host country and what is the evidence for this? Where possible, please provide information on what each student / trainee is now doing (or what they expect to be doing in the longer term).

The project has focused on building the capacity of ACAP staff to include focused biodiversity conservation measures in the management of ACA, as well as supporting biodiversity monitoring in other Nepalese protected areas. The project has trained the senior management and field staff of ACA in the principles and techniques of defining conservation objectives and monitoring protocols, and field survey methods for selected species. This experience has been the basis for the production of Guidelines for Biodiversity Assessment and Monitoring, which include examples from ACAP. Since the start of the project Siddhartha Bajracharya has become Programme Manager for KMTNC, responsible for the development of management plans and monitoring for all the protected areas under the responsibility of KMTNC. Ram Chandra Nepal, Senior Conservation Officer of ACAP, was responsible for the operation of the project in Nepal from May 2002 to September 2004 and participated in all the training courses. He is currently on a two-year MSc course in Norway. Most of the other ACAP field staff who participated in the project's training are still working for KMTNC, although some of them are now working in other protected areas. Unfortunately, the work of ACAP in the southern sector of ACA has been severely limited due to the Maoist conflict and some staff have been unable to continue working in this region. Nawa Raj Chapagain, the ACAP GIS officer is continuing to support the design of biodiversity monitoring fieldwork and the documentation and presentation of the results.

- Discuss the impact of the project in terms of collaboration to date between UK and local partner. What impact has the project made on local collaboration such as improved links between Governmental and civil society groups?

The relationship between UNEP-WCMC, the University of Edinburgh and the King Mahendra Trust for Nature Conservation has developed into a strong collaboration over the life of the project. After visits to Nepal by Professor Peter Furley in 2002 and Philip Bubb in early 2003 the collaboration become consolidated with the three week visit to the UK by six KMTNC staff for training in March 2003. This was when the project become fully established with a team and action plan. The collaboration has had a significant positive impact in building the capacity of ACAP and the KMTNC to conduct biodiversity assessment and monitoring. The development of the training courses and especially the development of the monitoring protocols and the Guidelines has been conducted in a collaborative manner. Within Nepal the project has been developed in collaboration with the Department of National Parks and Wildlife, in terms of their staff having participated in some of the training and being kept informed of the project's developments. The concluding national workshop was a significant event in promoting collaboration between KMTNC and other organisations active in protected area management in Nepal. This strengthened the reputation of KMTNC in developing management of protected areas, with good will generated for future collaboration for the standardisation of biodiversity monitoring approaches.

- In terms of social impact, who has benefited from the project? Has the project had (or is likely to result in) an unexpected positive or negative impact on individuals or local communities? What are the indicators for this and how were they measured?

The project has benefited in an indirect manner the 120,000 people living in 55 villages within the ACA. The surveys of the costs and benefits of the conservation and development work of ACA have identified general satisfaction and support for the work of ACAP. Most villagers surveyed reported benefits from the development work, but the cost of losses to crops from the increased wildlife populations was regularly reported. Current regulations do not permit the control of wildlife populations within the Conservation Area, but the project has identified the need for ACAP to work with the Department of National Parks and Wildlife to discuss measures to address this problem. The surveys also found limited distribution of the income from tourist-related activities, with tourists only visiting some localities and only some households

participating in tourism support. However, whilst tourism is greatly reduced due to the Maoist conflict the opportunities for promoting wider benefits from tourism are very constrained. Local communities have also benefited indirectly from the project through the training provided to KMTNC in social survey techniques, to improve their design of development activities. It had been hoped that the project would be able to develop participatory monitoring and management of biodiversity resources with the Conservation Area Management Committees (CAMC) established by ACAP. The project did establish 140 forest inventory plots in all the villages in the northern sector of ACA, which are part of the Conservation Area Management Plans for the CAMCs. These plots were all identified and surveyed with the participation of local people. However, the setting of biodiversity conservation objectives and monitoring was not attempted with the CAMCs, because there are not sufficient ACAP staff resources to adequately set-up and support this work amongst other priorities for village development activities. Local people were trained to identify signs and collect data as part of the surveys for snow leopard, blue sheep and cheer pheasant.

6. Project Outputs

All project outputs have been quantified in the table in Appendix II using the coding and format of the Darwin Initiative Standard Output Measures. Almost all the outputs were achieved according to the agreed schedule. The only output not achieved was the number of weeks spent by UK project staff on project work in the host country in Year 1, because it was not considered necessary for two UK staff to conduct the project inception visits before the training courses started.

Additional outputs included reports on the bird conservation priorities of ACA and a guide to the Mammals of ACA in Nepali to support conservation education. It should also be acknowledged that the project-supported fieldwork has obtained scientifically valid baseline data on the status of key species in ACA, such as snow leopard, blue sheep and cheer pheasant. The resulting tested monitoring protocols, with specific conservation objectives, are a key output of the project, although not published as research.

Full details are provided in Appendix III of all publications and material that can be publicly accessed, e.g. title, name of publisher, contact details, cost.

In Nepal the Guidelines publication has been distributed throughout the protected areas managed by KMTNC and to all national government departments, NGOs, universities and development institutes involved in biodiversity conservation. These include the Ministry of Forest and Soil Conservation, Department of National Parks and Wildlife Conservation, Department of Forest, Department of Forest Research and Survey, ICIMOD, IUCN, WWF, UNDP, Nepal Nature Dot Com, and Tribhuvan University. The Guidelines were launched at the project's national workshop in April 2005 and distributed by post. They contain to be available from KMTNC for Nepalese Rs. 400/-. KMTNC have undertaken to translate and publish the Guidelines in Nepali during 2006 at their own cost.

In the UK the Guidelines publication is available as a free pdf download from http://www.unep-wcmc.org/collaborations/BCBMAN/

or by post from UNEP-WCMC. It is hoped that they will also be available through the IUCN bookstore. They are being distributed to the main biodiversity conservation NGOs in the UK and internationally. Any further costs of dissemination will be covered by UNEP-WCMC.

7. Project Expenditure

Expenditure details	2002/03 Budget	2002/03 Actual	2003/04 Budget	2003/04 Actual	2004/05 Budget	2004/05 Actual	Total Budget	Total Actual

There were no changes from the agreed budget.

8. Project Operation and Partnerships

- How many local partners worked on project activities and how does this differ from initial plans for partnerships? Who were the main partners and the most active partners, and what is their role in biodiversity issues? How were partners involved in project planning and implementation? Were plans modified significantly in response to local consultation?

The project was designed and implemented in partnership with the King Mahendra Trust for Nature Conservation, which is the largest conservation NGO in Nepal. KMTNC began its conservation initiatives in the Annapurna region in 1986 and has been responsible for the management of the Annapurna Conservation Area since its creation. The former Director of ACAP, Siddhartha Bajracharya, designed the project with UNEP-WCMC staff and the technical support of Professor Peter Furley, Department of Geography, University of Edinburgh. The design of the fieldwork to assess the costs and benefits of conservation in ACA was conducted with field visits to Nepal in 2002. Similarly, the objectives and details of the training courses were defined with the management staff of ACAP during visits in early 2003. The participants for the training courses were all selected by KMTNC, including staff from sites other than ACA. The annual work plans for field testing of the monitoring protocols were determined by KMTNC in consultation with UNEP-WCMC. The development of the Guidelines for biodiversity assessment and monitoring was conducted through adaptation of the materials used in the training courses and feedback from the participants. The drafts of the Guidelines were reviewed line-by-line with the staff of KMTNC. The name of the Guidelines was changed from a Manual at the request of KMTNC.

- During the project lifetime, what collaboration existed with similar projects (Darwin or other) elsewhere in the host country? Was there consultation with the host country Biodiversity Strategy (BS) Office?

The project made links with two other Darwin projects in Nepal:

- Institutionalising Participatory Integrated Forest Management Assessment in Nepal, co-ordinated by Dr O Oliver Springate-Baginski of the University of East Anglia;
- Building capacity for plant biodiversity inventory and conservation in Nepal, co-ordinated by Professor S Stephen Blackmore of Royal Botanic Garden Edinburgh.

Dr Springate-Baginski and two members of the Institute of Forestry of Nepal participated in a project planning meeting with UNEP-WCMC and the University of Edinburgh in October 2002. During the project periodic conversations were had with Dr Springate-Baginski about the security situation Nepal and its effects on fieldwork. Members of the Institute of Forestry of Nepal were invited to the project's national workshop, but were unable to attend.
Staff participating in RBGE project from the Royal Nepal Academy of Science and Technology participated in the project's concluding national workshop.
In Nepal the Department of National Parks and Wildlife Conservation were informed of the aims and activities of the project by Philip Bubb on visits to Nepal and by KMTNC. The DNPWC actively contributed to the final workshop and were supportive of the project's results, expressing interest in seeking to standardise biodiversity monitoring methods in protected areas.
The International Centre for Mountain Development (ICIMOD) in Kathmandu were also informed of the project. Some communication was established between their GIS mapping of community forests and the GIS work of ACAP.
The project also made links with the RSPB and their work with BirdLife Conservation Nepal, who are conducting trials of participatory bird monitoring by communities in the Terai lowlands. Members of BirdLife Conservation Nepal were invited to the project's concluding workshop.
The design and analysis of the Cheer Pheasant survey was conducted with the assistance of Dr Peter Garson of the World Pheasant Association.

- How many international partners participated in project activities? Provide names of main international partners.

Apart from the involvement of the University of Edinburgh in the project no other international partners participated in project activities.

- To your knowledge, have the local partnerships been active after the end of the Darwin Project and what is the level of their participation with the local biodiversity strategy process and other local Government activities? Is more community participation needed and is there a role for the private sector?

The KMTNC have continued to develop their biodiversity monitoring programme within the Annapurna Conservation Area, although the activities of KMTNC in some parts of ACA and other protected areas in Nepal have become restricted by the Maoist conflict. The management of ACA is built around the functioning of committees for different activities at the village level, including the Conservation Area Management Committees. These committees can be seen as a partnership between KMTNC and local communities. KMTNC will be discussing the results of biodiversity monitoring for key species such as snow leopard, blue sheep and cheer pheasant with relevant CAMCs, to include this information in their operational plans. The forest inventories are already part of the formation of these plans. More community participation is needed in biodiversity assessment and monitoring, but this must respond to the priorities of local people and be part of a development process. For example, in the Phu valley area of ACA where the first snow leopard surveys have been conducted, there are village snow leopard committees. These exist to ensure the survival of snow leopards whilst minimising significant depredation of livestock and damage to livelihoods. Closely

controlled eco-tourism with local guides to look for snow leopards is being discussed with KMTNC and the local committees, who are already involved in the survey work. Further development of the community participation in biodiversity monitoring in ACA will be developed. This did not develop as far as might have been hoped within the time frame of the Darwin project, because the professional staff of ACAP need to be trained and have experience in biodiversity monitoring before they could adapt to the circumstances of local communities.
There may be a limited role for the private sector in supporting biodiversity monitoring in ACA and other protected areas, through specialist wildlife tours. Eco-tourism operations can benefit from having reliable information to go to see high interest species such as snow leopard and cheer pheasant, employing local guides and services which also help to fund the monitoring and conservation actions for these species. Discussions for such activities are underway with KMTNC, but the situation is significantly hampered by the Maoist conflict in these regions.

9. Monitoring and Evaluation, Lesson learning

- Please explain your strategy for monitoring and evaluation (M&E) and give an outline of results. How does this **demonstrate** the value of the project? E.g. what baseline information was collected (e.g. scientific, social, economic), milestones in the project design, and indicators to identify your achievements (at purpose and goal level).

The basic mechanism for monitoring of implementation of the project was conducted through Quarterly and Annual reports from the KMTNC to UNEP-WCMC on the agreed work programme and results and financial expenditure, as well as the six-monthly and annual reports by UNEP-WCMC to the Darwin Initiative. The detailed work programme for the implementation of the project was agreed through meetings, e-mail and phone calls between UNEP-WCMC and KMTNC. These were based on the Outputs and Activities in the logical framework, incorporating issues raised by feedback from the Darwin Secretariat in response to the annual reports. The most effective means of monitoring, evaluation and planning was through meetings, which allowed for sufficient discussion and identification of the most important issues and the most appropriate actions. Visits by UK staff to Nepal, discussions during training sessions, phone conversations, and discussions during the production of the Guidelines, all enabled a joint planning of priorities and progress.

An evaluation of the project's achievements and their sustainability were discussed at a meeting on 26 April 2005 between Philip Bubb (UNEP-WCMC), Professor Peter Furley (University of Edinburgh), Ganga J. Thapa (Executive Officer, KMTNC), Dr Siddhartha Bajracharya (Project Manager, KMTNC), Roschan Sherchan (Project Director, ACAP) and other ACAP and KMTMC senior staff.
Major milestones in the implementation of the project were:

- commencement of field surveys to assess the costs of benefits of conservation in ACA in 2002;
- training course for six KMTNC staff in the UK, March 2003.
- KMTNC staff trained in the UK delivered a five day course in May 2003 for eleven of their colleagues responsible for the nature conservation activities of the field offices of ACA.
- October 2003 training course for thirteen of the staff of KMTNC to consolidate the design of monitoring protocols and learn field survey methods.
- March 2004 twenty-five staff of KMTNC were trained in social survey techniques and eighteen field staff were trained in forest inventory.
- During 2004, field testing of survey methods and improvement of monitoring protocols.
- October 2003 – first revision of complete first draft of Guidelines for biodiversity assessment and monitoring.

- April 2004 – National workshop on biodiversity assessment and monitoring and launch of the Guidelines.
- April 2004 – Two papers accepted for publication on the impact of community involvement on biodiversity conservation.

To evaluate achievement of the project at the goal is not yet possible at the stage of concluding the project, in terms of improved conservation status of species and habitats. This will hopefully be possible to assess in three to five years time from future monitoring work using the protocols developed by the project. Regarding improved effectiveness of the protected area network in Nepal, in the case of ACAP there are now specific conservation objectives and baseline data for some key species and habitats which did not exist before. With the tested monitoring protocols and institutional capacity to design and conduct monitoring, this should significantly improve the effectiveness of achieving biodiversity conservation in ACA. This work is now institutionalised as a new part of the work programme of ACAP.
At the national scale, the project's national workshop and the distribution of the Guidelines has raised the profile and importance of biodiversity monitoring for effective protected area management, as well as providing guidance and examples for this.
The project has also established baseline information and survey methods on the perceptions by local communities of the costs and benefits of conservation and development activities by ACAP, with the resulting publications. This has contributed to increasing the effectiveness of ACAP by identifying needs such as measures to address the negative impacts of wildlife on crops and livestock.

- What were the main problems and what steps were taken to overcome them?

The main problems were:
- increasing limitations in the southern sector of ACA on where and how KMTNC could operate due to the activities of Maoist rebels;
- the senior staff member of ACAP responsible for biodiversity monitoring left Nepal to study in Norway during 2004;
- defining scientifically valid field survey techniques that are practical in the extremely mountainous and remote terrain.

The Maoist conflict meant that training and fieldwork was concentrated in the northern sector of ACA, so that the institutional capacity was still developed and results obtained.
The new staff member of ACAP responsible for biodiversity monitoring quickly learnt about the project and was able to continue its implementation with the support of colleagues. The process of reviewing the drafts of the Guidelines and presenting them at the national workshop ensured that he understood their content.
Some of the initial methods for locating sampling sites for blues sheep and snow leopard had to be modified, which was one of the reasons for conducting field trials to test the methodologies in the monitoring protocol.

- During the project period, has there been an internal or external evaluation of the work or are there any plans for this?

During the implementation of the project informal evaluations of progress and results were conducted during meetings and training sessions between UNEP-WCMC and KMTNC. A final project evaluation meeting was conducted after the national workshop with UNEP-WCMC, University of Edinburgh and the senior management of ACAP and KMTNC. This assessed progress against the components of the logical framework, identified priorities to build the sustainability of the project's outcomes, and identified opportunities for future collaboration. An external evaluation is not planned.

Key lessons from this project include:

- Practical and scientifically valid data can be obtained for important biodiversity features of a large protected area with a modest investment of resources. However, the selection of methods for surveys, sampling design and data analysis requires the input of professionals able to understand the requirements for scientific and statistical validity of these methods.
- Successful biodiversity assessment and monitoring to support protected area management requires much more than obtaining useful data. This work also needs to be part of an institutional programme and culture of setting measurable objectives and monitoring progress in achieving them. In the case of this project such a management culture has been developing, but achieving this aim may require different approaches and skills to conventional training.
- The communication of the results from biodiversity monitoring to local people, management and other stakeholders is very important to build support for this work and for the protected area.

10. Actions taken in response to annual report reviews (if applicable)

- Have you responded to issues raised in the reviews of your annual reports? Have you discussed the reviews with your collaborators? Briefly summarise what actions have been taken over the lifetime of the project as a result of recommendations from previous reviews (if applicable).

The comments and questions of the reviews of the Annual Reports for the first two years of the project have been discussed with KMTNC and a joint response prepared and included in the work plans.
Review comments from the first report emphasised the importance of follow-up to the UK training, which has been successfully carried out. This included the UK trained staff training their colleagues, a further two week training course in ACA, and accompanying the testing of field methods. Comments from the second report asked for more information on the surveys of local villagers perceptions of the costs and benefits of conservation. These have now been written-up and accepted for publication in two journals, with a third paper in revision. More information was also requested on the role of the Department for National Parks and Wildlife (DNPWC) regarding KMNTC and ACAP. As well as this information being provided in a response to the report the DNPWC were active in presenting their experience in biodiversity monitoring at the project's national workshop, and supporting the Guidelines. The of level involvement of local communities in participatory biodiversity monitoring was questioned in the second review. Establishment of such community-based monitoring was not actually an explicit aim of the project as detailed in the original project document and logical framework. However, its importance is recognised by UNEP-WCMC and KMTNC and training included participatory techniques. As explained above in Section 8 (Partnerships) the management of ACA is built around the functioning of committees for different activities at the village level, including the Conservation Area Management Committees which have operational plans. The forest inventories are already part of the formation of these plans. More community participation is needed in biodiversity assessment and monitoring, but this must respond to the priorities of local people and be part of a development process. KMTNC will be discussing the results of biodiversity monitoring for key species such as snow leopard, blue sheep and cheer pheasant with relevant CAMCs, to include this information in their operational plans. Community participation in biodiversity monitoring in ACA has not develop as far as might have been hoped within the time frame of the Darwin project, because the professional staff of ACAP needed to be first trained and have experience in biodiversity monitoring before they could adapt to the circumstances of local communities.

11. Darwin Identity

- What effort has the project made to publicise the Darwin Initiative, e.g. where did the project use the Darwin Initiative logo, promote Darwin funding opportunities or projects? Was there evidence that Darwin Fellows or Darwin Scholars/Students used these titles?

The Darwin logo was used on all literature and reports produced by the project, including the Guidelines publication and the web page for the project. The national project workshop was prominently promoted as a product of the Darwin Initiative of the UK government.

- What is the understanding of Darwin Identity in the host country? Who, within the host country, is likely to be familiar with the Darwin Initiative and what evidence is there to show that people are aware of this project and the aims of the Darwin Initiative?

The participants of the project's national workshop showed a high degree of recognition of the Darwin Initiative as a UK government funded programme. Staff from the Royal Nepal Academy of Science and Technology participating in the RBGE Darwin project prominently acknowledged their current and past achievements through Darwin Initiative support.

- Considering the project in the context of biodiversity conservation in the host country, did it form part of a larger programme or was it recognised as a distinct project with a clear identity?

The project was largely recognised as a distinct project within the programme of work of KMTNC, which included supporting the effective management of protected areas throughout Nepal.

12. Leverage

- During the lifetime of the project, what additional funds were attracted to biodiversity work associated with the project, including additional investment by partners?

A grant of £300 was provided by the World Pheasant Association to support the survey of cheer pheasant, but no other additional external funds were attracted to biodiversity work associated with the project. KMTNC/ACAP has allocated £7,000 annually from its budget for biodiversity monitoring.

- What efforts were made by UK project staff to strengthen the capacity of partners to secure further funds for similar work in the host country and were attempts made to capture funds from international donors?

For the biodiversity monitoring to be sustainable for ACAP it cannot rely on external funding, although this would obviously increase the extent of what could be undertaken. KMTNC and ACAP have considerable capacity as the largest conservation NGO in Nepal for fund-raising and UNEP-WCMC was not requested to provide direct assistance in this aspect. However, discussions started at the final project evaluation meeting to collaborate in developing proposals for training in biodiversity monitoring as part of a South Asia Regional Biodiversity Conservation Training Centre, which is being proposed for Royal Chitwan National Park.

13. Sustainability and Legacy

- What project achievements are most likely to endure? What will happen to project staff and resources after the project ends? Are partners likely to keep in touch?

The project achievements most likely to endure include periodic monitoring of snow leopard, blue sheep and cheer pheasant, forest extent from remote sensing data, and management of community forests based on detailed inventories. These results will be used to design appropriate conservation and management actions with local communities.

One of the key measures to ensure sustainability will be the inclusion of biodiversity monitoring as a new activity in the ACAP Management Plan and Annual Work Plans, which are currently being revised. Activities will include scheduling repeat fieldwork for snow leopard and blue sheep surveying, further development of SMART objectives and monitoring protocols, and assessment to consider the inclusion of other biodiversity features for conservation objectives and monitoring (e.g. Himalayan Tahr). Monitoring of snow leopard and cheer pheasant will be linked to pilot eco-tourism ventures with community involvement, to improve livelihoods. Funding for biodiversity monitoring will come from the ACAP budget, although has been reduced due to declining revenues from tourist trekking permits.

KMTNC project staff will continue to be include biodiversity monitoring within their work, although it is likely that some of the trained in ACAP will move to other protected areas managed by KMTNC as part of their normal operations.

An additional impact of the project has been the inclusion of plans for biodiversity monitoring in the new management plans for three other major protected areas in Nepal, the management of which is being passed to KMTNC by the Department of National Parks and Wildlife. These sites are Shey Phoksundo, Shivapuri and Rara National Parks, which will bring 55% of the area of protected areas in Nepal under the management of KMTNC. Siddhartha Bajracharya is responsible for the development of the management plans and monitoring for the protected areas managed by KMTNC, and this will ensure an ongoing national impact of the project.

The sustainability and impact of the project will be increased by translation of the Guidelines into Nepali, as well as seeking the endorsement of the Guidelines by the Department of National Parks and Wildlife Conservation (DNPWC), and promoting their use in other Protected Areas managed by KMTNC and the DNPWC. Currently KMTNC is in discussion with the UNEP South Asia Regional Office and other donors to establish a Regional Biodiversity Conservation Training Centre at Chitwan National Park, which is managed by KMTNC. The Guidelines would then form the base of training courses in biodiversity assessment and monitoring for all countries in south Asia, and UNEP-WCMC is in discussions with KMTNC to develop funding proposals for this.

- Have the project's conclusions and outputs been widely applied? How could legacy have been improved?

With the launch of the Guidelines at the end of the project there has not yet been time for these to be widely applied in Nepal or elsewhere. So far the Guidelines have been distributed in response to requests from South Africa, China, Vietnam, Mexico, Chile, USA, Canada, and the GEF. The Guidelines are in the process of being distributed to all the major conservation NGOs, including the World Commission on Protected Areas of the IUCN.

An additional impact of the project has been the inclusion of plans for biodiversity monitoring in the new management plans for three other major protected areas in Nepal, the management of which is being passed to KMTNC by the Department of National Parks and Wildlife. These sites are Shey Phoksundo, Shivapuri and Rara National Parks, which will bring 55% of the area of protected areas in Nepal under the management of KMTNC. Siddhartha Bajracharya is responsible for the development of

the management plans and monitoring for the protected areas managed by KMTNC, and this will ensure an ongoing national impact of the project.

- Are additional funds being sought to continue aspects of the project (funds from where and for which aspects)?

Currently KMTNC is in discussion with the UNEP South Asia Regional Office and other donors to establish a Regional Biodiversity Conservation Training Centre at Chitwan National Park, which is managed by KMTNC. The Guidelines would then form the base of training courses in biodiversity assessment and monitoring for all countries in south Asia, and UNEP-WCMC is in discussions with KMTNC to develop funding proposals for this.
UNEP-WCMC is in the process of a review of its work and training and capacity building will be significantly expanded in the future. The experience of its staff from this Darwin project and the training resources developed and Guidelines publication will form a significant component of this work. UNEP-WCMC has significant links with the Management Effectiveness Task Force of the IUCN Commission on Protected Areas and it is hoped to develop an active promotion of the results of this Darwin project through this network, including capacity building. Funding for this will be sought from UNEP and other donors once the plans for this work are agreed later in 2005.

14. Value for money

- Considering the costs and benefits of the project, how do you rate the project in terms of value for money and what evidence do you have to support these conclusions?

UNEP-WCMC would rate the project as reasonable value for money. The project has achieved all of its planned outputs within budget and to schedule. True value for money will be better determined in two to three years time, depending on the extent of biodiversity monitoring being conducted by KMTNC and the use of the results in protected areas management decisions. The project perhaps had more potential than was realised to involve other agencies in monitoring particular species and developing common approaches, but KMTNC is very well placed to develop this. The project has also developed very valuable capacity and resources with UNEP-WCMC which will be utilised to promote a worldwide impact improved biodiversity monitoring for protected area management.

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

Please complete the table below to show the extent of project contribution to the different measures for biodiversity conservation defined in the CBD Articles. This will enable us to tie Darwin projects more directly into CBD areas and to see if the underlying objective of the Darwin Initiative has been met. We have focused on CBD Articles that are most relevant to biodiversity conservation initiatives by small projects in developing countries. However, certain Articles have been omitted where they apply across the board. Where there is overlap between measures described by two different Articles, allocate the % to the most appropriate one.

Project Contribution to Articles under the Convention on Biological Diversity		
Article No./Title	**Project %**	**Article Description**
6. General Measures for Conservation & Sustainable Use	-	Develop national strategies that integrate conservation and sustainable use.
7. Identification and Monitoring	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	20	Establish systems of protected areas with guidelines for selection and management; regulate biological resources, promote protection of habitats; manage areas adjacent to protected areas; restore degraded ecosystems and recovery of threatened species; control risks associated with organisms modified by biotechnology; control spread of alien species; ensure compatibility between sustainable use of resources and their conservation; protect traditional lifestyles and knowledge on biological resources.
9. Ex-situ Conservation	-	Adopt ex-situ measures to conserve and research components of biological diversity, preferably in country of origin; facilitate recovery of threatened species; regulate and manage collection of biological resources.
10. Sustainable Use of Components of Biological Diversity	-	Integrate conservation and sustainable use in national decisions; protect sustainable customary uses; support local populations to implement remedial actions; encourage co-operation between governments and the private sector.
11. Incentive Measures	-	Establish economically and socially sound incentives to conserve and promote sustainable use of biological diversity.
12. Research and Training	50	Establish programmes for scientific and technical education in identification, conservation and sustainable use of biodiversity components; promote research contributing to the conservation and sustainable use of biological diversity, particularly in developing countries (in accordance with SBSTTA recommendations).

13. Public Education and Awareness	-	Promote understanding of the importance of measures to conserve biological diversity and propagate these measures through the media; cooperate with other states and organisations in developing awareness programmes.
14. Impact Assessment and Minimizing Adverse Impacts	-	Introduce EIAs of appropriate projects and allow public participation; take into account environmental consequences of policies; exchange information on impacts beyond State boundaries and work to reduce hazards; promote emergency responses to hazards; examine mechanisms for re-dress of international damage.
15. Access to Genetic Resources	-	Whilst governments control access to their genetic resources they should also facilitate access of environmentally sound uses on mutually agreed terms; scientific research based on a country's genetic resources should ensure sharing in a fair and equitable way of results and benefits.
16. Access to and Transfer of Technology	-	Countries shall ensure access to technologies relevant to conservation and sustainable use of biodiversity under fair and most favourable terms to the source countries (subject to patents and intellectual property rights) and ensure the private sector facilitates such assess and joint development of technologies.
17. Exchange of Information	10	Countries shall facilitate information exchange and repatriation including technical scientific and socio-economic research, information on training and surveying programmes and local knowledge
19. Bio-safety Protocol	-	Countries shall take legislative, administrative or policy measures to provide for the effective participation in biotechnological research activities and to ensure all practicable measures to promote and advance priority access on a fair and equitable basis, especially where they provide the genetic resources for such research.
Total %	**100%**	**Check % = total 100**

16. Appendix II Outputs

Please quantify and briefly describe all project outputs using the coding and format of the Darwin Initiative Standard Output Measures.

Code	Total to date (reduce box)	Detail (←expand box)
Training Outputs		
1a	Number of people to submit PhD thesis	
1b	Number of PhD qualifications obtained	
2	Number of Masters qualifications obtained	
3	Number of other qualifications obtained	
4a	Number of undergraduate students receiving training	
4b	Number of training weeks provided to undergraduate students	
4c	Number of postgraduate students receiving training (not 1-3 above)	
4d	Number of training weeks for postgraduate students	
5	Number of people receiving other forms of **long-term** (>1yr) training not leading to formal qualification(i.e not categories 1-4 above)	1- Siddhartha Bajracharya trained during 2002-3 in the collection and analysis of data from ecological and socio-economic surveys, including participatory methods.
6a	Number of people receiving other forms of **short-term** education/training (i.e not categories 1-5 above)	Year 1 2 and 3 – 5 KMTNC staff trained in principles and methods of biodiversity assessment & monitoring, as well as GIS techniques for the GIS Officer. Year 2 – 18 KMTNC staff trained in social survey techniques and forest inventory.
6b	Number of training weeks not leading to formal qualification	Year 1 – 5, Year 2 – 28, Year 3 – 15.
7	Number of types of training materials produced for use by host country(s)	1 – Guidelines for biodiversity assessment and monitoring for protected areas published.
Research Outputs		
8	Number of weeks spent by UK project staff on project work in host country(s)	Year 1- 3, Year 2 – 5, Year 3 – 6.
9	Number of species/habitat management plans (or action plans) produced for Governments, public authorities or other implementing agencies in the host country (s)	1 – Recommendations to KMTNC/ACAP for the management of ACA.
10	Number of formal documents produced to assist work related to species identification, classification and recording.	1- “Mammals of the ACA” produced in Nepali, to support conservation education.
11a	Number of papers published or accepted for publication in peer reviewed journals	2 – 1 paper in Environmental Conservation, 1 paper in Biological Conservation, 1 paper in revision for Oryx.
11b	Number of papers published or accepted for publication elsewhere	
12a	Number of computer-based databases established (containing species/generic information) and handed over to host country	
12b	Number of computer-based databases enhanced (containing species/genetic information) and handed over to host country	

Code	Total to date (reduce box)	Detail (←expand box)
13a	Number of species reference collections established and handed over to host country(s)	
13b	Number of species reference collections enhanced and handed over to host country(s)	

Dissemination Outputs		
14a	Number of conferences/seminars/workshops organised to present/disseminate findings from Darwin project work	1 – Final project dissemination workshop, Kathmandu, 25 April 2005. 50 participants.
14b	Number of conferences/seminars/ workshops **attended** at which findings from Darwin project work will be presented/ disseminated.	
15a	Number of national press releases or publicity articles in host country(s)	1 national press release for the launch of the Guidelines and the final workshop, with articles in 2 national newspapers.
15b	Number of local press releases or publicity articles in host country(s)	
15c	Number of national press releases or publicity articles in UK	
15d	Number of local press releases or publicity articles in UK	
16a	Number of issues of newsletters produced in the host country(s)	1- newsletter in Nepali on the project distributed to communities in the ACA.
16b	Estimated circulation of each newsletter in the host country(s)	
16c	Estimated circulation of each newsletter in the UK	
17a	Number of dissemination networks established	
17b	Number of dissemination networks enhanced or extended	
18a	Number of national TV programmes/features in host country(s)	
18b	Number of national TV programme/features in the UK	
18c	Number of local TV programme/features in host country	
18d	Number of local TV programme features in the UK	
19a	Number of national radio interviews/features in host country(s)	1 – interview with the KMTNC project co-ordinator during the national workshop
19b	Number of national radio interviews/features in the UK	
19c	Number of local radio interviews/features in host country (s)	
19d	Number of local radio interviews/features in the UK	
Physical Outputs		
20	Estimated value (£s) of physical assets handed over to host country(s)	£4,350 computing and field equipment
21	Number of permanent educational/training/research facilities or organisation established	
22	Number of permanent field plots established	10 forest plots in Year 1, 140 forest plots, 5 cheer pheasant plots, 5 snow leopard and blue sheep plots, 3 forest bird plots in Year 3.
23	Value of additional resources raised for project	£17,000 staff time donated by the University of Edinburgh.

17. Appendix III: Publications

Provide full details of all publications and material that can be publicly accessed, e.g. title, name of publisher, contact details, cost. Details will be recorded on the Darwin Monitoring Website Publications Database that is currently being compiled.

Mark (*) all publications and other material that you have included with this report

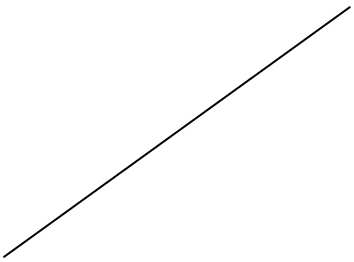
Type * (e.g. journals, manual, CDs)	**Detail** (title, author, year)	**Publishers** (name, city)	**Available from** (e.g. contact address, website)	**Cost £**
Manual *	Guidelines for Biodiversity Assessment and Monitoring for Protected Areas.	KMTNC, Nepal and UNEP-WCMC, UK	Available free as a pdf download from: http://www.unep-wcmc.org/collaborations/BCBMAN/ or by post from UNEP-WCMC or from KMTNC, Nepal	5
Journal*	Bajracharya, S. B., P. A. Furley and A. C. Newton. (in press) Effectiveness of community involvement in delivering conservation benefits to the Annapurna Conservation Area, Nepal	Environmental Conservation.		free
Journal*	Bajracharya, S. B., P. A. Furley and A. C. Newton. (in press) Impacts of community-based conservation on local communities in the Annapurna Conservation Area, Nepal	Biodiversity and Conservation		free
Journal*	Bajracharya, S. B., P. A. Furley and A. C. Newton. (in revision) Tourism in the Annapurna Conservation Area of Nepal: an opportunity or a threat to conservation?	Submitted to Oryx.		
Report*	Carol and Tim Inskipp (2003) Bird Conservation Priorities of the Annapurna Conservation Area. 73 pages	UNEP-WCMC	Available on request from Philip Bubb	free

18. Appendix IV: Darwin Contacts

To assist us with future evaluation work and feedback on your report, please provide contact details below.

Project Title	Building Capacity for Biodiversity Assessment and Monitoring in Nepal
Ref. No.	163/11/020
UK Leader Details	
Name	Philip Bubb
Role within Darwin Project	Project Manager
Address	UNEP-WCMC, 219 Huntingdon Road, Cambridge CB3 0DL, UK
Phone	
Fax	
Email	
Other UK Contact (if relevant)	
Name	Professor Peter Furley
Role within Darwin Project	Advisor on social and ecological survey design and analysis
Address	Department of Geography, School of GeoSciences, University of Edinburgh, Drummond Street, Edinburgh EH8 9XP, Scotland, U.K
Phone	
Fax	
Email	
Partner 1	
Name	Siddhartha Bajracharya
Organisation	King Mahendra Trust for Nature Conservation
Role within Darwin Project	National Co-ordinator
Address	PO Box 3712, Jawalakhel, Lalitpur, Kathmandu, Nepal
Phone	
Fax	
Email	
Partner 2 (if relevant)	
Name	
Organisation	
Role within Darwin Project	
Address	
Fax	
Email	

19. Appendix V: Logical Framework

Project summary	*Measurable indicators*	*Means of verification*	*Important assumptions*
Goal *To assist countries rich in biodiversity but poor in resources with the conservation of biological diversity and implementation of the Biodiversity Convention*		The effectiveness of the protected area network in Nepal improved, as indicated by the improved conservation status of threatened species and habitats	The tools that are developed by the project are effective, are adequately communicated to counterpart staff, and are then adopted widely
Purpose To improve the effectiveness of protected area management in Nepal by improving the capacity of managers of protected areas to assess status and trends in biodiversity	Tools for biodiversity assessment appropriate for use by protected area managers in Nepal developed and tested Nepali protected area managers trained effectively in the use of biodiversity assessment tools	Reports describing field testing of manual and associated biodiversity assessment tools Reports assessing the implementation of biodiversity assessment tools by protected area staff	Manual produced on schedule, describing tools appropriate for use by counterpart staff Training workshops are effective in developing, testing and disseminating methodologies for the assessment of biodiversity Field research is successfully completed
Outputs Tools for assessing biodiversity developed Capacity to undertake biodiversity assessments increased Impact of community involvement on biodiversity conservation assessed Costs and benefits of participation in protected area management on local communities analysed	Manual produced for biodiversity assessment Minimum of six Nepali staff trained in biodiversity assessment techniques Publications produced describing impacts on biodiversity Report produced describing effectiveness of protected area management	Manual published by end of project Reports of training workshops held in each year of the project Papers published in international scientific journal Report submitted to protected area administration	Manual publication occurs according to schedule Training workshops held as planned, involving Nepali participants Results of sufficient scientific standard obtained Results of sufficient scientific standard obtained

Activities			
Manual written describing biodiversity assessment techniques	Annual and quarterly progress reports	Annual and quarterly reports produced on schedule	Staff available for writing of manual
Training courses held in UK for Nepali staff	Training course reports	Training course reports produced within 1 month of course completion	Staff available for attendance at training course
Workshops held in Nepal for implementation of biodiversity assessment tools	Workshop reports	Workshop reports produced within one month of completion	Staff available for attendance at workshops
Field research programme undertaken in Nepal, assessing impacts of protected area designation	Annual and quarterly reports describing progress in field research	Annual and quarterly reports produced on schedule	Logistical support required for field research made available; field sites accessible and local communities willing to participate

20. Appendix VI: Preliminary Assessment of Biodiversity Resources that need monitoring in ACA

Compiled by:
Ram Chandra Nepal, Senior Conservation Officer
Annapurna Conservation Area Project
King Mahendra Trust for Nature Conservation
P.O. Box 183, Pokhara, NEPAL

A. FLORAL RESOURCES

State	Pressure	Response
Resource: Trans-Himalayan Rangelands (Mustang and Manang) *Caragana, Lonicera, Carex* and *Cobressia* species		
Degraded in over-grazed areas	Livestock grazing pressure, closure of Tibetan rangelands for grazing Nepalese livestock	Pasture categorization and improvement of traditional grazing system on-going through UMBCP
Resource: *Juniperus* stand of Samar, Upper Mustang		
Very sparse trees	Fuelwood collection (Lucrative source of fuelwood as compared to its alternative *Caragana)*	Regulated under the CAMC. Private and community plantation as alternative
Resource: *Rhododendron* forest of Ghandruk-Ghorepani		
Degrading in certain parts	Fuelwood, Timber collection	Being protected under the CAMC. Current protection insufficient in certain parts
Resource: Forests in the intensive use zone (all over ACA)		
Unknown: Need to be monitored	Continuous use for fuelwood, timber and fodder	Regulated under the CAMC. Private and community plantation as alternative
Resource: Major NTFPs – *Daphne* spp., *Swertia chiraita, Piper longum, Arundinaria spp., Taxus baccata, Alliums* spp., *Swertia* spp. (found in upper Mustang), *Aconitum spicatum* (Bikh), *Cordyceps sinensis* (in Manang), *Dactylorhiza hatagirea* (Panch Aule), *Picrorhiza scrophulariiflora* (Kutki), *Paris poliphyla* (Satuwa)		
Increasing stock in some area whereas decreasing in the areas where illegal collectors harvest unscientifically	Illegal harvesting, Growing pressure from local communities for legal harvesting	Forest protection under CAMCs, Punishment for illegal collectors, Management has working towards granting permission for legal harvesting as per CAMR 2053 and CAMD 2056

Note:
UMBCP – Upper Mustang Biodiversity Conservation Project.
NTFP – Non-timber forest product.
For all the biological resources following apply as response:

1. Conservation Area Management Act, Regulation and Directives issued by His Majesty's Government of Nepal as policy framework for their protection.
2. Conservation Area Management Committee (CAMC) and some of their sub-committees like Forest Management Committee (FMC), Snow Leopard Conservation Committee (SLCC) have been instituted for their protection.

3. Conservation Area Management Operational Plan (CAMOP) is prepared for regulated use of the natural resources within ACA at the CAMC level.

B. FAUNAL RESOURCES

State	Pressure	Response
Resource: Snow leopard, Blue Sheep, Musk Deer		
Lack of detailed information on population. Decreasing as compared to 3-4 decades according the local people	Competition with livestock for grazing (in case of Blue Sheep and Musk Deer) Decreased prey base and reiterative killing (in case of Snow leopard)	Pasture categorization and improvement of traditional grazing system on-going through UMBCP Depredation hot-spot identification on-going to reduce snow leopard – livestock conflict thereby reducing the reiterative killing
Resource: Tibetan wild Ass, Tibetan Argali, Tibetan Gazelle		
Little known. Scientifically recorded just 3 years back	Competition with livestock for grazing	Pasture categorization and improvement of traditional grazing system on-going through UMBCP
Resource: Common leopard		
Population may have increased due to forest protection	Increased cases of livestock killing by common leopard. Demand from local community for their culling	No intervention
Resource: Barking deer, Assamese monkey		
Population may have increased due to forest protection	Increased cases of crop raiding. Demand from local community for their culling	No intervention
Resource: Brown Bear		
Large mammals with insufficiently know status in upper Mustang, Vulnerable	Not known	No intervention

C. Resource: Birds

Species	Significance	Pressure	Response
Tibetan Snowcock	Rare game bird of the alpine meadows	Not Known	No intervention
Chukar	Important prey species for Golden Eagle	Not Known	No intervention
Common Hoopoe	common summer visitor for breeding, reflects healthy farm and meadows	Not Known	No intervention
Ibisbill	A rare species, reflects healthy and protected streams	Not Known	No intervention
Black Kite	a common scavenger of the area benefits from sacred groves	Not Known	No intervention
Lammergeier	Have widest wingspan (9ft)	Not Known	No intervention

	among Nepalese birds, indicator species		
Himalayan Griffon	Benefits from sky burial practice and an indicator species	Not Known	No intervention
Golden Eagle	Indicates rich area of prey species e.g., game birds and small mammals	Intentionally killed to avoid losses of lamb and young and weak ones of goat	No intervention
Common Raven	An indicator species and a sacred bird to the local	Not Known	No intervention
White-throated Dipper	Indicator of the healthy and protected streams	Not Known	No intervention
Wallcreeper	A rare and beautiful bird of the cliff and steep slopes	Not Known	No intervention
Tibetan Sandgrouse	A rare and beautiful bird of Tibetan origin	Not Known	No intervention
Pheasants	Some species are endangered, some are of national importance and some are of conservation importance	Not exactly known	No intervention

Note:
Snow Leopard: It can be monitored in Marchung-Chudingdhing and Samjung area during the winter months.

Brown Bear: It can be monitored in the Ghemi lekhs, Panga and Shey pasture areas.

Blue sheep: Special attention should be given in Damodar Kunda area as the population number is very good.

Tibetan argali: Upper Valley of Damodar Kunda is a primary habitat of Tibetan Argali.

Tibetan gazelle: Tibetan gazelle can be monitored by using nomads in the Chhujung and Dhalung pasture during summer.

Kiang: Kiang can be monitored by using nomads in the Chhujung and Dhalung pasture during summer.

Musk deer: Musk deer is the only deer species found in upper Mustang in an isolated forest patches in Samar. This deer can be monitored very easily due to easy access to the area.

21. Appendix VII : Programme of the National Workshop on Biodiversity Assessment and Monitoring, April 2005

NATIONAL WORKSHOP ON

BIODIVERSITY ASSESSMENT AND MONITORING

Organised by

KING MAHENDRA TRUST FOR NATURE CONSERVATION

and

UNEP-WORLD CONSERVATION MONITORING CENTRE

PROGRAMME

APRIL 25, 2005

INAUGURAL SESSION		
1000 – 1025 Hours		Registration
1025 – 1030 Hours		Arrival of the Chief Guest Hon.Dr. Shankar P Sharma
1030 – 1035 Hours		Welcome speech by the Member Secretary, KMTNC
1035 – 1040 Hours		Inauguration of the workshop by the Chief Guest
1040 – 1045 Hours		Remarks by Philip Bubb, UNEP-WCMC
1045 – 1050 Hours		Remarks by Dr. Tirth Man Maskey, DG, DNPWC
1050 – 1055 Hours		Launching of the **Guidelines** by the Chief Guest
1055 – 1100 Hours		Inaugural Speech by the Chief Guest
1100 – 1105 Hours		Vote of thanks by the Executive Officer, KMTNC
1105 – 1130 Hours		**Tea Break**
FIRST SESSION Session Chair: Dr. Pitamber Sharma		
1130 – 1145 Hours		'Constraints and opportunities in Biodiversity Conservation in Nepal' by Prof. Dr. Tej Kumar Shrestha, Head, Central Department of Zoology, TU
1145 – 1200 Hours		'Importance of Wildlife Assessment and Monitoring in the Protected Areas of Nepal' – Prof. Karan B Shah, Head, Natural History Museum, TU
1200 – 1215 Hours		'Biodiversity Monitoring in Protected area?' Dr. Khadga Basnet, Associate Prof., Central Department of Zoology, TU
1215 – 1245 Hours		Discussions
1245 - 1250 Hours		Remarks by the Session Chair
1250 – 1350 Hours		**LUNCH**

SECOND SESSION KMTNC-DARWIN INITIATIVE PROJECT Session Chair: Prof. (Dr.) Krishna Kumar Shrestha, Tribhuvan University	
1350 – 1405 Hours	Overview of KMTNC-Darwin Initiative Project by Dr. Siddhartha B. Bajracharya, KMTNC
1405 – 1420 Hours	'Guidelines for Biodiversity Assessment and Monitoring for Protected Areas' Mr. Roshan Sherchan, KMTNC
1420– 1435 Hours	'Cheer Pheasant Monitoring in ACA' by Mr. Raju Acharya
1435 – 1450 Hours	'Blue Sheep and Snow Leopard monitoring in ACA' by Mr. Kamal Thapa, KMTNC
1450 – 1505 Hours	'MIS system for ACA' by Mr. Nawaraj Chapagain, KMTNC
1505 – 1535 Hours	Discussions
1535 – 1540 Hours	Remarks by the session chair
1540 – 1615 Hours	**Tea Break**
THIRD SESSION INFORMATION SHARING AMONG CONSERVATION PARTNERS Session Chair: Mr. Narayan Poudel, DDG, DNPWC	
1615 – 1630 Hours	Presentation from DNPWC
1630 – 1700 Hours	Presentation from Central Department of Botany, TU
1700 – 1715 Hours	Presentation from WWF
1715 – 1730 Hours	'NepalNature.com in Biodiversity Assessment and Monitoring in Nepal' Mr. Ukesh R. Bhuju and Dr. P. R. Shakya, NepalNature.Com
1730 – 1745 Hours	'Landscape approach for Biodiversity Conservation – ICIMOD initiatives' Dr. Nakul Chhetri, ICIMOD
1745 – 1800 Hours	'Participatory evaluation and monitoring of community forestry programme' Mr. Sagendra Tiwari, Act. Country Representative, IUCN - Nepal
1800 – 1825 Hours	Discussions
1825 - 1830 Hours	Remarks by the session chair
CLOSING SESSION	**CLOSING OF THE WORKSHOP**
1830 – 1835 Hours	Closing remarks by Prof. Peter A Furley, University of Edinburgh, Scotland
1835 – 1840 Hours	Remarks by Mr. Philip Bubb, UNEP-WCMC
1840 – 1845 Hours	Remarks by Mr. Narayan Poudel, DDG, DNPWC
1845 – 1850 Hours	Closing of the workshop by Mr. Arup Rajouria, MS, KMTNC
1900 Hours	**Reception and Dinner**