

Darwin Initiative for the Survival of Species

Annual Report

1. Darwin Project Information

Project Ref. Number	162/12/030
Project Title	Building Capacity for Plant Biodiversity, Inventory and Conservation in Nepal
Country(ies)	Nepal
UK Contractor	Royal Botanic Garden Edinburgh
Partner Organisation(s)	Royal Nepal Academy of Science and Technology, Kathmandu, Nepal (RONAST). HMG Ministry of Forests and Soil Conservation, Department of Plant Resources, Kathmandu, Nepal (DPR). Tribhuvan University, Central Department of Botany, Kathmandu, Nepal (TU-CDB).
Darwin Grant Value	£112, 150 [£43,450 in Year 2]
Start/End dates	1 st June 2003 - 31 st March 2006
Reporting period (1 Apr 200x to 31 Mar 200y) and report number (1,2,3..)	1 st April 2004 - 31 st March 2005, Annual Report No. 2
Project website	http://rbg-web2.rbge.org.uk/nepal/darwin
Author(s), date	Dr Mark F Watson, Prof. Stephen Blackmore, Prof. Dayananda Bajracharya, 15 th June 2005

2. Project Background

For its area the Kingdom of Nepal is one of the most biologically diverse countries, with 118 distinct ecosystems and great altitudinal range (60 to 8848 m), even within short distances. However, unlike neighbouring countries such as Bhutan, Nepal has no published Flora. An earlier Darwin Initiative project established an important taxonomic database, and this provides a platform for documenting the distribution and conservation status of plants as basis for establishing conservation priorities and action plans and, ultimately, the preparation of a Flora. However, the baseline of reference collections in Nepal (e.g. the national herbarium, KATH) is incomplete, and trained taxonomists are few in number.

HM Government of Nepal's 10th Five-Year Plan (2002) and the National Biodiversity Strategy (2002) have recently prioritised institutional strengthening and human resource development as key areas needed for the management of the biodiversity of Nepal. In the light of this, RONAST approached RBGE on behalf of the participating institutes requesting assistance through the Darwin Initiative. The current capacity building Darwin Initiative project was developed from this collaboration and addresses the needs identified in these two government policy documents.

3. Project Purpose and Outputs

The purpose of the project is to strengthen the institutional base for plant taxonomy in Nepal (in particular the herbarium collections and staff at DPR and TU-CDB), so that Nepal has in-country reference collections of its rich flora and the necessary taxonomic expertise to meet its needs in responding to the CBD. Eighteen Nepalese scientists will receive training in field techniques of data recording and plant specimen collection, and the assessment of conservation status (according to new IUCN categories). Training will also be provided on modern herbarium techniques for collection management, documentation and utilisation. The aim is to provide the fundamental skills to enable Nepalese scientists to generate taxonomic information and to undertake conservation status assessments, including plant species and habitat action plans. All 18 participants will attend training workshops in Nepal and then, in groups, take part in field training in Nepal and attend a study visit to RBGE. Additionally, this training programme will develop the human resources needed for Nepal to contribute to international collaborative efforts towards a Flora of Nepal (coordinated by RBGE and involving institutions in Japan, Nepal, UK and USA). The Darwin Initiative project will contribute to the aims of the Global Taxonomy Initiative (GTI) and the Global Strategy for Plant Conservation (GSPC) established under the CBD.

The Logical Framework is provided in Appendix 1 (revised following the reviewers comments on the first annual report) and summarises the project outputs. The project Gantt chart (Appendix 2) records the timing of major events. Specific outputs for the reporting year are treated in more detail in the following sections.

Owing to political instability and safety concerns, modifications were made to the location of the two fieldwork training events. These were relocated to National Park areas where the safety of participants was more assured. Approval was not sought from the Darwin Secretariat. No major alterations are foreseen.

4. Progress

Project History

This project is an outcome of a meeting held at RBGE in May 2002 involving Prof. Bajracharya (RONAST), Dr K.R. Rajbhandari [KRR] (DPR) and Prof. K.K. Shrestha [KKS] (TU-CDB), and supported by The British Council, Kathmandu. It builds on collaborative links developed during Darwin Initiative project (Plant Information and Technology Transfer for Nepal [Project No. 162/06/052]) and a joint RBGE-DPR botanical expedition in Nepal in 2001. Although the first scheduled event for the project was the Edinburgh Planning Meeting, Drs M.F. Watson [MFW] and M.R. Pullan (RBGE) visited Kathmandu in June 2003 (separately funded) and met with project partners to discuss the project. Representatives of the Nepalese partner organisations and RBGE staff met in Edinburgh in September 2003 for the Planning Meeting. These two meetings provided good discussions of concerns and misunderstandings between the project partners and set a formal basis for collaboration and shared management of the project. Reports were produced for these and subsequent events which provide a valuable record of what was discussed and decisions made. The project website was launched in January 2004, at the same time the selection procedure for Darwin Scholars was initiated. The website provides background information on the project, project timetables, downloadable application forms, reports, etc. It is the major means of publicising the project and disseminating documentation. Eighteen Nepalese scientists were recruited onto the project in February, two as Project Co-ordinators (KRR & KKS) and sixteen as Darwin Scholars. Darwin Scholars comprise a set number of institutional nominees (from RONAST, DPR and TU) and six appointed by open competition. The First Training Workshop in Nepal (March/April 2004) was preceded by a high profile Inaugural Ceremony attended by the British Ambassador and senior representatives from HM Government of Nepal and Tribhuvan University. The First Training Workshop laid the foundation for future project work by providing comprehensive coverage of fieldwork plant collecting and data recording techniques, including practical sessions in the field. An introduction to the KATH and TUCH Herbaria and herbarium-based research was also given to initiate work on the Darwin Scholars' personal projects. The final activity of the year was a project monitoring meeting after the workshop, where the problems encountered during the year were discussed, and solutions found. During the year field collecting equipment, computers, books

and other teaching materials were procured, sent to Nepal, and given to the partner organisations and Darwin Scholar.

Summary of Progress 2004-5

Four main events were undertaken during the last reporting year: two Fieldwork Training Expeditions (May and November 2004), one in-country workshop (November 2004) and the first of the UK Study Visits (January/February 2005). These are reported in detail in the following sections. Darwin Scholars were active throughout the year, primarily working on their personal project groups examining herbarium specimens and preparing a Flora of Nepal-style account. Some Darwin Scholars undertook fieldwork studies on their own initiative, one (Bhaskar Adhikari) participated as a tutor on student field courses and hence passed on the training he had received on the Darwin Initiative project. All outputs and activities for the reporting year were accomplished, although some adjustments to timings and locations were necessary (see below). Some difficulty was found engaging the media, especially in Nepal, but in the UK we had success in promoting the project during the UK Visits where several newspapers ran articles (see supporting materials).

First Training Expedition, June 2004

Organisation and permissions for the botanical expedition went smoothly, aided by excellent collaboration with our Nepalese partners. Five Nepalese botanists accompanied three from RBGE on a 19-day trek-based expedition to Sagarmatha National Park (Everest region). 368 gatherings were made, including 228 herbarium collections (in sets of six, i.e. about 1200 specimens), with an additional 500 field records. All the collections had accurate habitat and ecological notes (including threats to the habitats and condition of the vegetation) and abundance assessment. These data give added value to the collections and feed in to conservation assessments and action plans. Three sets of herbarium specimens have been left in Nepal (with DPR, TU-CDB and the National Park administration), three were brought back to RBGE and will be used during future identification sessions. A separate report on the expedition has been produced including specimen listings, and is provided in Appendix 3 (available through the project website). Verbal feedback from the expedition participants was very favourable, and we were all very pleased with the outcomes. Due to the switch to a higher altitude than planned (see below), we were rather early in the flowering season for the area we visited and consequently the actual numbers of collections were lower than we anticipated. Nevertheless, all the training objectives of the expedition were met, and the reduced volume of plant material enabled us to focus more on training and testing of collecting methods and data recording techniques. Two Darwin Scholars (Bhaskar Adhikari and Kamal Maden) went on to undertake fieldwork of their own, borrowing equipment supplied by the project.

The most significant problem encountered was the location of fieldwork. The original plan for the three training expeditions was to journey to botanically less well known parts of Nepal: the midlands in the east, the central lowlands and the highlands in the west. Unfortunately, the political situation with the Maoist insurgency in Nepal has deteriorated, it is not longer safe to visit remote areas that do not have government security. On the advice of HM Government of Nepal we decided to change the location of this first fieldwork from east Nepal to the Sagarmatha National Park in the highlands on the border of central and eastern Nepal. This area would be safe for us to work in, but the timing would be outside the peak collecting season for this area (the dates of the expedition were set with lower altitudes in mind). Nevertheless, there are benefits to exploring these areas out of the normal season as you are more likely to discover new things and the focus was on training and quality not quantity of collections. Changes were also necessary for the second training expedition (see below), and the third expedition will return to Sagarmatha National Park in the autumn 2005. This will give the added benefit that we can target botanically rich areas already located during the June expedition and build on the good contacts that we have developed with the National Park Officials.

Feedback from First Training Workshop

An analysis of the Darwin Scholar feedback was produced in September 2004 (see supporting documents). Shortcomings and lessons learned were incorporated into the running of the second workshop. These included increasing the level of practical sessions,

reducing time lost through transportation problems, providing teaching materials at the end of the workshop, and including the requested theory sessions (e.g. CBD, flora writing, classification and identification).

Second Training Workshop, November 2004.

Three members of staff from RBGE visited Kathmandu for the second Training Workshop. The workshop lasted for eight days, involved 16 Darwin Scholars, 5 main trainers and 5 additional speakers representing WWF-Nepal, the King Mahendra Trust for Nature Conservation, Integrated Centre for Mountain Development, the United Nations Development Programme and Tribhuvan University. In addition four of the Scholars gave presentations. The teaching materials used were collected on a CD and each scholar was given a copy after the workshop (see supporting material), and it is available on our website.

The aims of the Workshop were:

- develop the participants' abilities to write accounts for the Flora of Nepal
- to develop their identification skills
- to train them in modern methods of data management
- to improve their understanding of biodiversity and conservation issues in Nepal

The Workshop sessions were a mixture of lectures, practicals and discussions, and were grouped into seven themes:

- Flora Writing Skills
- Identification Skills
- Angiosperm Phylogeny
- Conservation Assessment
- Major Plant Families
- Biodiversity & Conservation in Nepal
- Electronic Data Storage, Management and Presentation.

The combined report of the Second Training Workshop and Second Fieldwork is given in Appendix 4

Second Training Expedition, November-December 2004

The training expedition lasted 14 days and visited sites in the Terai around Chitwan National Park and in the Siwalik Hills to the north of Hetauda. Six Darwin Scholars and Dr Krishna Shrestha accompanied the three RBGE staff, and because of the large size of the group it was split into two teams who collected in separate sites. 494 collections were made (ca. 2,000 specimens) of flowering plants the primary focus, with more limited collections made of ferns and fern allies and bryophytes. Specimens were gathered in sets of at least three and usually five, with duplicates distributed to the National Herbarium (KATH), Royal Botanic Garden Edinburgh (E), Tribhuvan University (TUCH) and the National Park administration or the Natural History Museum depending on whether the specimen was collected inside a National Park. The fifth set was retained and will probably be sent to Tokyo (TI) which is a partner in the Flora of Nepal Project. Training objectives were as for the first training expedition, and all were met. The group was unable to visit Parsa Wildlife Reserve because of a recent Maoist incident there and fears about land mines, and there was a ban on road travel for two days of the visit to Chitwan. Alternative localities were found, but there was a general nervousness about the security situation.

First UK Study visits, January-February 2005

In January and February 2005 eight Nepalese botanists visited the UK during the first set of two-week Study Visits. Dr Keshab Rajbhandari (Co-ordinator) lead both the groups, the first comprising Darwin Scholars Ms Vidya Manandhar, Ms Nirmala Pandey and Mr Rajesh Uprety, and the second Ms Anjana Giri, Mr Kamal Maden, Dr Sangita Shrestha and Dr Mohan Siwakoti. Dr Rajbhandari stayed in the UK for the two days between the two groups and for three weeks after the return of the second group. The aims of the UK Study Visit were to:

- Enable research on personal projects using herbarium and library resources at the three major UK botanical institutes: RBGE (E), The Natural History Museum, London (BM), and Royal Botanic Gardens, Kew (K). These institutions house valuable materials not available in Nepal (especially historic materials), but vital to a revisionary studies.

- Participate in one-to-one tutorage of Darwin Scholars by RBGE staff on the personal projects.
- Develop identification skills by working on the specimens collected during the first two Training Expeditions.
- Provide general experience in the organisation and running of international herbaria in the UK (E, BM and K).
- Provide more detailed experience in the activities and research undertaken at RBGE, especially with regard to use of the living collections for education and reasearch.
- Develop an understanding of British and Scottish culture and way of life, which helps when developing collaborative programmes.

A full report is provided in Appendix 5. The Darwin Scholars prepared a draft account of their project group in advance which they worked on during their visit. During their time in the UK the Scholars spent as much time as possible researching their project group and revising their manuscript (both alone and in collaboration with tutors). All the Scholars were able to consult vital specimens and literature which were not available to them in Nepal. All Scholars had some species for which they had not seen any material of at all, and for others only a few specimens. Identification skills were improved by the Darwin Scholars working singly with a tutor used the RBGE herbarium and literature from the library to identify specimens collected during the fieldwork events. Some 159 collections were named to species. This demonstrated the value of complete material in the gathering and accurate supporting data, and also the importance of good keys and descriptions for their own work.

Whilst in Edinburgh tours provided experience of: public display/education living collections (under glass and outside) with interpretive materials; non-public research living collections (under glass and outside); plant propagation and Nursery facilities; Quarantine House; Herbarium office administration and database systems; Herbarium specimen mounting; and library. A weekend day trip was arranged to Dawyck Botanic Garden (the nearest of RBGE's specialist gardens), which is developing a research collection of woody Himalayan plants. In order to extend the cultural experiences gained whilst living and working in the UK, each group was taken to an evening ceilidh and a restaurant specialising in Scottish cuisine.

On the first visit, Dr Rajbhandari planted a young tree grown from seed collected in Nepal in 2001 to inaugurate the Nepalese plantings at Dawyck Botanic Garden. This attracted media attention and was featured in several local newspapers. Although during Press interviews we requested that the Darwin Initiative be mentioned in the articles, but unfortunately this rarely got through to print. Examples of the press cuttings are provided in the supplementary material with this Annual Report.

During a short visit to London the Darwin Scholars were able to tour round and work with the collections of the two other major UK botanical collections relevant to Nepal: The Natural History Museum, London, and Royal Botanic Gardens, Kew.

Launch of the Plants of Nepal website, March 2004, and revised project website

The project website has been revised through the year giving up to date information for the project participants and other interested people. It has recently been greatly enlarged and now forms part of an integrated web resource on the plants of Nepal. This includes reliable information on the plant biodiversity, vegetation types, physiography, climate, Himalaya mountain building, conservation issues and actions, with plant lists, a fact file and a bibliography. Linked through this website are the Flora of Nepal pages gazetteers and information on botanical exploration. These pages will be greatly expanded as data becomes available in the future, e.g. as outputs from the Flora of Nepal project.

Opportunity arose during the summer of 2004 for Dr Krishna Shrestha to work at Missouri Botanical Garden, St Louis, USA (funded by MBG) to update the Plant Information Database and incorporate it into the eFloras database system. This provided a practical route to getting the dataset updated and checklist made available on the web (both objectives of the current Darwin project). KKS continues to develop the dataset in Nepal with the assistance of Darwin Scholar Ram C. Poudel. The future plan is to incorporate the dataset into the Flora of Nepal data management system and serve this from RBGE. Until then the eFloras site is willing to host the checklist and a link is provided from the Darwin Initiative project website and Flora of Nepal pages on the Plants of Nepal website.

Procurement of Equipment

An important element of the project is to provide equipment that will enhance the fieldwork capabilities of Nepalese botanists and for research in the partner institutes. A great deal of equipment was provided in year 1, and this was enhanced by additional materials as advised by the partner institutes. Extra fieldwork equipment in Year 2 included: more wooden presses, straps, field presses, digging tools, GPS units (4), bulk silica gel (40kg) and two portable petrol generators (essential for running computers, digital cameras, etc). Local sources in Nepal for seed collection bags and field presses were investigated, the former successfully, the latter with prospects but currently lacking quality. When the Scholars visited the UK they found the high-power dissecting microscopes invaluable. They are not available in the two main herbaria in Nepal, and so one each for KATH and TUCH was bought with savings made on project funds (ca. £1,000 each). Taxonomic reference books have been bought for all three partners in Nepal, as directed by their institutional needs. Notable amongst these are a set of Edinburgh Journal of Botany (from 1970 onwards) for TU, and all published volumes of Flora of China Text and Illustrations for KATH. As in the first year, shipping of these materials has been greatly helped by The British Council Kathmandu who allowed usage of the British Forces Post Office: a cheaper and more reliable service than regular airmail.

Difficulties Encountered

Difficulties in fieldwork location due to the Maoist troubles again caused some changes of plan (see above). Fieldwork training was still able to be undertaken, although the original aims to try and target under-represented areas of Nepal are not now possible: these are the most insecure places to go at the moment. Instead, emphasis was placed on training and developing novel ways of data recording in the field. The final fieldwork location will be the same as the first, but timed for autumn instead of spring. This will give added benefit of knowing the ground and revisiting known rich areas at a different time of the year.

The sudden political change in early February 2005 caused anxiety and some confusion as this was at the time when the first group of Darwin Scholars would be returning to Nepal and the second group arriving (see Appendix 5). The suspension of flights to Nepal was thankfully short and did not disrupt plans. However, the severing of communication (telephone, fax, email etc.) with Kathmandu meant that we were unsure if our electronic payment of air tickets would get through, and whether the second group of Scholars would be permitted to leave. Thankfully, even though the Scholars could not contact us, they arrived as planned and we then learnt that the only difficulty was that the payment for tickets did not get through in time. RONAST were swift into action and promptly guaranteed payment to the travel company in Kathmandu. This is tangible evidence to the strong trust and collaboration that now exists between project partners in Nepal and with RBGE.

Obtaining UK Visas for our Nepalese colleagues was much more difficult in some cases than was foreseen. Letters of support were provided for all those due to travel to the UK, and there were no problems for those in full time employment, especially those employed by HM Government of Nepal. However, there were significant difficulties in the first batch of applicants with the application of Mr Bhaskar Adhikari. Mr Adhikari is a young, unmarried man without full-time employment. He is a dedicated, very bright botanist involved in various botanical and conservation projects, but his lack of a track record of travelling outside Nepal, and his lack of financial stability and savings counted against him in the judgement of the Visa Department and he was refused a visa. There was no time for him to reapply and unfortunately Mr Adhikari had to defer his visit to next year. We feared a similar problem with Mr Kamal Maden in the second group, and so used the lessons learned to provide additional information in support of his application. This was sufficient and he was granted his visa. Visits to Nepal in 2005 will be used to liaise with the British Embassy staff to help provide documentation to strengthen the case for Bhaskar Adhikari's reapplication for the second visit, and for others who might fall into a similar category (e.g. Mr Ram Chandra Poudel).

During the year we unfortunately lost one of our Darwin Scholars as Naresh Thapa emigrated to Australia. This was not only disappointing to us as Naresh was an active participant in the workshop discussions, but also KATH lost its only Pteridophyte specialist. Naresh was selected from the Open Competition places, and so it was agreed that we would fill his place with the reserve candidate chosen at the time (Ms Sajan Dahal). Sajan is a senior botanist at KATH, and it was felt that she would not be too disadvantaged in having

missed out on the first workshop. She joined the second workshop and participated in the second fieldwork (Sangeeta Rajbhandari will take Naresh's place on the third fieldwork). Ms Nirmala Pandey was ill just before the first fieldwork and so could not participate. She also joined the second fieldwork expedition and so did not miss out on this element of the training. It is important to retain some degree of flexibility, and so far we have been successful in accommodation unavoidable changes.

Keeping the Project website up to date has been needlessly made more complicated by other important sites that we link to changing their directory structures and creating broken links. Unfortunately this is not an uncommon problem, but at least this could be helped by providing forward links from old pages (we have done this for pages we have had to move). We were very surprised to find that the project pages on the Darwin Initiative main website had all subtly changed location. It is very unfortunate as there will now be many broken links on Darwin Projects websites which cross linked back to the main DI site.

Project Design.

Apart from the changes to the localities of the fieldwork events, there have not been any major changes to the design of the project as it is working well and achieving the desired outcomes. Content of the workshops and fieldwork training have been adjusted and enhanced to take on board suggestions from our Nepalese counterparts.

Over the past two years, as we have worked more closely, we have gained a deeper understanding of the problems and constraints faced by our Nepalese partner institutions (especially within the KATH herbarium) in recruiting new staff. There is particularly a problem in providing career opportunities for promising young botanists. We are currently engaged in formulating solutions to this and have put forward a suggestion for a Post Project funding (see below).

Workplan for Reporting Year 2005-6

The timetable of work for the next reporting year is given in the form of the revised Logistical Framework (Appendix 1) and Gantt chart (Appendix 2).

5. Actions taken in response to previous reviews (if applicable)

Responses to the reviewer's comments to the first annual report were made in September 2004. Actions taken to address the failings are as follows:

Provision of a detailed analysis of Darwin Scholar feedback from first workshop

This has been provided, see supporting materials.

More emphasis on monitoring progress and providing more detail on output progress

Additional information is provided in this year's reports on the achievements and quantifiable outputs. This has been useful for us in assessing the success of the elements of the projects and judging progress against the stated aims.

An additional output is added to the logframe to reflect human capacity building

This has been done (see Annex 1 and Appendix 1), and again has been a useful addition.

The project team should consider whether the political instability is likely to affect their ability to complete the reference collection. Alternatives might have to be considered if the third field expedition can not be carried out.

The project team keeps a close eye on the political situation in Nepal, with advice from the British Embassy, Kathmandu, and HM Government of Nepal. Political instability affects almost all of our project work to some extent (see above under Progress), and by retaining a flexible approach we have been able to cope with the difficulties and still achieve our objectives. The third field expedition will not be able to go to the West as planned, and will now target Sagarmatha National Park (see above under Progress).

Little progress on the training Manual

Materials used during the training workshops will be collated together in the form of a training Manual that can be used by those in Nepal (also other Darwin Projects are interested in this) to train others. Martin Pullan (RBGE bioinformatics specialist) collated all the materials from

the second training workshop into a series of PowerPoint presentations that are combined into a self contained series accessible on a CD-ROM (included in Supporting Material). This was given out to participants at the end of the workshop and is available on the project website (under 'Teaching Materials'). This was very well received by the participants and work is currently underway to retrospectively convert the materials used in the first workshop into this format and similarly distribute. The same format will be used for the third and final workshop. Options will be explored on ways to distribute these materials in a training manual format, possibly using ideas from the RBG Kew 'CBD for Botanists' (previously funded by the DI).

Development of a plant information system for the website has not yet been initiated

This was planned for years 2 (and 3), but has been completed in year 2. The broader Plants of Nepal website (www.floraofnepal.org) has been launched (see above), which includes the web version of the plant information system and a great deal of supplementary information on Nepal and its plant biodiversity.

6. Partnerships

The collaboration between UK and Nepalese partner institutes has been good throughout the project and continues to grow. Trust is a vital element of this, and has been built on through regular communication, delivery of promises, involvement, open discussions, and especially face-to-face meetings. Increase in trust is difficult to quantify, but it is apparent from the open expressions of views and concerns, and the free exchanges between project members. The action of RONAST in guaranteeing payment of air tickets to the UK, when the RBGE electronic payment was caught up in the communication blackout in early February (see above under UK study visit), was a strong measure of the high level of trust between us. Another measure of the collaboration between Nepalese participants is the joint authorship of the paper in *Plant Resources* (see Outputs below). There are no unforeseen problems with the relationships.

Collaborations established in year 1 have continued. Within Nepal the project has established new links with WWF-Nepal, the King Mahendra Trust for Nature Conservation, and the United Nations Development (see 2nd Workshop report). Recently RBGE has also established links with Conservation International regarding future joint fieldwork. Nepalese partners also maintain strong links with the biodiversity conservation community in Nepal, often as active participants and prominent members of organisations such as: Nepal Botanical Society, Ethnobotanical Society of Nepal, and the Natural History Museum.

7. Impact and Sustainability

The high profile of the project in Nepal established in year 1 continues, as is evident by the honoured guests attending the opening ceremony of the second workshop and the evening reception (see above for details). Dr U. Sharma, Director General of Department of Plant Resources (DPR), will be joining the team of Darwin Scholars in the third fieldwork expedition to Sagarmatha National Park. Dr Sharma is a senior Government official, who previously was the first Warden of Sagarmatha National Park. His knowledge of the area and perspectives on the changes since his time there in the mid 1970's will add to the training experience for the Darwin Scholars. Influence on HM Government Nepal activities in biodiversity conservation will primarily be through our project partners in Nepal, especially the staff of DPR. Their active participation in many aspects of the project feeds directly into plant biodiversity conservation activities for which they are charged to undertake (as stated in the National Biodiversity Strategy, 2002).

The main components of the exit strategy (and legacy) are the continuation of biodiversity exploration, collection, research and documentation by the Darwin Scholars and participating institutions. Equipment supplied for this (both to individuals, and to institutes) will be available for them to undertake this work and train others. All three host country institutions are strongly committed to the project and to the Flora of Nepal. Staff time has been allocated to participation in the project activities and research on their personal projects. It is recognised that it will be essential to develop an active group of botanists working in the National Herbarium (KATH) including existing DPR staff at KATH and liaising with TU-CDB. We are currently exploring ideas and funding opportunities to provide salaries for new

researchers and office facilities at KATH which will form the nucleus of this group. This will also address the poor career opportunities for promising young botanists that exists at the moment. See below (Post Project Funding) for further details.

8. Post-Project Follow up Activities (max 300 words)

Aim - To further build the expertise and independence of young Nepalese botanists to allow them to develop their work on the Flora of Nepal, and to improve their chances of future employment within the Department of Plant Resources.

Rationale - Production of the Flora has been discussed for the last 30 years, though with only minor outputs produced till now, and it is important to maintain the momentum generated by the current project and give a core of trained personnel the opportunity to carry on their work. Poor career structure and the lack of long term opportunities for recently qualified botanists are serious impediments to building capacity. The project has identified two very able Scholars, both currently without permanent employment, who would benefit greatly from two years of employment, particularly if this included extended visits to the UK. These activities would be particularly suitable for Darwin funding because they follow on directly from the project activities, but increase the length of time spent working in the UK.

Programme - The Scholars will be employed at KATH, writing accounts for the Flora, conducting independent field work, identifying and incorporating new specimens and curating and databasing the existing collections. They will work with staff at KATH and TUCH and conduct training programmes for university students and NGOs using the materials developed for the Darwin Workshops. By the end of the second year they will be leading independent field programmes with other members of DPR staff, using the equipment purchased by the Darwin Project.

Two visits to the UK of at least 3 months will be required to collect literature and observe specimens in UK and other European herbaria. These visits will give the opportunity for close supervision of their work and do much to consolidate the training given in the current project. Mark Watson and Colin Pendry will further supervise activity during annual visits to Nepal, and RBGE will be approached for funding for these trips.

Budget

£

9. Outputs, Outcomes and Dissemination

Progress was made on all agreed outputs, and those assigned to year 2 were completed. The online version of the plant checklist was brought forward from year 3 and made possible from additional funding by Missouri Botanical Garden (see above).

Dissemination activities in the host country were primarily targeted at the participants of the workshop (including the guest speakers) and fieldwork training. Nepalese participants continued to disseminate information informally to colleagues, and formally to students on field courses and practical sessions. Project Co-ordinators in Nepal had occasional meetings with Darwin Scholars to exchange information. The expanded website is an important vehicle for disseminating general information to a broad audience worldwide, and also more technical, specific information to those who require it. Future dissemination to other scientists and the general public in Nepal will continue through the long-term involvement of RBFE in biodiversity research in Nepal (especially the Flora of Nepal project) funded by a mixture of core RBGE funding, expeditions grants, and private sponsorship. These activities would be greatly enhanced by the employment of young, enthusiastic Darwin Scholars to work in Nepal (see Post Project Funding).

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

Code No.	Quantity	Description
4C	18 Nepalese	16 Darwin Scholars and 2 Project Co-ordinators
4D	12 weeks	one 2-week workshop in Nepal & two 3-week fieldwork training in Nepal, one 4-week UK study visit
7	4	CD of PowerPoint workshop training materials, guidelines for fieldwork, personal projects, Flora of Nepal authors (see below)
8	33	RBGE staff during 2 fieldwork and 1 workshop
11A	1	See Publications
12B	1	Plant Information for Nepal database was updated and made available online (see project website)
13A	2	First expedition (368 collections in six sets, ca. 1200 specimens); second expedition (494 collections in 3-5 sets, ca. 2000 specimens).
14A	1	Second training workshop
15A	2	
15C	3	
15D	2	
17A	1	Darwin Scholars in Nepal news network
19A	1	Mark Watson (BBC Radio Scotland)
20	£8,000	Microscopes, reference books, collecting equipment, herbarium supplies, etc.
22	£3,700	Funding for David Knott on first fieldwork, part funding for second workshop and fieldwork, discounted air tickets and excess baggage

Table 2: Publications

Type * (e.g. journals, manual, CDs)	Detail (title, author, year)	Publishers (name, city)	Available from (e.g. contact address, website)	Cost £
Bulletin of Department of Plant Resources No 25*	Botanical expedition in the Sagarmatha National Park, east Nepal in 2004. K.R. Rajbhandari, et al. (2004):63-67 & cover	DPR, Kathmandu	Dept. Plant Resources, PO Box 2270, Thapathali, Kathmandu, Nepal	?
Journal: Our Nature 2*	Plant Collection and Herbarium Techniques. K. Maden (2004): 53-57	Nature Conservation and Health Care Council	Nature Conservation and Health Care Council, Biratnagar, Nepal	?
CD-ROM*	Training material used in 2 nd Workshop, anon (2004)	RBGE	www.floraofnepal.org	free

factsheet*	Expedition guidelines, anon (2004)	RBGE	www.floraofnepal.org	free
factsheet*	Project work guidelines, anon (2004)	RBGE	www.floraofnepal.org	free
manual	Flora of Nepal guidelines for authors, anon (2004)	RBGE	www.floraofnepal.org	free

10. Project Expenditure

- Please expand and complete Table 3.

Table 3: Project expenditure during the reporting period (Defra Financial Year 01 April to 31 March)

Item	Budget (please indicate which document you refer to if other than your project schedule)	Expenditure	Balance
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Notes:

Overspend of £793.73 under Capital budget heading and £25.93 in postage has been offset against Others heading with the permission of the Darwin Initiative.

11. Monitoring, Evaluation and Lessons

Monitoring of activities was achieved by the production of detailed reports with reference to the stated deliverables and outputs, and the running of formal and informal feedback sessions. Evaluation of the second workshop, UK Visits and the performance of the trainers was achieved through the feedback sessions. Group verbal feedback sessions for the UK Study Visits worked very well and everyone participated and felt able to speak their mind. However, the verbal group feedback session for the second workshop worked less well as not everyone contributed and it was felt that some were inhibited in presenting all their views. In retrospect the questionnaire feedback forms used for the first workshop were better, and these will be used in the third workshop.

Direct evaluation of the performance of the Darwin Scholars through formal assessments was not considered appropriate given the variation in seniority in the participants. Instead, monitoring the performance and understanding of Darwin Scholars was undertaken through one-to-one sessions during the workshop practical classes and UK Study Visit. All Scholars

visiting the UK were asked to complete the first draft for their specialist group, and feedback was given on these during one-to-one sessions. Examples of these draft accounts are provided in the supporting materials. Quality of data recording and specimen collection during fieldwork was monitored continuously with the Scholars working closely with trainers. Inadequate material was not accepted and very quickly all the material collected was of high quality with complete collection data recorded (see spreadsheets of collection data). The quality of the collections and draft reports demonstrate the effectiveness of the project in meeting its objectives.

The lessons learned from this year are covered above. Again, flexibility to adapt schedules was of prime importance to maintaining successful outcomes. Two lessons merit specific reiteration. The first is the value of one-to-one training for the assessment of individual knowledge and levels of achievement. Help and advice can be tailored to the needs of the individual. Project deadlines were requested by the Darwin Scholars, and these will be implemented. The second lesson was the necessity to make particular efforts to help some of the disadvantaged Scholars obtain UK Visa's. It is hoped that if extra effort is made to strengthen the weak cases then everyone will be able to complete their UK visits in 2006.

12. OPTIONAL: Outstanding achievements of your project during the reporting period (300-400 words maximum)

■ I agree for ECTF and the Darwin Secretariat to publish the content of this section

The project has had a very active year both in Nepal and the UK, with training expeditions, workshops and visits to Edinburgh and London. Theory learned during workshops was put into practice in the field during two contrasting expeditions which studied everything from high altitude dwarf alpine in Sagarmatha (Mount Everest) National Park to tall trees of the subtropical Terai collected from the backs of elephants in Chitwan National Park. It is especially noteworthy that we have been able to maintain an active field programme outside the Kathmandu Valley during these difficult times of civil unrest and dramatic political developments.

The study visit to the UK was of particular importance to the scientific training of Darwin Scholars, and working one-to-one with RBGE scientists. This has given them the confidence to critically assess published works and question past identifications of herbarium specimens. They are able to develop their own research programmes instead of following existing literature and potentially perpetuating misconceptions and misinformation. UK training is invaluable for building a sense of independence for the Scholars and allowing them to experience at first hand the diverse biodiversity research activities at Royal Botanic Gardens Edinburgh and Kew, and The Natural History Museum. Scholars said that this had been a "Vision widening" experience and that they were keen to apply this back in Nepal.

The smooth running of the project is entirely due to the trust and collaboration that has been built up between project partners in Nepal and in the UK. This is developed through free and open communication, personal visits and active involvement of all partners. The strength of these relationships, and the high esteem in which the project is held, was demonstrated in February 2005 during the dramatic political change; the visit of one group of Scholars would not have taken place without the prompt action of RONAST to underwrite travel costs during the communications freeze which temporarily isolated Nepal from the outside world.

Darwin Scholars have participated enthusiastically in the training programmes and many are already producing quality taxonomic revisions. Several Scholars are now undertaking independent fieldwork of their own and delivering training on university student fieldwork courses. Key botanists for the future are being identified through the activities of the project and we look forward to seeing them continue to grow in confidence and expertise.

The heightened level of cooperation and collaboration has promoted the success of the project, and also sets the stage for future work on biodiversity and conservation studies in Nepal.

Annex 1 Report of progress and achievements against Logical Framework for Financial Year: 2003/2004

Project summary	Measurable Indicators	Progress and Achievements April 2003-Mar 2004	Actions required/planned for next period
<p>Goal: To draw on expertise relevant to biodiversity from within the United Kingdom to work with local partners in countries rich in biodiversity but poor in resources to achieve</p> <ul style="list-style-type: none"> • The conservation of biological diversity, • The sustainable use of its components, and • The fair and equitable sharing of the benefits arising out of the utilisation of genetic resources 			
<p>Purpose</p> <p>To strengthen the capacity of Nepal to conserve and use sustainably its rich plant resources by training Nepali botanists to collect plants and assess conservation status in field. To enhance the representation of species in the collections and to train staff in collections and information management in the herbarium. Enabling Nepalese to contribute to international taxonomic research on Nepal.</p>	<p>18 (maximum) Nepalese botanists from DPR, CDB and other institutions to be trained.</p> <p>Collection of 2000-3,500 sets of herbarium specimens.</p> <p>Representation of native species in herbaria to be increased from c 33% to c 75%</p> <p>Completion of preliminary assessments of conservation status</p> <p>Preparation of descriptions and accounts for Flora of Nepal</p>	<p>16 Darwin Scholars and 2 Project Co-ordinators participated in the training workshop; 10 Scholars and 2 Co-ordinators participated in the fieldwork training. 7 Scholars and 1 Co-ordinator participated in the UK Study Visit.</p> <p>ca. 890 collections (in 5 sets) made with complete habitat, associated species, abundance and conservation data.</p> <p>All 16 Darwin scholars have prepared first draft accounts, 7 that visited the UK have advanced drafts</p>	<p>Complete training programme with one field expedition, one workshop and one round of UK study visits.</p> <p>Ensure submission of manuscript for Flora of Nepal accounts.</p> <p>Complete training manual in electronic and hard copy.</p> <p>Produce labels for herbarium specimens (with identifications) and distribute.</p>
<p>Outputs</p> <p>Training materials - course book on Plant, identification and Herbarium Management</p>	<p>Publication of manual as training resource for the future.</p>	<p>Training materials used in the second workshop are available on interactive CD and project website.</p>	<p>The interactive CD was distributed at the end of the workshop and will be done for the final workshop.</p>

Presentation of Nepal Plant Information System via the web.	Information accessible via the internet	Online version is now accessible on eFloras website via link from project website.	Objective completed.
Collection and curation of new herbarium material for reference collections and documentation of status.	Herbaria of DPR (KATH) at Godawari and Tribhuvan University (TUCH) to include 75% of Nepalese plant species.	ca. 890 collections (in 5 sets) made with sets for KATH and TUCH. Identifications and labels will be completed in year 3 and distributed	As fieldwork location is very limited it will not be possible to target the very remote areas, so limiting coverage of plant species.
Preparation of accounts for Volume 3 of the Flora of Nepal	Accounts for 18 plant groups in Volume 3 to be produced as part of the course assessment	Training in writing Flora accounts was given in the 2 nd workshop. Accounts from 7 Scholars (21 genera) who have received UK training are in First Draft stage, 3 Scholars have produced substantial manuscripts (8 genera), remaining scholars will produce account by Jan 2006 in advance of UK visit.	Scholars reported that they required deadlines and regular correspondence to help them complete their person project tasks. This has been initiated and will continue.
Enhance human capacity in Nepal for herbarium management, plant collection, biodiversity assessment and description	18 Nepalese botanists to be trained	16 Darwin Scholars and 2 Project Co-ordinators participated in the training workshop; 10 Scholars and 2 Co-ordinators participated in the fieldwork training. 7 Scholars and 1 Co-ordinator participated in the UK Study Visit.	Workshops, expeditions and UK visits have all proved successful and format will be repeated. Lessons learned with UK Visa applications will be used.

Note: Please do NOT expand rows to include activities since their completion and outcomes should be reported under the column on progress and achievements at output and purpose levels.

Appendix 1. LOGICAL FRAMEWORK (REVISED)

<i>Project summary</i>	<i>Measurable indicators</i>	<i>Means of verification</i>	<i>Important assumptions</i>
<p><i>Goal:</i></p> <p>To draw on expertise relevant to biodiversity from within the United Kingdom to work with local partners in countries rich in biodiversity but poor in resources to achieve</p> <ul style="list-style-type: none"> • the conservation of biological diversity, • the sustainable use of its components, and • the fair and equitable sharing of the benefits arising out of the utilisation of genetic resources 			
<p><i>Purpose</i></p> <p>To strengthen the capacity of Nepal to conserve and use sustainably its rich plant resources by training Nepali botanists to collect plants and assess conservation status in field. To enhance the representation of species in the collections and to train staff in collections and information management in the herbarium. Enabling Nepalese to contribute to international taxonomic research on Nepal.</p>	<p>18 (maximum) Nepalese botanists from DPR, CDB and other institutions to be trained.</p> <p>Collection of 2000-3,500 sets of herbarium specimens.</p> <p>Representation of native species in herbaria to be increased from c 33% to c 75%</p> <p>Completion of preliminary assessments of conservation status</p> <p>Preparation of descriptions and accounts for Flora of Nepal</p>	<p>Evaluation of participants at end of each training workshop</p> <p>Specimens incorporated into herbaria</p> <p>As above</p> <p>Status reports drafted for 50% of species collected.</p> <p>Manuscripts prepared for editorial committee.</p>	<p>Selection of participants will include individuals with differing levels of responsibility within DPR and CDB with qualifications ranging from school level or graduate to postdoctoral.</p> <p>The target for new herbarium specimens is a conservative one based on joint fieldwork, the numbers may be much higher if Nepali participants are able to undertake additional fieldwork.</p>
<p><i>Outputs</i></p> <p>Training materials - course book on Plant , identification and Herbarium Management</p> <p>Presentation of Nepal Plant Information System via the web.</p> <p>Collection and curation of new herbarium material for reference collections and documentation of status.</p> <p>Preparation of accounts for Volume 3 of the Flora of Nepal</p> <p>Enhance human capacity in Nepal for herbarium management, plant collection, biodiversity assessment and description</p>	<p>Publication of manual as training resource for the future</p> <p>Information accessible via the internet</p> <p>Herbaria of DPR (KATH) at Godawari and Tribhuvan University (TUCH) to include 75% of Nepalese plant species.</p> <p>Accounts for 18 plant groups in Volume 3 to be produced as part of the course assessment</p> <p>18 Nepalese botanists to be trained</p>	<p>Completion of publication</p> <p>Evaluation of web site</p> <p>Enhancement of collections.</p> <p>Completion of manuscripts</p> <p>Botanists attend workshops, fieldwork and study visits.</p> <p>Coursework evaluated</p>	<p>Botanists are able to attend all the activities</p>
<p><i>Activities</i></p> <p>Initial planning workshop in Edinburgh and three larger training workshops in Kathmandu.</p> <p>Botanical exploration, collecting and assessments.</p> <p>Encorporation of materials into KATH and TUCH herbaria, documntation.</p> <p>Extension of Information Systems to the internet</p>	<p>Activity Milestones (Summary of Project Implementation Timetable)</p> <p>Year 1. Senior Nepalese botanists to RBGE for planning and training (collections and conservation status assessment), workshop in Kathmandu (focus on collection and field documentation)</p> <p>Year 2. Fieldwork followed up by identification of collections and workshop at RBGE (for first group of Nepalese botanists). Workshop in Kathmandu (adding curation and collections management skills) leading into fieldwork.</p> <p>Year 3. Final workshop (including presentation of results to Government officials) and field work in Nepal, and followed by identification of collections and workshop at RBGE (for second group of Nepali Botanists). Publication in Nepal of training manual derived from coursework and practical experience in the field and herbaria, revision of information systems and presentation via the web, completion of manuscripts for Flora of Nepal.</p>		

