



**PLANT ENDEMISM OF THE CENTRAL ANDEAN VALLEYS,
BOLIVIA**

*DARWIN INITIATIVE ANNUAL REPORT
FOR 1 APRIL 2003-31 MARCH 2004*

*DEPARTMENT OF PLANT SCIENCES
UNIVERSITY OF OXFORD*

Darwin Initiative for the Survival of Species

Annual Report

1. Darwin Project Information

Project Ref. Number	162/11/010
Project Title	<i>Plant Endemism of the Central Andean Valleys of Bolivia</i>
Country(ies)	<i>Bolivia</i>
UK Contractor	<i>Department of Plant Science, University of Oxford</i>
Partner Organisation(s)	<i>Herbario Nacional de Bolivia, La Paz (principal partner)</i> <i>Herbario Nacional Forestal "Martin Cardenas", Cochabamba</i> <i>Herbario del Oriente, Museo "Noel Kempf Mercado", Santa Cruz</i> <i>Herbario de Chuquisaca, Sucre</i>
Darwin Grant Value	£187,866
Start/End dates	<i>1 October 2002 – 30 September 2005</i>
Reporting period (1 Apr 200x to 31 Mar 200y) and report number (1,2,3..)	<i>1 April 2003 – 31 March 2004</i> <i>Annual Report no. 2</i>
Project website	N/A
Author(s), date	<i>John R. I. Wood with contributions by Stephan Beck (La Paz) and Colin Hughes 31 May 2004</i>

2. Project Background

Most conservation and biodiversity research in Bolivia has been centred on the moist tropical forests in the Andean foothills and Amazonian lowlands, and it is in these areas that most protected areas are located. The essential premise of the project is that the drier, central Andean valleys are relatively neglected both in terms of research and conservation, and that they contain rich biodiversity and important centres of plant endemism. The area of the project's work is essentially the Andean basin of the Rio Grande and its

tributaries and a series of inter-Andean valleys lying between this area and the Peruvian border.

This area contains several of the country's major centres of population including Cochabamba and the legal capital, Sucre, while the two largest towns, La Paz and Santa Cruz lie at the edge of the project area. While this clearly increases the potential threat to the biodiversity of the project area and the urgency of identifying key areas for protection, it also means that all four established herbaria, our partner institutions in Bolivia, have a close interest in our area of study. These institutions are all relatively new and have few resources. They have almost no tradition of taxonomic research, which remains largely the preserve of non-Bolivians to this day.

The project essentially works in Bolivia for the six-month period, November-April each year. This coincides with the rainy season when significant plant collecting is practical. UK training is planned to take place in the May-October period when project activities within Bolivia are minimal.

3. Project Purpose and Outputs

- *Project Purpose: to identify hotspots of plant endemism in and around the central Andean valleys of Bolivia for future conservation.*

We continue to make steady progress towards achieving our purpose. It is, of course, too early to identify hotspots firmly especially as endemic species occur over much of the project's area of operations. However, it seems very likely that one of these will be the lowest part of the Rio Grande valley which appears to be a hotspot for endemic plants. Several sandstone outcrops are also significant.

- *Project Output 1: List/Data base of as many endemic plants as possible with distribution maps.*

The data base at all four institutions is growing fast. All specimens collected during the project's life (some 3000) have been entered together with data for over 9,000 other specimens. At the present time only a limited effort has been made to add in data of endemic species from the outside the Bolivian herbaria or from literature as the emphasis has been mainly on the collection of general data and facilitating the transfer of information stored in EXCEL to BRAHMS.

Project Output 2: Six Bolivians able to identify species in six major families or groups.

Although none of the six principal project workers have yet gone for training in the UK they are all making progress with their respective groups (Amaranthaceae, Cactaceae, Compositae, Ferns, Labiatae, Leguminosae, Portulacaceae, Umbelliferae) and there is every reason to expect that they will be competent at identifying a wide range of species in these important groups by the end of the project

Project Output 3: Attractive popular field guide to selected plants with emphasis on endemics.

This output is not due for completion for another year but substantial progress has been made towards collecting the photographs needed for this.

Project Output 4: Production of posters on value and conservation of selected species/habitats.

This output is not due for completion for almost a year but we already have over 50 paintings completed and available for use in posters

- *The only change related to our outputs or proposed operational plan relates to UK training. Training in Oxford was originally included in the project proposal and schedule to begin in the 2003-4 year. We requested the postponement of this start to the 2004-5 year as the original timing was too close to the project's beginning to allow the selection of study programmes and supervisors. This change was agreed by the Darwin secretariat in June 2003*

4. Progress

- *Project history: Although preliminary discussions between Oxford University and our four partner institutions in Bolivia had taken place over several months in the summer of 2002, the project really began in November 2002 with the arrival of our field co-ordinator, John Wood, in Bolivia. During the final months of 2002 project workers were selected in all four partner institutions in Bolivia on the basis of public advertisement and selection by representatives of Oxford and the Bolivian institutions. During the period January to March 2003 all four institutions received donations of computers, printers, GPS and other field equipment. Herbarium furniture and stationery (especially for specimen mounting) was provided according to the needs of each institution. Two digital cameras were also provided. Training in the use of digital cameras and in using the BRAHMS data base was given after the software was installed. Simultaneously an extensive programme of field collecting and on the job training in collection methods took place. By the end of March 2003 over a thousand collections had been made, data entry was advancing and the project was well established in all four partner institutions.*
- *The agreed work plan for the project over the reporting period, which was outlined in our previous annual report, is copied below:*

<i>April 2003</i>	<i>Fieldwork in Bolivia</i>
<i>May-September 2003</i>	<i>Project essentially in recess with part-time work in UK and Bolivia on the identification of specimens and entry and editing of information in the data bases.</i>
<i>October – April 2004</i>	<i>Return of John Wood to Bolivia (replaced by Colin Hughes in December-January) and the re-initiation of field work in the project area to coincide with the rainy season. Throughout this period the bank of specimens, data and images will be built up in all partner institutions.</i>
<i>October 2003</i>	<i>One week's workshop in La Paz for all project workers led by John Wood and Stephan Beck on plant identification.</i>
<i>January 2004</i>	<i>Second workshop on plant identification (mainly Leguminosae) led by Colin Hughes</i>
<i>February 2004</i>	<i>Workshop on plant illustration by Rosemary Wise followed by selection of illustrator for UK training and start of preparation of project posters.</i>

- Early 2004* *Visit by Denis Filer to advance data base work, incorporating software for mapping etc with workshop in each centre.*
- February 2004* *Selection of 3-4 Bolivian co-workers for UK training in the May-October 2004 period.*

This work plan fully conformed to the original project proposal and schedule except that that UK training was planned to begin in May 2004 instead of May 2003.

The project was able to keep strictly to the above work plan throughout the reporting period meeting all agreed milestones with two minor exceptions:

- 1. The visit of Denis Filer to advance the data base work actually took place in the first week of May 2004 just outside the reporting period.*
 - 2. The workshop on plant illustration posed a problem in the selection of an illustrator for UK training. Much the ablest Bolivian illustrator proved to be a young student (Eliana Calzadillo) half way through her degree course. Since she is neither qualified nor committed yet to botanical illustration work, we decided on the following approach after discussion with our principal Bolivian counterpart. No scholarship would be offered to Eliana but she would be encouraged to develop her illustration skills by a combination of on-going advice from Rosemary Wise and payment from the project funds to illustrate taxonomic papers to be published by project workers. Additionally one of the possible scholarship candidates for 2005 (Hibert Huaylla) who had attended the illustration workshop and had some potential would be offered some illustration training as part of his UK training programme. The additional scholarship place would go to Julia Gutierrez who joined the project late (January 2004).*
- *Project achievements in 2003-4:*

Data base work: *BRAHMS software was installed in February 2003 in all four partner herbaria and training was provided at the same time. BRAHMS was developed at Oxford by Denis Filer and is in use in many countries and international institutions. The software is flexible and offers all the fields to be expected for a herbarium data base including collector, number, family, genus, species, subspecific ranks, date of determination, description, geographical notes, ecological notes, date of collection, GPS data, distribution of specimens etc. Additional fields can be created if required. Amongst other benefits are the ability to link digital images of living or herbarium specimens to the data and the ability to create distribution maps. The system comes with manuals in Spanish and is under constant development*

Since installation all collections made under the project's aegis (\pm 3000) have been entered in the database. A further 2000 odd entries of endemic plants have been added from existing herbarium collections in Bolivia. We have begun on the far larger task of transferring existing data stored in EXCEL or WORD documents to BRAHMS. Some 7,000 entries have been transferred into BRAHMS. Two of the herbaria (Sucre and Cochabamba) are interested in putting all their data into BRAHMS and one other (La Paz) is examining the possibility of doing this. Only a very small quantity of data from literature or from herbaria outside Bolivia has

been put into BRAHMS to date but this will become more important as we move into producing taxonomic papers and maps of endemic species.

Training in the use of BRAHMS is provided by Denis Filer on his visits to Bolivia (the most recent in May 2004) and through e-mail when required. Monitoring of data is largely informal (through checking by those using the data) but we are aware that our products are effective means of monitoring: for example, a distribution map will reveal unlikely points that need revision and possible correction.

Field Collecting: The project has now collected about 3000 numbers which have been presented to the Bolivian herbaria and are mostly duplicated at Kew. A substantial number have been named and mounted and are now available for consultation in Bolivian herbaria. This is quite a significant achievement as in most herbaria collections are not mounted and available for study for many years after collection. We are well on our way to our target of 4000 specimens. In addition to herbarium collections the project has collected around 300 living cactus specimens which are kept in the Botanical Garden in Cochabamba, as this is the most suitable location geographically and climatically. Two of our project workers received training in collecting and studying this important family in November and December 2003 from a group of cactus experts led by Martin Grant of Hull University. Building up a collection of living cactus in a Bolivian botanical garden seems the best way to make specimens available for study and propagation, thus preserving wild populations.

The project has now made collections from all the principal valley systems in the north of our area (Apolo, Charazani, Sorata, Sud Yungas, Rio Abajo, La Paz, Luribay, Quime/Inquisivi, Ayopaya as well as much of the vast Rio Grande valley system on which the project is centred. Our collections cover all families of flowering plants and where collection of dried material is difficult, Cactaceae, for example, we have collected using alcohol and have begun a programme of collecting living material, which is described below. We cannot claim that our knowledge is more than superficial. The season under review was frustratingly dry in our core area (We had two abortive visits to the lower parts of the Rio Grande), many areas have only had a single visit (three visits at different seasons is desirable). Some promising areas (Cocapata, for example) need full investigation and, of course, there are numerous side valleys, rock outcrops, distant forest relics etc that have never been visited by us or anyone else. In selecting areas for study and collection we rely heavily on verbal reports from people living in the area, data from maps and on increasingly accurate predictions based on knowledge of climate, geology, orientation etc.

The quality of our specimens continues to be commended by experts in different groups and we plan to maintain our emphasis on quality rather than quantity.

Herbarium identification: This work is steadily advancing with about 50% of project specimens accurately named, principally in the families Acanthaceae, Amaranthaceae, Anacardiaceae, Araliaceae, Asclepiadaceae, Celastraceae, Convolvulaceae, Labiatae, Leguminosae, Ranunculaceae, Umbelliferae but also in individual genera and groups. To achieve this we have had help from experts such as Gwil Lewis and David Goyder from Kew, Eve Emshwiller from the Field Museum and several

others. We are in fact very dependent on expert help of this kind and are waiting identifications in such important families as Compositae and Gramineae. Nonetheless skills within the project workers are growing steadily and should receive a boost once UK training takes place (see also under systematics training below)

Botanical Illustration: Two workshops each of a week's duration were successfully delivered, one in Cochabamba, one in Sucre with a total number of 13 participants. It seems that the only professional (but untrained) botanical illustrator in Bolivia has benefitted from this and one younger but outstanding person has been identified for future support (see discussion above)

Photography: All four institutes now have digital cameras and all project workers use these as part of their work. Skills vary but a bank of around 600 photographs is now available both of plants and habitats, the former linked to the BRAHMS data base. These photographs are an essential resource for our field guide and also for the production of posters. In addition to the outputs in our logframe we hope to use digital photography for posters for some much visited places in the project area: the archaeological park at Samaipata, the Toro Toro National Park and perhaps also for Sorata and the hills west of Sucre. These productions would help raise the project profile significantly and could generate income for local people through the promotion of tourism.

Training in Systematics: Two workshops, one of 3 days related to legumes and another general one of 5 days in La Paz have been given together with a lot of informal training in the field and the herbarium. However the main thrust of our training work in systematics will be given as part of UK training from June 2004 onwards

Enhanced capacity of the Bolivian herbaria: We have continued to enhance the capacity of the Bolivian herbaria during the year, completing the purchase of digital cameras for all four institutions, buying compactors for La Paz and herbarium cabinets for Sucre, making agreements for the purchase of compactors for Cochabamba and above all in the purchase at almost 40% discount of a large part of the remaining stock of herbarium paper in Bolivia. This last purchase should ensure that all four herbaria will advance rapidly in the mounting of herbarium specimens and continue doing so well beyond the project's life. This will help taxonomic work very significantly by making large numbers of currently unmounted specimens available for research.

- No significant difficulties were encountered during the year. One of our project workers (Alain Carretero) from Sucre resigned on being offered a scholarship for an MA in Denmark. Julia Gutierrez was selected to replace him after consultation with the Herbarium in Sucre. She had been a reserve candidate in the original project selection process and was already familiar with the project's work. We had some bad luck with weather. The basin of the Rio Grande, which is at the centre of the project's area of study, was exceptionally dry and virtually no rain fell this year. We were, thus, unable to examine thoroughly one of the most promising potential hotspots for endemic species
- There has been no change in project design, methods or indicators in the past year. We believe it is still too early to review our exit strategy.

- *Timetable (work plan) for the next reporting period*

<i>April 2004</i>	<i>Final month of second cycle of field work in Bolivia</i>
<i>May</i>	<i>Data base training to update systems, trouble shoot problems, install new software, give further training and copy all data for inter-institutional sharing</i>
<i>June-Sept</i>	<i>3 (possibly 4) project workers come to UK for training and research project leading to production of taxonomic papers</i>
<i>September</i>	<i>Final agreement on projects and supervisors for UK training in 2005 with loan requests etc</i>
<i>October (late)</i>	<i>Return of Oxford field co-ordinator to Bolivia</i>
<i>November</i>	<i>Meeting of project workers to plan project activities in the final year, agree exact timetable, priorities and responsibilities etc</i> <i>Workshop on plant identification (La Paz)</i> <i>Initiation of final six month cycle of field work, data base entry, processing of specimens, collection of digital pictures etc</i> <i>Visit by Rosemary Wise to follow up illustration workshop and complete posters</i>
<i>December</i>	<i>Completion of taxonomic papers by Bolivian staff who received UK training in 2004</i>
<i>March 2005</i>	<i>Possible additional visit by Rosemary Wise if outside sponsorship is obtained. Preparation of posters for publication. Selection of teacher collaborator for poster workshops.</i>
<i>Early 2005</i>	<i>Final visit by Denis Filer to update data base systems and provide additional training.</i>

This plan clearly envisages both additional visits by Rosemary Wise and some slippage with the timing for the production of posters. This is because of good prospects of getting additional funding for poster production through sponsorship by (BG) British Gas (Bolivia). This should be confirmed in August 2004 but the money will only become available in January 2005. The agreement of the Darwin secretariat for these small changes in milestones will be sought once the sponsorship situation is clear.

5. Actions taken in response to previous reviews

- *The previous review raised two principal issues. One was over the budget, which was related to a misunderstanding over the reporting dates. The project had not, in fact, overspent. The second was related to the project's logical framework. We agree that the last item under the heading "Project Activities" (Enhanced capacity in Bolivian herbaria) is an output rather than*

an activity. We will seek the Darwin secretariat's agreement to this change at the same time as requesting their agreement to the change in the dates of the milestones mentioned in 4 above in September this year. We plan to discuss indicators of achievement at the start of the new season at the meeting in La Paz at the beginning of November. The other minor points related to terminology and more detailed information on fieldwork and the fields in the data base have been addressed in this report.

6. Partnerships

- *Collaboration between Oxford and our four host country partners has remained excellent throughout the year. The main point of contact with each institution is through our project worker(s) but we also have frequent contact with their managers who participate in all major decisions. Fieldwork, workshops and meetings have all been organised smoothly. All necessary permits and other documentation have been acquired through our partners. The project has been able to meet most requests for equipment and stationery as well as support the participation by other herbarium staff in workshops and field trips. Our only problems, admittedly very minor and infrequent, have been with project workers over expenses and time management. These have been solved with more explicit guidelines. In general the high degree of collaboration is undoubtedly one of the strengths of the project.*
- *Apart from our regular links with the Direccion General de Biodiversidad and the Bolivian National Parks we also have a good relationship with the local representatives of the other principal organisation supporting the Bolivian herbaria, the Missouri Botanical Garden, and co-ordinate our support for the three smaller herbaria with them. We have also agreed to interchange data. We also have very close relations with the Royal Botanic Gardens at Kew and Edinburgh. We have arrangements with staff from both to help in the supervision of Bolivian project staff when they come to UK for training. We have done joint fieldwork with staff from Kew, who have also helped the project with the identification of collections. Two of our Bolivian project workers have also participated in field work on cactus with Martin Grant of Hull University.*

7. Impact and Sustainability

- *The project is well known amongst the botanical and biodiversity community in Bolivia but will not have a high profile amongst the general public until its final stage. However we have made some effort in the past year to raise our profile. Project workers have produced a large poster of the project's work for an exhibition (Cochabamba) and another for two exhibitions in Santa Cruz; they have given a presentation at an international conference (Tarija) and a television interview in Santa Cruz.*
- *The main evidence for increased biodiversity capacity at this stage lies in four areas: the growing capacity of project workers to name plant material, the increasing size of the project data base with its capacity to generate information, the growing bank of digital photographs and the increasing accessibility of herbarium specimens for all who do biological research*

8. Post-Project Follow up Activities

- *The following activities grow out of and would serve to consolidate project results:*
 - a) *Detailed botanical surveys, full inventories and a popular illustrated flora of each site for conservation identified in the original project. The popular flora would serve to raise public awareness of the importance of the site.*
 - b) *Negotiations with local communities and other sciences (archaeology, palaeontology, zoology, ornithology...) as well as government bodies to propose the management and use of sites for conservation. An important part of this would be educational, as local communities would need to know and value what they are being asked to conserve.*
 - c) *Preparation of publicity material and posters/short guides for each selected site.*
 - d) *Financial support for academic/study visits, data repatriation (especially type specimens), field work and other opportunities for Bolivian staff to expand their publications on specific genera to full accounts of the families of their specialisation based on work in the project and as a follow-up to the "Checklist of the Bolivian Flora". This activity would reinforce the legacy of the project by strengthening the skills of Bolivian botanists transforming them into genuine national experts while at the same time providing biodiversity workers with effective keys and guides to important plant families.*
 - e) *Bolivian botanists have taken enthusiastically to data-basing material using BRAHMS and the main herbaria have data of great interest to the wider scientific community which is being organised for research and curation purposes. The next logical steps would be to add in data from literature and foreign herbaria and make this data available on the internet. The advantages to both the scientific community and the Bolivian herbaria would be high. The Bolivian herbaria would benefit by increasing interest regionally and globally in their collections. Meanwhile, the scientific community would have access to information on species, individual collections and images –although this strictly controlled by the herbaria individually. Implementation would require training from Denis Filer.*
 - f) *The development of a larger bank of digital photographs as an adjunct to the data base (e) and as a support for the activities outlined in a-d above.*
 - g) *Continued capacity building for Bolivian herbaria.*
- *These follow-up activities serve to sustain the achievements of the original project and fit Darwin's aims fully focussing on conservation, raising public awareness of and participation in biodiversity conservation. There is also a strong emphasis on increasing Bolivia's capacity to carry out taxonomic and conservation work through training and repatriation of data.*
- *Evidence of the commitment and capacity of the host country lies in the progress and enthusiasm with which project workers have taken to field work, taxonomic research, data basing and digital photography, although clear demonstration of this awaits the later stages of the project when*

publications come out. It also lies in the resources given to the Bolivian herbaria by the Darwin Project (Digital cameras, computers, software etc) and in the increasingly accurately named herbarium material in each Bolivian herbarium.

9. Outputs, Outcomes and Dissemination

- We were able to keep to our implementation timetable except for the postponement of the second database workshop from “early 2004” to the first week of May just outside the reporting period
- Project workers have produced a large poster of the project’s work for an exhibition (Cochabamba) and another for two exhibitions in Santa Cruz; they have given a presentation at an international conference (Tarija) and a television interview in Santa Cruz. The exhibition and the television interview were aimed at the general public while the conference was presentation was aimed at ecologists and biodiversity workers.

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

Code No.	Quantity	Description
5	6 Bolivian botanists	Principal project workers who receive on-going training in field, herbarium (and later in UK)
6	5 Bolivian botanists	One week’s workshop on plant identification led by John Wood and Stephan Beck in La Paz
6	13 Bolivian botanists/illustrators	One weeks workshop (Cochabamba) repeated in Sucre with attendance of 6 and 7 people on techniques of botanical illustration
6	5 Bolivian botanists	One week’s workshop on plant identification led by John Wood and Stephan Beck in La Paz
6	8 Bolivian botanists	Three day workshop on Legume systematics and identification led by Colin Hughes in Cochabamba
8	29 weeks	John Wood 20 weeks in field as co-ordinator, trainer, field and herbarium worker Colin Hughes 5 weeks in field as trainer and field worker Rosemary Wise 4 weeks in field for illustration and training work
12	4	Data bases established, functioning and growing in all partner institutions
13A	± 3000	Herbarium specimens and around 250 living specimens
14B	2	I conference presentation in Bolivia I conference presentation in UK (Both international conferences)
18C	1	Television interview with project co-ordinator in Santa Cruz
20	£5691 approx	Equipment provided includes a large quantity of

		herbarium paper for all herbaria, compactors for La Paz, digital cameras for Sucre and La Paz, herbarium cabinets for Sucre and miscellaneous items such as pots, leather gloves, presses, mounting equipment as requested
23	2 free BA return flights	Two flights (London-Sao Paulo return donated by BA, representing a saving to the project of around £800 Time of herbarium managers in Bolivia representing around £400 Colin Hughes flight costs to Bolivia from his own funds (£750) and time on project work (£2000) Dr Scotland's time in UK (£1000)

- *No publications have been made in the reporting period but three papers based wholly or partially on project work have been accepted for publication:*
 1. *A new species of Ovidia by Rogers, Antezana, Wood and Beck to be published in Novon*
 2. *Two new species of Gomphrena by Ortuno & Borsch to be published also in Novon*
 3. *Endemismo de la plantas de los valles centrales de Bolivia by Mendoza to be published in a collection of conference papers.*

10. Project Expenditure.

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

Item	Budget (based on project schedule with modification agreed with Darwin secretariat on 2/6/03)	Expenditure	Balance

- *Explanations for differences between budget and expenditure*

1. *We have an underspend on travel largely because we were able to get two free BA tickets from London to Sao Paulo*
2. *We have overspent on equipment largely because of the decision to bulk purchase the remaining stock of herbarium paper held by the only supplier in Bolivia at the express wish of our partner institutions and to take advantage of a large discount. This single item amounted to nearly £3000*
3. *We have underspent on local salaries largely because of unexpectedly favourable exchange rates which have saved the project over £1000.*

11. Monitoring, Evaluation and Lessons

- *Monitoring and evaluation is both qualitative and quantitative. Training is evaluated by observation of how those trained perform in their tasks: Can they enter and retrieve information from the data bases? Can they take good quality digital photographs? Is the quality of their collections and their field data adequate and improving? We also evaluate the number of plant collections (± 3000), the number of digital images stored on the computer ((600+) and the number of data entries (12,000+). Initiative and morale can be evaluated by the number of independent field trips carried out, the number of specimens identified etc. All these activities will contribute to the project outputs (posters, field guides, scientific publications) as well as creating a sound scientific base for the reports and proposals to be presented to the Bolivian authorities as part of the project purpose.*
- *We believe that the original design of the project was essentially sound and that we are essentially on track to achieve project aims. We are still somewhat daunted by the size of our task and it is clear that strict prioritisation of activities will be necessary in the remaining 18 months of the project's life.*

12. OPTIONAL: Outstanding achievements of your project

We would prefer to wait until next year or our final report to emphasise our achievements

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><i>To identify centres of plant endemism in and around the central Andean valleys of Bolivia for future conservation</i></p>	<p><i>1. Number of key sites/zones identified</i></p> <p><i>2. Number of endemic species accurately named for each site/zone</i></p> <p><i>3. Enhanced public awareness of and support for the conservation of endemic species</i></p>	<p><i>(report impacts and achievements resulting from the project against purpose indicators – if any)</i></p> <p><i>Sites will only be identified after the next season</i></p>	<p><i>(report any lessons learned resulting from the project & highlight key actions planning for next period)</i></p>
<p>Outputs</p>			
<p><i>1. List/Data base of as many endemic plants as possible with distribution maps)</i></p>	<p><i>1. Existence of data base for consultation by relevant organisations</i></p> <p><i>2. Species and geographical coverage of data base</i></p>	<p><i>(report completed activities and outcomes that contribute toward outputs and indicators)</i></p> <p><i>Data base established and growing at each herbarium with over 10,000 entries in total</i></p>	<p><i>(report any lessons learned resulting from the project & highlight key actions planning for next period)</i></p>
<p><i>2. Six Bolivians able to identify species in six major families or groups</i></p>	<p><i>3 Number of Bolivians successfully completing training</i></p>	<p>UK training to begin in June but ability to identify species growing steadily</p>	
<p><i>3 Attractive, popular field guide to selected plants with emphasis on endemics</i></p>	<p><i>4 Existence of field guide and posters</i></p>	<p>Not due till final stages of project but substantial number of photos now available for inclusion</p>	
<p><i>4. Production of posters on value and conservation of selected species/habitats</i></p>	<p><i>4 Existence of field guide and posters</i></p>	<p>Not due for another year but over 50 paintings prepared for inclusion in the posters</p>	

Annex 2: Project Logical framework

Project summary	Measurable indicators	Means of verification	Important assumptions
<p>Goal</p> <p>To assist countries rich in biodiversity but poor in resources with the conservation of biological diversity and implementaion of the Biodiversity Convention</p>		<p>1 Legislation/Regulations related to conservation, biodiversity and education</p> <p>2. Reports by the Direccion Nacional de Biodiversidad and other relevant bodies</p> <p>3. Media reports on public attitudes to conservation issues</p> <p>4. <i>Data on habitat and speces loss</i></p>	<p>1 Public support for conservation is maintained</p> <p>2. Rural poverty is progreesively eliminated</p> <p>3. <i>Government regulation is effectively implemented</i></p>

<p>Purpose</p> <p><i>To identify centres of plant endemism in and around the central Andean valleys of Bolivia for future conservation</i></p>	<p>1 Number of key sites/zones identified</p> <p>2 Number of endemic species accurately named for each site/zone</p> <p>3 <i>Enhanced public awareness of and support for the conservation of endemic species</i></p>	<p>1. Reports submitted</p> <p>2. Proposed conservation measures by local/national authorities</p> <p>3 Sale of project guides, calendars etc</p> <p>3. <i>Media reports</i></p>	<p>1. Staff available for field work in Bolivia</p> <p>2. Plants can be accurately named</p>
<p>Outputs</p> <p>1. List/Data base of as many endemic plants as possible with distribution maps</p> <p>2. Six Bolivians able to identify species in six major families or groups</p> <p>3 Attractive, popular field guide to selected plants with emphasis on endemics</p> <p>4. <i>Production of posters on value and conservation of selected species/habitats</i></p>	<p>1. Existence of data base for consultation by relevant organisations</p> <p>2. Species and geographical coverage of data base</p> <p>3 Number of Bolivians successfully completing training</p> <p>4 Existence of field guide and posters</p>	<p>1 Examination of final documents including data base, field guide and posters.</p> <p>2 Number of specimens identified by Bolivians trained in project</p> <p>3. Publications by Bolivians trained</p> <p>4 <i>Project reports</i></p>	<p>1. There is time to assess a representative range of sites with endemic plants in different seasons</p> <p>2. Bolivian staff reach a sufficient level in their training</p> <p>3 Experts are available and willing to identify specimens where appropriate</p>
<p>Activities</p> <p>1. Training of Bolivians in data bases, field collecting, herbarium identification and the preparation of botanical illustrations and photos.</p> <p>2. 6 x UK training in systematics of specific groups.</p> <p>3. Field collecting</p> <p>4 Enhanced capacity in Herbario Nacional with equipment and bibliography</p>		<p>1. Project reports</p> <p>2. Number and quality of specimens collected and illustrated</p> <p>3. Number of Bolivian staff able to use data base</p>	<p>1 Suitable candidates for training are available</p> <p>2 Bolivian staff are given time for training and field work.</p> <p>3 Bolivian staff are available for field work</p>