Darwin Initiative

Annual Report

1. Darwin Project Information

Project Ref. Number	*13024*
Project Title	*Inventory and Conservation of the Bryoflora of South Western Patagonia*
Country(ies)	*Chile*
UK Contractor	*Biological Sciences, Queen Mary University of London*
Partner Organisation(s)	*Universidad de Magallanes/Omora Foundation*
Darwin Grant Value	*£186,280 (total); £89,840 (Year 1)*
Start/End dates	*September 2004 – March 2007*
Reporting period (1 Apr 200x to 31 Mar 200y) and report number (1,2,3..)	*September 2004 (Project start date) to 31 March 2005. Report 1*
Project website	*N/A*
Author(s), date	*Prof Jeff Duckett, Dr Shaun Russell, August 25, 2005*

2. Project Background

The Magellanic Province of southern Chile is a "hotspot" for bryophyte diversity in South America, but many more species remain to be discovered especially among the Hepatics. There is a dearth of local bryological expertise, scant protection for indigenous flora and severe threats to native vegetation. The region's national parks have no permanent staff, and there is increasing habitat-loss through farming and forestry, including moss-collecting and peat-digging. Relaxation of military control in the Fuegian Channel zone is leading to rapidly increasing exploitation of natural resources, and adverse impacts on local habitats and remnant native American populations who hold endangered ethno-botanical knowledge. This project addresses these issues through base-line survey and inventory of the bryoflora, capacitation of local biologists through infrastructure development and training, plus conservation awareness-raising among local, regional and national stakeholders.

3. Project Purpose and Outputs

"To assist a poorly-resourced academic institution (Universidad de Magallanes, Punta Arenas – "UMAG") and NGO (Omora Foundation) in southern Chile to improve knowledge and contribute to the protection of the inadequately-known but extremely rich bryoflora of the Magellanic Province. Through training and awareness-raising, to ameliorate the habitat impacts of commercial moss-collecting and peat digging in the south western region of Chile. To establish in vitro cryptogamic conservation laboratory facilities in southern Chile, maintained by trained staff. To provide biological support for regional development planning and Chile's National Biodiversity Strategy (including the World Heritage Site candidacy of Charles Darwin's landing site at Wulaia Bay, adjacent to the Beagle Channel)." Logical framework at Annex 1.

The outputs and proposed operational plan have not been significantly modified over the reporting period. There was one slight deviation (see under "Progress" below).

4. Progress

This is the first Annual Report for the project, to 31 March, 2005. As the project was only able start in September 2004 due to delayed confirmation of Darwin Initiative funding, this Report refers only to the first six months of the project (October 2004 – March 2005). Before that time, considerable effort had been expended by the UK and Chilean partners in pre-project activity. This included earlier exploratory field work and training activity funded by the UK and Chilean governments, as well as considerable stakeholder ground-work for conservation planning. This has provided a very sound basis for the success of the newly-operational Darwin Initiative project.

Progress over the six-month reporting period for this first Annual Report, has been in line with the agreed timetable and logical framework. In fact, all targets (commitment of personnel-days, survey and inventory, infrastructure development, training etc) have been significantly exceeded (see Annex 1).

Project achievements:

- 1 world-class bryophyte culture laboratory established at UMAG (first in South America) with a second ancillary (field lab) facility to follow, through leveraged funding
- 128 UK personnel-days in-country, as against 101 planned
- 9 international collaborators from Denmark, Germany, Korea, Spain and the USA contributed a further 56 personnel-days to the project (un-planned).
- 6 UK staff on field expedition, as against 3 staff planned
- 3-weeks spent on field expedition work, instead of 2-weeks planned (due to field trips around Punta Arenas in addition to the ship-borne expedition)
- 30 localities intensively sampled throughout southern and western Fuegia, including several sites visited by Charles Darwin aboard HMS Beagle 170 years previously
- Estimated 3000 specimens and more than 200 species collected so far
- Important taxonomic and biogeographic data already emerging (initial results to be presented at the British Bryological Society Annual Meeting in September 2005)
- 16 local practitioners trained, against 12 planned
- 151 person-days of bryology and conservation training delivered, against 120 planned.
- A further 50 person-days of training are planned within the second 6 months of the project as a result of newly leveraged funding
- UK team-members have assisted their Chilean counterparts with an application for UNESCO “Biosphere Reserve” status for the study area south of the Beagle Channel and Darwin Cordillera, principally Islas Hoste and Navarino, and the Cape Horn archipelago (Wollaston Group).
- As a result of Prof Stuart Harrop (formerly Legal Director of the London Stock Exchange, and now Britain’s first Professor of Wildlife Law) giving his time free-of-charge to the project, we were able to assist members of the local native American community in our study area, with preparation of land claims and planning for ecotourism-based livelihood strategies.

The only minor difficulty with the project so far, resulted from the late start in September 2004 due to delayed confirmation of funding. This left insufficient lead-time to prepare for and advertise the planned training course in the southern summer of January 2005 (it had been intended to deliver this conservation training course as a “formal” offering at UMAG). The decision was therefore taken to complete the

laboratory-based training as planned, but to shift the bulk of the conservation training from lecture theatre to the field.

In the event, a longer period of practical, field-based training was delivered, to a larger number of trainees than planned, using a larger number of UK trainers, plus a "bonus" contingent of international expert collaborators. Chilean participants from government, academia, NGOs and the private sector were trained: 1) during field trips in the vicinity of Punta Arenas, 2) as participants in the ship-borne survey expedition, and 3) during the mid-expedition specimen curation period at the Omora Foundation HQ in Puerto Williams (see Appendix 2). All of this was accomplished within the existing Darwin Initiative budget. We feel that the project has actually been enhanced by this "enforced" re-design of the training delivery strategy. However, the need for formal, institution-based training still exists, and this will be addressed as planned during Year 2 project activities.

An initial worry was that, as only relatively few scientists in the UK and abroad have knowledge of and capacity to work on the bryoflora of Patagonia, we would have to call on the services of overseas specialists for diagnosis of some of the research material, but within a limited staff-time budget. We need not have worried, as the study has proved to be of such interest to international experts, that many have offered to give their time free-of-charge to the project, and to co-publish their findings under the "Darwin banner". This enhanced international dimension of the British-led project, is another valuable outcome that will further promote the profile and impact of the Darwin Initiative worldwide.

The project timetable (workplan) for the next reporting period remains as set out in the original application, viz:

Project implementation timetable

Date	Financial year: *Apr-Mar 2004/5* *Apr-Mar 2005/6* *Apr-Mar 2006/7*	Key milestones
Apr 2005	*Apr-Mar 2005/6*	*Issue biological report on Wulaia prospective World Heritage Site*
Aug 2005	*Apr-Mar 2005/6*	*Begin regular exchange of culture material and light microscope images of freshly collected specimens of southern South American bryophtes with global network of cryptogam specialists*
Jan 2006	*Apr-Mar 2005/6*	*Complete second bryological field expedition, to western Fuegia*
Feb 2006	*Apr-Mar 2005/6*	*Complete Conservation Training Courses*
Mar 2006	*Apr-Mar 2005/6*	*Year 2 monitor, evaluate and report*

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

N/A

6. Partnerships

The UK team have had a particularly rewarding collaboration with their Chilean project partners (UMAG and the Omora Foundation) over the reporting period. This has been largely due to the enthusiasm, commitment and generosity of the Head of

the Department of Natural Resources at UMAG (Dr Andres Mansilla) and his staff Dr Ricardo Rozzi and Dr Francesca Massardo, who are also Co-Directors of the Omora Foundation. Their facilitation has allowed a considerably wider pattern of partnership relationships to develop, with great benefits for the future of the Darwin project. During the survey work and training activity, UK team members have interacted with Chilean participants from the government, academia, NGOs and the private sector. The initiative has also attracted expert scientists to contribute at their own expense, from Denmark, Germany, Korea, Spain and the USA. A particularly valuable relationship has developed with the Governor of the Provincia Antartica Chilena, Mr Eduardo Barros, who has assisted and promoted our work at every opportunity.

The project has had contact with workers on several previous Darwin projects in Chile, including Senda Darwin and Raleigh International, and is also exchanging information with teams working on other Darwin projects elsewhere in the world (RSPB, Coral Cay Conservation, Partners in Development, WWF-Pacific etc).

More collaborations are expected as a result of the project's objective of dispersing and inter-changing biological specimens from Fuegia under the RBG Kew Millennium Seed-Bank project, and for study by other overseas specialists.

7. Impact and Sustainability

The profile of the project has been raised within the first six months by media briefings, press releases, newspaper reports and public meetings (copy of a sample newspaper and web report at Appendix 5). It is expected that even greater national awareness of the project will be raised during the Year 2 reporting period, as plans are in hand for a special half-day Seminar to be held in the nation's capital Santiago, to further publicise the biodiversity conservation work and results of the project. This will be summarised in the Half Year Report for Year 2 (due October 2005). The exit strategy for the project remains as outlined in the project application.

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

N/A

9. Outputs, Outcomes and Dissemination

All promised outputs have been achieved and significantly exceeded during the first reporting period (see "Progress" above, and Logframe and Appendices, below).

Dissemination of project results and activities has been through the training activity (Appendix 2) and media releases (e.g. Appendix 5). Early results will also be formally aired at the Annual Meeting of the British Bryological Society, on September 10th, 2005, at the University of Wales, Bangor. The project exit strategy allows for continuation of dissemination activities through the self-funded publications of UMAG (e.g. Annales del Instituto de la Patagonia) and the Omora Foundation.

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

Code No.	Quantity	Description
8	21	Number of working weeks (5-6 days) spent by UK staff on project work in host country for the reporting period

		National press release in host country
15A	1	Local press release in UK
15D	1	Number of people who received training in field & laboratory bryology, conservation & eco-guiding
6A	16	
6B	30	Person-weeks training (151 person-days)
		Permanent research facility established which will continue after Darwin funding ceases
21	1	
20	£committed)	Estimated value of physical assets handed over to host country

As this initial Report covers only the first six months of the project (early biodiversity survey and training activity) there are no formal publications yet to report, apart from media releases. However, contributions have been made to an in press publication on the Microdiversity of Cape Horn (see Appendix 4) and to a Review Volume which forms the principal scientific support for a Biosphere Reserve application to UNESCO. A full page article on the Project entitled "To the Ends of the Earth" has appeared in the QMUL Bulletin, 30 July/August 2005 p10-11. In addition, work on specimens collected during the Expedition has contributed to forthcoming publications in international Journals (see below), and will form key elements of new work on bryophyte phylogeny:

Carafa A, Duckett JG, Knox JP,Ligrone R.2005. Distribution of xylans in bryophytes and tracheophytes; new insights into basal relationships in land plants. New Phytologist.

Renzaglia KS,Duckett JG, Duff J, Ligrone R, Shaw J, Schuette S. 2006. Bryophyte phylogeny: advancing the molecular and morphological frontiers. Bryologist.

Table 2: Publications

Type * (e.g. journals, manual, CDs)	Detail (title, author, year)	Publishers (name, city)	Available from (e.g. contact address, website)	Cost £
N/A				

10. Project Expenditure

Total expenditure has been closely in line with the budget, but some re-arrangement of intra-budget allocations has been necessary due to developments at UMAG. There emerged a much larger requirement for laboratory consumables to get the lab functioning and to cope with the greater influx of specimens than envisaged. Conversely however, the Chilean sea-weed industry has donated a photo-microscope to Dr Mansilla's laboratory, thereby obviating the need for this item under the DI budget. Small savings were also made on other capital items such as the Laminar Flow Bench, due to exchange rate fluctuations and cheaper transportation costs. Some of these savings have been directed at better equipping the UMAG lab with peat coring equipment and reference texts. Our Chilean collaborators had flagged up a further need for a small field laboratory attached to the Omora Foundation HQ in Puerto Williams, as a facility for sorting, drying and observing specimens before transmission to the culture laboratory at UMAG. Negotiations have resulted in the Chilean Navy donating a shipping container for housing this facility,

and we are therefore using the remaining capital budget to contribute towards the equipping of this “satellite” unit in Puerto Williams. Darwin Initiative leverage is therefore achieving a significant multiplier effect by establishing two co-functional laboratories in the project area instead of one.

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
Rent, rates, heating, overheads etc			
Office costs (e.g. postage, telephone, stationery)			
Travel and subsistence			
Printing			
Conferences, seminars, etc			
Capital items/equipment			
Others			
Salaries (specify)			
TOTAL			

11. Monitoring, Evaluation and Lessons

We have monitored progress on this project so far, against the implementation timetable, output commitments and standard measures such as time spent in-country, value of infrastructure established, numbers of trainees and duration of training, publications etc. We are also monitoring additional leveraged funding which is accruing to the project, and will be reflected in the next reporting period. In addition, through constant communication and feed-back, we are collecting information on training impact, viz: breadth (e.g. the range of stakeholder groups accessed), depth (e.g. report-back from trainees and their employers on enhanced awareness and improved capacity) and legacy (e.g. evidence of collaborators and trainees achieving new scientific understanding and sustainable conservation successes in their region).

Lessons that we have learned from work during this reporting period include the necessity of adapting the project design to external influences; for example accommodating the delayed funding start with the narrow summer working season beyond 50° South, and scaling-up the level of project activity (within existing budget) to manage larger numbers of specimens and collaborators than expected, and wider and deeper training outreach.

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

The principal achievement has been the establishment, within 4-months of the project start-date, of a world-class bryophyte culture laboratory (first in South America) at our project partner institution in southern Chile (Universidad de Magallanes). This included shipping all the laboratory equipment, including a Laminar Flow Bench, out from the UK (see images in Appendix 6). We also regard as outstanding, the way in which all project team members worked beyond the call of duty to get a daunting Year 1 expedition and training commitment off the ground, and successfully completed with targets exceeded within five months of funding–start. We have been pleasantly surprised by the willingness shown by top international experts to contribute their time free-of-charge to this project, which will result in an even higher level of quality and quantity for the research outputs. We are also pleased that we have been able to contribute to the planning for a UNESCO "Biosphere Reserve" in the Cape Horn region (further news on this to follow in the Half Year Report for Year 2 activity). We also feel proud that we have been able to assist members of the historically disadvantaged local community of native American people (the "Yaghan" community) in the study area, with scientific support for formal land-claim initiatives and planning for ecotourism-based livelihoods.

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

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
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 • 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			
Purpose *(insert original project purpose statement)* *To better understand and conserve the threatened Magellanian "bryo-diversity hotspot" in southern Chile*	*(insert original purpose level indicators)* Completed survey and inventory; nos. of research publications; nos. of trained specialists; lab facility established; nos. of contributions to conservation plans and initiatives	*(report impacts and achievements resulting from the project against purpose indicators – if any)* Comprehensive Year 1 survey and inventory completed; several research publications in press and preparation; laboratory facility established, equipped and functioning (with a second leveraged facility planned); one contribution to a Conservation Plan successfully completed (UNESCO Biosphere Reserve application) and a second (World Heritage Site) in preparation	*(report any lessons learned resulting from the project & highlight key actions planning for next period)* The high degree of success of the project in its earliest phase (Year 1 biodiversity survey, training delivery, infrastructure development and leveraged funding targets all exceeded in first six months) has led to an "embarrassment of riches" in terms of research material, and a correspondingly more complex project management burden. Outputs are already significantly greater than envisaged and may result in a need to re-schedule some activities within the project timetable.
Outputs			

(insert original outputs – one per line)	*(insert original output level indicators)*	*(report completed activities and outcomes that contribute toward outputs and indicators)*	*(report any lessons learned resulting from the project & highlight key actions planning for next period)*
Knowledge of Fuegian bryophyte diversity significantly improved	Comprehensive inventory of Fuegian bryophyte species published	Project commitment was for 101 UK personnel-days in Chile in Year 1. In the event, 128 days have been completed in-country by the UK team. In addition, 9 international collaborators from Denmark, Germany, Korea, Spain and the USA contributed a further 56 personnel-days to the project. 30 localities have been sampled throughout southern and western Fuegia, resulting in the collection of an estimated 3000 specimens representing more than 200 species.	Due to the high level of interest shown in the project by the international bryological community, and the willingness of overseas specialists to contribute at their own expense, a larger number of specimens than expected have accrued to the Year 1 expedition. This has extended the time necessary for processing and analysis of material before all specimens are named and deposited in UK and Chilean herbaria. However, research outputs will remain on schedule.
Enhanced understanding of relationships and functioning of Fuegian bryophyte vegetation	Research papers on taxonomy, biogeography and ecology of Fuegian bryophytes produced	Contributions on bryophytes are being made to the publication "Explorando la Micro-biodiversidad del Cabo de Hornos" (in press – see Appendix 4) and several other research communications are in train as research on the first year expedition collections gets under way. Early results will be given in a paper on the "Bryophytes of Southern Chile" by the Project Manager at the Annual Meeting of the British Bryological Society at Bangor in Sept 2005.	All project contributors are now working on the specimens and results from the Year 1 expedition. Important new taxonomic and biogeographic findings are already emerging. The volume of collections may extend the period within the project time-table before a full set of results can be published. However, project personnel are on track to meet the stated output commitments.
Capacitation of local biologists for bryological survey, research and conservation.	Completion of 2-week course in bryophyte culture and conservation for 12 Chilean & Argentinean	151 person-days of bryology and conservation training have been delivered to 16 local trainees in the	Training commitment will be significantly exceeded in the first year of the project. Possible re-

	biologists (120 person-days).	first 6 months of the project (see Appendix 2). A further 50 person-days of training are planned in the second 6 months of the project as a result of newly leveraged funding.	jigging of Year 2 training activity may therefore be requested (within budget) so as to capitalise on this progress and further extend the reach and impact of the training.
Chilean conservation agencies and natural resource users influenced to protect bryophyte-rich habitat	Completion of 2x1-week courses for 24 Chilean conservation and forestry staff, and representatives of farming and tourism sectors	This is on-schedule for year 2 of the project and will be supplemented by the additional 50 person-days of training to be included in Year 1 as a result of newly leveraged funding.	Training commitment will be significantly exceeded in the first year of the project. Possible re-jigging of Year 2 training activity may therefore be requested (within budget) so as to capitalise on this progress and further extend the reach and impact of the training.
Local capacity for *in vitro* culture of endangered cryptogam species established	In vitro facilities established and functioning, and staff trained at UMAG/IP	A brand-new in vitro bryophyte culture laboratory (first in South America) has been established and equipped at UMAG by the Darwin Initiative team during the first six months of the project. Local staff training was completed on schedule. New commitments from the Chilean partners will result in an ancillary facility being established as a field laboratory at the Omora Foundation's study centre on Isla Navarino.	We budgeted for full-cost of the laboratory facility at UMAG, but our Chilean partners were able to secure appropriate premises at lower than expected cost, and contributed additional "volunteer labour" to assist with installation. This has contributed to savings that are sufficient to allow for a second "field laboratory" to be established which will greatly enhance the efficiency and productivity of the culture lab at UMAG.
Conservation of Fuegian vegetation and habitats enhanced	Project inputs to Biodiversity Action Plan and regional development plan secured	Project personnel have attended and contributed to regional development planning meetings with local stakeholders in the project area, including community leaders, government agency representatives and private sector entrepreneurs. They have also assisted with provision of base-line material and briefings to UNESCO	Lessons learnt during the Biosphere Reserve "campaign" will also be applied to the longer term efforts for establishment of a UNESCO World Heritage Site at the notorious Darwin/Fitzroy landfall near the Beagle Channel (Caleta Wulaia).

		representatives in support of an application for “Biosphere Reserve” status for the study area.	

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.