Darwin Initiative Annual Report 1

Capacity Building for Temperate Rainforest Biodiversity Conservation in Chile

Biodiversidad en el bosque templado lluvioso

Centro para la Biodiversidad

un proyecto Iniciativa Darwin

Darwin Initiative Annual Report 1

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Project Leader Name	Prof. Alison Hester
Project website	www.centrobiodiversidad.org
Author(s), date	Nicolas Galvez, Jerry Laker, Alison Hester, Rodrigo Calcagni, Karl Yunis, Mercedes Ibanaz , Cristian Bonacic. 30th April 2007.

1. Project Background

The main purpose of the project is to establish new public-private partnerships for conservation, with a particular focus on securing habitat connectivity in the Valdivian temperate rainforest region of Chile. This multidisciplinary project seeks to create a local research infrastructure with practical forest conservation activities designed to engage the private sector in sustainable forest management, through demonstration, capacity-building, and volunteer-driven actions. Research focuses on the role of transition zone habitats, currently outside the national protected area system, for endemic mammal and avian fauna. This will give important information on the dynamics of large-scale biodiversity threats, and provide a framework for prioritising future activities in support of the Convention on Biological Diversity

The Macaulay Institute and the Wildlife Conservation Research Unit, Oxford have both worked in Chile for around 10 years on wildlife management issues affecting the country's rich endemic fauna, with our local partner, Fauna Australis, the wildlife research unit of the Catholic University in Santiago. Since mid-2002, we have developed a collaboration with the Chilean NGO, Parques para Chile (PPC), and the national parks authority, CONAF, to establish a research and education facility in the Valdivian forest ecoregion of Chile that will underpin their work to support the National Biodiversity Strategy. This facility is being constructed using local private sector financing, and will undertake locally-relevant biodiversity research to support sustainable development initiatives.

Valdivian rainforest is widely recognised as a globally important "biodiversity hotspot". (e.g. by Conservation International, and WWF Global 200). Forest clearing for farmland has reduced and fragmented lowland forests in the IX and X Regions of Chile. Now, 80% of what remains, including remnant stands of Araucaria (*Araucaria araucana*), is found at altitudes above 1000m. Lower altitude forests support higher biodiversity, and remain threatened.

Figure 1. General location of study Area in Chile

The project is located in the pre-Andean cordillera of the Araucania region of Chile (Figure 1), which is a representative area of the threats and dynamics of the Valdivian Temperate Rainforest. Initial analysis shows that public and private protected areas represent 29% of the study area. In turn, 60% of these lands are above the line of permanent snow during winter (i.e. 1100m) reducing access to protected areas for wildlife during the winter season (see map). The project attempts to address this by assessing and monitoring key lowland habitats for wildlife. Wildlife data will be presented to key stakeholders and decision makers, specifically in support of an ongoing process to establish this area as a Biosphere reserve.

The detailed map (Figure 2) shows our study area near the small town of Pucon. The permanent snow line during winter is shown in white and public and private protected areas are represented in green. The main lakes, Villarica, Caburgua and Cólico are highlighted. The protected areas that are shown are: Huerquehue National Park, Villarica National Park, Villarica Reserve. The Namuncahue Biological Corridor, a private conservation initiative led by Parques para Chile (project partner), gathers a group of land owners for land conservation. The first private conservation initiative in Chile: the Cañi Natural Sanctuary, is shown.

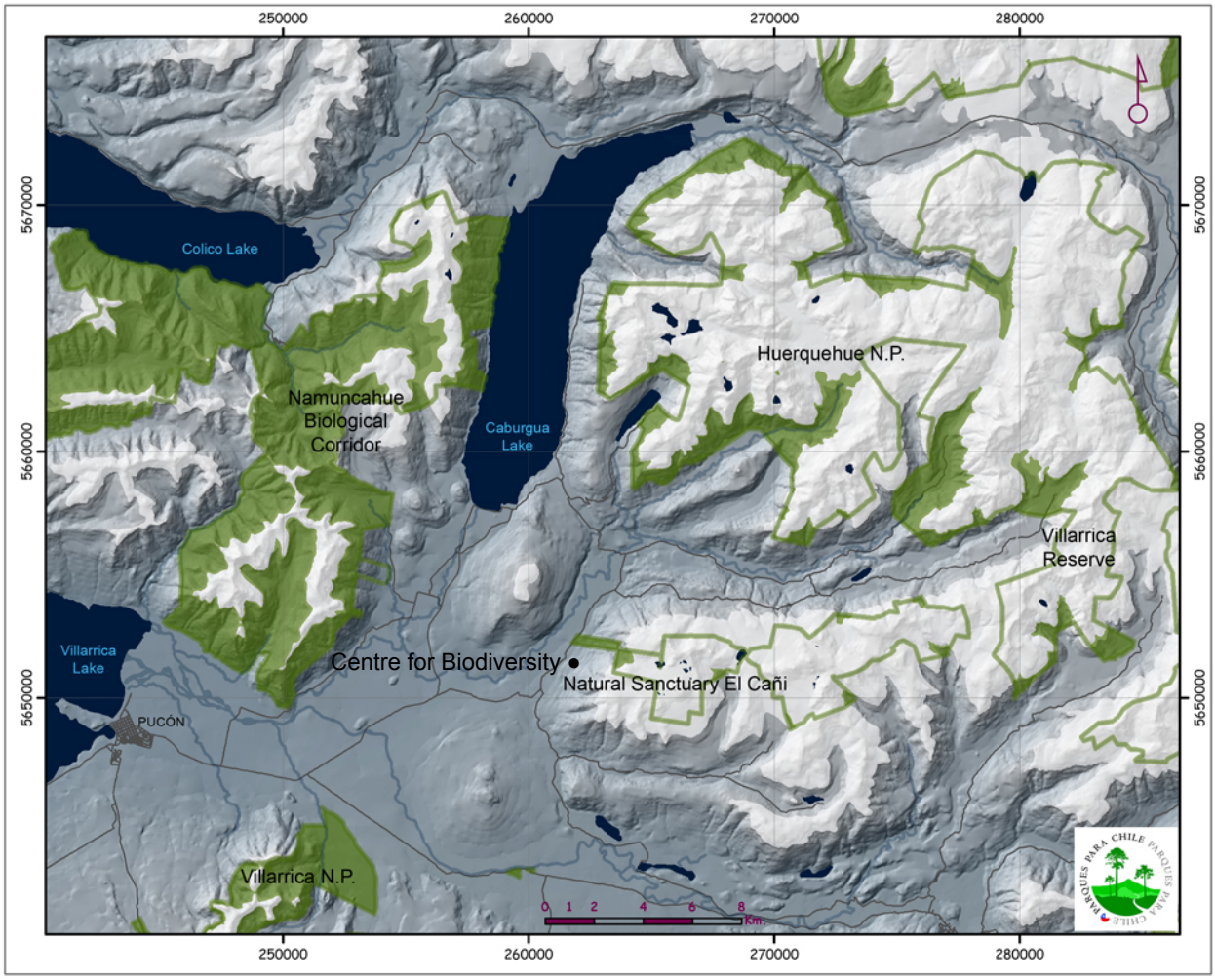

Figure 2. Detail of study area, showing the location of the Centre for Biodiversity, and the public and private park system around the town of Pucon.

2. Project Partnerships

The Macaulay Institute has a project manager overseeing this project on site in Chile on a permanent basis. This has greatly facilitated the establishment of good working relationships with the various institutions and individuals involved.

. Parques para Chile is working with stakeholders towards establishment of the Araucarias Biosphere Reserve using the scientific information arising from the collaboration created by this project. The Darwin has already been of great support to both host country partners, inasmuch as it provides a framework for a wide range of proposals, and activities.

WildCRU has had staff in the area to provide training, and develop a PhD programme. The different areas of expertise are complementary, and the partnership is working well at achieving the tasks set out in this project.

Other Collaborations: In November 2006, in collaboration with the British Consulate in Santiago, we set up a networking meeting for the 5 Chilean Darwin projects. This was an opportunity to familiarise the teams with one another, and for these to present the projects to CONAMA. The Darwin Initiative project in the Maichin valley is particularly close, geographically, to our study area, so we organised several meetings with their staff to keep ourselves informed and offer support, where appropriate.

Formal collaboration agreements (*convenio*) have been made with the Chilean Department of the Environment (CONAMA), the CBD focal point, and The Department of Agriculture (SAG), who administrates wildlife management issues, as well as the National Parks authority, CONAF.

3. Project progress

The following section on the progress of the project is a summary of activities conducted from the start of the project (July 2006) to the submission of this report (April 2007).

3.1 Progress in carrying out project activities

1. A research and education facility for local biodiversity issues:

One of the activities established for year one is the completion of a business plan and designs for the research centre. The business plan has three main activities, aiming to achieve long-term income for the functioning of the Centre for Biodiversity. First; a newly built Café-Restaurant functioning as a visitor centre is a base for outreach activities, courses, and meetings, and is expected to become an important source of income. Second, conservation volunteers from the UK provide support for the research activities, and contribute to site maintenance. Thirdly, fundraising from local and public sources provides for further development of the research infrastructure at the Centre for Biodiversity.

The visitor centre, “Café del Centro”, at the Centre for Biodiversity (Figure 3) was opened at the end of January 2007. Since then, we have begun a programme of educational activities, including talks on rainforest conservation, puppet shows for children involving environmental issues and research results. Also, the visitor centre is now the official meeting place for the process of creating the new Araucarias Biosphere Reserve

Figure 3. Cafe del Centro, at the Centre for Biodiversity

Figure 4. Educational activities in local schools and Puma puppet for story telling with table puppets

During the first 10 months there have been at least 20 volunteers working in research activities (i.e. wildlife monitoring, camera trapping, information for GIS), construction of paths and organic gardens, as model activities for sustainable forestry and agriculture at the centre. In addition to Quest Overseas, a strong link is being developed with a UK volunteer agency called "Working Abroad". Our activities were promoted through their web page and the first volunteers from this agency are currently working at the centre for a two month period. In addition, a student-volunteer that led a group of UK volunteers in July-September of 2006 from Cambridge University, is developing a project for specific research activities at the centre for a students as part of their course in biological sciences. The first group, a team of about 15 students from this initiative, will arrive in December 2007.

Figure 5. Volunteers and Chilean MSc students on our winter expedition, July 2006

A brochure was designed and printed for publicity for the project, explaining various aspects of the work and partnerships involved in the project. It also includes information about the importance of the Tolten catchment and the endemic flora and fauna associated with the temperate rainforest ecoregion. A web page (www.centrobiodiversidad.org) is still under construction for the project, expected by June 2007. There is a link in the Fauna Australis web page (www.fauna-australis.puc.cl) that explains the scientific objectives of the project in English.

2. . Knowledge on temporal-spatial use of habitats.

The study site in Pucon is notable for its wide extent of protected areas, surrounded by a semi-natural matrix, with all the common land use conflicts generated by agriculture, forestry and development. While extensive, the current system of protected areas does not include the full array of biological communities and is not sufficiently large and connected to maintain important ecological processes or viable populations of sensitive wildlife. The task of protecting the ecological integrity of the area still remains, and this is why efforts are being made through the integration of GIS, remote sensing and field research to adequately study the best possible design for a protected area network.

In excess of 80% of the park system is above the winter snowline, obliging many of its inhabitants to rely, during at least part of the year, on the fragmented habitat below about 800m above sea level. Some of these species, such as the Pudu (*Pudu pudu*, Figure 7), and guiña (*Oncifelis guigna*, Figure 8) are thought to be obligate forest dwellers, and may be limited by this apparent winter habitat bottleneck. Other more adaptable species, such as the puma (*Felis concolor*) may need to use this fragmented farmland matrix in the winter, and be more exposed to the human-wildlife conflicts – in this case, predation of livestock and illegal hunting by farmers.

Our research programme for the Centre for Biodiversity is taking a broad look at these issues to support decision making over the future course of urban planning and rural development. Two main lines were followed this year, the preparation of high quality cartography, and an evaluation of the large mammal and bird fauna, and their association with different habitats throughout the seasons.

The cartography took a boost with the winning of a contract (worth approx £100,000) by Parques para Chile from a consortium of government agencies for a new high-resolution (1:10,000) digital survey of the area (360km²) involving new aerial photography of the whole area. This work is aiming to produce an accurate regional biodiversity analysis, on the basis of which a proposal will be developed for creating a network of new and existing reserves, restoration areas, and linkage zones which better reflect the needs of large mammals for over-wintering habitat through landscape-level GIS modelling and field research.

PPC is now creating up-to-date remote sensing products and GIS coverages as base-line data for biodiversity studies. Work done in year 1 includes a vegetation map of 120k ha in area, with detail relevant to the project's conservation and science field work, including altitude classes, forest classes, grids, protected area boundaries, watersheds, etc. For example, in the next phase of this work we aim to link vegetation polygons to camera trap, scat and sighting data in a way that makes mapping of habitat applicable at the landscape scale through GIS spatial modelling.

The data themes currently being mapped are: Existing and potential vegetation; Forest cover data with information on canopy cover, successional stage, age or size class; Elevation; Slope; Aspect; Rivers, streams and headwaters; Wetlands; Road and trail systems (access maps); Constructions; Existing protected area networks; Field data on mammal and bird species distributions.

The field studies began with an evaluation of the fauna using different lowland habitats. We conducted an initial study to look for signs of animal presence and to determine the most appropriate monitoring and research strategy for the duration of the Darwin project.

We assessed the presence of wildlife through transects to observe tracks, signs, scats, direct observation, and camera trapping. Combining all sites, a total of 10 km and 23 km of transects were conducted in grasslands and forest, respectively. Direct observation was only successful for birds due to the secretive behaviour of other mammals in the forest.

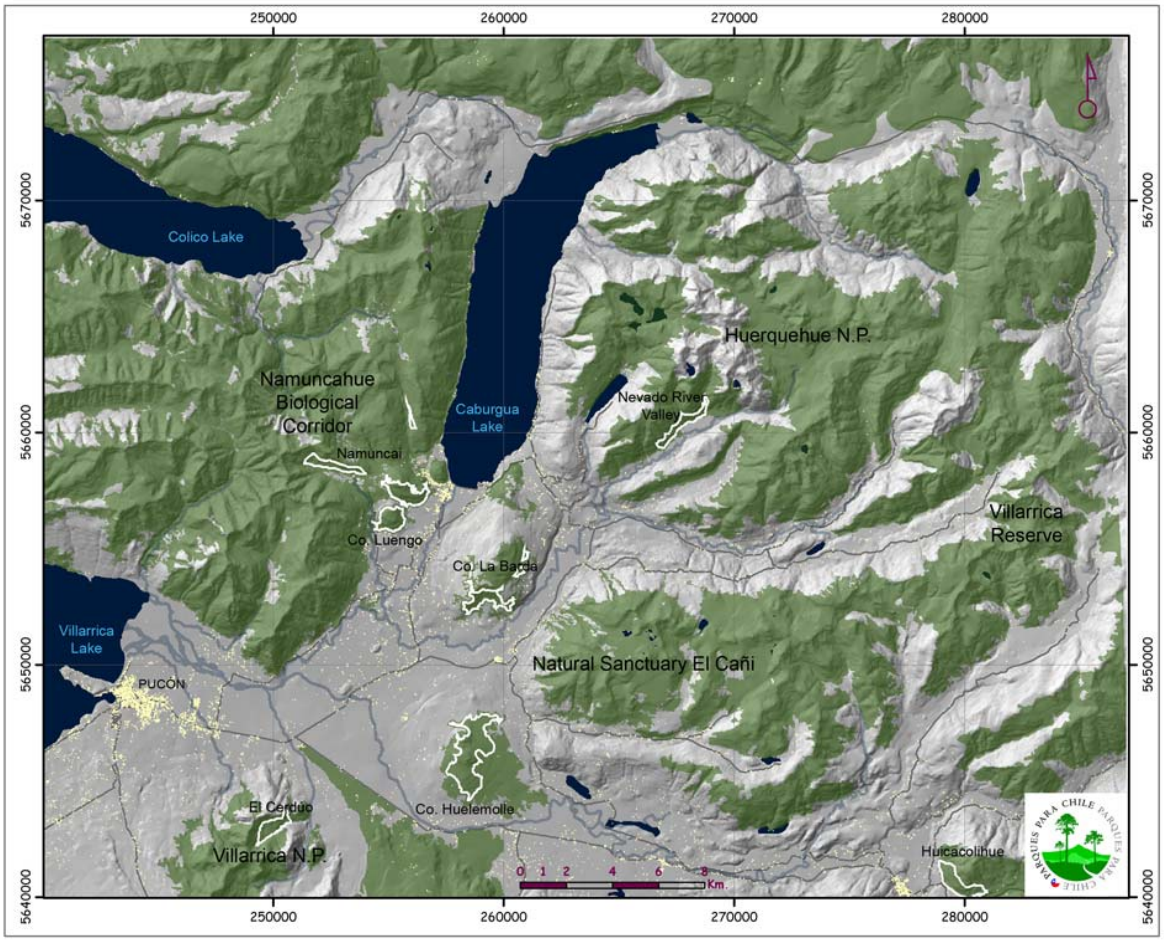

Figure 6. The study area showing the main forest cover (green), and sites that will be surveyed using the camera traps (outlined in white).

For the initial sampling phase, the cameras were set up for a 6 month period in the sites shown in Figure 6, with a periodic check up and film change. After that initial period, we set up cameras in two main sites, with the new sampling scheme that is being developed for a long term monitoring project (see below). During both sampling periods the same transect routes were conducted to check the cameras, thus repeating transects, where we spatially recorded and collected, scats, footprints and signs. This information, in addition to the camera captures, is being used as an input for the GIS database of the Centre for Biodiversity. An ongoing list of bird species richness is being developed.

The camera traps have demonstrated so far the presence of 8 species of large mammals in continuous forest as well as remnant forest fragments. There are a total of 38 photos of wildlife gained during this first period. Initial results show that the trapping rate (nº photos per camera days) of cameras at lower altitude sites was significantly higher than at higher altitudes, thus giving an initial insight as to the importance of lowland forest habitats in the area for these large mammal species.

The native species captured by the cameras so far are: Puma (*Puma concolor*), Kodkod (*Oncifelis guigna*), Pudú (*Pudu pudu*), Chingue (*Conepatus chinga*), Culpeo fox (*Psuedalopex culpeus*), and Gray fox (*Pseudalopex griseus*). Two exotic species were recorded, these being

Wild boar (*Sus scrofa*) and the European Hare (*Lepus capensis*). Also, feral dogs have been recorded at all the sites, which, along with the wild boar, are suspected to represent a significant threat to wildlife conservation in the area. Domestic cows were also recorded at several sites, giving important insights into the use of these forest areas by local farmers.

Figure 7. Pudu (*Pudu pudu*) in continous forest.

Figure 8. Melanic Guiña (*Oncifelis guigna*) in forest fragment

These results have been used, together with existing literature and expert advice, for the development of a new long term monitoring scheme to analyze the importance of lowland forest habitat for large mammals in the Namuncahue biological corridor and other forested areas outside protected areas of the IX region. This new monitoring scheme will be carried out during 2007-2009 and it involves sampling during two winters and two summers at the same sites. All cameras will be set up within the 400-800 masl altitude range. We have considered that below this range, human activities dominate the landscape and above this range, environmental

conditions during winter pose important environmental stress for wildlife populations. All sites are south facing slopes of lowland temperate rain forest, specifically, mixed Evergreen with deciduous forest habitat.

It is also important to mention that the sites are privately owned. The total number of land owners is 17 and some sites have as many as 5 landowners. Through a continuous effort in understanding land ownership and to explain and motivate owners in the research that we are conducting, we have obtained permission to conduct our studies on their land. This established relationship will be important for promoting conservation orientated practices at a local level.

In relation to birds, we have observed a total of 67 species from transect recordings to date in grasslands and forests. These are distributed in 29 Families, with Passerines the most represented: 39% of all species (n=26). It is important to mention that 15% of the species recorded are endemic to the southern cone of South America (i.e. Chile and Argentina). This list will continue to be updated as new species are observed during field work. A monitoring scheme that will register bird density and species richness in different seasons, has been established in the same lowland forest sites that the cameras traps will survey for the rest of the duration of the Darwin initiative.

During this year two species-specific projects have also been developed with help from other funding and the Darwin Initiative. These projects involve research on Puma (*Puma concolor*) and Darwin's frog (*Rhinoderma darwini*).

During January 2007, a doctoral student, Tucker Murphy, from WildCRU, visited the Centre of Biodiversity to evaluate the possibility of undertaking part of his thesis in the study area on Puma. His study will evaluate the scale of puma:human conflict and establish recommendations that will improve the conservation status of this large carnivore. A proposal to CONAMA has been successful in securing a £7000 grant to support this work. Two further grant proposals (Kaplan and Disney Foundations) have been submitted for additional funding of this project. Through funding from the Darwin Initiative we will undertake a pilot GPS collar feasibility study with the puma. On the basis of that trial, we aim to develop a wider ranging study of puma ecology in Chile through Tucker Murphy's Doctorate research.

Darwin's frog is considered as Vulnerable and facing a high risk of extinction in the wild (IUCN Red list, 2007). A preliminary scoping study was carried out with scientific support of the Wildlife Trust Alliance to evaluate the actual risk posed by pathogens, introduced species and habitat loss.

3. Chilean MSc research projects

In July we had a week of training fieldwork with 6 MS(c) students of the Wildlife masters program of the Catholic University supervised by Dr. Cristian Bonacic. It involved the students in the setting up of cameras, transects looking for tracks, and vegetation sampling. Professor Alison Hester and Dr. Alessandro Gimona, from the Macaulay Institute, worked with the students in the field during the expedition. Also it was a great opportunity to motivate future candidates to undertake their research projects in the Centre for Biodiversity.

The students from this training activity did not undertake research projects because most had projects in other areas. As for new MSc projects, we are promoting research subjects and a selection process for the new generation of MSc students from the Wildlife Conservation Program of the Catholic University. We have also, contacted scientist in other institutions that could be interested in having their MSc students conduct their research at the Centre.

One Chilean MSc research project has been approved by Dr. Cristián Bonacic, regarding the small feline Guiña or Kodkod (*Oncifelis guinga*). Initial work is being conducted with the student as to the research questions, design and timeframe.

MSc students installing camera traps

During January a Chilean MSc (e.g. Tomás Ibarra) and undergraduate (e.g. Tomás Altamirano) students of Fauna Australis received tree weeks of training with help of a doctorate student from WildCRU on diet analysis of carnivores, specifically the exotic mink (*Mustela vison*). The main purpose of the activity was for the WildCRU doctorate student, with vast experience in analyzing feces, to teach the technique to the Fauna Australis MS(c) student. The main results are the following: 400 mink feces samples analyzed and a first draft of a research paper. The Darwin initiative and the Centre for Biodiversity will receive acknowledgements in the scientific paper. It was acknowledged that it was a cooperation of the WildCRU (OXFORD) and Fauna Australis to the Centre of Biodiversity.

4. Workshops with campesinos on sustainable forest management.

Building up good relationships with the *campesino* community is seen as fundamental to achieving positive impacts for biodiversity conservation. During this first phase of the project, we have conducted house to house visits in the local community. This work has supported the choice of suitable sites for undertaking the fauna surveys. *Campesinos* on whose land we have photographed wildlife with the camera traps have been presented with a laminated colour print of “their” animal. This low-key approach has been successful in building up a reservoir of trust and understanding in the local community, though which to introduce concepts of environmentally responsible land management. The experience gained suggests that the workshops originally contemplated may not be the most appropriate way to train *campesinos*.Parques para Chile held three workshops in association with the implementation of an ecotourism concession to improve infrastructure and education in Huerquehue National Park. In Year 2, there will be a workshop series with *campesinos* to build awareness about sustainable land management and how this can be integrated into regional policy through the biosphere reserve buffer and transition zone classifications. We will evaluate this to decide if this is an appropriate format to use for capacity building with *campesino* communities

We have used the workshop format for stakeholders. A stakeholder workshop for the Namoncahue Biological Corridor in October 2006 was effective in focusing attention on the need for a sustainable development framework for biodiversity conservation in the study area.

5. Participatory consultative process for UNESCO Biosphere Reserve.

Parques para Chile has worked to stimulate the integration of activities by the various agencies of regional and local government to achieve sustainable tourism, known as the *Consejo de Desarrollo Sustentable de Araucania Lacustre.* The partnerships are for the process to establish a new Biosphere Reserve. At the end of October, Parques para Chile, with support from the Darwin Initiative, held a stakeholders meeting. The authorities from the Ministry of Infrastructure (MOP), the National Commission of Environment (CONAMA), the National Tourism Service (SERNATUR), Municipality of Pucón, the National Forestry Service (CONAF), the authorities of national production (CORFO), participated in a day long activity. MOP presented a forward thinking presentation on how a thoughtful design for future infrastructure could positively influence sustainable development, in particular, tourism, and protect natural heritage. Karl Yunis presented a blueprint for environmentally positive planning via the Namoncahue Biological Corridor project, and invited other agencies present to join in the project. We had a visit to the Namoncahue reserve where the 9 agencies involved pledged enthusiastic support for the initiative.

In January 2007, a series of meetings was begun to move forward the plan to establish a UNESCO-MAB Biosphere Reserve. The plan developed by Parques para Chile with the National Park Authority, CONAF, is to reactivate the existing Araucarias Biosphere Reserve (Conguillillo, IX Region) by expanding the nucleus to include the whole of the current distribution of the Araucaria tree, and to establish buffer and transition zones to guide development throughout the Andes foothills in the IX Region.

The main stakeholders are CONAF, the environment agency (CONAMA), tourism agency (SERNATUR), the administrator of the existing Araucarias Biosphere Reserve, the two organizations that represent territorial planning and decision makers (Araucanía Lacustre y Araucanía Andina), and the representatives of the Centre for Biodiversity.

The meetings hosted by Parques para Chile at the Centre for Biodiversity, confirmed widespread agreement that the reform of the biosphere reserve should be a priority for the region. A committee was formed of the stakeholders present who will initiate a process of public consultation, and develop a proposal to present to UNESCO by March 2008. A web site to support this process has been created (http://rbaraucarias.blogspot.com/).

3.2 Progress towards Project Outputs

This project has had a successful first 9 months, and has made good progress with all the Project outputs, both those with support of the Darwin Initiative and those conceived as products of co-financing.

First output: the completion and opening of the new Visitor Centre (*Cafe del Centro*), as a private initiative to boost the development of the Centre for Biodiversity site. The activities planned (and already started) in the centre (i.e. talks, environmental education, general project information) are an important platform to establish new public-private partnerships for conservation at a local and international scale. The centre also now serves as the official place of all meetings between public and private stakeholders regarding the planning and future creation of the Biosphere Reserve. Office facilities for 5 students and accommodation for 10-15 people in two wooden chalets were established at the Pichares site (where the café is located),and a new office has been opened for 4 research staff and a secretary in Pucon to advance the cartography work.

Second, fieldwork has been successful in developing a monitoring and research strategy for wildlife that will address the issues regarding winter lowland habitat. through lessons learned in the first pilot phase of this work, we have now developed a sampling design for the long term monitoring. The sampling design has been reviewed and approved by senior scientists in the project. The survey methods (i.e. camera traps, transects) have proved successful for wildlife research in the temperate forest habitat. The permission obtained from landowners to access their lands for our selected monitoring sites has established an important network with positive

assurance for the continuation of our work for at least the duration of the Darwin project. With these networks successfully built during the first year of project, we have now set the basic sampling structure to allow us to collect data that will be publishable in scientific and popular journals.

Third, training given in July 2006 to MS(c) students of the accredited Masters programme of wildlife conservation at the Catholic University of Chile, run by Dr. Cristian Bonacic, director of Fauna Australis (eg. Project partner), has been the first step in recruiting Chilean MS(c) students to undertake their research projects in the Centre. The third generation of students has just begun the school year (i.e. March 2007). New MS(c) students will have to decide their research project during the following year. Selection of possible candidates to undertake research projects in the study area of the Darwin project is being conducted. One project has been approved so far that will study Guiña (*Oncifelis guigna*). Research projects of the candidates will be set within the log frame of the project in order to submit research papers and presentations to conferences (eg. Output indicator).

Fourth, preparatory work has been carried out towards the "workshop programme on sustainable use" which will use the new café and visitor centre facility. The results from the studies described above will set priorities for the workshop programme, in order to identify and cover crucial issues in sustainable use of the forest, livestock management and conservation directives for *Campesinos* in the study area.

Fifth, meetings with key stakeholders and the formation of a committee to develop the proposal and work plan for the Biosphere Reserve submission by March 2008,are on target for the log frame of the project. The information obtained from wildlife research will also be an important input for this biosphere proposal. The consulting process in the communities is ongoing, and the involvement and support by key territorial 'actors' of the public and private sectors, is a crucial starting point for support of the proposal.

All year 1 milestones in the log frame have been completed, indicating that the project is well on schedule.

3.3 Standard Output Measures

Table 1. Project Standard Output Measures

Code No.	Description	Year 1 Total	Year 2 Total	Year 3 Total	Year 4 Total	TOTAL
1A	PhD student from Bermuda at WildCRU-OXFORD. Mitigation of Puma (*Puma concolor*) conflict.	1				
1B	PhD degree candidate	1				
2	MS(c) candidate initiating research project in Guiña (*Oncifelis guigna*)	1				
4A	Training undergraduate student in faeces-diet analysis training.	1				
4C	Training of Chilean MS(c) students of the wildlife conservation	8				

	programme-PUC, by senior scientists of the Darwin project. Camera trapping and Forest sampling					
4C	Training faeces-diet analysis training of Chilean MS(c) students of the wildlife conservation programme-PUC by doctorate student from WildCRU-OXFORD.	1				
4D	Total weeks of Chilean MSc training	4				
14A	Meeting "Darwin projects in Chile"	1				
14B	Poster in 7th Annual Darwin Initiative lecture (Dec 2006)	1				
16A	Darwin Newsletter Nº8 March 2007. "Biodiversity conservation in Chile´s Temperate Rainforest Ecoregion"	1				
16C	Darwin Newsletter available on internet-wide circulation of newsletter	-				
22	Sites for wildlife monitoring	6				
New-Brochure	Brochure of the centre of biodiversity and the Darwin project-English and Spanish	1				

Table 2. Publications

Type * (eg journals, manual, CDs)	Detail (title, author, year)	Publishers (name, city)	Available from (eg contact address, website)	Cost £
* Brochure	Centre for Biodiversity, Chile		Macaulay Institute (available in English, Spanish and Portuguese)	Free
* Poster	Hester, A. and Laker, J. (2006). Capacity Building for Temperate Rainforest Biodiversity Conservation.	Macaulay Institute	Macaulay Institute, or internet download	£10, in print, free as .pdf.

3.4 Progress towards the project purpose and outcomes

The Biosphere Reserve proposal to be submitted by March 2008 is an important indicator of the establishment of a valuable public and private partnership for conservation. The proposal contemplates an extension of the present Araucaria Biosphere Reserve to cover almost the entire range of the Araucaria forest as a nucleus zone. The initial results of the wildlife monitoring and research in the area will have an important input in this proposal, and in the public consultation process that accompanies it. Wildlife research and information, networks of landowners and *campesinos*, and the protection of the *Araucarias*, will empower the proposal to ensure habitat connectivity in the temperate rainforest and sustainable use of the forest.

The activities of the first year that establish the foundation for future activities have relevance towards CBD objectives and the articles mentioned in the project proposal (i.e. 8, 10, 12, 17 and 18). This is also relevant for the contribution of the project to the National strategy of biodiversity conservation.

The output indicators continue to be adequate for measuring the fulfilment of the purpose of the project. The indicators represent and group the main activities that will build capacity for biodiversity conservation. The quantitative analysis of outputs clearly demonstrates project purpose (i.e. scientific and popular journals, Biosphere Reserve Proposal, MSc research projects, workshop with *campesinos*). In the preceding sections it is detailed how the activities of year 1 are setting the foundations for the timely completion of these later stage output indicators.

3.5 Progress towards impact on biodiversity, sustainable use or equitable sharing of biodiversity benefits

The Darwin Initiative has strengthened five programmes to promote biodiversity conservation and sustainable use of natural resources at different scales in this area:

1. The Namoncahue Biological Corridor is an alliance of land owners and the national parks authority, CONAF, created to secure appropriate management for conservation of a 20,000 ha area of forest in a public-private partnership. Parques para Chile put together a Management Committee for this initiative.

2. Araucarias Biosphere Reserve (Figure 9) will create an ecoregion-wide framework for sustainable development. The reserve will also set protection criteria of lowland forest habitat with help from research information that will be obtained during the Darwin Initiative project.

3. Araucania Lacustre Sustainable Development Council has been strengthened by this project in its mission to develop a sustainable development plan for the 3-lakes region.

4. The Darwin project positively influenced the awarding of the ecotourism concession for Huerquehue National Park, and surrounding areas to Parques para Chile. This will ensure that a sustainable development perspective is maintained in the design and construction of footpaths, visitor centres, campsites and other infrastructure.

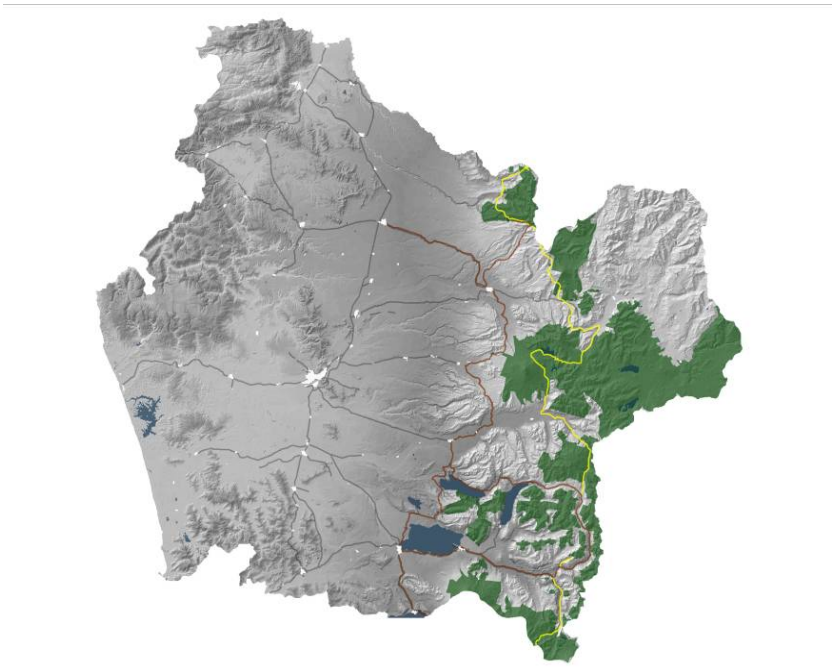

Figure 9. IX Region of Chile, showing proposed nucleus (shaded in green) for new Araucarias Biosphere Reserve.

5. The long-distance Millennium footpath project, Sendero de Chile, is now being designed by Parques para Chile in the study area. This integrated project involves a consultative process with landowners and indigenous groups, route planning, design of infrastructure, field guides, signposting, and a web site.

6. The Darwin project also played an albeit minor role in influencing the establishment of an advanced course in sustainable development (*Diplomado en Desarrollo Económico Territorial Sustentable)* at the Instituto de Desarrollo Regional del Universidad de la Frontera (IDER). This course is shared between the university and Parques para Chile, and has financing from the European Union and the Chilean government agency SERCOTEC.

7. Increased knowledge of habitat use by wildlife, backed up with empirical data and images, will increase awareness of conservation issues in the area. This information will help efficient conservation measures to be implemented that will reduce habitat loss (e.g. deforestation and fragmentation) and mitigate threats for biodiversity in the area.

8. The project on puma conflict mitigation in the area will help to offset negative biodiversity impacts by rural communities by reducing economic loss due to predation, and helping the farmers to live more harmoniously with wildlife predators.

9. The research and education centre for temperate rainforest biodiversity conservation, with a self sustaining plan will assure long term activities in research and conservation action at a local scale. The Centre for Biodiversity has been set up during this first year of the project.

4. Monitoring, evaluation and lessons

In order to monitor and evaluate the progress of the project, an internal report every two months has been written by personnel on site and presented to project partners. The reports analyzed progress in key aspects of the project and along the timeline of the proposal in order to achieve yearly milestones and future outcomes. Important feedback from project partners to field personnel was obtained through this process, as well as more informally, and decisions were taken to fulfil project objectives.

The contribution of project outputs for the overall purpose of the project was explained in the preceding sections.

During this first year one Chilean MS(c) project has begun in the Darwin project and 20 students on the programme visited for a short study trip. We have decided to actively promote research projects to scientists in other institutions as well as the Catholic University, to build greater research capacity than is possible from one University alone. A student from the National School of Geographic Sciences (ENSG), France, will soon start his project on forest fragmentation using GIS analysis of a time series of photographs of the area. The new generation of MS(c) students from the Wildlife conservation Programme of the Catholic University will receive talks and offerings for key topics of research in the study area of the Darwin project. We also consider that the WildCru (University of Oxford) PhD Puma project will contain some issues that an MS(c) student will be able to address as part of his or her dissertation.

5. Actions taken in response to previous reviews. Not applicable

6. Other comments on progress not covered elsewhere

Though we have continued to follow the original broad research plan, the main research design has been revised from experience gained as we set up our pilot pilots within the logistic difficulties of working in this ecosystem. The scale of the wildlife research monitoring is large and the terrain and scope of the study is complex. In order address this difficulty, we have conducted a detailed survey of access roads, times, and possible sites to establish a base camp during research, survey and monitoring work.

The work anticipated with volunteers has created some challenges. The anticipated volunteer programme with Quest Overseas did not yield any volunteers during 2006. We therefore broadened our collaboration. Another agency (Working Abroad) has now sent 2 volunteers, and we have brought in several more volunteers directly as individuals. One of our 2006 volunteers has now organised for a volunteer team of students from Cambridge University to visit for 4-6 weeks later this year. Some minor difficulties arose regarding the balance between research and volunteer work expectancies and, learning from this experience, we are now putting into place a more structured plan to minimise this potential conflict and ensure win-win experiences for all. We will now program more structured workplans for volunteers and limit big teams to the most field intensive work periods (i.e. winter and summer).

7. Sustainability

The project is addressing and conducting research in key issues for the conservation of species in the temperate rain forest. The Biosphere reserve proposal will ensure protection of important lowland habitats which are not currently protected. Wildlife data that is being obtained about the presence of endemic mammals, like the Pudu or Guiña, in different sites with camera traps is a new method that distinguishes the project from others in the temperate rain forest.

Dissemination activities to date in Chile include a brochure, talks, meetings, networks (i.e. landowners) and environmental education for children (see point 8).

The agreement achieved by the main stakeholders in territorial decisions, for the Biosphere Reserve proposal and committee (explained in preceding sections) is clear evidence for wider interest in the project and the wildlife research that is being conducted through the Darwin Initiative. If the proposal is accepted and the existing Biosphere Reserve extends to the study area, an important framework will be established for the capacity of biodiversity conservation in the temperate rain forest. This initiative is one of several shared projects between Parques para Chile and CONAMA that have been facilitated by the Darwin project: These include the *Comite de Biodiversidad Regional*, the design of the long-distance Millennium footpath - *Sendero de Chile,* as well as the *Comite de Iniciativa para la Ampliación Reserva de la Biosfera.*

The Centre for Biodiversity and its Visitor Centre have made a promising start already in Year 1 of this project and will form an important nucleus of research and dissemination in favour of the conservation of biodiversity in the area. Even should the Biosphere Reserve plan not be realised, the important Darwin project outputs, outcomes and impacts will still be sustained (i.e. wildlife research, public awareness, training, MSc projects, scientific and popular publications, workshops).

8. Dissemination

A brochure explaining the activities of the project and the Centre for Biodiversity was designed and printed in both English and Spanish. This has been made available through the visitor's centre-café and handouts to relevant actors in Chile and elsewhere (eg., government officials, landowners, and municipality, plus project partner-disemmination to a wider international audience).

The project organized a meeting in Year 1 that brought together all Darwin Initiative projects running in Chile (Round 14), plus representatives of the British Embassy and CONAMA (explained in preceding sections). The Namuncahue Biological Corridor meeting with government officials and local actors also took place where the activities of the Darwin Initiative in support of the Centre for Biodiversity were explained.

A series of talks have been conducted that have explained wildlife conservation issues in the area and the first results of our research. Several lectures have also been held about the project in the Catholic University of Chile. These have been targeted for various audiences, including general audience (i.e. people not related to the subject), government officials (e.g. SAG and CONAF), and students (undergraduate and MSc).

Environmental education activities with local schools have been conducted and presented as activities of the Centre for Biodiversity with support from the Darwin Initiative.

The plan is to continue these activities even after the Darwin project ends, through the visitor centre-café and the Centre for Biodiversity. The Café-visitor centre, as a private business, will gather funds for dissemination activities. the joint location of the Centre for Biodiversity and the Café is a perfect scenario for meetings and talks at many scales to publicise the important conservation and research work in the area (i.e. scientific, general public etc).

Table 1 ,

*Expenditure on salaries was elevated beyond 10% of the annual budget this year, as we needed extra staff for development of cartography resources in Chile. This will be adjusted back to the original budget through years 2 and 3.

9. Outstanding achievements of your project during the reporting period.

We agree for ECTF and the Darwin Secretariat to publish the contents of this section

Advances in biodiversity conservation require the informed inspiration and coordination of actors and decision-makers throughout society. Using an interdisciplinary approach, combining the strengths of the university and NGO sectors, we have started to make progress on guiding landscape level decision making based on reliable, science-based knowledge.

We are working to provide local solutions to issues with global relevance – providing positive reasons for biodiversity conservation, exploring new models for private-sector investment in conservation, and creating awareness and enthusiasm at all levels for addressing biodiversity conservation issues in this area.

There have been several key advances during the first 9 months.

1. Establishing the Centre for Biodiversity, Pucon.

The Centre for Biodiversity is an innovative concept in Chile. The physical infrastructure is based around a public-private partnership in which commercial activities, in the form of a visitor centre Café del Centro, and ecotourism will support an infrastructure for not-for-profit activities, such as conservation science, environmental training and workshops. A 6ha site has been acquired strategically located at the entrance to a 1000ha protected area of araucarias, the Cañi. Office facilities have been established for 5 researchers on this site, plus another office for GIS in Pucon. The Cafe del Centro is complete, and running. The Centre has already hosted a range of talks and meetings since its opening in February 2007 and will provide a focus for environmentally positive action in the area through conservation work involving volunteers, thesis students, focus groups and courses.

2. Launching the conservation science programme at the Centre for Biodiversity

The Centre for Biodiversity is working to find mechanisms that inspire private landowners to practice conservation management either within or outside the National Park system, seeing this as the key to generate wide scale benefits for society, making the links between biodiversity, sustainable development and landscape management.

The science strategy developed within the Darwin Initiative project is designed to support this process. We have opened up several lines of research that together aim to generate information about the flora and fauna of the catchment and its relationship with ongoing processes of land use change. In this first phase, we have advanced well in 3 main areas:

1. Preliminary evaluation of large mammal presence and distribution though camera trapping. This work is supplemented with interviews with farmers to identify points of conflict, such as livestock predation and hunting, between wildlife and the local community. Chilean partners have secured a grant to supplement this work.
2. Digital cartography (1:10,000) of vegetation, hydrology and land use in the study zone based on aerial ortho-photo interpretation. Chilean partners

have secured grant to fund mapping, based on missions flown in Jan 2007.

3. Establishment of the Committee (*Comité de Iniciativa*) to create the new Araucarias Biosphere Reserve. The nucleus zone of the new reserve will extend to almost the entire range of the Araucaria (*Araucaria araucana*) tree, while its buffer zone will provide a framework for sustainable development in the Andes sector of the IX Region of Chile. The Darwin project is hosting this process at the Centre for Biodiversity.

Linking science and technology with community-oriented social change is the essence of this Darwin project, and the mechanism by which we expect the Pucon area, the study site for this project, to become the benchmark for environmental good practice in Chile.

Annex 1 Report of progress and achievements against Logical Framework for Financial Year: 2006/07

Project summary	Measurable Indicators	Progress and Achievements April 2006 - March 2007	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 constrained 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*		Founding of Centre for Biodiversity Knowledge on presence and use of key lowland habitat by large mammals and birds Biosphere Reserve process initiated Project established for mitigation of carnivore-*campesino* conflicts	
Purpose To establish new public-private partnerships for conservation, with a particular focus on securing habitat connectivity in the Valdivian temperate rainforest region of Chile. The work supports National Biodiversity Strategy objectives, and relates to Articles 8, 10, 12, 17 and 18 of the CBD.	1. New research and education field centre 2. Information on habitat use by endemic mammals and birds. 3. Education for Chilean and international post-graduates. 4. Local capacity building for campesinos and indigenous groups. 5. A plan for a UNESCO Biosphere Reserve to catalyse private sector involvement in forest conservation	1. Visitor centre plus office facilities for 5 researchers built and running on the same site, Additional GIS lab in Pucon now secured and operating. 2. Good results from pilot wildlife surveys - used for early publicity and for design of main research and monitoring phase, years 2-3. 3. Training of MSc students and start of PhD and MSc project (i.e. Puma and Guiña) 4. Local capacity building initiated 5. Committee for the development of the proposal and work plan established – proposal to UNESCO to be submitted March 2008	Further work on research.education centre Survey of 6 lowland habitat sites with camera traps for large mammals, bird surveys and transects. Publication of first results in popular and scientific journals. Participation and presentation of work at conservation meetings 2 MSc projects and PhD project running Biosphere Reserve proposal submitted by March 2008 to UNESCO

Output 1. A research and education facility for local biodiversity issues	Facility constructed using co financing from local businesses	The opening of the Visitor Centre and the research office facility has boosted environmental education activities and talks on research results, in addition to the promotion of the project in the public and private sectors through the coordination of the Biosphere Reserve proposal. This opens possibilities for support and co-funding for the further development of the research centre. There is strong local support for the project.
Activity 1.1 Develop field centre for research and education in Pucon		The 6ha site was secured in 2005, using a private sector investment. Office facilities for 5 researchers are completed on the site (Jan 07), plus a GIS laboratory for 5 researchers (Nov 06) in Pucon, using co-financing from Parques para Chile.
Activity 1.2, Volunteer programme		The volunteer programme is part of the business plan for the Centre for Biodiversity. We have initiated an alliance with Working Abroad and a student-driven initiative from Cambridge University. These initiatives involved 20 volunteers this year. The objective of the programme is to engage UK volunteers in the research activities at the centre and help with fieldwork activities. The programme is educationally driven.
Activity 1.3 WildCRU and MLURI scientists supervision of Chilean MSc students		Visits were made by Alison Hester, Jerry Laker and Alsessandro Gimona (Macaulay) (Jul 06), David MacDonald (Nov 06) and Tucker Murphy (Jan 07) from WildCRU. Each of these visits involved supervision and training of the MSc students at the Catholic University.
Activity 1.4 Opening of the visitor centre		The visitor centre, Cafe del Centro is finished and running. Activities to promote the project of the Centre for Biodiversity and the Darwin Initiative have been conducted. The activities will continue throughout the year with talks, environmental education and meetings of the committee of the Biosphere Reserve Proposal.
Activity 1.5. Brochure of the Centre for Biodiversity		The brochure, in English and Spanish, is a means to promote the work and the project in the public and private sectors, in order to receive support and bring new partnerships for the fulfilment of the aims of the Centre.

Output 2. Knowledge on temporal-spatial use of habitats	Scientific and popular publications	A research programme has been implemented to monitor endemic mammals, birds, amphibians, and bats. Species lists were prepared, endemic (and other) mammals were photographed in the field with camera traps. Records were begun of sightings and signs of wildlife. New cartography is well advanced based on aerial ortho-imagery. Publications expected during next reporting period.
Activity 2.1. . Identify spatio-temporal dynamics of key mammal and avian endemic fauna		Initial surveys involved transects, camera trapping and direct observation. These have been used to develop research design that will monitor and investigate endemic large mammals and birds in key lowland habitat.
Activity 2.1.1. Research design in key lowland habitats		The main research design (created using the year 1 pilot study results) will undertake sampling in 6 sites that represent two lowland forest habitat conditions of the study area: Large fragments and continuous forest. Three replicates per habitat class will allow robust statistical analysis of the data. Large mammals and birds will be sampled through Camera trapping, transects and direct observation. This will be conducted during two winters and two summers. The data obtained will give crucial information about temporal and spatial habitat use by wildlife.
Activity 2.1.2. PhD project on Puma conflict mitigation		This project, to be undertaken by WildCRU PhD candidate, Tucker Murphy, aims to study the magnitude of the conflict between the Puma and small livestock farmers. Through surveys we will obtain temporal and spatial data of this large carnivore. During this next year we will conduct a GPS feasibility study with this large carnivore. One collar will be placed on an adult animal to analyze the effectiveness of this technique in the temperate rain forest of this area. The results of this study, if positive, will support a large scale study with GPS collars for research in movement, predation, and population estimates in the study area.
Activity 2.1.3. Darwin Frog project		A preliminary survey of Darwin's Frog has been carried out to identify future research priorities. The activities have been conducted with help from the Wildlife Trust Alliance and will involve the formulation of a project within the Darwin Initiative project log frame.
Activity 2.2. Map habitat use		Land cover vector coverages were prepared for the central study area. With support from a £100,000 Chilean government grant, Parques para Chile extended this work by commissioning new aerial orthophoto database in Jan 07. Digital cartography based on this is in preparation, due during next reporting period. Wildlife and vegetation survey is georeferenced to link with this dataset.

Output 3. 3-6 Chilean MSc research projects advancing project research objectives	MSc courses successfully completed, plus two research projects initiated to date.	During this period 12 MSc and undergraduate students have received training and have contributed to the project. One Chilean MSc from the Wildlife conservation programme at the Catholic University is starting his project on Guiña (*Oncifelis guigna*). We are in the process to recruit further Chilean MSc students to undertake their research projects. The indicator is appropriate because the completion of MSc courses and works presented at conferences and journals is a result of well planned and executed research projects in relevant topics to conservation.
Activity 3.1. Training of Chilean MSc and undergraduate students		A training course for 12 MSc students on winter surveying of fauna and flora was carried out in July 2006. This activity will continue with the new generation of MSc candidates at the Wildlife conservation programme at the Catholic University in order to involve more MSc research projects during the next reporting period.
Activity 3.2 MSc project in Guiña (*Oncifelis guigna*)		An MSc student candidate will undertake his research project in Guiña. Initial work on the scientific knowledge of the species is being conducted. This project should evolve during this next year.
Activity 2.3. PhD project on Puma (*Puma concolor*) conflict mitigation		Being an activity of Output 2, the research that will take place will raise issues, data and samples that will fulfil PhD dissertation requirements, therefore being an important activity for this output.
Output 4. Workshops with *campesinos* on sustainable forest management	Workshop programme, report and course notes	One-on-one house meetings with the campesinos were carried out and proved to be a highly successful way of building trust and informing them of our work and the important issues in this project. We are re-designing our planned approach to capacity building of campesinos based on the experience of this year 1 activity.
Activity 4.1. Training in non-exploitive forest management. Sustainable forest management workshop, Namoncahue Biological Corridor		A workshop was conducted for 25 people involved in the Namoncahue Biological Corridor project in October 2006. The event involved 4 formal presentations, followed by a field visit to the proposed public-private park.
Activity 4.2 Stakeholder workshop series for Huerquehue National Park concession, CONAF-SERNATUR.		Parques para Chile has won a tender for the Ecotourism concession to Huerquehue National Park and surrounding areas and 3 workshops with community groups have aimed to establish a consensus on management priorities for the protected areas.

Output 5. Participatory consultative process for UNESCO Biosphere Reserve	Nomination documentation and supporting information compiled.	A committee was formed, after meetings with stakeholders of governmental agencies and the private sector, which has the mission to build the proposal and work plan that will ensure the submission of Nomination documentation by March 2008. The indicators, if fulfilled, show that a partnership between relevant territorial actors was established in favour of conservation and sustainable development in the region.
Activity 5.1 Conformation of committee for the Proposal		The Biosphere Reserve stakeholders meeting in January 2007 was the culmination of an extended period of lobbying by Parques para Chile. There was enthusiastic support for the plan to revitalize the existing, but ailing Araucarias Biosphere Reserve, by extending the nucleus, and creating an effective policy for buffer zone management. A committee was established to prepare submissions to MAB-UNESCO. Activities during this next year include the consulting process in the communities, gathering of information and documents, and writing the proposal and submission
Output 6. Project management	Project management documentation	Meetings were held monthly both in the period leading up to the start date, and throughout the project. Nico Galvez has prepared 2-monthly summaries of progress for internal project progress monitoring. A six month report was submitted to the DI secretariat to schedule. This report is presented to schedule.
Activity 6.1 Management meetings		A plenary coordination meeting took place in Pucon, in July 2006. Bi-monthly meetings have been held between Chilean partners and Macaulay to review progress and plan activities.
Activity 6.2. Project reporting		Six-month and annual reports presented to schedule. We keep bi-monthly progress summaries for internal management purposes.
Activity 6.3 Dissemination		A brochure was prepared in Spanish, English and Portuguese for dissemination purposes. Posters were presented at The 7th Annual Darwin lecture, and the Wildlife Trust Alliance Annual Meeting 2006, Venezuela. The project was presented at Darwin Initiative Seminar that we organised in Santiago Nov 2006. Web site content is prepared, but uploading is delayed temporarily (expected June 2007). Article about the project published in Darwin Newsletter Feb 2007.

Annex 2 Project's full current logframe (not changed from original proposal)

Project summary	Measurable Indicators	Means of verification	Important Assumptions
Goal: To draw on biodiversity expertise from UK scientists 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 benefits arising out of the utilisation of genetic resources			
Purpose To establish new public-private partnerships for conservation, with a particular focus on securing habitat connectivity in the Valdivian temperate rainforest region of Chile. The work supports National Biodiversity Strategy objectives, and relates to Articles 8, 10, 12, 17 and 18 of the CBD.	1. New research and education field centre 2. Information on habitat use by endemic mammals and birds. 3. Education for Chilean and international post-graduates. 4. Local capacity building for *campesinos* and indigenous groups. 5. A plan for a UNESCO Biosphere Reserve to catalyse private sector involvement in forest conservation	1. Facility commissioned and constructed. 2. Scientific papers analysing spatial ecology of endemic fauna 3. Formal collaboration agreements with universities. 4. Course outlines and reports 5. Nomination documents presented	1. Darwin grant succeeds in leveraging local financial resources. 2. Successful management of fieldwork 3. Facilities, funding, and supervision offered meets university requirements 4. Sufficient local interest in courses 5. Sufficient agreement between local stakeholders to support this initiative
Outputs 1. A research and education facility for local biodiversity issues 2. Knowledge on temporal-spatial use of habitats. 3. 3-6 Chilean MSc research projects advancing project research objectives 4. Workshops with *campesinos* on sustainable forest management 5. Participatory consultative process for UNESCO Biosphere Reserve.	1. Facility constructed using co financing from local businesses 2. Scientific and popular publications 3. MSc courses successfully completed, Work presented at appropriate conference and submitted to appropriate journals 4. Workshop programme, report and course notes 5. Nomination documentation and supporting information compiled.	1. Output presented to Darwin Initiative with project report 2. Output presented to Darwin Initiative 3. Copies of theses and conference abstracts presented to Darwin Initiative. 4. PPC reports presented to Darwin Initiative 5. Documentation presented to Darwin Initiative.	1. Local private sector funding can be leveraged using Darwin grant 2. Successful collaboration of research partnership 3. MSc. Students will select offered programme 4. *Campesinos* receptive to sustainable development approach 5. Evidence from output 2. supports Biosphere reserve as appropriate mechanism to engage private sector in conservation.

Activities	Activity Milestones	Assumptions
Research 1. Identify spatio-temporal dynamics of key mammal and avian endemic fauna 2. Map habitat use 3. Define threats to biodiversity and incentives for conservation Capacity building 4. Develop field centre for research and education in Pucon 5. Training in non-exploitive forest management. 6. WildCRU and MLURI scientists supervision of Chilean MSc students. Dissemination 7. Publications in both English-language and Chilean scientific press Project management 8. Coordination meetings, periodic evaluation, quality standards, internal peer review, reporting.	Year 1. 1. Start-up meeting, Pucón, July 2006. 2. Stakeholder workshop held with community leaders and sustainable development experts 3. Complete business plan and designs for research centre. 4. Establish wildlife monitoring transects, camera traps, and mist netting sites in study areas. Year 2 5. Tracking key forest endangered species (e.g. Magellanic woodpecker, wild cat, native deer) 6. Strategy developed for Biosphere Reserve with stakeholder participation 7. Build and equip field centre Year 3 8. Analysis of results from 4. Publish preliminary results 9. Policy report published on private sector conservation 10. Develop long-term international r&d strategy for Centre Year 4 11. Publication of results from 4 and 5. 12. Biosphere Reserve nomination completed 13. Commission research centre building. Ongoing 14. Host 2 MSc research projects in Pucón per year, 15. Wildlife monitoring by UK volunteers and Chilean research workers 16. Local training courses and workshops 17. Management meetings and reports to Darwin Initiative 18. Peer review of manuscripts by Macaulay Institute and Fauna Australis.	Proposed methods appropriate for field conditions Effective capture methods developed Local community support is secured. Stakeholders support biosphere concept Government continues to support CBD objectives Continued enthusiasm by local institutions Local financing leveraged by Darwin grant

Annex 3 onwards – supplementary material (optional)

A3.1. Selection of meeting reports

A3.2. Programme for Darwin projects Chile meeting, Nov 2006

A3.3. Poster displayed at 7th Annual Darwin Initiative Lecture

A3.4. Example internal project progress report (separate pdf)

A3.1. Darwin Project meeting reports

Meeting 1 – 13 April 2006. Ramon Quezada, 0520 Pucon.

Present – Pía Bustos, Cristian Bonacic, Jerry Laker, Karl Yunis.

Agenda

- Agree general concepts about the purpose of the Project and immediate priorities
- Agree policy on employment of staff to run the Project
- Discuss and develop roles within the Project
- Discuss operational mechanisms for handling of funds and Project accounting
- Develop the role of the Catholic University in the establishment of the Centre for Biodiversity

Notes

Agree general concepts about the purpose of the Project and immediate priorities

Purpose of the Project – to establish a science program for the Centre for Biodiversity. Research capacity is measured in terms of baseline data about local habitats, and faunal distribution, as well as adequate equipment for ecological field studies of a wide variety of animals and plants. We will encourage species specific projects, such as Darwin frog, and Monito del Monte to be linked in with the general Darwin work, using separate grants, where appropriate supported by the Catholic University.

The Darwin itself will evaluate the seasonal changes in distribution of several species (to be decided) to evaluate the relative importance of human land uses and activities on biodiversity conservation throughout the year.

A website for the Centre for Biodiversity will be establish to disseminate information and results of the Darwin funded research. The domain name “www.temperaterainforests.org” was agreed to be appropriate and vacant.

We have an email account for general project communication – darwinchile@gmail.com.

Jerry will organize a meeting shortly with the British Embassy, and the British Council in Santiago to establish their interest and potential future contributions to the project.

We will hold a meeting with Alison in July 2006 to familiarize her with the site and all the main operational issues. It was felt that this meeting only need involve the main partners. David MacDonald is considering the practicalities of visiting Pucon for a meeting at the end of May (he is unavailable in July).

Fieldwork is expected to begin already in June or July with the expected arrival of 3 Cambridge biology students. They will assist in developing fieldwork protocols together with students from Fauna Australis. Some field equipment is likely to be required.

Agree policy on employment of staff to run the Project

Staff members employed by the Darwin project to work at the Centre for Biodiversity will be the responsibility of Pia.

Several options regarding employment of staff were discussed – an open advertisement of the post was considered, but it soon became clear that Karl and Cristian already have preferred candidates. The 2 concerned, Mercedes, and Nicolas have different but complementary experience – in GIS and project management, and an important factor is that both are well-known and trusted. It is thought that Nico would need a salary of CLP$900,000 per calendar month, while Mercedes needs CLP$600,000 per calendar month. The combined salary at current exchange rates would only last for 2 years as budgeted (GBP45,000 available in total). We decided that this is acceptable as it will be made clear that a part of their remit would be to bring in further projects to the Centre for Biodiversity. The worst case scenario is that they will not succeed in generating future salary. If that were to happen, Jerry, Pia, Karl and Cristian are still available to carry on project management and reporting to bring the Darwin project to a successful conclusion.

Karl noted that Mercedes´contract with the Municipality is up for renewal in 2 week's time, meaning that there is some urgency to define her position. We agreed that the Centre for Biodiversity should contract her short-term (3 months) to undertake some preliminary GIS work to prepare vegetation-type vector coverages of the study area in support of the development of fieldwork methodology design.

Cristian will approach Nico to establish what salary and conditions he will need. He currently works in Pumalin, and his wife has recently had a baby, so appears keen to move to the relative civilization of Pucon. The appointment is not subjected to the same urgency as for Mercedes – Nico's current employer is potentially an important ally of the Centre for Biodiversity project, so Cristian will need to be diplomatic to ensure that this headhunting does not cause problems with Pumalin.

Likewise, Karl will liaise with Mercedes.

Both candidates will be interviewed by Jerry and Pia before a final decision is made.

Discuss and develop roles within the Project

Jerry. Representing Alison, Project leader as Project manager, Chile. Will ensure that the overall objectives of the Darwin project are met, including the development of the Centre for Biodiversity. Jerry is also responsible for financial management of the project, which will to a large degree be carried out directly with Macaulay.

Pia, representing Parques para Chile. Responsible for Staff management and logistics related to fieldwork.

Cristian, representing the Universidad Católica de Chile. Responsible for development of conceptual framework for the research programme, methodologies and preparation of students to undertake fieldwork at the Centre for Biodiversity.

Karl, Parques para Chile, GIS specialist. Responsible for development of GIS tools used throughout the course of the project, supported by Mercedes.

Discuss operational mechanisms for handling of funds and Project accounting

To date Jerry has not received details of the contract and reporting guidelines from the Darwin Initiative secretariat. However, from the budget presented in Round II of the Darwin selections, it would appear that budget has not been allocated specifically to individual partners, remaining at the discretion of the project leader, to ensure the best possible allocation of funds. Both Cristian and Karl expressed an interest that funds should be used directly on this project, as far as possible without passing though either parent organization to simplify project accounting. The Catholic University will require to charge a small annual overhead.

The most attractive suggestion would seem to be that any costs incurred outside Chile, e.g. purchase of equipment and UK partner costs, can be paid directly by Macaulay. Payments in Chile will be paid in response to the presentation of invoices and receipts by Jerry to Macaulay. Payments to reimburse costs will be made to a personal bank account in the UK dedicated exclusively to the project. The statements from this account will also be presented as evidence of exchange rates for all payments.

Jerry agreed to find out the implications for his own personal income tax liability in Chile, and if this is no problem to propose this method to Alison for approval, subject to the Darwin guidelines.

An important factor in financial management of the project is the formalization of the legal status of the Centre for Biodiversity. Up until now, this has been somewhat vague. From now on, it is important for the involvement of the Catholic University (and for any future donors towards the construction of the centre) that the not-for-profit nature of the Centre be formally established. Currently, the ownership of the land on which the Centre is based is in private hands, and over time it is envisaged that the land will be purchased using a trading surplus from the activities of the Centre – provision of accommodation and food for visiting workers, restaurant, sales of plants etc. The main issue that remains to be decided is the legal entity that will have ownership of the site, once the purchase is complete, and the form in which the social, rather than personal profit nature of this entity can be demonstrated. Jerry agreed to develop a proposal to address this issue.

Field trip 14th April 2006. Namoncay field site

Same team, accompanied by Andrea Quiroz, PhD Student, Austral University (Ecology of monito del monte).

Purpose of the visit. To evaluate logistics of fieldwork and get a feel for the vegetation and terrain. A new building is currently under construction at Namoncay as an events centre. When it is finished (3 months) it will be available for use by fieldwork teams. It is not clear how many could be housed, but probably up to 20 students in basic conditions. The site is only ½ hour from Pucon, accessible by 4x4, and has about 300 ha of native forest of a wide age range. It is an ideal fieldwork base.

Cristian will start work on developing a series of sampling methodologies that can be carried out by his students and possibly Quest groups.

Andrea confirmed that this area is most likely occupied by monitor del monte. She is keen to find a way to continue to work on the species after she finishes her PhD in November. Cristian floated the idea that she should go for a CONICYT grant sponsored by Fauna Australis. If a way can be found, Andrea will come, with all her traps to survey the site in November-December time (no chance between now and then as they hibernate).

Conclusions

A valuable meeting to bring Cristian up to speed with the situation in Pucon. It is clear that some of the facilities are far advanced, but that there remains the urgent construction of some more accommodation if we will be able to have all the planned students and volunteers staying on-site this winter.

Darwin Project

Meeting – GIS and field methods – 11 May 2006.

Present – Pía Bustos, Jerry Laker, Karl Yunis, Meche Ibañez.

Agenda

- Coordinate ecological and GIS methodologies for collection of field data

Notes

Karl presented the rationale behind the need to design the sampling methodology from the outset around the future needs for data suitable for spatial modeling in a GIS. The fundamental data elements for GIS modeling are the data coverages that may be point, raster (grids) or vector (polygons) in nature.

Meche is working on developing a high quality vector vegetation map at 1:10,000 scale of the study area (Namoncahue, Huerquehue and Cañi).

In order to be able to use the vegetation data collected in the field in the GIS, it will need to serve as descriptor for the polygons of homogenous vegetation identified in the map. Karl estimates that if we end up with 1 ground truthing point for every 10 polygons of that vegetation classification, we will be able to produce fairly reliable species distribution maps, and robust habitat associations.

The main issue is that the field characterization of each polygon ought to be carried out at a point at or close to the natural centre of that polygon. In practice, the sample points can be given to survey teams who will have to find those points using GPS.

The sampling methodology at that point is not critical, as long as we agree a technique at the beginning and stick with it. Karl imagines a 25 m radius circle, within which we can measure tree density for the different species, and trunk diameter, as well as make a species list of smaller plants. We discussed the possibility to use the Braun-Blanquet methods, as a widely used standard for describing plant communities.

The sampling procedure could begin with a 15 minute period for bird identification, followed by tree cover evaluation and vegetation assessment. Whatever methods we decide on, the ideal is that we do something compatible with other organizations (e.g. Catolica or Natural History museum).

We agreed to look into the possibility to obtain equipment to evaluate the forest canopy – Karl has seen an instrument like an upward-looking fish-eye lens, with software calibrated to evaluate cover that could be very useful for standardizing this part of the sampling.

The first expedition will be in winter, so not an efficient time for evaluating vegetation, apart from tree species, trunk size and density.

The establishment of these sample sites, based on the polygons is additional to and complementary to any of the other sampling methodologies for fauna, such as the camera traps, tracks, direct observations etc. It is hoped that these other studies will shed some light on habitat associations, amongst other things, and that this information can then be projected, by inference, to the larger scale, using the vegetation and topology coverages.

Other matters arising

We discussed the interview, yesterday with Nicolas Galvin. We were unanimously content that Nico will be part of the team. His good practical skills in conservation work are evidenced by the job he is currently doing as administrator of Caleta Gonzalez in Parque Pumalin. He is dissatisfied with that job for 2 reasons – changing family circumstances (his wife, Claudia, had a baby, Tineo, recently) mean that it is less attractive to work in such isolation. Secondly, the job has little or no scientific content, being mainly concerned with maintaining ecotourism facilities. He is very enthusiastic about our project, as he sees the potential for him to develop his scientific career in conservation. The nature of his job means that he can either leave soon, or next march. Leaving later this year, would cause much greater problems for his employer, with the approaching tourist season. He is happy to hand in his notice on receipt of a formal offer from us, with a view to starting early in July.

Cristian had mentioned $CLP900,000 as a net salary. Actually, we are unlikely to be able to offer much more than this figure as gross salary. Nico said he cannot accept less than $CLP 800,000. Jerry will prepare some budgets, and revise our offer. We noted also that Nico and Meche are very similar in terms of academic record, age and work record. It is not sensible or fair to offer a wide discrepancy in salary.

We will have to find a vehicle of some description for Nico to be able to work effectively.We will help to look for an appropriate house for him to rent close to Pichares. Ideally he and his family will live on-site, but that will require further construction work.

Meeting – Expedition July 2006- July 3, 2006.

Present – Pía Bustos, Jerry Laker, Karl Yunis, Nicolás Gálvez.

Agenda

- Initial welcome of Nicolás Gálvez to the project and schedule of the July expedition.

Notes

- Nicolás was brought up to date with some of the short term activities at hand.
- A schedule of the July expedition was elaborated as a first draft. The schedule has been handed out for revising.
- Initial discussion for the sampling strategy was conducted. Karl stated the need to establish sampling in a grid system rather than a point due to difficulties to reach specific points in homogeneous areas of forest (access, GPS error etc). It was agreed that for river systems specific points were feasible. In was stated that regardless the sampling that is to be done, it must be compatible with the GIS modeling that Karl is working on, plus have scientific validation. These matters will be sorted out with Cristian, Alison and Alessandro when they arrive July 16.
- Management of the expedition groups was discussed. Initial proposals state that the groups must not be more that 5 persons. With in the group, each person must be in charge of specific taxa. Each group must collect flora samples for identification or corroboration of the species noted. This must also be a learning process as to the elaboration of a herbarium. The possibility of having park rangers of CONAF accompany the groups was stated. Plus, the necessity to link with local hunters to learn to identify animal paths in order to properly set up the camera traps.
- Information was updated regarding the construction work of the Pichares, Namoncay and Namoncahue facilities. Karl stated that there have been advances but the facilities are not ready for the first expedition. They should be ready in two weeks to an acceptable stage; in order to receive the first group.

Centre for Biodiversity

17-April-2006

Matters arising from management meeting, 13-04-2006

Clarification of legal status and land tenure for the future Centre for Biodiversity

The winning of the Darwin Initiative contract obliges us now to press forward with plans to construct a research and training facility to support biodiversity conservation in the Chilean temperate rainforest region. As this is a joint undertaking with several private and institutional partners, it is necessary to formalize the legal basis for the Centre.

The purchase of the property in 2005 was carried out, when the previous owner needed to sell up, with the philanthropic aim of supporting Parques para Chile's efforts to establish a financially self-sustaining research and conservation facility. Currently the land on which this "Centre for Biodiversity" will be established is held in the name of Jerry Laker as registered owner of the property. By verbal agreement, Karl Yunis has a 1/10 share in the land value. A return on this investment (approx CLP140k, made up of 100k in land purchase, plus 40k in capital works to construct catering facilities and lodgings) is needed by the partnership, either representing interest on investment or repayment of some or all of the capital outlay.

The Centre for Biodiversity is a project of the NGO, Parques para Chile. Its purpose is wholly philanthropic in nature, being for research, training and conservation in Chilean temperate rainforest ecology. A further investment of some CLP100k will be required in order to get the envisaged infrastructure in place. The Centre for Biodiversity has its first contract, worth GBP200,000, financed by the Darwin Initiative of the UK government, which will form the core science programme for the next 3 years.

An agreement with the Catholic University to use the Centre as a base for training graduate and postgraduate students is currently a central pillar of the research activities. The Catholic University is a full partner in the Darwin project, and will play an important role in establishing the research agenda at the Centre.

While the Darwin project will establish research capacity at the centre, by allowing the purchase of a substantial amount of research equipment, it will not contribute directly to any capital works in the Centre. It is envisaged to reinvest the overheads generated by the project in construction, and this will be roughly CLP$17,000 over the same time period. Further investments are needed in the form of donations, and the reinvestment of income generated by volunteer parties from Europe, sale of ornamental trees, restaurant services etc.

It is anticipated that a large part of the investment in construction of the centre will come from charitable donations. Once built, the centre will be financed in (at least) 5 ways: – 1. by stipends charged to research students using the facilities; 2. by research contracts based and run at the centre for biodiversity; 3 by conservation volunteers; 4. by residential courses and 5. by overheads charged on consultancies.

In order for the Centre to receive charitable donations for infrastructure investment, or to develop a close partnership with the Catholic University (or any other, for that matter) the benefits of such investments should not contribute to realizable property value gains by any particular individual. Changes to the current property title situation are thus proposed.

Jerry and Karl will donate the land on which the centre is to be built to one or more non-profit organizations. In practice, this site would be approximately 7000m², with a market value of at least CLP$20 million (subject to valuation).

An obvious partner for the Centre for Biodiversity is Rainforest Concern, who have already committed to local conservation on a large scale by land acquisition in Namoncahue. RC is also a partner in the Darwin Initiative project, and recognizes the advantages of establishing a research facility that will greatly amplify the impact for forest conservation of their current investments in land acquisition.

We will offer shared ownership of the site to Rainforest Concern in return for their substantial contribution to the construction costs of the Centre. We envisage that Parques para Chile could be the other owner, repeating the arrangement in Namoncahue, where PPC is an effective and trusted local partner. Within the Parques para Chile structure, the Centre for Biodiversity becomes the joint responsibility of Karl, Jerry, Rodrigo and Marcelo. Peter Bennet is representative of Rainforest Concern.

We have a deal established with CONAF by which they will donate timber to the project for construction if we undertake to build them an office for their *guardaparques* at the site. The timber (Douglas fir) is currently still standing, and would be shared between the Centre and CONAF in the ratio 70:30. The centre will have to cover all the sawmill costs and transport. Recently sawn timber requires approximately 1 year to dry in a stack (drying facilities, though at a cost, are available locally). The CONAF office will be constructed on the same plot of land donated to the Centre for Biodiversity, thus guaranteeing tenure in perpetuity, and forming the portal at the entrance to the property.

The rest of the land (approximately 5 ha, mostly of native woodlands, but including catering facilities, and 3 cabañas already built) would remain in private ownership by Jerry and Karl, who will undertake to develop the ancillary services for the Centre – accommodation, restaurant etc. on a semi-commercial basis, at least until the business has returned a large part of the capital invested. It is envisaged that at some point in the future, income generated by lodging and restaurant services will form the core funding for the centre, if necessary. When this situation arises, the business will be reconstituted as a charitable foundation. This will not occur until the business is running effectively, has paid back its land value, and has an effective management structure in place.

This strategy frees up the site for establishment of the Centre for Biodiversity on a non-profit basis, sharing ownership with an important donor organization. It makes the important division in physical space between the public and private elements of this project, giving the initial private sector investment a window of opportunity to recoup some or all of the original capital invested without impacting in any way on generously donated funds. Most importantly it will restore transparency to the business management at the Centre – establishing a safe, long-term structure that can guarantee the effectiveness of charitable donations, while also creating conditions to allow the effective provision of essential services to the centre on a commercial basis.

A3.2. CONAMA-DARWIN INITIATIVE PROJECTS MEETING

CHILE

Date: November 21st, 15:30, 2006

Place: Auditorium, Faculty of Agriculture and Forestry of the Catholic University of Chile. Campus, San Joaquín. Av. Vicuña Mackenna 4860, Macul, Santiago.

Description:

The purpose of the "CONAMA-DARWIN PROJECTS" meeting is to inform the National Commission of Environment (CONAMA), the purpose of the Darwin Initiative and how the present Darwin projects in Chile are aiming to contribute to the national strategy for the conservation of biodiversity. It is also an opportunity for the Darwin projects in Chile to exchange ideas and experiences. Plus, Professor David MacDonald, chairman of the Darwin initiative scientific committee, will give a lecture.

Also, the British Embassy's Deputy Head of Mission, Mr. Peter Connolly, will present the priorities of the British Government in the area of environment,

Organizers

- Fauna Australis, Faculty of Agriculture and Forestry of the Catholic University of Chile (PUC).

Participants

- CONAMA
- British Embassy
- Darwin initiative-Professor David MacDonald
- **Darwin project 1**: Community Resource Management Planning in the Maichin River Valley, led by Paul Oldham, University of Lancaster, Centre for Economic and Social Aspects of Genomics in partnership with the Mapuche organisation Consejo de Todas las Tierras and CONAF.
- **Darwin project 2**: Conservation of endangered coastal biodiversity hotspots of Central Chile, led by Dr. Stephen Harris and Dr. David Boshier, University of Oxford, in partnership with CONAF, CONAMA (Maule region), CODEFF, forestry companies CELCO, MASISA and Bosques de Chile.
- **Darwin project 3**: Reducing the Impact of Exotic Aquaculture on Chilean Aquatic Biodiversity, led by Carlos Garcia from the University of Wales Swansea, in association with the Universidad de Los Lagos, Centre for Ecology and Hydrology (UK), Oregon State University (US), University of Victoria (Canada), the Salmon Technological Institute (Chile) and CONAMA
- **Darwin project 4**: Conserving and using entomopathogenic fungi and nematodes within Chile, leaded by Dave Moore CABI Bioscience Chile, from CABI Bioscience Chile, in partnership with the Instituto de Investigaciones Agropecuarias, Universidad de Chile and Universidad Austral de Chile.
- **Darwin project 5**: Building capacity for Temperate Rainforest Biodiversity Conservation in Chile, leaded by Alison Hester from the Macaulay Institute, in partnership with Fauna Australis of the Catholic University of Chile, Parques para Chile, Rainforest Concern (UK), Quest Overseas (UK), CONAF, and the private sector and the regional authorities

Meeting Schedule

15:30 Welcome speech by the dean of the Faculty of Agriculture and Forestry, Dr. Guillermo Donoso Harris

15:40 British Embassy's Deputy Head of Mission, Mr. Peter Connolly– UK Environmental Priorities

16:00 Professor David MacDonald- Chairman of Darwin Initiative Scientific Advisory Committee

16:20 CONAMA - Outline of strategy for the conservation of biodiversity

16:40 Presentations by local representatives of the 5 Darwin Projects (10min each)

17:30 Questions arising and open discussions

18.00 Closing comments

18:10-19:00 Cocktail

CAPACITY BUILDING FOR TEMPERATE RAINFOREST BIODIVERSITY CONSERVATION

Alison Hester and Jerry Laker
The Macaulay Land Use Research Institute, Craigiebuckler, Aberdeen, AB15 8QH • e-mail: a.hester@macaulay.ac.uk

INTRODUCTION

A Darwin Initiative project in Chile aims to develop a science-based approach to achieving conservation of endemic biodiversity within a framework of local sustainable development

We are working to provide local solutions to issues with global relevance – providing positive reasons for biodiversity conservation, exploring new models for private-sector investment in conservation, and creating awareness and enthusiasm at all levels for addressing biodiversity conservation issues.

The project has 5 main aims:

1. Establish a permanent facility for field-based research and education – the Centre for Biodiversity, Pucon
2. Develop a science programme for the Centre for Biodiversity.
3. Support activities to build networks of local actors in sustainable development
4. Link students and volunteers with opportunities to get involved in biodiversity conservation
5. Undertake activities in local schools to raise awareness of biodiversity conservation issues.

THE CENTRE FOR BIODIVERSITY, PUCON

The Centre is an innovative concept in Chile. The physical infrastructure is based around a public-private partnership in which commercial activities, in the form of a visitor centre/ cafeteria - the Café Tucuquere, and ecotourism, will support an infrastructure for not-for-profit activities, such as conservation science, environmental training and workshops. The Centre will provide a focus for environmentally positive action in the area through conservation work involving volunteers, students, focus groups and courses.

THE SCIENCE PROGRAMME AT THE CENTRE FOR BIODIVERSITY

Our research aims to generate information about the flora and fauna of the Tolten river catchment and its relationship with ongoing processes of land use change. In this first phase, we are concentrating on four main areas:

1. Digital cartography (1:10,000) of vegetation, hydrology and land use based on aerial orthophoto interpretation
2. Preliminary evaluation of large mammal presence and distribution though camera trapping, recording of scats, tracks and direct observations. This work is supplemented with (a) interviews with farmers to identify points of conflict between wildlife and local communities, such as livestock predation and hunting and (b) a feasibility study on the use of GPS collars
3. Field evaluation of vegetation community distribution, composition and structure
4. Movement studies of woodland birds, using mark-recapture.

THE ART OF PUTTING SCIENCE INTO ACTION

The research outcomes will support an ongoing process of NGO activity which seeks to establish mechanisms for local decision making that embody the principles of sustainable development. Plans are being developed to enlarge the already existing Araucarias Biosphere Reserve to include the whole range of the monkey puzzle tree in Chile. Such a change, already supported by several key government agencies, would establish a sound framework for landscape-level integrated planning, ensuring that biodiversity and protection of old-growth forests are included as fundamental components of the human environment and the development process. This linking of science and technology with community-oriented social change is the essence of this project, and the mechanism by which we expect the Toltén catchment to become the benchmark for environmental good practice in Chile.

SUSTAINABLE DEVELOPMENT - THE IMPROVEMENT OF QUALITY OF LIFE IN A HEALTHY ENVIRONMENT

Advances in sustainable development require informed inspiration and coordination of actors and decision-makers throughout society. Sustainable development is more paradigm than politics, tending to cut through traditional political differences, and is often inspired just as much by intuition as it is by information. However, by combining the skills of the Chilean conservation NGO, Parques para Chile, with an international research team, this Darwin Initiative project aims to create a powerful alliance to guide integrated landscape level decision making.

A3.4 Example internal progress report (see pdf)

Checklist for submission

	Check
Is the report less than 5MB? If so, please email to Darwin-Projects@ectf-ed.org.uk putting the project number in the Subject line.	Y
Is your report more than 5MB? If so, please advise Darwin-Projects@ectf-ed.org.uk that the report will be send by post on CD, putting the project number in the Subject line.	Y
Do you have hard copies of material you want to submit with the report? If so, please make this clear in the covering email and ensure all material is marked with the project number.	No
Have you completed the Project Expenditure table?	Y
Do not include claim forms or communications for Defra with this report.	OK