

# Darwin Initiative – Final Report

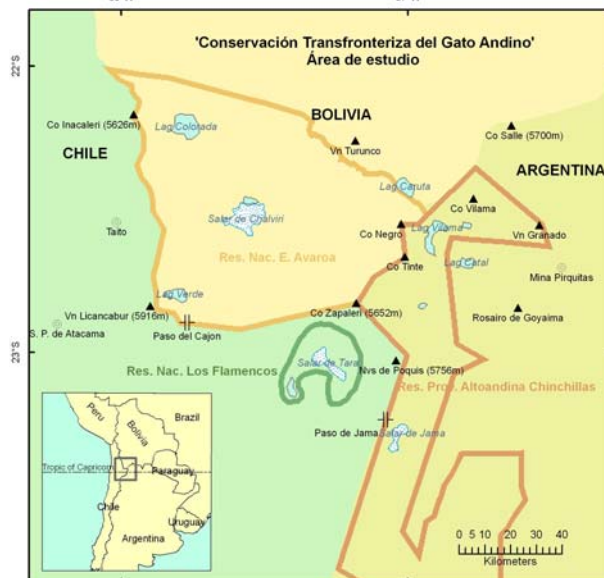
## Darwin project information

Project Reference	14-028
Project Title	Conservation of Puna's Andean cats across national borders
Host country(ies)	Argentina, Bolivia and Chile
UK Contract Holder Institution	Wildlife Conservation Research Unit (WildCRU), University of Oxford
UK Partner Institution(s)	
Host Country Partner Institution(s)	Andean Cat Alliance (AGA); Universidad Nacional del Sur, Museo de Ciencias Naturales de Salta, Universidad Nacional de Salta (Argentina); Colección Boliviana de Fauna (Bolivia); Fundación Biodiversitas, Universidad de Chile, Universidad Mayor, Universidad Católica (Chile); Wildlife Conservation Network (USA)
Darwin Grant Value	£159,186
Start/End dates of Project	01 October 2005 – 31 March 2009
Project Leader Name	Claudio Sillero-Zubiri
Project Website	<a href="http://www.wildcru.org">www.wildcru.org</a> <a href="http://tinyurl.com/andeancats">http://tinyurl.com/andeancats</a>
Report Author(s) and date	C. Sillero-Zubiri, J. Marino, M. Lucherini, M.J. Merino, L. Villalba & A. Iriarte; 30 June 2009

## 1 Project Background

The endangered Andean cat is endemic to the Central High Andes and is one of the least known wild cats in the world. The High Andes is a priority biome in Latin America because of its high level of endemism. Using the Andean cat as a flagship for the conservation of the fragile High Andes ecosystem this project sought to develop a network of scientists, educators and managers across adjacent conservation areas in the triple frontier between Argentina, Bolivia and Chile, to deliver effective biodiversity conservation.

By supporting the work of local conservationists and educators, and working closely with the Andean Cat Alliance, we delivered: 1) research to better understand the ecology and distribution of carnivores and their prey; 2) increased capacity of scientists, protected area staff and educators; and 3) enhanced awareness of the importance of High Andes biodiversity among those living there, particularly school children (Annex 1 & 2).



## 2 Project support to the Convention on Biological Diversity (CBD)

We operated in cooperation with Governmental institutions and NGOs from host countries and the developed world developing capacity and awareness programmes. The multinational structure of the project facilitated information exchange between and within countries on scientific research, educational procedures and wildlife management tools. The project outputs contributed to biodiversity conservation of the High Andes, a regional conservation priority identified by the CBD, in several ways (Annex 3): a) we collated, collected, analyzed and organized a database on the little known vertebrate community of the High Andes; b) focusing on the Andean cat, a species of particular concern, we identified potential threats to its conservation, namely hunting, reduced genetic variability, intra-guild competition, and habitat degradation due to mining and tourism off-road activities -the latter affecting many other vertebrate species; c) we promoted relevant biodiversity research in the region, building up a baseline for the conservation of High Andes biological diversity; d) we investigated traditional knowledge on biological resources in the region; e) we established training programmes for local people, school teachers, protected area staff and young scientists; f) we supported training environmental educators and conservation biologists in the host countries.

As a result we raised awareness of the importance of biodiversity conservation among local communities and, through a range of media, disseminated these ideas to the general public. Crucially, we assisted stakeholders from the triple frontier region to establish cooperation guidelines for protected areas in the three host countries, including the signature of the Tilcara Agreement (see below). This agreement will help stakeholders to implement a common international strategy for biodiversity conservation in the region and thus directly contributes to the 2010 Biodiversity Target.

## 3 Project Partnerships

The PL has been involved with the Andean Cat Alliance ([www.gatoandino.org](http://www.gatoandino.org)) since 2002, largely as an adviser developing AGA's network. The DI project was conceived to strengthen and expand the AGA partnership with a regional focus. The triple frontier partnership between stakeholders from Argentina, Bolivia and Chile was formally launched at the onset of the Darwin project in 2005, with a Common Methodology workshop in San Pedro de Atacama, Chile. We developed common research protocols and data standards for High Andes carnivores and their prey base, and set up the bases for a fluid exchange of information. The partnership was subsequently strengthened through UK project members visits (at least yearly) for fieldwork and training of partners. We took full advantage of biannual AGA meetings in La Paz (Bolivia, 2006) and Arequipa (Peru, 2008) to share experiences and lessons learnt with the Darwin project.

Cooperation among protected area staff from range countries was formally developed through six meetings of the PL with various governmental representatives of the three countries, and two tri-national training and cooperation workshops (E. Avaroa National Park, Bolivia, 2006 and Jujuy, Argentina, 2007). Two project members visited Oxford to work with UK staff in data analyses and writing: Magdalena Bennett (GIS analyst from Chile; 2 visits, for a total of 6 weeks) and Mauro Lucherini (Project Coordinator, Argentina; 6 weeks).

The developing collaboration facilitated the establishment of new collaborations and strengthening old ones. Examples are: common AGA databases; common tools for environmental education activities and their evaluation; an initiative to mitigate damage of tourism off-road in the triple frontier; the analysis of High Andes carnivores activity patterns; standardized density estimates of small cats populations across 4 areas; and population genetics of High Andes small cats, with our project contributing over 500 samples. Most of these collaborations have led to concrete outputs in the form of manuals or publications in peer-reviewed journals (Annex 4 & 5).

During a final international meeting in Tilcara (Argentina, December 2008) we developed, with government agencies legally responsible for the implementation of conservation policy in host countries, a formal agreement for integration of High Andes conservation activities. A significant player in this initiative was the High Andes Flamingo Conservation Group (GCFA in Spanish - [www.flamencosandinos.org](http://www.flamencosandinos.org)), a NGO operating across national borders in the same area,

protecting wetlands and populations of three sympatric flamingo species. The project culminated with the signature of a MoU in early 2009, the “*Tilcara Agreement*” by government agencies signatories of CBD (Annex 7).

As a result of these efforts, the partnership triggered by the DI project now involves all relevant conservation agencies around the triple frontier, and the entirety of AGA and GCFA networks. These organizations are now acting together to implement common conservation initiatives in the region. The benefits and achievements of our multi-team and cross-border approach have attracted great interest and promoted other AGA multinational initiatives elsewhere.

## **4 Project Achievements**

### **4.1 Impact: achievement of positive impact on biodiversity, sustainable use or equitable sharing of biodiversity benefits**

Our ultimate goal was to improve the conservation of biological diversity in the Central High Andes, particularly vertebrates with a focus on carnivores. The impact of project activities may not be evident at the time scale of this project. Nevertheless, we have put in place partnerships and mechanisms that are expected to lead to improved awareness and institutional capacity in support of biodiversity conservation in the region, and a future reduction in threats to the persistence of Andean cat populations, and of all vertebrates in general, in the triple frontier. This is because local communities and agencies now have a better understanding of the importance of biodiversity conservation, and are more willing and better prepared to implement conservation actions. The regular presence of research and education teams in the field throughout the DI project, and the efforts devoted to education and community participation, have raised the profile of the Andean cats among local communities. We witnessed an increasing interest in local and regional media for Andean cats and High Andes conservation, progressing towards our goal of establishing the Andean cat as a flagship for the natural and cultural landscape of the High Andes.

A more tangible impact of the DI project on conservation policy in host countries was the Tilcara Agreement for cross-border conservation cooperation signed by PA authorities and partner institutions. DI project partners are also working to support the upgrading of Las Chinchillas Regional Reserve to the level of national protected areas in Argentina; and the creation of the Licancabur National Reserve in Chile.

The DI project had an important social impact in some of the communities in the triple frontier. Many people benefited directly, for instance local park staff and teachers that received training, others benefited through employment as field assistants. The skins of Andean cats hold a very important spiritual role among High Andes peoples, which impact negatively in the wild population. Through our education work we are promoting a shift in this cultural paradigm, seeking to reduce hunting pressure while keeping the Andean cat as an important spiritual icon. An additional, longer lasting, impact of the project concerns the encouragement to resurrect traditional trans-boundary forms of exchange and communication between related communities in Bolivia and Argentina.

### **4.2 Outcomes: achievement of the project purpose and outcomes**

More rural people living in the High Andes, and those in nearby towns and cities in the tri-national region, are now aware of the existence and plight of Andean cats and the need to protect natural resources in the High Andes. The impact of our educational activities, as tested in Argentina, was evidenced by a change in school children’s attitudes and knowledge before and after an education campaign. Combined with more informal education work conducted with adults, we expect to influence attitudes and increase peer pressure to reduce direct negative impacts on Andean cats and other wildlife and, more generally, to encourage more sustainable uses of High Andes natural resources.

The project contributed to increase those human resources available to conservation in the host countries via formal training of university students, short-term training of research assistants, protected area staff and school teachers, and the dissemination of standardized field and educational techniques for High Andes conservation work. Local partners in the host

countries will continue their research and conservation projects in the region, and collaborate with AGA, GCFA and PA authorities to implement agreed protocols and monitoring activities. We have delivered a strengthened network of specialists from multiple disciplines and countries; we expect this network to continue to grow and increase stakeholder participation.

The coordinated effort devoted to study carnivores and their prey has created a baseline of biological information that should benefit and inform future research and conservation activities among all partners and agencies responsible for natural resources in the region. For example, new knowledge of Andean cat distribution within Avaroa National Reserve assisted managers with ongoing zonation under new reserve regulations.

### **4.3 Outputs (and activities)**

The project achieved the outputs stated in the logical framework, according to the indicators set up from our initial expectations (Annex 1 & 4). Most research, education and networking activities were implemented within the original timetable. There was a delay at the onset of the project, due to difficulties in transferring funds to local partners, but a proper level of synchronization among partners was achieved by the time of our first international workshop in early 2006. During the final year delays in genetic lab results delayed the submission of some student theses (2 of a 3-5 target finalized, with 5 more well advanced and to be completed soon).

#### **Output 1. Key conservation areas for Andean fauna identified**

The methodological manual for High Andes carnivores produced in year 2 provided standard field techniques for all local partners, and was subsequently adopted across AGA membership. Project partners coordinated complementary ecological studies in all host countries. Field surveys were conducted with the participation of students (all countries), park staff (Chile and Bolivia) and local wildlife monitors (Argentina) and included: a) carnivore sign transects and camera-trapping to register presence of various carnivores, their prey and habitat use; b) collecting carnivore faecal samples for DNA identification and dietary studies; and c) live-trapping, direct counts and sign recording of rodent prey in various habitats to study prey availability. Some 15 new localities were surveyed, leading to new records of Andean cats for some locations (Annex 13). Information was collected from 242 line-transects, >750 habitat points for prey-habitat relationships data and to map vegetation for model, 3 camera-trapping seasons to estimate local abundance of Andean cats and Pampas cats in Argentina (in progress) and extensive camera-trapping in Chile to detect presence of Andean cat and other carnivores.

Extensive surveys, data on the diet and activity patterns of High Andes carnivores, and the availability of prey in areas with and without carnivore signs, helped develop conceptual and spatial models to better understand the causes of rarity in the Andean cat (a good summary of current knowledge of this species is the book chapter produced by the project to be published by Oxford University Press). Andean cats, but also Pampas cats and culpeo foxes to a lesser extent, depend heavily on rodent prey, particularly mountain vizcacha, but birds can also be important in diet. The presence of rocky outcrops, offering refuge for cats and their preferred prey, and the distance to 'vegas' (wetland) productivity pockets, but not the presence of foxes, were the best predictors of the presence of wild cats in the region. Some localities within the triple frontier study area are very arid and therefore less suitable for carnivores; the area along the eastern slopes of the Andes is the more productive, but a predictive model based on climatic variables indicated that, at a larger spatial scale, the whole tri-national area constitutes a core range for Andean cats. Information generated using records of Andean cat presence, the habitat predictive models, and analysis of the impacts of off-road driving highlighted the significance of this region for the conservation of viable populations of Andean cats, and of key characteristics of the High Andes landscape that need to be protected to conserve carnivores and their prey.

#### **Output 2. Enhancement of local community environmental awareness**

Environmental education activities were coordinated with other AGA projects and members, and summarized in the *Guide for High Andes Educators*, now used by most AGA members in the four range countries and a number of rural schoolteachers and educators in some 25

localities in the tri-national region, staff from the Administración de Parques Nacionales (APN) in Argentina and Corporación Nacional Forestal (CONAF) in Chile.

Outputs included the production of baseball caps, educational posters and banners to promote High Andes conservation, a Bingo featuring Andean wildlife, two storybooks for young children printed in Bolivia and Argentina and distributed widely among High Andes schools of the four range countries of the Andean cat, well beyond our study area. An education campaign in Chile in collaboration with CONAF reached 4 new rural schools (85 school children) and delivered 10 public talks. In Argentina and Bolivia we worked with 12 rural schoolteachers and 3 headteachers. Seven local youth received training in environmental education, both individually and collectively in two workshops (Purmamarca, 2006 and Jujuy, 2008). Several of these trainees are now working independently supervised by local partners. With these initiatives we delivered environmental education activities to several hundreds of school children in Argentina, Chile and Bolivia.

### **Output 3. Training of future local conservation biologists**

In total the project provided opportunities for field and lab training to a total of 48 undergraduate (mostly short-term) and 10 graduate students across the three countries. We worked closely with several students supervising their theses, overseeing field work, analyses and writing up.

In Bolivia M. Viscarra and O. Torrico completed their Honours projects (Universidad Mayor de San Andrés) on the distribution, abundance and diet of High Andes carnivores in Reserve Eduardo Avaroa. Omar Osco is completing his Honours project at San Andrés.

In Chile the theses of two MSc students at Universidad Mayor are well advanced, C. Chirgwin on carnivore community habitat preferences and resource availability, and P. Alvarez on tropic ecology of High Andes carnivores

In Argentina several students from Universidad Nacional del Sur have benefited from training through the project. J. Reppucci is completing his PhD on ecology and abundance of Andean and Pampas cats in Argentina's High Andes. C. Tellaeche and C. Rodriguez are working on Honours projects. E. Luengos Vidal has been awarded a fellowship to compare the structure of carnivore guilds in the Pampas and High Andes.

We leveraged two postgraduate scholarships from the Sidney Byers Foundation (US). J. Reppucci travelled to Mongolia for hands-on experience on snow leopard camera-trapping and to USFWS Patuxent Wildlife Research Centre for camera-trap data analyses. M. Bennett of Chile travelled to Madrid and Oxford to work on the GIS database, spatial analyses and habitat suitability models.

### **Output 4. Capacity for biodiversity conservation increased through trans-frontier cooperation between protected area staff and biologists in three countries**

We sought to build long-term cooperation between governmental agencies and NGOs working in the conservation of High Andes biodiversity in the host countries. We used the two training manuals in formal training activities, and integrated individuals interested in research and educational activities.

Two international workshops held in Jujuy (December 2007) and Tilcara (December 2008), attended by representatives from Bolivia's Servicio Nacional de Areas Protegidas (SERNAP) Chile's CONAF, and Argentina's APN, Dirección Nacional de Fauna and Dirección de Medio Ambiente de Jujuy. GCFA and AGA were also present. The Tilcara Agreement set out the guidelines for collaboration for the conservation of the High Andes biodiversity around the triple frontier and the signatories formally requested technical advice from AGA and GCFA networks.

During these meetings Argentine authorities confirmed their interest in upgrading the status of Las Chinchillas Provincial Reserve, and asked the support of AGA and GCFA for the mapping and compilation of a management plan.

### **Output 5. Guidelines for good practice for conservation of the Puna disseminated more widely**

An additional outcome of the Tilcara Agreement is that all technical and ecological knowledge accrued by the project will be directly available to the signatory agencies through the collaboration herewith established. During the last phase the project emphasis was on data

processing and analysis, creating valuable databases (Annex 12) and various publications that are currently being disseminated. The results are already informing PAs managers in ongoing decisions for zonation and control of tourism within the protected areas (Los Flamencos y Avaroa), including the effects of off-road-driving (Annex 15), and collaborations for technical support involving project members continue.

Seven issues of a six monthly project newsletter (Annex 14) were extremely useful to communicate project progresses and results to partners and local communities, reinforcing networks and helping to disseminate conservation messages, supplemented by workshops targeting different audiences. Training manuals have already been adopted widely and standard data collection continues by students, volunteers, and PA staff.

Within the scientific and conservation community the results are disseminated via scientific papers spanning natural history of carnivores to human perceptions, and 17 presentations to international and national conferences. Media coverage of the project, project activities and results increased throughout the duration of the project, in the local and national media.

#### **4.4 Project standard measures and publications**

In addition to the very well received training manuals the most significant publication resulting from the project to date is a chapter in a forthcoming book on Biology and Conservation of Wild Felids published by Oxford University Press and edited by D.W. Macdonald and A. Loveridge (due in late 2009).

In addition to the project standard measures and publications (Annex 4 & 5) we presented our work in several international conferences. E.g., Society of Conservation Biology, (Port Elizabeth, South Africa); Biology and Conservation of Wild Felids Conference (Oxford, UK); 3rd Argentina-Chile Bi-national Meeting of Ecology (La Serena, Chile); 3rd Bolivian Mammal Conference (Santa Cruz de la Sierra, Bolivia); 6th Wildlife Conservation Network Expo (San Francisco, USA).

#### **4.5 Technical and Scientific achievements and co-operation**

All project partners cooperated towards the scientific and technical achievements of the project. Researchers worked in a coordinated way using common protocols, ensuring data quality and compatibility, and supervising the work of students, field assistants and PAs staff. The success in achieving our technical and scientific outputs thus relied not only on the quality and quantity of newly generated information, but also on true transfrontier collaboration and cooperation of all stakeholders. The project's scientific work appreciably increased our knowledge of the ecology and distribution of High Andes carnivores and Andean cats in particular. This was up to now the least known of all wild cat species, chiefly due to methodological and logistical difficulties associated to the study of rare and elusive species. Full descriptions of methods and findings in manuscripts published or subjected to peer review journals (Annex 17) and theses (Annex 18). Below is an overview of our technical and scientific achievements:

1. Field manual of field techniques to study High Andes carnivores, and more specifically Andean cats and their prey, developed in cooperation with AGA partners and disseminated widely amongst AGA members and project partners.
2. A method of line-transect counts of carnivores signs adopted for ecological research in Bolivia and Argentina; camera-trapping used to detect Andean cat presence in Argentina and Chile. These methods provided the bulk of information for two Honours thesis, two manuscripts for peer-reviewed journals (in their final phases), a book chapter, and additional results to be presented in the 10<sup>th</sup> International Mammal Conference (Argentina, August 2009).
3. Presence of Andean cats at each side of the triple frontier confirmed by field surveys conducted by students working with a project partner in each country; including the first records for Eduardo Avaroa National Reserve (Bolivia) and Licancabur-Tatio (Chile). These records suggest a continuous population across borders, and unveil areas either unsuitable of low Andean cat density (e.g. where camera-trapping and transect failed to confirm their presence).
4. An updated AGA database of 240 confirmed Andean cat records across the species distribution, including these new records and compiled by other project members.

5. Predicted distribution of suitable Andean cat habitat at the continental (South America) scale, using the Andean cat presence dataset and a set of climatic variables (Annex 13). This is a collaboration between Oxford and colleagues in Chile with expertise in GIS and modelling. Using MAXENT (programme which applies an algorithm suitable for relatively small databases and specialized organisms) we explored environmental relationships and produced a map of probabilities depicting the degree of suitability of each 1km-cell. We confirmed that Andean cats are largely restricted to high altitude habitats in the Central Andes, with aridity and extreme temperatures also affecting the distribution of known records. The model also predicts suitable habitats at lower elevations in Monte eco-region of Argentina towards the southern end of the species distribution, where new records continue to emerge. The tri-national region appears as one main core area for Andean cats, limited to the south by the 'Arid arch' that straddles the Andes constraining the distribution of best Andean cat habitats along the High Andes. There is a large proportion of optimal habitats in the Argentine side (probability >5); Bolivia contains some dry, lower quality areas, but the large extension of habitat there encompasses important areas for Andean cats; and in Chile Los Flamencos protects smaller patches of best habitat within a more arid matrix, with important habitat corridors between core areas (A scientific paper with these results is ready for submission).

6. GAP analyses of the representation of suitable Andean cat habitats within the network of protected areas in South America (IUCN database) and across countries. Also a database (Annex 12) including the extent of suitable and optimal habitats for each PA, and whether it has confirmed Andean cat presence.

7. Ecological information from 242 line-transects from REA and Vilama, Argentina, collated into one central database (Annex 12). Analyses explore relationships between presence of Andean cats and other carnivores, their prey and environmental variables. Using presence-absence data and resource selection functions we evaluated various possible biological models. The presence of small cats was best explained by the abundance of mountain vizcacha, the presence of rocky outcrops (where they find refuge), and the proximity to characteristic 'vegas' (wetlands, particularly in the most arid areas in Chile); the presence of culpeo sign did not affect the presence of small cat sign.

8. Andean cats share a narrow pool of rodent prey across boundaries, are largely dependent on the large mountain vizcacha as their main prey, and more specialized than other sympatric carnivores. Mountain vizcachas are a large, profitable prey, but small rodents and birds are also common in the diet of Pampas cats and culpeos. The study in Bolivia by student M. Viscarra permitted comparisons with previous work to encompass samples from the three countries in the trinational region.

9. A technical paper on methods for the estimation of relative abundance of mountain vizcachas, including line transect pellet count, observation and photographic rates. Although not validated against true abundance, correlation between indices suggests that simple and affordable methods can be used when protocols are standardized and sampling efforts carefully calculated, but photographic rates may provide the most reliable estimates, especially where mountain vizcachas are nocturnal.

7. A chapter book reviewed by world experts in felid biology and conservation (Oxford University Press, in press) reviews existing and new knowledge generated by the project to explore causes of rarity in Andean cats, and its conservation implications, including high habitat/prey specificity, low detectability and intraguild competition.

8. A GIS database of climatic variables (1km resolution) and PA polygons at the continental scale; a regional GIS database for the tri-national area, including vegetation maps (resolution 25m), from a supervised classification of a Landsat TM+ image, elevation and orientation (from a DEM), hydrological systems, roads, tourist attractions, etc.

9. Andean cat records from tri-national region (>20) to fit a distribution model at a smaller scale and higher resolution than the South American model (manuscript in preparation).

10. Assessment of the distribution of disturbance of, and threats posed by, off-road driving by tourism operators. Particularly upon key habitats for Andean cats and reproductive colonies of flamingos (in collaboration with GCFa) (Disturbance maps complete; spatial analyses in progress).

11. Temporal segregation of High Andes carnivores explored from camera-trapping data. Carnivore activity patterns overlap widely, most species are active largely at night, but there are indications that Pampas and Andean cats segregate their temporal niches, a possible mechanism to reduce intra-guild competition.

12. A first study of the population genetics of Pampas and Andean cats. Andean cats harbour extremely low mitochondrial and nuclear genetic diversity, but some management units can be identified among cat populations. A historical bottleneck and low effective population size seem responsible for the low genetic diversity (published and submitted papers).

13. Assessment of local and traditional knowledge of High Andean biological resources, from personal interviews and community workshops. Some negative perceptions and negative attitudes towards carnivores in general, but the causes remain unclear; low tolerance especially for pumas, the main predator of livestock; in the case of small cats lack of awareness of their ecological role underlies negative attitudes. Environmental education can be used to improve their image and to reduce retaliatory killings.

14. These ecological studies revealed which key components of the High Andes ecosystem would be suitable to measure changes in the suitability of habitats for carnivores (and Andean cats in particular) and in the occupancy or abundance of carnivore populations. Developing guidelines or monitoring plans for High Andean carnivores and prey is an ongoing process, involving all AGA members. Working still required to determine the scale and effort needed to achieve comparable measures, with adequate accuracy, to measure changes in time.

#### **4.6 Capacity building**

As per the project purpose capacity building was a major output. Project accomplishments in this regard are listed in section 4.3 under Output 4. We built a mechanism for trans-frontier cooperation between governmental agencies and NGOs working in the conservation of High Andes biodiversity in the host countries, leading to the Tilcara Agreement which provides a mechanism to capitalize on the human resources enhanced by the project.

A large share of our efforts was dedicated to this training and human development. APN, CONAF and SERNAP, our main government partners have improved human resources as a result of this partnership, specifically through training workshops targeting their staff, field training and participation in education campaigns.

The academic support provided by Oxford staff and partner universities facilitated the training of students from Universidad Nacional del Sur, Universidad Nacional de Salta, Universidad Nacional de La Pampa, Universidad Nacional de La Plata, Museo de Ciencias Naturales de Salta, CONICET (Argentina); Universidad Loyola, Universidad Mayor de San Andrés, Universidad Mayor de San Simón, Universidad Tecnológica Boliviana (Bolivia); Universidad Mayor, Universidad de Chile, Universidad Católica de Chile (Chile). A total of 10 undergraduates and graduates have completed or are expected to complete their theses in connection to this project, largely thanks to DI resources. 200 weeks of hands-on training were provided to 58 additional students.

The PL and Oxford ecologist worked closely with partners advising students on ecological research and data collection and analysis. In turn UK personnel acquired valuable experience through their participation in this project, improving their organizational, managerial and facilitation skills. The Oxford ecologist extended her spatial ecology skills by learning additional GIS and modelling tools and working closely with a geographer and a modeller.

The project involved many members of the AGA network, and contributed to the institutional development of AGA, increasing the level of cooperation between members and the internal flow of information, as well as assisting with the preparation of an institutional strategy.

#### **4.7 Sustainability and Legacy**

The Tilcara Agreement is likely to be the longest enduring achievement of this project, since it provides tangible evidence of host country interest in High Andes biodiversity and sets the bases for future collaboration, formally inviting AGA and GCFA to provide technical advice to



government agencies. A forthcoming AGA meeting (Argentina, August 2009) will discuss ideas for common activities within the Tilcara Agreement framework.

All host country partners in this project are active members of AGA, an organization now stronger and more efficient than at the beginning of our project. AGA network and regular meetings provide a suitable environment for project partners to stay in touch. Indeed it is very likely that project partners will continue to work together on new projects concerning High Andes biodiversity conservation; there are funding proposals already in place for additional work in the triple frontier. There also indications that some of the students we trained will keep working on related topics.

The databases produced by the project will be kept updated by AGA and expanded as new data comes in and they are used for research and monitoring activities. We anticipate continued collaboration with GCFA and government agencies in Bolivia and Chile on the second phase of the off-road project.

The PL and Oxford ecologist plan to remain involved with High Andes conservation in the triple frontier, e.g., in a supervisory role of M. Bennett's PhD, and developing additional work jointly with AGA and GCFA. We are currently discussing funding sources.

## **5 Lessons learned, dissemination and communication**

The key lesson is that in communication among partners is essential in international collaborations, and good mechanisms to establish and maintain communication should be agreed and implemented early on. Through good networking and partnerships the project will in all likelihood outlive its first three years and the investment, contributing to its legacy.

The effort required to collect and collate data and information with common protocols should not be underestimated.

We consider that the project was successful at disseminating its results and conservation message, by using a variety of approaches, from scientific papers and technical reports to newsletters, to reach the different audiences representing the various stakeholders. Also some concrete applications are already tangible, including: a) the use of information on Andean cats and their prey in implementation of a zonation in Avaroa, b) plans to control tourism in the tri-national region, c) an information campaign for tourists with the Andean cat as flagship species, d) lobbying for the creation of new protected areas in Licancabur-Tatio (Chile) and Vilama (Argentina).

The structure we put in place and the strong bonds promoted within AGA and more recently with GCFA, guarantees that post-project follow-up actions will exist and that information dissemination will continue well after project termination. Additional evidence of these future developments is that several common publications have already been planned with partners.

### **5.1 Darwin identity**

The Darwin Initiative logo has been used in all outputs directly produced by the project. These included newsletters, posters, banners and leaflets, training manuals and reports. The logo also featured in all conference presentations and public talks we and our partners gave. Darwin contribution is acknowledged in all scientific and popular publications resulting from the project. The logo was displayed in the project vehicle.

Our project was linked to several research and conservation initiatives undertaken by project partners. Those partners acknowledged DI as one of their own sponsors. The transfrontier approach embraced by the DI project is the first of its kind within the AGA network, and as such attracted a lot of attention. Among stakeholders, partners, other members of the AGA network the transfrontier project was strongly identified with Darwin Initiative and Oxford University.

Our impression is that in the host counties there is greater awareness and a better understanding of the Darwin Initiative now than 4 years ago. Initially it was only scientists and a few civil servants that seemed to be aware of the Darwin Initiative as a source of funding, whereas a larger constituency is now familiar with it. This may have been influenced by the media attention given to Charles Darwin 200<sup>th</sup> anniversary.

## 6 Monitoring and evaluation

To determine whether the project and its components were conducted as planned we carried out an internal project evaluation throughout the course of the project. This progress evaluation took into account annual report reviews and determined whether the project was meeting its stated purpose, objectives, outputs and milestones according to the proposed timetable. Towards the end of each project year, an evaluation took place to assess strengths, weaknesses and implement corrective measures. We also assessed the cost-effectiveness of what had been accomplished, benefits to trainees and the effectiveness of components. No changes to the original logframe were deemed necessary.

The main project activities, timetables and the staff responsible for the execution of the project were included in the project's annual operational plan. We promoted the participation of all partners in the evaluation of the project. All universities involved evaluated the proposed plans for the theses conducted during the project. Outcome indicators served as a baseline for measuring success. Success was estimated based on training and education outputs (number of people trained and training weeks), cooperation activities with local institutions, and academic outputs (theses, papers and technical reports).

The main difficulty of the project was the large geographic extent of the study area and the logistics involved in accessing and travelling in the High Andes. We solved this by allowing flexibility to project partners to carry out their field work at their own convenience, always within the general operational plan.

At the end of the project we evaluated whether the project was replicable, transportable and applicable to other parts of the High Andes. We examined how research and training contributed to understanding of the key factors involved in the long-term conservation of Andean cats and High Andes habitats. We also evaluated the realised potential of the Andean cat as a flagship for High Andes biodiversity conservation, and are considering applying for a DI post-project for additional work in this context.

### 6.1 Actions taken in response to annual report reviews

The reviewers were very positive in the annual reports. All issues raised by the reviewers were discussed with project partners, and actions to address them were jointly agreed. In the last review there were three issues that required addressing in the final report:

1. **Additional survey areas and Andean cats detected.** These data are incorporated in the Andean cat record database (Annex 12) and used in the model (see map in Annex 13).

2. **Lack of comment on the assumptions presented in the log frame.** While initial assumptions were not discussed specifically they proved to be correct, as supported by project outcomes. These included the overall assumption that local communities and PA management will support project activities and be prepared to incorporate future management recommendations, and that local population would react positively to the project. There was little evidence of hunting during the duration of the project, although we are unable to confirm that our activities resulted in reduced hunting pressure on cats and other fauna.

Our scientific research confirmed the assumption that Andean cats are limited mainly by the distribution of highland vertebrate prey, and that their distribution across the tri-national region, albeit at apparent low density, encompasses critical habitats for three flamingo species, recovering vicuña populations, patches of *Polylepys* (a high altitude endemic tree), and extensive networks of wetlands and associated fauna, in accordance with our assumption that Andean cats are a good umbrella species for High Andes biodiversity. Local communities, particularly children, were receptive to the environmental message (as evaluated by before-after surveys in Argentina), PA staff was available and motivated for training and participation, and biologists cooperated and mutually benefited from sharing previous High Andean expertise. The Tilcara Agreement is ample proof of the recognition of common problems and solutions for conservation across countries and of potential synergies achieved through cooperation. Reinforced and expanding networks, and evolving collaborative projects, all give sustenance to our assumption that transfrontier cooperation can trigger good communication among stakeholders.

3. **Further evidence of Andean cat is an effective flagship.** Largely restricted to the High Andean ecosystem, a priority biome in Latin America because of its high level of endemism, we argued that the Andean cat had potential as a flagship for High Andes conservation. Although rare and elusive, Andean cats are charismatic and have religious significance amongst the Aymara and Quechua peoples, for whom they symbolize prosperity and abundance. In its flagship role Andean cats have so far helped raise awareness of the need to protect High Andes biodiversity, at least among, but not restricted to, researchers, donors and conservation agencies. The drive and enthusiasm generated by by AGA members across the species range, has already resulted in the production of an Action Plan for its conservation, a field manual with standardized methodologies, and common educational strategies to increase awareness of the need to protect Andean ecosystems among local communities. Yet, there is a challenge to improve the image of Andean cats among those with a more negative attitude. AGA is working with PA authorities to develop coordinated activities to address common threats to the High Andes biodiversity, such as the illegal hunting of vicuñas, livestock grazing, unregulated off-road tourism, as well as highlighting the needs for wildlife monitoring. This initiative includes a precursor of international collaboration in the region, GCFA, which works on critically important wetlands for the conservation of flamingos. GCFA and AGA have joined forces in this common endeavour. Potentially, Andean cats and flamingos may also help foster compliance with environmental impact legislation from the mining industry, particularly regarding the use of water, and best-practice guidelines for the burgeoning off-road tourism market.

## 7 Finance and administration

### 7.1 Project expenditure

Item	Budget (£)	Spending (£)	Difference from Budget (£)	% Difference
<b>Staff Costs</b>				
<b>Rent, rates, heating, lighting, cleaning</b>				
<b>Consumables &amp; other Staff Costs</b>				
<b>Travel and subsistence</b>				
<b>Printing</b>				
<b>Conferences &amp; Seminars</b>				
<b>Capital items</b>				
<b>Other</b>				
<b>TOTAL</b>				

Due to different budget headings available on Oxford University's finance system "Oracle" the Items listed do not match those in the original budget. Please note this award was extended for 6 months, and this explains the overspend figures on **Staff Costs** and **Travel & Subsistence** in particular. Purchase of camera traps and cost of sniffer-dog training included under **Other**. Overseas workshops expenditure was charged to **Other**, explaining the overspend and associated underspend in **Conferences & Seminars**.

## 7.2 Additional funds or in-kind contributions secured

In addition to confirmed matching funding of £92,750 the project raised an additional US\$15,660 for training sniffer dogs, US\$12,150 for the Off-road project and US\$9,940 to support creation of new protected area in Argentina. These grants were awarded by the Wildlife Conservation Network. Two Sidney Byers Training Scholarships were also received, totalling £13,500. WildCRU contributed full-time use of a 4x4 truck, worth an estimated £6,000 for the duration of the project.

## 7.3 Value of DI funding

DI funding allowed us to expand the networking spirit of the Andean Cat Alliance into an ambitious transfrontier approach. Without DI support we would not have been able to train people, produce standard data collection and education protocols and undertake field surveys across the study area. More important DI funding allowed us to hold the essential stakeholder workshops that resulted in the final Tilcara Agreement.

## 7.4 List of Annexes (Submitted in a separate CD. Those marked \* also accompany this report)

### **International agreement**

\*Annex 7: The Tilcara Agreement for transfrontier collaboration

### **Training manuals & education material**

Annex 8: Methodological manual

Annex 9: Education manual

Annex 10: Banners

\*Annex 11: Off-road information campaign

### **Databases & Maps**

Annex 12: Biological data on Andean cats, carnivores, prey and protected areas (4 databases).

\*Annex 13: Maps of Andean cat distribution and predictive models (1 map included with report)

### **Newsletters & reports**

Annex 14: Project Newsletters (0-6)

Annex 15: 'Proyecto Huella Unica' (off-road) report 2007-2009 (spanish)

### **Publications**

\*Annex 16: Book chapter

Annex 17: Selected publications in peer reviewed journals

Annex 18: Thesis (3)

## Annex 1 Report of progress and achievements against final project logframe for the life of the project

Project summary	Measurable Indicators	Progress and Achievements April 2007 - March 2009	Actions required/planned for next period
<p><b>Goal:</b> 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</p> <ul style="list-style-type: none"> <li>• The conservation of biological diversity,</li> <li>• The sustainable use of its components, and</li> <li>• The fair and equitable sharing of the benefits arising out of the utilisation of genetic resources</li> </ul>		<p>Better knowledge of High Andes vertebrate fauna. Authorities in all three countries signed framework MoU for international cooperation in High Andes biodiversity conservation. Local communities, PA staff and general public more involved in High Andes conservation. School Children attitude more favourable to biodiversity protection.</p>	<p>(do not fill not applicable)</p>
<p><b>Purpose</b></p> <p>To facilitate long-term protection of the vertebrate biodiversity of the Central Andes High Andes across national frontiers, through establishment of the Andean cat as a conservation flagship, local community participation and protected area (PA) staff training.</p>	<p>New knowledge on the distribution of Andean cats and prey and identification of key conservation sites for vertebrate species.</p> <p>Increased local environmental awareness.</p> <p>Increased capacity of scientists, practitioners and PA staff to implement conservation measures and train their successors to do the same.</p>	<p>Andean cat established as a flagship for High Andes conservation, thanks to expansion of research, networking and education activities. Standardised data collection resulted in greater, more efficient collaboration under AGA network. More people now aware of High Andes natural resource conservation needs. Many have received training in field techniques and education tools. Unprecedented baseline of biodiversity data resulted in greater understanding of ecology of High Andes carnivores and their prey. Most data processing completed and mss published or submitted. More mss in progress.</p>	<p>Implement Tilcara Agreement.</p> <p>Complete and publish additional publications and continue presentation of results in conferences.</p> <p>Seek additional funding for further conservation activities in the triple frontier.</p>
<p><b>Output 1.</b> Key conservation areas for Andean fauna identified.</p>	<p>Basic understanding of cat / prey ecology by yr1.</p> <p>Mapping of Puna habitats and cat / prey distribution by yr3.</p>	<p>Surveys confirmed presence of Andean cats across triple frontier region, suggesting one continuous population across straddling national borders. Andean cats share the same pool of rodent prey across borders. Andean cats largely dependent on mountain vizcacha as main prey. More specialized than other sympatric carnivores.</p> <p>A model of Andean cat distribution identified the tri-national region as a core area for the species, with suitable habitat across borders. Combined data analyses generated by standard methods showed Andean cat presence is associated to rocky outcrops (refuge), mountain viscachas, and proximity to characteristic wetlands, 'productivity pockets' of this landscape. A large scale South American model and a small scale regional model of habitat suitability for the tri-national area produced, with gap analyses and key areas for conservation of Andean cats and other High Andes vertebrates. Report detailing the distribution and threat posed by tourism off-road driving on key habitats. Using academic and publication indicators proved essential to maintain focus and purpose for the project.</p>	

Activity 1.1. Field surveys and data collection by students and project members in the 3 countries.		<p>Surveys included first records of Andean cats for Eduardo Avaroa (Bolivia) and Licancabur-Tatio (Chile). Standardised methodology and data collection implemented across AGA partners, facilitating cooperative analysis. Compilation of two common databases, available to all stakeholders.</p> <p>Numerous publications have been produced and submitted and more being developed. Two student theses completed and four more are advanced.</p>
Activity 1.2. Training of sniffer dogs to identify Andean cats from faeces		Dog handlers and sniffer dogs selected, field training and tested completed. Unfortunately trained dogs failed in sampling specificity. More work is required, but lack of funding placed this activity on hold.
<b>Output 2.</b> Enhancement of local community environmental awareness.	1 teacher training workshop and production of education materials by yr1. All relevant local communities & schools reached by yr 3	<p>Education campaigns reached all relevant communities thanks to the coordinated work of project partners, students, educators, park rangers and young villagers trained. Educational activities will continue beyond Darwin project. Indicators were appropriate, but evaluation of effects of activities via analysis of before-after awareness surveys not completed.</p> <p>Off-road education campaign used posters (500) banner (5) and brochures (10,000) to raise awareness of the problems of uncontrolled tourism among travel agencies and local communities, PA managers and visitors. Focus on PAs in Chile and Bolivia, where most tourism occurs. Workshops in both countries to inform travel operators of High Andes diversity and conservation. Off-road project will continue for another year.</p>
Activity 2.1. Teachers' workshops		Three training workshops for educators completed. One more will be held in Argentina in 2009.
Activity 2.2. Selection and training of local education officers		Local Education Officers trained and currently in activity in three host countries.
Activity 2.3. Edition of a manual for High Andes educators		Completed, demonstrated in workshops and fully adopted by AGA members, Network of High Andes Educators and local institutions.
Activity 2.4. Education at schools and community meetings		Completed and ongoing in three host countries. Additionally two off-road tourism workshops with travel agents and local communities.
Activity 2.5. Production of posters, banners and children storybooks		Posters and banners in display. Two storybooks produced and distributed widely in the three host countries (plus Peru). Off road campaign produced posters, banners and leaflets.
Activity 2.6. Evaluation of education effects on attitude change		Evaluation completed in Argentina, shared with AGA partners and submitted for publication.
<b>Output 3.</b> Training of future local conservation biologists.	In-country training of at least 6 project members from 4 partner institutions on survey techniques by yr 1.	Monitoring manual in use by all project partners and other AGA members. Standard methodology in place in three hot countries. Final output far exceeded indicator target.

Activity 3.1. Edition of a manual with input from project members and other AGA members		Completed and distributed among AGA members, academic institutions, local authorities and protected area staff. Interest for manual shown beyond host countries.
Activity 3.2. Students, volunteers and protected area staff receive training in survey techniques		Carried out and completed in all host countries, under supervision of relevant local project member. Training to be continued by project partners beyond DI project.
Activity 3.3. Supervision of Master, PhD and graduation students		Direct supervision carried out by local partners and advice from UK partners. Two theses completed and four more advanced. Ongoing support with data analyses, completion of outstanding theses, scientific papers and presentations to conferences.
<b>Output 4.</b> Capacity for biodiversity conservation increased through trans-frontier cooperation between protected area staff and biologists in three countries.	3 PA management and guard's training workshops by yr 2. 1 tri-national PA meeting by yr3.  Agreement on a framework for communication and collaboration across frontiers.	Three international workshops provided training to PA staff and led to the signing of Tilcara cooperation agreement on High Andes biodiversity conservation across borders by PA authorities from the three host countries. Indicators were appropriate.
Activity 4.1 PA management and guard's training workshop in Bolivia		Implemented. Report available: Workshop on Andean cat conservation in protected areas Villalba L. 2006 (in Spanish)
Activity 4.2 Formal visits to PA authorities (regional and national) in Argentina		Completed. Six formal meetings by Project Leader accompanied by relevant local partners.
Activity 4.1 PA staff technical workshop in Argentina		Implemented. Report available: Transfrontier conservation Workshop of the Andean cat, Marino M.J. 2008 (in Spanish)
<b>Output 5.</b> Guidelines for good practice for conservation of the Puna disseminated more widely.	Local media coverage (newspapers, radio & TV), 1 training manual by yr 2, 2 peer-reviewed publications by yr 3, 1 Andean cat monitoring plan in place by yr 3.	Two Technical manuals and seven newsletters printed and distributed to various stakeholders (from local leaders and teachers to all other AGA members and the general public via websites). Peer-review publications completed. First draft of Andean cat monitoring plan in preparation, with other AGA members.
Activity 5.1. Edition of training manual compiling previous experiences by biologists and educators		Printed and distributed among AGA members, academic institutions, PA agencies.
Activity 5.2. Dissemination of standardized methods for collection and analysis of data during the bi-annual AGA meeting		UK and local attended AGA 2006 and 2008 meetings, first introducing concept and then securing the adoption of standardized methods across AGA membership.

## Annex 2 Project's final logframe, including criteria and indicators

Project summary	Measurable Indicators	Means of verification	Important Assumptions
<p><b>Goal:</b></p> <p>To draw on expertise relevant to biodiversity from within the United Kingdom to work with local partners in countries rich in biodiversity but poor in resources to achieve</p> <ul style="list-style-type: none"> <li>• the conservation of biological diversity,</li> <li>• the sustainable use of its components, and</li> <li>• the fair and equitable sharing of benefits arising out of the utilisation of genetic resources</li> </ul>			
<p><b>Purpose</b></p>			
<p>To facilitate long-term protection of the vertebrate biodiversity of the Central Andes Puna across national frontiers, through establishment of the Andean cat as a conservation flagship, local community participation and protected area (PA) staff training.</p>	<p>New knowledge on the distribution of Andean cats and prey and identification of key conservation sites for vertebrate species.</p> <p>Increased local environmental awareness.</p> <p>Increased capacity of scientists, practitioners and PA staff to implement conservation measures and train their successors to do the same.</p>	<p>Results of monitoring and GIS analysis of High Andes habitats, Andean cat &amp; prey base distribution.</p> <p>Records of education campaign coverage and attitude surveys.</p> <p>Scientific papers, technical reports, research theses and conference abstracts. Copies of publications sent to DI.</p>	<p>Local population reacts to project by reducing hunting pressure on cats and other fauna.</p> <p>Local communities and PA management support project activities and are prepared to incorporate future management recommendations.</p>
<p><b>Outputs</b></p>			
<p>Key conservation areas for Andean fauna identified.</p>	<p>Basic understanding of cat / prey ecology by yr1.</p> <p>Mapping of Puna habitats &amp; cat / prey distribution by yr3.</p>	<p>Field survey reports submitted.</p> <p>3-5 theses submitted.</p> <p>Peer-reviewed papers submitted.</p>	<p>Andean cats limited mainly by the distribution of highland vertebrate prey.</p> <p>Andean cats suitable umbrella species for Puna biodiversity.</p>
<p>Enhancement of local community environmental awareness.</p>	<p>1 teacher training workshop and production of education materials by yr1. All relevant local communities &amp; schools reached by yr 3.</p>	<p>Educational materials.</p> <p>Participant attendance and assessment records.</p> <p>Results of before-after awareness survey of education campaign.</p> <p>Reports from community monitors.</p>	<p>Local communities, particularly children, are receptive to environmental message</p>



Training of future local conservation biologists.	In-country training of at least 6 project members from 4 partner institutions on survey techniques by yr 1.	Workshop report with monitoring guidelines booklet. Standardized field methodology applied across boundaries.	Biologists cooperate and mutually benefit from sharing previous Puna expertise.
Capacity for biodiversity conservation increased through trans-frontier cooperation between protected area staff and biologists in three countries.	3 PA management and guard's training workshops by yr 2. <b>1 tri-national PA meeting by yr3.</b>  Agreement on a framework for communication and collaboration across frontiers.	Participant workshop attendance and assessment record.  Report of agreement between PA managers for continuous collaboration.	Existence of common problems and solutions for Puna conservation across countries.  Existence of potential synergies to be achieved through cooperation.  Local stake-holders and PA staff available and motivated for training and participation.
Guidelines for good practice for conservation of the Puna disseminated more widely.	Local media coverage (newspapers, radio & TV), 1 training manual by yr 2, 2 peer-reviewed publications by yr 3, 1 Andean cat monitoring plan in place by yr 3.	Records of media coverage.  Records of the distribution of publications to all relevant stakeholders.	Trans-frontier cooperation triggers communication among stakeholders.
<b>Activities</b>	<b>Milestones (Summary of Project Implementation Timetable)</b>		
Project organisation	Yr1: Project planning (Oct-Dec05)		
Workshops	Yr1: Teachers' training workshop and start implementation of education campaign (Jan-Feb06); Yr1: biologists workshop on habitat survey and monitoring skills, production of monitoring manual (Jan-Mar06); Yr2: PA staff workshops in-country (Mar-Sep06); Yr3: one tri-national workshop, agreements for future collaboration (Jan-Mar08?)		
Field research programme	Yr1-3: Field surveys by students and biologists (Apr06–Mar08); Yr2-3; data analysis, production of maps, reports and publications; Yr3: Students submit thesis, long-term Andean cat monitoring plan accorded (May-Jun08)		
Education programme	Yr1: Drafts of education material (Dec05-Jan06); Yr2: Distribution of education material (by Jan07); Yr1-3: Education campaign at local schools and community meetings		
Dissemination/publicity material	At least 1 radio broadcast and newspaper article per year in each country; project results in local & international publications and conferences (various dates); 2-3 peer-reviewed publications by July 08		

## Annex 3 Project contribution to Articles under the CBD

### Project Contribution to Articles under the Convention on Biological Diversity

Article No./Title	Project %	Article Description
7. Identification and Monitoring	25	Identify and monitor components of biological diversity, particularly those requiring urgent conservation; identify processes and activities that have adverse effects; maintain and organise relevant data.
12. Research and Training	30	Establish programmes for scientific and technical education in identification, conservation and sustainable use of biodiversity components; promote research contributing to the conservation and sustainable use of biological diversity, particularly in developing countries (in accordance with SBSTTA recommendations).
13. Public Education and Awareness	25	Promote understanding of the importance of measures to conserve biological diversity and propagate these measures through the media; cooperate with other states and organisations in developing awareness programmes.
Other Contribution	20	In-situ conservation, exchange of information
Total %	100%	Check % = total 100

## Annex 4 Standard Measures

Code	Description	Totals (plus additional detail as required)
<b>Training Measures</b>		
1a	Number of people to submit PhD thesis	1 (Argentina)
1b	Number of PhD qualifications obtained	None
2	Number of Masters qualifications obtained	2 (Chile)
3	Number of other qualifications obtained	Honours projects 3 (Bolivia); 1 (Argentina)
4a	Number of undergraduate students receiving training	48 (6 Bolivia, 16 Argentina, 26 Chile)
4b	Number of training weeks provided to undergraduate students	151 (12 Bolivia, 92 Argentina, 47 Chile)
4c	Number of postgraduate students receiving training (not 1-3 above)	10 (1 Bolivia, 4 Argentina, 4 Chile)
4d	Number of training weeks for postgraduate students	43 (4 Bolivia, 22 Argentina, 17 Chile)
5	Number of people receiving other forms of long-term (>1yr) training not leading to formal qualification( ie not categories 1-4 above)	1 (Argentina)
6a	Number of people receiving other forms of short-term education/training (ie not categories 1-5 above)	52 (33 Bolivia, 13 Argentina, 6 Chile)
6b	Number of training weeks not leading to formal qualification	83
7	Number of types of training materials produced for use by host country(s)	3
<b>Research Measures</b>		
8	Number of weeks spent by UK project staff on project work in host country(s)	18
9	Number of species/habitat management plans (or action plans) produced for Governments, public authorities or other implementing agencies in the host country (s)	1 in prep.
10	Number of formal documents produced to assist work related to species identification, classification and recording.	1
11a	Number of papers published or accepted for publication in peer reviewed journals	10
11b	Number of papers published or accepted for publication elsewhere	3 (1 book chapter, 2 divulgation articles)
12a	Number of computer-based databases established	2 (transects and GIS)

<b>Code</b>	<b>Description</b>	<b>Totals (plus additional detail as required)</b>
	(containing species/generic information) and handed over to host country	
12b	Number of computer-based databases enhanced (containing species/genetic information) and handed over to host country	1 (AGA)
13a	Number of species reference collections established and handed over to host country(s)	None
13b	Number of species reference collections enhanced and handed over to host country(s)	None
<b>Dissemination Measures</b>		
14a	Number of conferences/seminars/workshops organised to present/disseminate findings from Darwin project work	24 (6 Bolivia, 6 Argentina, 12 Chile)
14b	Number of conferences/seminars/ workshops attended at which findings from Darwin project work will be presented/disseminated.	17
15a	Number of national press releases or publicity articles in host country(s)	9
15b	Number of local press releases or publicity articles in host country(s)	3
15c	Number of national press releases or publicity articles in UK	None
15d	Number of local press releases or publicity articles in UK	3
16a	Number of issues of newsletters produced in the host country(s)	7
16b	Estimated circulation of each newsletter in the host country(s)	200 hard copies, 2 e-lists, 2 websites
16c	Estimated circulation of each newsletter in the UK	2 e-lists, 2 websites
17a	Number of dissemination networks established	2 (GIS, tour operators)
17b	Number of dissemination networks enhanced or extended	1 (Andean cat records, habitat transects)
18a	Number of national TV programmes/features in host country(s)	None
18b	Number of national TV programme/features in the UK	None
18c	Number of local TV programme/features in host country	2
18d	Number of local TV programme features in the UK	None
19a	Number of national radio interviews/features in host country(s)	1
19b	Number of national radio interviews/features in the UK	1
19c	Number of local radio interviews/features in host country (s)	2
19d	Number of local radio interviews/features in the UK	1
<b>Physical Measures</b>		
20	Estimated value (£s) of physical assets handed over to host country(s)	£12,000
21	Number of permanent educational/training/research facilities or organisation established	None
22	Number of permanent field plots established	None
23	Value of additional resources raised for project	£123,600
<b>Other Measures used by the project and not currently including in DI standard measures</b>		
	Internet press release ( <a href="http://tinyurl.com/lfnych">http://tinyurl.com/lfnych</a> )	1

## Annex 5 Publications

Type *	Detail	Publishers	Available from	Cost £
Manual *	Guidelines for High Andes Educators. M.J. Merino, editor. (2006)	GECEM, UNS Bahía Blanca, Argentina		Free
Manual *	Manual of Survey Methods for High-Andes Carnivores. Cossios, D. et al. (2007).	AGA & WildCRU Buenos Aires, Argentina	Paper and electronic versions from: <a href="http://www.wildcru.org">www.wildcru.org</a> <a href="http://tinyurl.com/andeancats">tinyurl.com/andeancats</a>	£10/Free
Scientific publication	Planning a common educational strategy for Andean cat conservation. Lucherini M. y Merino M.J. (2006).	<i>Oryx</i> 40: 137-138		Subscription
Scientific publication	Diet of the Andean mountain cat, colocolo, and culpeo in high-altitude deserts of Argentina. Walker S. et al. (2007)	<i>Journal of Mammalogy</i> 88: 519-525.	<a href="http://www.mammalsociety.org">www.mammalsociety.org</a>	Subscription
Scientific publication	Human-carnivore conflicts in the high-altitude Andes of Argentina. Lucherini M. & Merino M.J. (2008)	<i>Mountain Research and Development</i> 28:81-85.	<a href="http://www.mrd-journal.org">www.mrd-journal.org</a>	Subscription
Scientific publication	Ecological and biogeographic inferences on two sympatric and enigmatic Andean cat species using genetic identification of fecal samples. Napolitano C. et al. (2008)	<i>Molecular Ecology</i> 17:678-690.	<a href="http://www.blackwellpublishing.com">www.blackwellpublishing.com</a>	Subscription
Scientific publication	How rare is the rare Andean cat? Lucherini M. et al. (2008)	<i>Mammalia</i> 72: 95-101.	<a href="http://www.degruyter.com/journals/mammalia">www.degruyter.com/journals/mammalia</a>	Subscription
Scientific publication	Influence of ancient glacial periods on the Andean fauna: the case of the pampas cat. Cossios et al. (2009)	<i>BMC Evolutionary Biology</i> 9: 69.	<a href="http://www.biomedcentral.com/1471-2148/9/68">www.biomedcentral.com/1471-2148/9/68</a>	Free
Scientific publication	Human-puma conflicts in three areas from the southern cone of South America: preliminary data. Lucherini M. et al. (2009)	<i>Cat News</i> 49: 29-30.	<a href="http://www.catsq.org/catnews">www.catsq.org/catnews</a>	Subscription
Chapter in scientific book	Highland cats: ecology and conservation of the rare and elusive Andean cat. Marino J. et al. (in press). In <i>Biology and Conservation of Wild Felids</i>	Macdonald D.W. & Loveridge A.J. (Eds.). Oxford University Press, UK	<a href="http://www.oup.co.uk">www.oup.co.uk</a>	
Scientific publication	"Programa EduGat": el componente educativo de un proyecto para la conservación del gato andino. Merino M.J. et al. (in press)	<i>Tópicos en Educación Ambiental</i> 7.	<a href="http://www.anea.org.mx">www.anea.org.mx</a>	Subscription
Scientific publication	A comparison of three methods to estimate variations in the relative abundance of mountain vizcachas ( <i>Lagidium viscacia</i> ) in the High Andes ecosystems. Lucherini et al. (in press)	<i>Journal of Neotropical Mammalogy</i>	<a href="http://www.sarem.org.ar">www.sarem.org.ar</a>	
Scientific publication	Activity pattern segregation of carnivores in the high Andes. Lucherini et al. (in press)	<i>Journal of Mammalogy</i>	<a href="http://www.mammalsociety.org">www.mammalsociety.org</a>	
Scientific publication	Education contributes to the conservation of the endangered	<i>Conservation and Society</i>		

	Andean cat. Merino M.J. & Lucherini M. (submitted)			
Divulcation publication	Globalizing conservation of the mountain ecosystems. Reppucci J. & Koustoubh S. (submitted)	<i>BBC News Magazine</i>		
Scientific publication	Spatially-explicit inference for open populations: Estimating demographic parameters from camera-trap studies. Gardner, B. et al. (submitted)	<i>Ecology - Statistical Reports</i>	<a href="http://www.esajournals.org/loi/ecol">www.esajournals.org/loi/ecol</a>	
Scientific publication	Between high-altitude islands and high-altitude corridors: the population structure of the Andean cat. Cossíos D. et al. (submitted)	<i>Animal Conservation</i>	<a href="http://www.wiley.com/bw/journal.asp?ref=1367-9430&amp;site=1">www.wiley.com/bw/journal.asp?ref=1367-9430&amp;site=1</a>	
Storybook	La historia de Almita una gata andina. Cossíos D. & Merino M.J. (2008)	GECEM, UNS Bahía Blanca, Argentina		Free
Storybook	El gato andino y el cazador	AGA. La Paz, Bolivia		Free
Divulcation publication	El gato sagrado de los Andes. (2008)	<i>Muy Interesante</i> May: 8-12. (Chile)		
Divulcation publication	Detectives insaciables de la naturaleza. (2009)	<i>Muy Interesante</i> April (Argentina)		

## Annex 6 Darwin Contacts

<b>Ref No</b>	14-028
<b>Project Title</b>	Conservation of Puna's Andean cats across national borders
<b>UK Leader Details</b>	
Name	Dr Claudio Sillero-Zubiri
Role within Darwin Project	Project Leader
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Fax	
Email	
<b>Other UK Contact (if relevant)</b>	
Name	Dr Jorgelina Marino
Role within Darwin Project	Ecologist and modeller
Address	WildCRU (as above)
Phone	
Email	
<b>Partner 1</b>	
Name	Dr Mauro Lucherini
Organisation	Universidad Nacional del Sur
Role within Darwin Project	Local Coordinator
Address	Departamento de Biología, Bioquímica & Farmacia, San Juan 670, 8000 Bahia Blanca, Argentina
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