

## Darwin Fellowship - Interim Report

Darwin Main Project Ref No	EIDPS026
Darwin Project Title	<b>High Andes Conservation Without Borders</b>
Name of Darwin Fellow	Magdalena Bennett
UK Organisation	Wildlife Conservation Research Unit, Oxford University
Your Organisation(s)	
Your role within your Organisation	DPhil student
Start/end date of Fellowship	September 2010/ August 2011
Location	Oxford
Darwin fellowship funding (£)	£13,160
Type of work (eg research, training, other, please specify)	Research
Main contact in UK Organisation	Dr Claudio Sillero-Zubiri
Author(s), date	Magdalena Bennett 9th March 2011

### 1. Background

I was involved in the Darwin Project "Conservation of Puna's Andean cats across national borders" (project 14-028, 2005-2008), centred around the triple frontier of Argentina, Bolivia and Chile, from its inception. Collaborating with Oxford partners, I conducted studies of the spatial ecology of Andean carnivores, including sighting databases and a Geographic Information System of the area, and implemented the off-road driving mitigation component of the project in Chile. Since April 2010 I became involved with a Darwin initiative post project grant entitled "High Andes conservation without borders" (EIDPO038).

This Darwin Fellowship has supported me to develop biogeographical research that would contribute to the conservation of High Andes biodiversity in the triple frontier between Argentina, Bolivia and Chile. During my involvement with the original Darwin project we identified key areas for conservation of carnivores in the region (particularly Andean cats), the critical resources on which they depend (mainly highland wetlands, and rodent prey), and threats from unregulated off-road tourism. As a follow up of the original research I am currently identifying, measuring and mapping the threats that affecting the biodiversity and natural resources in the High Andes. I am carrying out a temporal analysis of satellite images to study in depth what is happening to the critical waters resources in wetlands, peatlands, salt pans and lagoons, since 1975.

The UK host organization, WildCRU, provides me with academic expertise in conservation and tools that are otherwise not available in my country. Through WildCRU I have established collaboration with Oxford University's School of Geography and the Environment to further my work on remote sensing in high mountains and regional climate modelling in the Andes.

## **2. Progress**

There was a delay in the start of the fellowship from July to September 2010 due to visa problems (since I had been accepted to Oxford University as a DPhil student I required a graduate student visa). Once these issues were resolved I was able to travel to the UK and start my fellowship and doctoral studies in September 2010.

My graduate work started in earnest in October 2010, under the supervision of Dr Claudio Sillero-Zubiri (WildCRU), and joint supervision by Dr Mark New from Oxford's School of Geography and Environment. I work closely with Dr Jorgelina Marino at WildCRU, who is the UK ecologist with the new Darwin project.

In December/January I worked in the field in the triple frontier of Argentina, Bolivia and Chile for two months, groundtruthing for the future mapping and collecting information on grazing activities, the condition of wetlands, and on water extraction for mining and urban use. I also extended the implementation of the off-road information campaign and contacted Protected Area managers in Chile, Bolivia and Argentina. In Bolivia the situation is complex because local communities are taking over the administration of the National Reserve Eduardo Avaroa from of SERNAP (organization charged with Bolivia's protected areas).

Currently I collating and analysing climatic data that will assist me with the mapping wetlands, their distribution, primary productivity and climatic correlates. We are collectively working to obtain as much information as possible from previous studies in the three countries, as governmental institutions do not have them in a database. Cartographic data and Geographic Information Systems were made available for Bolivia and Chile, but in Argentina there is only cartography at a scale too broad for the purposes of my study (1:250000). This will limit the analyses of satellite images for this area. Similarly there are not meteorological stations at high elevation in the Argentine side, but there are three in Bolivia; I am starting to receive some of the climatic data from Chilean after a long meetings and consultations.

### **3. Achievements and Outcomes**

I presented the Darwin project and my research plans in the First Latin American Congress (4TH Argentina) for the Conservation of Biodiversity in Tucumán, Argentina (22 – 26 November 2010).

I spent two months in the field, taking geo-reference points that describe each habitat in the triple frontier. I was able to study the lagoons and salty pans in Argentina in a totally dry state. In Bolivia I was in the site of a geothermic power plant near Colorada Lagoon, in Eduardo Avaroa National Park. I could see the peat lands, vegas and bofedales, that are drier than in previous years. In Chile I did a recognisance of the peat-lands and wetlands affected by water extraction due to mining or for urban use.

While in Chile I worked in an educational campaign on off-road driving, in collaboration with CONAF, the organization in charge of Chile's protected areas.

I have collected important information on water extraction, data from climate weather stations, peat-lands vegetation, and population census data, from government offices in Santiago, Chile.

### **4. Next Steps**

I am currently working in the lab at Oxford. I am identifying the different plant species from our surveys in the High Andes, and incorporating into a database all the geo-referenced information obtained.

Next I will start with the analyses of satellite images, for which I first need to investigate the recent climatic history in the High Andes in order to identify the sources and times of the images needed. I will be receiving further support from Dr Mark New from Oxford's School of Geography and Environment for the study of temporal changes in lagoons and salt pans, to be later linked to the data available from censuses of flamingos.