

# The Rufford Small Grants Foundation

# **Final Report**

Congratulations on the completion of your project that was supported by The Rufford Small Grants Foundation.

We ask all grant recipients to complete a Final Report Form that helps us to gauge the success of our grant giving. We understand that projects often do not follow the predicted course but knowledge of your experiences is valuable to us and others who may be undertaking similar work. Please be as honest as you can in answering the questions – remember that negative experiences are just as valuable as positive ones if they help others to learn from them.

Please complete the form in English and be as clear and concise as you can. We will ask for further information if required. If you have any other materials produced by the project, particularly a few relevant photographs, please send these to us separately.

Please submit your final report to jane@rufford.org.

Thank you for your help.

# Josh Cole, Grants Director

Grant Recipient Details	
Your name	Cristobal Pizarro with the collaboration of Dr. Sebastian Dardanelli and MV. Rodrigo Molina under the supervision of Drs. Ricardo Rozzi and Christopher Anderson
Project title	The Omora Bird Observatory: Long-Term Ornithological Studies and Conservation in the Cape Horn Biosphere Reserve, Chile
RSG reference	20.08.08
Reporting period	2009
Amount of grant	£5700
Your email address	jcpizarrop@gmail.com
Date of this report	08 March 2010



# **1.** Please indicate the level of achievement of the project's original objectives and include any relevant comments on factors affecting this.

	Not	Partially	Fully	
Objective	achieved	achieved	achieved	Comments
Create database		x		The first prototype is done, but several editions are still needed to finalize the final version. This project was done in conjunction with a student's thesis from the Computer Engineering Department of the Universidad de Magallanes (UMAG) and will be finished during the first semester of 2010.
Coastal bird census			Х	
Educational - ecotourism workshops			x	
Monthly coastal birds surveys			x	
Gull colony census/reproductive events survey			x	This work constituted an undergraduate thesis project from the Universidad de Concepción. A small technical report is done but major data analysis will be developed during 2010 by the two main researchers associated with this project. In addition, collaboration with the Agriculture and Livestock Service's Natural Resources Office has been initiated to protect this colony, which was found to be affected by invasive mink depredation.

# 2. Please explain any unforeseen difficulties that arose during the project and how these were tackled (if relevant)

**2.1. Weather**: During the winter, snow and ice build up on the roads, made it impossible to finish the coastal bird survey, therefore the last four eastern transects were not surveyed. We decided to cancel the surveillance of these transects because this sector of the coast was inaccessible during the whole winter. Nevertheless, the most diverse transects in this area were surveyed, obtaining valuable information about bird dynamics in winter.

**2.2. Navigation legislation**: Navarino Island has a Chilean Navy base. Therefore, the regulations for navigation are severe, including onerous permits and training that were not feasible to obtain. For this reason, the small islands closed to the shore were not directly surveyed and a sea-kayak was not purchased through the Rufford grant. In order to solve this problem, the islands were surveyed from the mainland, using binoculars and a telescope to include the proposed transects. The funds



budgeted for the kayak were used to finance two undergraduate students from two Chilean universities. These two students conducted their thesis research on a sea gull colony and the C-BIRD database, respectively.

2.3. Difficulties in interdisciplinary communication among ornithologists and informatics professionals: There are inherent difficulties in the understanding between professionals of different disciplines. This occurs largely due to the technical language and "way of working" of various subspecialties. For this reason, recurrent meetings between The Omora Bird Observatory (OBO) ornithologists, faculty, and administrators from the Computer Engineering Department at the Universidad de Magallanes (UMAG) were needed to produce a viable working relationship. Therefore, meetings were organized in order to jointly search for a student to conduct the database, to formalize the project, and finally to plan the work. Additionally, systematic effort was needed to train the undergraduate informatics student in bird banding in the field so that he could understand the OBO needs and therefore develop better C-BIRD software. This effort was formalized in an agreement between the Master in Science Program and the Computer Engineering Program at UMAG, and allowed us to create a new area for both programs and an interdisciplinary work in the same university. This previous work, however, "delayed" the database itself. In spite of the initial difficulties, this was a new experience gained for the entire Sub-Antarctic Biocultural Conservation Program, which thrives for interdisciplinary research, education, and conservation work. The database will be ready in the first semester of 2010.

# 3. Briefly describe the three most important outcomes of your project.

## 3.1. Research

**3.1.1. New bird species for the observatory:** Until this project, only 26 forest species were regularly monitored at the Omora Observatory. Today, we are looking at 40 species, which include marine, coastal, freshwater and other terrestrial birds.

**3.1.2.** New information about sub-Antarctic birds, their distributions, and wintermigratory activity: Winter surveys allowed us to clarify some aspects about the natural history of sub-Antarctic birds. In this way, two species (*Charadrius modestus* and *Chloephaga picta*) considered as migratory are now known to be resident or partially migratory, using coastal sites a wintering refuges. Furthermore, terrestrial bird species usually associated to terrestrial habitats, like *Xolmis pyrope, Zonotrichia capensis, Curaeus curaeus* and *Sturnella loyca* were detected foraging in littoral and intertidal areas, especially during winter and spring.

**3.1.3. Bird as trans-ecosystem marine-terrestrial link:** Monthly marine-terrestrial count points show that 11 species of birds share coastal and terrestrial habitats, especially the abundant terrestrial scavenger hawk Chimango Caracara (*Milvago chimango*), which could play an important role as a marine-terrestrial vector, transporting nutrients from the coast into the forests and shrublands and vice versa. As an example of this, we observed the remains of marine invertebrate exoskeletons, usually found in the middle of the forest, far from the coast (MSc thesis on this topic will be presented by CP in June 2010).

**3.1.4.** Most singular and diverse transects were selected for long-term monitoring: 36 transects were seasonally surveyed for birds (except for four during winter). We selected the 24 most diverse and singular transects to continue the on-going long term monitoring.



#### 3.2. Conservation:

**3.2.1. Importance of coastal areas for resident and migratory birds**: The coast has an essential role for the maintenance of bird communities, especially for resident birds during the winter. Reciprocally, birds play an important role as marine-terrestrial links transporting marine nutrients to terrestrial ecosystems, contributing, for example, to fertilize the young forest soil of this sub-Antarctic archipelagic region with the exoskeletons of marine invertebrates.

**3.2.2. Conservation of gull colony:** In spite of the fact that kelp gulls and other birds present in the bird colony of Punta Gusano (54°55'W-67°36'S) are common and a relatively unthreatened species, a nest site close to the town of Puerto Williams, provides an opportunity to develop an educational space, an ethical ecotourism resource and conduct a local conservation plan that involves the community. This plan can help to raise a conservation conscience about birds in the local community and allows us to integrate wildlife management, bird conservation and local development. This study identified the threats to the colony, such as local people harvesting eggs, predation by invasive exotic mink, and nest destruction by wild cattle. Also, basic parameters of the colony such as number of breeding species (5), reproductive pairs of *Larus dominicanus* and egg laying and hatching periods can be obtained. This information will be used to communicate the importance of the colony to the Livestock and Agricultural Service's Natural Resource Office and Chilean Navy directors to study the possibility to protect the gull colony with a fence across the base of the peninsula, as a first action in order to protect it from the wild cattle and feral dogs.

## 3. 3. Education:

3. 3.1. Teachers, pre-school and school students' workshops: As a one of the most meaningful goals achieved by this project, seven workshop cycles (which included theoretical and field sessions) were conducted in Puerto Williams and Punta Arenas. This was possible because the workshop cycles were developed in conjunction with three other Omora Park initiatives funded by Chilean government: 1) Explora-CONYCIT Fund: Little explorers of Cape Horn; 2) Environmental Protection Fund-CONAMA: Discovering and valuing the amazing underwater biodiversity, and 3) INNOVA-CORFO Fund: Ecotourism with hand lenses in the Sub-Antarctic Region. This allowed us to expand the educational impact of this project, including the "sub-Antarctic birds, as sea-forest links" as a permanent education topic for 30 teachers, 700 pre-school and 60 elementary school and scout students from the three major cities of the Magellan Region (Puerto Williams, Punta Arenas and Puerto Natales). The innovative Omora Park education methodology, focused on the training and education of teachers, so that the teachers themselves could impart the workshops to the children, with the help OBO and Omora Park's researchers. We subsequently produced multi-thematic posters with the marine-terrestrial relationships as topics, including freshwater and marine invertebrates, mosses and lichens and, and of course birds. In addition, we prepared a two-face brochure to be circulated as an insert in the major regional newspaper of the region (La Prensa Austral). Furthermore, we trained five high school students (ages 16-17) from Puerto Williams, as beginner birding guides, emphasizing scientific tourism, as a part of bird research and environmental ethics for the development of an ethical birding watching at the Cape Horn Biosphere Reserve.

**3.3.2. Funding for undergraduate and graduate students' fieldwork:** At the university level, this initiative contributed to the funding of two undergraduate students theses, one about gull colony management (veterinary medicine student from Universidad de Concepción) and



another about C-BIRD data base development (computer engineering student from the Universidad de Magallanes). Furthermore, this funding helped develop the thesis of one graduate student (Masters of Conservation student from the Universidad de Magallanes), who studied sub-Antarctic birds as a trans-ecosystem and interdisciplinary link at the Cape Horn Biosphere Reserve.

# 4. Briefly describe the involvement of local communities and how they have benefitted from the project (if relevant).

**4.1. Local inter-institutional collaborations:** Omora Park and OBO collaborated closely with Chile's Livestock and Agricultural Service and its Harmful Fauna Program (invasive mink, beaver, etc.). In this particular case, OBO provided the information about the presence of invasive exotic mink during the surveys, which was helpful to select sites for trapping and controlling this species.

**4.2. Local children and student environmental education**: As was explained in section 3.1, the involvement of local teachers was fundamental to conduct an effective environmental education about birds. Field sessions allowed for a better communication between teachers and researchers, stimulating them to teach "outside" of the classroom, which had very good results with the students, especially with those considered "problematic kids."

**4.3. Chilean, local students and volunteers' involvement:** Two volunteers and two Chilean students were involved through training to conduct bird surveys. Also, the high school students participated in the data collection of some transects.

# 5. Are there any plans to continue this work?

Yes. Our plans to continue this initiative include:

## 5.1. Research

**5.1.1. Consolidate and obtain long-term funding for coastal bird censuses:** We selected the best transects, in terms of balancing logistics and ecological criteria, to keep the bird censuses as an ongoing initiative.

**5.1.2.** From the results of this project, we can select some species using criteria related to conservation threats, abundance and or rarity of presence. In addition, migratory activity of certain birds can be studied in order to begin new research that would allow us to cover other conservation problems, such as salmon farming, global change, and predation by introduced species.

**5.1.3.** With the information obtained from this project and the ongoing marine and freshwater biodiversity research conducted by colleges at Navarino Island, we plan to develop research based on the study of specific ecosystems units, which involve marine, coastal and freshwater birds, invertebrates and algae as links between terrestrial and aquatic ecosystems. For example, coastal birds, as plovers, feeds on invertebrates, which growing on stranded kelp (a marine macroalgae) on the intertidal zone, and at the same time, kelp flies (a semi-aquatic insect) use the kelp as breeding and nesting sites. Furthermore, the study of marine-terrestrial ecosystem links will contribute with significant information to an emerging ecological field and to the nascent network of Long Term Socio-Ecological Research Sites in Chile, which include the Omora Park, the first one that links marine and terrestrial environments in the country. In addition, these new "discoveries" could be used as new topics for education and ecotourism activities in the Cape Horn



Biosphere Reserve. Finally, we would like to further develop this idea by creating an integrative field guide that will include coastal birds, as well as marine and freshwater invertebrates of the Cape Horn Biosphere Reserve.

**5.2. Conservation:** Communicate the results obtained from the gull colony monitoring to identify the actions to conserve it, as well as to develop an education and ecotourism space, if possible. Currently, we are planning meetings with the corresponding authorities in order to further develop this objective. Additionally, the coastal bird monitoring will allow us to identify sensitive and declining species and the threats involved in their long-term survival.

**5.3. Education:** The workshops with pre-school, elementary and high school students had excellent results and were a beautiful experience. In order to emphasize the importance of birds as marine-terrestrial links, we will continue with the teaching of this topic in the environmental education permanent workshop at the local school in Puerto Williams and in eco-tourism activities carried out at the Omora Park (see 3.3.1)

# 6. How do you plan to share the results of your work with others?

## 6.1. Regional to global outreach

**6.1.1. Congress and symposia presentations:** Sebastian Darnadanelli, ornithologist of OBO, presented preliminary results of coastal surveys in the Southern Connection Congress, in Bariloche, Argentina in February 2010. Also, in the interdisciplinary context, Cristobal Pizarro presented an educational framework of this initiative, in a philosophical symposium of the Iberoamerican Political Philosophy Association in Argentina in September 2009.

**6.1.2.** Scientific publications: Currently, two publications using survey data are being prepared and others will be forthcoming.

**6.1.3. Neotropical Aquatic Bird Census:** As a result of surveys, one coastal wetland, Laguna Zañartu-Seno Lauta complex (54°55′55″ S, 67°38′34″W), was selected to be included into the Neotropical Aquatic Birds Census, developed by Wetland International and locally coordinated by Chilean ornithologists. This is a small sub-initiative, which emerged from this project, and allows for the inclusion of a local ornithologist and other fauna professionals and technicians, as well as the Livestock and Agricultural Service of Navarino Island, into a participative long-term monitoring programme that spans the Americas.

## 6.2. Local outreach:

**6.2.1. Art - Sub-Antarctic Inhabitants project:** The coastal bird surveys were an inspiration for Rodrigo Molina, sculptor and Omora Park manager, who is creating a xylography series and clay sculptures about birds as marine and terrestrial links. His work could be finished and presented in April of 2010.

**6.2.2.** Publication of educational materials: As was described in 3.1, a poster and two-faced brochure was published and will be distributed to the local authorities and general public.

**6.2.3.** Local Newspaper press notes: One press note in the regional newspaper was published at the beginning of this project, and now we are preparing a press release for the end of the program. This issue highlights funding from RSG to help a young scientist develop his research and how the results could be helpful for bird conservation actions.



# 7. Timescale: Over what period was the RSG used? How does this compare to the anticipated or actual length of the project?

In the proposal we expected to develop this initiative over a 12-month period. The funds were received January 10<sup>th</sup> 2009 and the activities began in February 2009. The projected was carried out from February 2009 to February 2010. We used the time expected for the education activities, field campaigns, completed most of goals and obtained preliminary results, but we did not have enough time to process all the information collected and to develop and communicate the broader conservation implications from this project.

A similar situation occurred with the C-BIRD development. We will need additional time, to complete the first version (version 1.0), because interdisciplinary work takes time and energy, but we are sure, that this work will be useful and it will open a new window between informatics and ecological research in a regional university.

	-		-	
Item	Budgeted	*Actual	Difference	Comments
	Amount	Amount		
<b>Basic Birding Equipment</b>	880	948	-68	Better telescope purchased
Coastal Bird Database (C- BIRD)	1520	1573	-53	Extra expenses during process of C-BIRD (see 2.3)
Travels and trips	1280	1681	-401	Extra flight tickets and lodging for students financed in Puerto Williams to conduct C-BIRD and sea gull colony monitoring
Field campaigns	1520	1084	436	Sea kayak not purchased
Ethical Birdwatching Workshop	250	251	-1	Small difference in budgeted materials
Education program support	250	158	92	Some materials co-funded with others programmes
TOTAL	5700	5694	6	

8. Budget: Please provide a breakdown of budgeted versus actual expenditure and the reasons for any differences. All figures should be in £ sterling, indicating the local exchange rate used. \*Local exchange rate: 1 £ sterling = \$958.22 CHLP

## 9. Looking ahead, what do you feel are the important next steps?

**Consolidate inter-institutional alliance:** Consolidate inter-institutional alliances with local agencies such as CONAF (National Forestry Service) in order to increase the local participation in conservation initiatives in Navarino Island

**Consolidate inter-disciplinary work:** The work with educators was rich and fructiferous, but art and environmental ethics, for example, need to be more developed.

**Fund coastal census as an ongoing programme:** To have high socio-ecological impacts in the near future this initiative and effort need to be constant and local and socially pertinent.



**Promote local community bird conservation:** To achieve an effective bird-citizen conscience, more than one year of activities is needed. This is especially true if we plan to involve adults interested in bird conservation and ecotourism activities.

**Physical lab space is needed:** OBO has constituted a conceptual space for ornithologist, students and bird lovers to collaborate. Now a physical space is required, such as a laboratory, where people can meet and researchers can work and store biological material, organized in different areas such as avian diseases, parasitism, and diet studies. Most of this information could be easily collected and merged with the coastal census.

# 10. Did you use the RSGF logo in any materials produced in relation to this project? Did the RSGF receive any publicity during the course of your work?

Yes, the RSGF logo was used in all conferences, workshops and meetings in which the coordinators of this project participated. Furthermore, the logo was used in all published materials. Acknowledgement to RSG 20.08.08 will be included in future scientific publications.

# **11.** Any other comments?

In the name of the OBO team as well as personally, I want to thank the RSGF for the opportunity to coordinate and direct this project. It was my first experience conducting such an effort, and the results we achieved, including education, conservation, academic, scientific, outreach and community products would have been impossible without the support of the RSGF and the Omora Sub-Antarctic Biocultural Conservation Program, its team, friends and directors. Also, I want to thank the institutional support and facilities of Universidad de Magallanes and the scholarship from the Institute of Ecology and Biodiversity of Chile (PFB-23).