



# The Rufford Small Grants Foundation

## Final Report

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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](mailto:jane@rufford.org).

Thank you for your help.

**Josh Cole, Grants Director**

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Grant Recipient Details	
Your name	Fernando Díaz
Project title	Diademed Sandpiper Plover ( <i>Plegornis mitchellii</i> ): Conservation and Research of a Rare Andean Shorebird in Central Chile
RSG reference	16631-2
Reporting period	November 2014 - July 2016
Amount of grant	£5000
Your email address	fdiazsegovia@gmail.com
Date of this report	August 15 <sup>th</sup> 2016

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

Objective	Not achieved	Partially achieved	Fully achieved	Comments
Mark additional individuals of diademed sandpiper-plovers and continue survey and monitoring efforts for estimating demographic parameters and breeding phenology.			X	Everything OK with this objective except that it turned much longer than anticipated. The reason of this is that the research process is season dependent and related with an academic thesis, making it difficult to accelerate trainings, corrections and formalities. We expect to attach more complete results at the next RSG Final Report.
Work with conservation practitioners and stakeholders to complete a "Diademed Sandpiper Plover Conservation and Management Strategy for the Yeso Valley, Chile".		X		The work with the landowners was very difficult. We had only one meeting with them and some phone conversations. Although we tried to reach an agreement it was impossible. However, we summarised conservation proposals, collecting information of the species, the park and stakeholders. One of the tools used were the surveys for ecosystem service valuation (ATTACHED).
Begin with a public awareness campaign on Andean biodiversity and its threats.		X		One of our targets was installing a signboard at the park entrance but we never reached an agreement with landowners, then we had to change that point for another conservation activity. We will do oral presentations about our project at the Yeso Valley and surrounding communities to show the diademed sandpiper plover, the importance of the Andean

				wetlands and their threats. On these occasions we will distribute our educational material (trptychs), which is already designed (ATTACHED).
Continue the citizen science programme and educate volunteers about field techniques and conservation issues.			X	We didn't have any problem about this objective. We did 10 campaigns of fieldwork with volunteers to teach them about <i>P. mitchellii</i> conservation issues and field techniques. Because of the publication of the project's information in the webpage of the NGO Birds and Wildlife Observers Network of Chile ( <a href="http://www.redobservadores.cl">www.redobservadores.cl</a> ) we are still being notified about individuals of <i>P. mitchellii</i> banded by us in the Yeso Valley.

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

The most unforeseen difficulty in this project was the work with the landowners because we never reach an agreement about the conservation activities that we planned to do in their property. We had only one meeting with them when we resolve some issues, but over time we missed their support obstructing the development of our objectives. In summary, we couldn't complete the conservation strategy, we couldn't install the signboard at the park entrance, and they only allowed us to leave the triptychs with the administrator.

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

A) Estimation of demographic parameters and breeding phenology.

Demographic parameters:

About the reproductive success per nest, an average probability of nest survival (Mayfield Index) per season of 0.32 (0.28-0.36, n= 54 nests) was calculated from data of three breeding seasons (2011-2012, 2012-2013, 2013-2014). This seems relatively low compared with expectations for shorebirds: however, we must consider that there is a high variability of reproductive success in shorebirds, and that we observed second broods per season, and even a third, for *P. mitchellii*.

The clutch size determined for the species is relatively low, with an average of 1.9 eggs (1-2 eggs, n= 54 nests), whereas shorebird clutch size ranges between 1-4 eggs (Colwell, 2010). Regarding the nest density calculated for each nesting area, an average of 8.5 ha/nest (0.4-27.8 ha/nest) was estimated, taking into account a total of 54 nests and 10 nesting areas. With respect to the age of first reproduction, individuals of one year of age were found already with active nests.

Finally, in relation to demographic parameters, an apparent adult survival was estimated using data from four breeding seasons (2010-2011, 2011-2012, 2012-2013, 2013-2014). By Mark program, capture-recapture or resighting method, and Cormack-Jolly-Seber (CJS) model, we obtained apparent survival ( $\Phi$ ) and recovery rate ( $p$ ) constant in time (constant model) of:  $\Phi=0.76$  (SE= 0.04, 95% confidence interval= 0.60-0.83, n= 53) and  $p= 0.97$  (SE= 0.03, 95% confidence interval= 0.84-1.00), respectively. The apparent survival estimated value lies within the documented range for shorebirds (0.5-0.9; Colwell, 2010).

#### Reproductive Phenology

Reproductive behaviours were observed between October and March. However, it is likely that the reproductive season starts in August, because in the 2013-2014 season a chicken was observed during the first week of October. That is, courtship and incubation, before the formation of this chicken, probably occurred between August and September. An incubation period of 28-30 days was determined from direct observations of pairs incubating, hatching detection, and the egg flotation method. According to the phenological chart, with data collected between 2011 and 2016, we were able to find four concentration peaks of pairs incubating: mid-October, late November, the first half of January, and between late January-early February. The observations of offspring, with their parents, lies from late October to late March. *P. mitchelli* presents precocial offspring, which we saw with their parents until they were 4-6 weeks of age.

#### B) Proposals for a "Diademed Sandpiper Plover Conservation and Management Strategy for the Yeso Valley, Chile".

To develop this management proposal, we took into account population parameters, critical threats, opportunities for successful actions, and relevant stakeholders. First we standardised direct threats according to the unified classification of direct threats given by Salafsky et al. (2008), identifying six main threats: 1) poorly managed campgrounds; 2) unmanaged temporary campsites; 3) offroad vehicles for recreational reasons; 4) pets in recreational areas; 5) domestic animals allowed to roam in the wild and supported by natural habitats

(summer grazing of cattle, goat, sheep and equine); and 6) surface water diversion for consumption.

The appreciation of stakeholders was integrated into the proposal through a sociocultural study, which consisted in surveys to different kind of park visitors (i.e., families from nearby communities, ranchers, hikers, researchers, etc.) concerning the valuation of the species and its habitat. This evaluation method was well received by respondents, showing higher valuations for wildlife and landscape than for other ecosystem services. Preliminary results show that 70% of respondents are keen to protect *P. mitchellii* and support future conservation activities, although only 25% of respondents identified and revealed to have seen the species in this place.

About the conservation actions proposed, we identified eight main actions for short terms that should be considered in a "Diademed Sandpiper Plover Conservation and Management Strategy for El Yeso Valley, Chile", and can be pooled in two general managements.

- Land/water management: 1) site design for public areas (campground, campsites, trails and viewpoints for wildlife sighting, car parking, ranching areas, park entrance), protected areas (vegas and other wetlands), and water management; 2) demarcating borders for public areas and for protected areas; 3) controlling cattle, goat, sheep and equine ranching by reducing the stocking rates and limiting their feeding and transit area.
- Education and awareness: 1) monitoring workshops for park staff; 2) stakeholder education (for example, park staff, local students and teachers) on specific issues (park ecosystem and species, threats, sustainable actions); 3) signals and information brochures; 4) briefings for visitors; 5) websites.

c) Begin with a public awareness campaign on Andean biodiversity and its threats.

We design triptychs with the general information about the diademed sandpiper plover, Andean wetlands and biodiversity and local threats. As well as we included measures to improve the visitors' behaviour at the Yeso Valley. That educational material will be distributed at the national birders organisation, in oral presentations, at the park entrance and we will give it to people who will participate in outreach activities.

For the triptychs elaboration we received the help of the art designer Telly Gacitúa. She created every picture that appears on this material.

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

We collected opinions of visitors at Valle del Yeso through socio-cultural surveys recovery, which contributed to the formulation of management proposals for conservation of the species. To become effective this management, the local community and users will benefit from the development of better services, including conservation of the species that inhabit the park and the ecosystem of which they are part.

In addition, the upcoming outreach activities that we'll develop with children, teachers another local stakeholders (with already designed brochures), will benefit the local community and visitors to the park with the improvement of their knowledge on the Diademed Sandpiper Plover, the High Andean ecosystems and how taking responsibility for its care. In this way, the existing and future community can benefit from the ecosystem services provided by the High Andes.

In another aspect, the ornithological and birdwatcher community has been involved from the beginning in this project. During this time we have received the valuable participation of more than 100 volunteers for field work, whom we have transmitted knowledge of the species and methodology for monitoring it.

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

We plan to continue this work by supporting future teams that can carry on continue with the study, monitoring and conservation of the species.

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

We plan to share our results through different ways. We will speak at the upcoming Festival of Birds of Chile, in October, where part of the ornithological community of Chile will attend. In the future we hope to share our results through publications, lectures and conferences. We will also continue to post on our Facebook some interesting information about the diademed sandpiper plover, the high Andean ecosystems and how taking responsibility for its care, so our results can have a better reach to the people. And, in next spring, we will conduct outreach activities for local community of San José de Maipo.

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

The RSG was used from November 2014 to July 2016, and it will still be in use until December of this year. The duration of RSG has been longer than expected (November 2014 – October 2015) because our objectives are season dependent and some of them related with academic thesis, turning the research process much longer than anticipated. Another difficulty was that the work with the landowners was very difficult; we couldn't have enough meetings with them and at last moment they showed their disagreement about the signboard installation. This last topic made us redirect some activities.

**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.**

Item	Budgeted Amount	Actual Amount	Difference	Comments
Transportation	1835,65	1753,65	82,00	We didn't need transport for conversations with landowners and we had slightly less fieldwork days than expected.
Fieldwork supplies & equip.	850,77	740,30	110,47	Some volunteers helped with supplies and we had slightly less fieldwork days than expected.
Awareness supplies	706,17	0,00	706,17	The signboard couldn't be done because of the change of opinion of landowners; we will use this budget for outreach activities that we already discussed with Rufford. The design of triptychs is ready; we are waiting for outreach activities for printing them.
Salary	1587,18	1587,18	0,00	
<b>TOTAL</b>	<b>4979,77</b>	<b>4081,12</b>	<b>898,65</b>	

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

The Wildlife Ecology Laboratory of Universidad de Chile, in conjunction with our team, installed geolocators in 10 individuals of diademed sandpiper plovers last season to estimate the real location of the species during all year. The knowledge of the specie's movements will be important to estimate the actual distribution and the dimensions of their migrations. That information combined with our database is the strong evidence to know the population state.

**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, we used the logo for a poster that we presented at The Rufford Foundation Conference, Sudamérica 2015 (Quintay, Chile), in which we summarised the Project development since 2010. Also we used the logo recently for the awareness triptych design, which we will give to people participating in outreach activities, and to the caretaker of the park for distribution at the park entrance.

**11. Any other comments?**

We would like to thank Rufford Foundation for its support at our Second Project (RSG) with which we have achieved great steps in the knowledge of *P. mitchellii*.