

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. The Final Report must be sent in **word format** and not PDF format or any other format. 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. Please note that the information may be edited for clarity. 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	Valentina Franco Trecu
Project title	Uncovering Population Dynamics of Two Sympatric Otariid Species With Contrasting Population Trends in Uruguay: <i>Otaria flavescens</i> and <i>Arctocephalus australis</i> .
RSG reference	11105-2
Reporting period	March 2012 – February 2013
Amount of grant	5905
Your email address	pinnipedosuy@gmail.com
Date of this report	12/03/13

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
Estimating pup growth rates and survival in both colonies (Isla de Lobos and Cabo Polonio)			X	See Section 3 (Briefly describe the three most important outcomes) This result is one of the key attributes or indicators proposed by the SNAP (National System of Protected Areas in Uruguay) for the sea lion as a focal object of conservation in the Marine Protected Area of Cabo Polonio.
Obtaining reliable data on population abundance			X	See Section 3 (Briefly describe the three most important outcomes) This result is one of the key attributes or indicators proposed by the SNAP for the sea lion as a focal object of conservation in the Marine Protected Area of Cabo Polonio.
Contribute to the regional conservation effort		x		While we have contributed toward this goal during the execution of this project, the regional conservation efforts of these species is a long-term, on-going goal.
The results of this research could be considered as a stepping stone for future studies to assess the connectivity among populations.		x		This objective is part of the Latin American Net of Pinnipeds Marking (https://www.facebook.com/groups/414433735271952/) and is a long-term objective, considering that the amount of data increases as time passes. The massive marking of animals in recent years has contributed to the sighting of Uruguayan marked animals in other breeding or haul out colonies (e.g. Santa Catarina - Brazil –August/12 and San Matías Gulf – Argentina January/13).
Claudia Baladán 4th-year BSc. thesis			x	Claudia Baladán carried out, her undergraduate thesis for her BSc in the framework of this project. Her final report was presented in October 2012, when she obtained her degree.

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

N/A

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

These main outcomes consist of information considered as key attributes or indicators proposed by the SNAP for the sealion that was named as a focal object of conservation in the Marine Protected Area of Cabo Polonio.

1- Firstly, we found no significant differences between initial weights of male pups in IL and CP ($p=0.99$). However, newborn female pups in CP were heavier than those of IL ($U=211$, $p=0.04$). There were no differences in pup growth rates neither between colonies ($F=0.16$, $p=0.69$) nor between sexes ($F=2.95$, $p=0.09$) in both colonies. Monthly pup survival was estimated through capture-recapture models based on 122 individuals. The model selected ($AIC=237$, deviation=2.1) indicates that survival of pups of both sexes was higher in CP (0.53, confidence interval – CI= 0.40-0.66) than in IL (0.33, CI=0.23-0.45). Even when pups of both colonies grew at a similar rate in the first 2 months (critical period), females were born larger than males, which may explain the higher survival rate found in CP. Such differential survival is associated and could perhaps explain the positive population trend found in the CP colony. In contrast, the IL colony had a negative population trend that could be related to females in CP accessing to more or better food resources, or having weaker interaction with local fisheries. These results indicate that it is necessary to make greater efforts for conserving the CP colony so that its population continues to grow, and to continue the research efforts in IL in order to understand the factors responsible for higher pup survival rates in the latter colony.

2- Regarding the age structure we found that the proportion of pups in the population was higher in CP (26.1%) than in IL (16.7%) even though the percentages of females and juveniles was similar in both colonies (CP=62.5%, IL=61.6%). The sexual operational ratio (females per reproductive male) was higher in CP (7.7 females/male) than in IL (6.6). The latter would indicate that the larger size in CP and, possibly, its positive population trend may be due to the higher proportion of reproductive females in CP. An additional and noteworthy result is related to the proportion of sub-adult males (SM), which often kidnap and kill newborns, documented in several colonies of its distribution. While the proportion of sub-adult males was 3.4% in CP, it was 7.0% in IL, a difference that could explain the lower survival of pups of both sexes in the latter site.

3- Finally, from a management and conservation standpoint, a very important result obtained (along with the estimation of survival and population structure) was the estimation of current population sizes in both study sites. Our results indicate that there were overall 10,484 sealions and 121,204 fur seals. Moreover, we found that 79% of the sealion population and 40% of the fur seal population were found in Cabo Polonio. Results by area, species and age class are in Table 1. These are the first estimations of abundance for both species in Uruguay that were not obtained through simulations. Before these results, there was an information gap of 7 years regarding abundance and population trends in our country. In addition, the methods used by the Uruguayan authorities (DINARA) do not survey the entire population of either species, are based on simulations that use life tables of other species (that are highly variable even between populations), have logistic difficulties (Páez 2006), and differ very much from the methods used for both species in the remaining of their distribution range, preventing comparisons (first workshop on the current status of South American sealion, *Otaria flavescens* along the distribution range, held in Valparaíso, Chile).

Thus, estimation of population sizes, growth, survival rates and population structure obtained in this project become fundamental tools for knowing the status of local populations of both species in the Uruguayan littoral. Such information has been considered as key attributes and indicators of population status of pinnipeds by the National System of Protected Areas - National Administration of Environment (DINAMA) in the protected area Cabo Polonio. Additionally, they constitute an important contribution to the knowledge of these species, obtained according to methodologies used across their geographic ranges. These results will also be an important starting point for future studies on population connectivity of these species and the importance of local dynamics for the recovery of formerly exploited populations, constituting a necessary tool for their sustainable management.

Table 1. Number of individuals estimated for each area according to species and age class. AM adult males, SM subadult males, F+J females and juveniles, P pups.

Area	<i>Otaria flavescens</i>				<i>Arctocephalus australis</i>			
	AM	SM	F+J	P	AM	SM	F+J	P
I Encantada	188	36	1597	638	453	121	5837	5766
I del Marco	253	135	1703	854	533	270	8809	3426
Islote CP	22	38	950	21	10	2	2223	114
I Rasa	213	70	950	658	442	139	9000	11196
Islote Lobos	93	25	313	118	434	0	3672	2046
Isla de Lobos	224	126	1017	242	2249	502	48060	15900
Total	993	430	6530	2531	4121	1034	77601	38448

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

1- In October 2012 I gave a talk aimed at 12 park rangers who work in the protected area of Cabo Polonio and their coordinators. The aim of this talk/workshop was to share information about South American fur seals and sealions, present the research I have been conducting and the main results obtained. Also, I presented this research project. Sharing this information with park rangers is essential because they are the people who work in the area throughout the year and have direct contact with residents, local stakeholders, and with the thousands of tourists who visit the area during the summer months.

2- Community-based participatory research: *Sea lions interactions with artisan fisheries*. I have been participating of a community-based participatory research process (since April 2011) about the interaction between sea lions and artisan fisheries. In 2012 monthly workshops were conducted, and besides continuing with information and result discussions, we worked on the elaboration of a project with the objective of mitigate such interaction. The project is titled: "Mitigation of the impact of interactions between sea lions and artisan fishing: a participative research for the evaluation of pound net as an alternative fishing gear". The project is currently being considered for funding at the National Agency of Investigation and Innovation (ANII) (<http://www.anii.org.uy/web/convocatorias/fondo-sectorial-de-pesca-y-acuicultura-modalidad-i>).

Below, I present a summary of the project:

Interactions between marine mammals and fisheries are a subject of growing importance for conservation and concern for the management of fisheries worldwide. In Uruguay, the South American sealion would be the main cause of damages to fishing gears of artisanal fisheries, generating conflicts that involve socio-economical and ecological aspects. The magnitude of interactions has been assessed, but its situation regarding longlines has not been studied since 2002. Additionally, no method of mitigation has been tested yet. Hence, the objective of this project is to evaluate the use of pound nets to mitigate the interaction between sea lions and artisanal fishing in Piriápolis through participative research. Fishermen have identified such interaction as the prior local problem. The working team is POPA (in Spanish of For the Artisanal Fisheries), which has a trajectory of team working, focusing their actions in the interdisciplinary approach of problems related to artisanal fishery in Piriápolis. In the participative research conducted by POPA, all participants take part of each research stage and actions to take. This project put forth the design and construction of three variants of trawls, to be used with different bait. Experimental ship trips will be conducted and operational as well as economical effectiveness will be compared between pound nets and traditional fishing methods. The perception of fishermen on these not-widely used fishing gears and on the process of participative research will also be analysed. Finally, social activities such as elaboration of diffusion materials and workshops will be conducted. This project would be the first with these features and a great accomplishment for the community of fishermen and the group POPA.

5. Are there any plans to continue this work?

For the coming years, I plan to conduct census in order to estimate population trends of both species in both reproductive areas. Besides, this methodology used along the distributional range of the species allows comparing results and changes observed in other areas. Also, we plan to strengthen efforts and work along with researchers in South Argentina (Patagonia) and Brazil (Rio Grande – Santa Catarina) in order to understand the movement of individuals between areas, the use animals give to each of them and the importance of each reproductive colony.

Uruguay has recently approved a large project to build a main deep sea port on coast of the Rocha department, approximately 35 km from the Marine Protected Area of Cabo Polonio. While the actual building of the port will not begin before 2014, it seems necessary to gather basic information (population abundances and trends; intensity of habitat use, etc.) on the marine mammal species that live in this area in order to carry out the environmental impact assessment required by law. Our results show that Cabo Polonio is a very important area for the sea lion population (which is decreasing) since it is the breeding area of the 80% of the Uruguayan population and where this species has a higher offspring survival and mass at birth than elsewhere in the Uruguayan coast. In this context, it is extremely important to know foraging areas of sea lions reproductive females in Cabo Polonio so as to evaluate potential interactions with the building and operation of the deep sea port. We know that foraging areas used by Isla de Lobos' sea lion females tend to be located near the colony and up to 130 km from the coast (Riet *et al.* 2012) and thus that the impact generated by the port could include foraging areas used by adult's females of Cabo Polonio. I would be interested to investigate this subject using satellite instrumentation of reproductive females throughout the year in the Cabo Polonio colony.

Additionally, I also intend to participate in the project to evaluate an alternative fishing gear as a way to mitigate the interaction between sea lions and artisanal fisheries.

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

Diffusion to general public

In May 2012 I wrote an article in the magazine Mas Vida entitled “¿Qué son los pinnípedos?” (Spanish for “What are pinnipeds?”) in which I shared information on the species inhabiting our country, their behaviour, importance in the ecosystem and the research I have been conducting. You may find more information in the following link www.masvida.com.uy (Attached Article Pinnipeds VFrancoTrecu).

Report

A report will be submitted to government agencies such as the National Administration of Aquatic Resources (DINARA) of the Ministry of Livestock, Agriculture and Fisheries (MGAP) and National System of Protected Areas - National Administration of Environment (DINAMA).

Workshops

In the next few months I will give another talk to park rangers and SNAP officials (System of Protected Areas - DINAMA) who are responsible for monitoring the protected areas, to share the information obtained in the current project.

Community-based participatory research

(<https://www.facebook.com/grupopopa.porpescaartesanal?fref=ts>)

In 2012, I continued working in the project that aims to address some of the questions regarding the interaction between sea lions and fisheries, the group POPA. The team is integrated by artisanal fishermen, DINARA (National Administration of Aquatic Resources - management agency), local NGOs, and researchers from the Faculty of Sciences. I shared the results of my projects in meetings and monthly workshops of this participatory research.

Academic activities

I plan to write at least one research article which will be published in a peer review journal.

Results were presented in national and international conferences:

1. Third Uruguayan Conference of Animal Behaviour. Montevideo-Uruguay. 29-31 August 2012.
2. 15th Work Meeting of Marine Mammals Experts from South America. Puerto Madryn, Argentina, 16-20 September 2012.
3. Uruguayan Zoological Journeys 6-8 December 2012.

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 over a period of 12 month as I was planned.

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
Two Flights (Jagüel airport - Punta del Este, Maldonado)	900	900	0	
Photographer for flights (two times)	280	300	-20	price adjustment
350 Afflex tag pairs (Isla Lobos and Cabo Polonio)	345	350	-5	price adjustment
Scale	150	160	-10	price adjustment
Two tag applicators	50	55	-5	price adjustment
Two trips Montevideo-Punta del Este-Montevideo (aerial surveys) (three people)	90	90	0	
Three trips Montevideo- Punta delEste-Montevideo (travel to isla de lobos) (five people)	225	250	-25	price adjustment
Three Boat trips Harbour Punta del Este- Isla de Lobos -Pta del Este (5 nm)	450	500	-50	price adjustment
Three trips Montevideo-Cabo Plonio (five people)	450	450	0	
Three trips Cabo Polonio - reproductive Colony (2 nm)	150	150	0	
trips Montevideo -Puerto Madryn (data analysis)	500	350	150	I won a scholarship to supplement the costs.
Food Cabo Polonio (4 days, five people, three times)	375	430	-55	price adjustment (Following Marine Protected Area implementation, price have increased greatly)
Food Isla de Lobos (7 days, five people, three times)	570	600	-30	price adjustment
Allowances (per day) during captures in Cabo Polonio (4 days, two people)	480	500	-20	price adjustment
Allowances (per day) during captures in Isla de Lobos (7 days, two people)	840	850	-10	price adjustment
Material for sample collection (alcohol, gloves, etc)	50	40	10	price adjustment
Total	5905	5975	-70	

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

I think it would be very important to continue the aerial censuses to estimate and monitor the abundance, trends and structure of the sealion and fur seal populations in both breeding sites (IL and CP). It is also essential to strengthen the links with researchers in Argentina and Brazil to know the dispersal rates of both species between breeding areas. Moreover, it is important to continue estimating growth and survival rates of pups in both colonies, or at least in Cabo Polonio to further evaluate the population' and indirectly the importance of protected area.

Given the imminent building of deep sea port in Rocha, I am interested to investigate the foraging ecology and feeding areas of reproductive sea lion females in the Cabo Polonio colony using satellite instrumentation. In this way it will be possible to provide prior knowledge of the area to generate baseline information that will be key for the studies of the potential environmental impact inherent in the building and operation of the deep sea port.

In another vein, I believe that it will be very important (both from conservation and societal points of view) to evaluate alternative fishing gears that help mitigate the interaction between sealions and artisanal fisheries along the Uruguayan coast.

Finally I recall that a main objective of our research is to share the findings with the decision makers and government agencies that are responsible of managing the marine resources. In Uruguay I will continue my past a current involvement in the specialist workshops organized by SNAP and deep sea port commission where I intend to contribute with pertinent biological data.

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 de RSGF logo in:

- Talk to of Cabo Polonio park rangers and their coordinators.
- Poster presented in Third Uruguayan Conference of Animal Behavior. Montevideo-Uruguay. 29-31 August 2012 (See Pictures Juca 2012 Stabile).
- Poster presented in Third Uruguayan Conference of Animal Behavior. Montevideo-Uruguay. 29-31 August 2012 (See Pictures Juca Baladan).
- Talk presented in Third Uruguayan Conference of Animal Behavior. Montevideo-Uruguay. 29-31 August 2012 (See Picture Juca 2012 Franco-Trecu).
- Posters (2) presented 15th Work Meeting of Marine Mammals Experts from South America. Puerto Madryn, Argentina, 16-20 September 2012 (See pictures RT 2012 1 and 2).
- Talk presented in 15th Work Meeting of Marine Mammals Experts from South America. Puerto Madryn, Argentina, 16-20 September 2012 (See pictures RT 2012 Franco-Trecu).
- Poster presented in Uruguayan Zoological Journeys 6-8 December 2012 (See picture Zoo 2012).