

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	Juan Martín Cuevas
Project title	Habitat uses and migratory patterns of Patagonian chondrichthyans: new conservation strategies based on satellite telemetry.
RSG reference	9515-1
Reporting period	February 2011 - February 2012.
Amount of grant	£5966
Your email address	juanmartin_cuevas@yahoo.com.br
Date of this report	

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
1) Record the habitat uses, vertical movements and regional migrations (trophic and reproductive) of sharks and rays in Patagonia, Argentina.		X		We are still analysing the regional movements of <i>Galeorhinus galeus</i> in Northern Patagonia. Large individuals of the skate <i>Atlantoraja castelnaui</i> could not be found in the new study area (Anegada Bay, Natural Reserve of San Blas, Northern Patagonia).
2) Link the behaviour of sharks and rays with environmental variables (temperature, salinity, light intensity) and the primary production of Patagonian waters.		x		We are still analysing the behaviour of <i>Galeorhinus galeus</i> to link it with the primary production of the Anegada Bay. Large individuals of the skate <i>Atlantoraja castelnaui</i> could not be found in the new study area (Anegada Bay, Natural Reserve of San Blas, Northern Patagonia).
3) Link the migratory behaviour of the Patagonian sharks and rays with the fishery fleet movements.	X			Due to the premature release of the tags, the distance travelled by the individuals was shorter than expected and there was no commercial fishery fleet operating on the area where both individuals were tracked.
4) Create new conservation strategies for sharks and rays in Patagonia using a Geographical Information System (GIS) based on their habitat uses and migratory patterns.	X			This objective will be fully achieved in June 2012.

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

The main challenges faced during the project were related to logistic issues of the tagging campaign. Due to mechanical problems with the oceanographic vessel "Puerto Deseado" our tagging campaign was first delayed until September 2011 and then canceled. After that, we had to look for alternative logistic field support near the study area. We found it through the union with the shark tagging programme of the Argentine Natural History Museum "Bernardino Rivadavia" with whom we contacted local sportive anglers of Villalonga (Anegada Bay). Since then, we count on their knowledge and willingness to cooperate with our logistical issues on the field.

Other problems were related to ecological issues of our target species. The school shark *Galeorhinus galeus* was very difficult to find in the San Matías Gulf, the original study area. Thus, we had to move to the north and get inside the Anegada Bay (Natural Reserve of San Blas) during the reproductive season in November, in order to find large individual aggregations of *G. galeus*. Due to the absence of large individuals of the skate *Atlantoraja castelnaui* in the Anegada Bay we decided to tag two females of *G. galeus*.

Further problems were related to the lack of information about the species behaviour such as the time they remain at a certain depth. To detect the death of the individual, the tag was programmed to automatically release when depth variations were not larger than ± 3 m during a period of 48 hours. Unfortunately the preset parameters were achieved and the tags were prematurely released. However both tags were successfully recovered, the data was downloaded and the tags were sent back for rebattery, so we are able to plan a new deployment in March 2012.

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

- 1) On one hand females of *Galeorhinus galeus*' behaviour in Argentina can reach the sea surface frequently, during day and night. *Galeorhinus galeus* during the reproductive season remains inside the study area (Anegada Bay) in shallow water longer than what was initially considered. On the other hand, it also moves from shallow waters inside the bay (0, 25 m) to deep waters outside the nursery area (22, 5 m) in a 6 hours period. They spent most of the time between the surface and 10 meters depth during the day (70 and 100 %) and night (72 and 100 %). Another discovery related to its depth behaviour is that school sharks can remain more than 2 days in a water column of 6 m. This type of behaviour could be related to a pregnant state of the individuals during the reproductive season inside the study area.
- 2) One of the females of *Galeorhinus galeus* spent most of the time in waters between 17 and 19 °C during day (84%) and night (78%) during the reproductive season inside the nursery area. The other female divided the time between waters from 17 to 19 °C (day: 50%, night: 44%) and waters from 19 to 21°C (day: 50%, night: 56%).
- 3) The two females of *Galeorhinus galeus* tagged during the survey travelled at least 48 km in 21 days and 51 km in 11 days from shallow waters inside of the bay to deeper waters in the open ocean. The data are the minimum distance travelled by the individuals connecting in a plausible track the tagging point with the released one.

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

Since we made a scientific union with the shark tagging programme of the Argentine Natural History Museum "Bernardino Rivadavia" (MACN) we were able to contact local sportive anglers of Villalonga town near the new study area (Anegada Bay, Natural Reserve of Bahia San Blas, Northern Patagonia) to help us during the field work. As part of the MACN program this local fishermen were trained to identify, sex, measured and tag sharks using conventional spaghetti tags since November 2010. Thus, as an extension of the MACN conventional tagging programme in the area, we invited these recreational anglers to participate in the first satellite shark tagging in Argentina, explaining the methodology and main objectives of our project. We will share with them the results of our project by e-mail and orally during the future campaigns; in order to keep them involved and as real active members of the programme. Finally, one of the members of the group will broadcast our results

locally on a TV programme for sportive anglers in Villalonga. He will also send information and images to a similar TV programme in BB, the most crowded city near the studied area.

5. Are there any plans to continue this work?

Yes. Through the RSG grant and therefore the satellite tags acquisition we made a scientific union, during October 2011, with the shark tagging programme of the Argentine Natural History Museum “Bernardino Rivadavia” (MACN). The MACN program “Assessment and Conservation of a Nursery Ground for Threatened Sharks in Argentina” is directed by Gustavo Chiaramonte and works since 2007 in San Blas Bay Natural Reserve tagging sharks with conventional spaguetti tags. Since this union (MACN + CONDROS) we are applying as one group for new grants with our unique proposal for the conservation of sharks and rays in Argentina, combining traditional and satellite tagging methods.

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

We are preparing the first article to publish our information in international peer-reviewed journals. An on line press article was published by the Universidad Nacional del Comahue in Patagonia (Argentina, Neuquén) explaining the objectives of the project and the field work done in November 2011 (Link: prensa.uncoma.edu.ar/index.php?option=com_content&view=article&id=1706:realizan-el-pri). We will publish in this web site the final results once they were completely analyzed during 2012.

We were also interviewed by a national scientific TV program where we explained the objectives of the project. The interview is programmed to appear in March 2012 in “Científicos Argentinos” (link: http://www.tvpublica.com.ar/tvpublica/mediateca?t=Cient%C3%ADficos%20Industria%20Argentina&tag=tvpublica.mediateca.cientificos&order=fecha_asc&opt=20&url=¶ms=).

A new interview with the most popular newspaper of the country will be carry out in March 2012 to explain the outcomes of the project (www.clarin.com.ar).

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 since July 2011 to the present.

Activity	Original Date	Actual Date	Comments
Equipment purchase: satellite tags (Mk10-PAT, Popup Archival Transmitting) will be used to track the individuals.	January 2011	July 2011	The total time spent to import the equipment from USA was 1 month longer than expected. Tags could not be purchased before the signature of the satellite contract.
Satellite uses contract: using the CLS company service data will be collected by satellite ARGOS and will be processed with the Track &	February 2011	May 2011	In February 28 th the project was approved and the grant was finally received in April 2012.

Loc service for PAT tags.			
Capture, satellite tagging and released of the individuals: field work.	March 2011	November 2011 / March 2012	Logistic problems and delay in the field work were explained in detail in point 2. / Two new individuals will be tagged during March 2012 using two refurbished tags.
Satellite tracking of the individuals: data will be processed and sent by the CLS service company at the end of the research to the team leader e-mail address.	March 2011 to March 2012	November and December 2011 / March 2012 to September 2012	Original tags were prematurely released. See detailed explanation in point 2. / Two new deployments are programmed for the next 6 months since March.
Tracking data and fleet movement analysis.	March & April 2012	January to March 2012 / September to November 2012	Three full month will be necessary for a thoroughly analysis of the actual and future data instead of the original 2.
Reports and GIS database construction.	May & June 2012	May & June 2012	

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
Equipment: 2 Mk10-PAT satellite tags.	4470	4470	0	
Pop up tag processing service - "Track & Loc".	1170	0	1170	It was not used during the project due to the prematurely released of both tags.
Satellite Argos System service.	326	326	0	
Dart applicator an leader attached	0	114	-114	Not considered in the original budget.
Shipping and insurance	0	102	-102	Not considered in the original budget.
2 Mk10 PAT-Rebattery and Repin.	0	953	-953	Both tags were successfully recovered. Due to its low probability of success the recovery of the tags it was not a reasonable item to be considered in the original budget.
Total	5.966,00.	5.965,00.	1,00.	

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

1. Tag two new individuals of threatened chondrichthyans species in Northern Patagonia in March 2012 using satellite and conventional tags.
2. Create new conservation strategies for sharks in Northern Patagonia using a Geographical Information System (GIS) based on their habitat uses and migratory patterns.
3. Continue searching for new funds to expand the present project incorporating new threatened chondrichthyans species of Northern Patagonia.
4. Strength our link with the local angler community, the real active stakeholders, in the Natural Reserve of Bahia San Blas and other angler communities of Northern Patagonia.

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, twice. First, in an oral presentation of my Ph. D. project as part of a post-graduate course among PhD students. And secondly , in a press communication spread by e-mail among national anglers organisations, commercial sportive fishermen, ONG's, scientific institutions and colleagues of Argentina, Uruguay and Brazil (two PFD's were attached).

11. Any other comments?

The new study area, Anegada Bay, is a shallow area with small inner rivers, natural channels, small islands and full of sand banks in the northern zone of the Natural Reserve of Bahia San Blas (39° 54' to 40° 36' S, 61° 50' to 62° 30' W). The reserve is highly influenced by discharges of nutrient-rich continental waters from the Colorado and Negro rivers and it is an important spawning and nursery area for a number of bony and cartilaginous fishes where shark species from different biogeographic provinces converge to reproduce. The shark-fishing season (October – April) coincides with the time of occurrence of large shark species inside the bay.

Activity table of the present project since it was started:

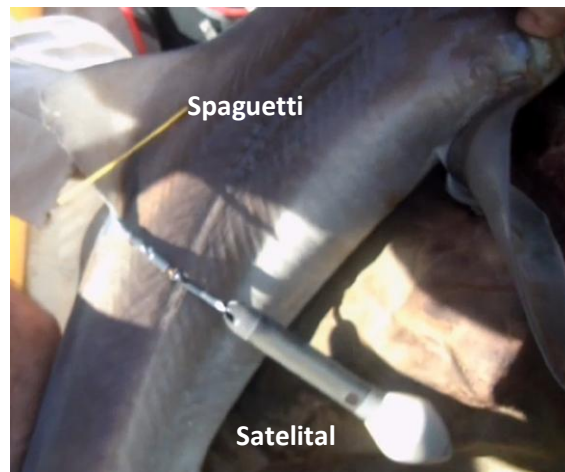
Activity	Not achieved	Partially achieved	Fully achieved	Comments
Equipment purchase: satellite tags (Mk10-PAT, Popup Archival Transmitting) will be used to track the individuals.			X	
Satellite uses contract: using the CLS company service data will be collected by satellite ARGOS and will be processed with the Track & Loc service for PAT tags.			X	A four years contract was celebrate with the CLS Company.
Capture, satellite tagging and released of the individuals: field work.			X	
Satellite tracking of the individuals: data will be processed and sent by the CLS service company at the end of the research to the team leader e-mail		X		Due to a premature released the tracking period was less than expected.

address.				
Tracking data and fleet movement analysis.		X		We are still working in the tracking data analysis.
Reports and GIS database construction.	X			This activity will be finished in later April 2012.

PRIMEIRA MARCAGEM SATELITAL DE TUBARÕES NA ARGENTINA

No dia 11 e 13 de novembro de 2011 foram marcados satelitalmente os primeiros tres tubarões nas aguas do Mar Argentino como parte da execução do projecto Tubarão do Grupo de Estudio de Peixes Cartilaginosos (CONDROS) do Instituto de Biología Marinha e Pesqueira Alte. Storni. As três fêmeas de cação (*Galeorhinus galeus*) capturadas foram marcadas em Bahía Anegada, Reserva de San Blas, Provincia de Buenos Aires (W 62° 01' 30'' e W 62° 08' 42'', S 40° 35' 6'' e S 39° 49' 30'').

Os três individuos posuem uma marca de liberação automática tipo PAT Mk10 para coletar informação de temperatura, profundidade e intensidade de luz do ambiente durante 6 meses. Logo de 180 dias a marca se desprenderá e flutuará hacia a superficie para depois enviar a informação resumida ao satélite ARGOS.



Izquierda: 3 marcas satelitales tipo PAT Mk10 (N° 11A067, N° 11A070 e N° 11A075) utilizadas no estudio. **Dereita:** Exemplar fêmea de *Galeorhinus galeus* com os dois tipos de marcas.

Também, cada exemplar foi marcado com marcas convencionales tipo spaguetti (N° MACN 503, N° MACN 558 e N° MACN 562) com o objetivo de poder seguir os movimentos logo da liberação da marca satelital. As marcas spaguetti pertencem ao programa de marcado do Museo Argentino de Ciências Naturais “B. Rivadavia”.

Pelo meio da aplicação de novas tecnologías, tentamos estudar padrões migratorios, movimentos verticais e uso de habitat dos condricios considerados predadores topos da Patagonia, para estabelecer novas ferramentas de manejo e elaborar novas estrategias de conservação que permitam a sua preservação.



No caso de encontrar os organismos marcados, se puder devolver o animal vivo ao água e comunicar a descoberta com o número da marca a juanmartin_cuevas@yahoo.com.br e gchiaram@retina.ar

Para mais informação:

www.condros.com.ar

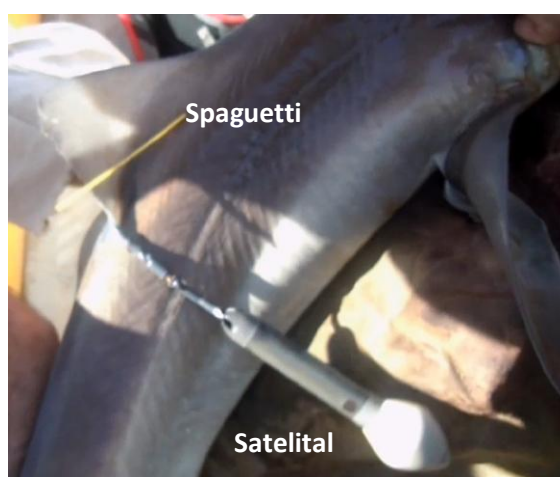
http://www.macn.secyt.gov.ar/investigacion/proyectos/vertebrados/ictiologia/pro_tiburones_fotogaleria.php



PRIMER MARCADO SATELITAL DE TIBURONES EN ARGENTINA

El viernes 11 y el domingo 13 de noviembre de 2011 se marcaron satelitalmente los primeros tres tiburones en aguas del Mar Argentino como parte de la ejecución del proyecto Tiburón del Grupo de Estudio de Peces Cartilaginosos (CONDROS) del Instituto de Biología Marina y Pesquera Alte. Storni. Las tres hembras de cazón (*Galeorhinus galeus*) capturadas se marcaron en Bahía Anegada, Reserva de San Blas, Provincia de Buenos Aires (W 62° 01' 30'' y W 62° 08' 42'', S 40° 35' 6'' y S 39° 49' 30'').

Los tres individuos poseen una marca de liberación automática tipo PAT Mk10 para coleccionar información de temperatura, profundidad e intensidad de luz del ambiente durante 6 meses. Luego de 180 días la marca se desprenderá y flotará hacia la superficie para luego enviar la información resumida al satélite ARGOS.



Izquierda: 3 marcas satelitales tipo PAT Mk10 (N° 11A067, N° 11A070 y N° 11A075) utilizadas en el estudio. **Derecha:** Ejemplar hembra de *Galeorhinus galeus* marcado con ambas marcas.

A su vez, cada ejemplar fue marcado con marcas convencionales tipo spaghetti (N° MACN 503, N° MACN 558 y N° MACN 562) con el objetivo de poder seguir los movimientos luego del desprendimiento de la marca satelital. Estas marcas pertenecen al programa de marcado del Museo Argentino de Ciencias Naturales "B. Rivadavia".

Mediante la aplicación de nuevas tecnologías, se pretende relevar patrones migratorios, movimientos verticales y uso de hábitat de los condriktios considerados predadores topos de la Patagonia, para establecer nuevas herramientas de manejo y elaborar nuevas estrategias de conservación que permitan su preservación.



En caso de encontrar los organismos, si puede devolver el animal vivo al agua y comunicar el hallazgo con el número de la marca a juanmartin_cuevas@yahoo.com.br y gchiaram@retina.ar

Para más información:

www.condros.com.ar

http://www.macn.secyt.gov.ar/investigacion/proyectos/vertebrados/ictiologia/pro_tiburones_fotogaleria.php

