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	Edgardo Ernesto Di Giacomo
Project title	Identification of egg-laying areas for chondrichthyan fishes in a coastal zone of San Matías Gulf, Northern Patagonia, Argentina.
RSG reference	16.12.09
Reporting period	April 2008- November 2009
Amount of grant	£5000
Your email address	edgardodigiacomo@gmail.com
Date of this report	11th November 2009

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
Locate egg –laying areas for several species of skates and one of holocephalan		X		It was not possible locate egg laying areas for skates because the prospect transect was negative. We only found three small egg cases of skates in shoreline coast. These cases correspond to a new record in San Matias gulf, so it is not known yet the species they belong. Probably they can be included in the genera *Psammobatis* or *Simpterigia.*
Delimititation of the egg-laying area		X		The limit that is indicated by the total absence of egg cases was not found yet. It is probably that the egg-laying area is beyond the protected zone.
Identification of epibionts			X	We identified as epibionts two species of macroalgae.
Identification of predation			X	The photographic record allowed us to identify two egg-cases attacked by predators.
Identification of different stages of external appearance from eclosion to hatching time			X	The variation from light brown to dark brown colour indicates the different moments since the egg cases are laid on the seabed till their eclosion.
Fecundity: estimation of egg- laying by female adult population based on field data			X	It was not possible to determinate the total number of eggs because the spawning area was larger than the survey area. It was only possible to calculate the fecundity by estimating a laying egg rate of 0.7 eggs per mature female per day. The calculation is based on the sampling data of local commercial catch.
Management plans for the local fishery		X		At the beginning of 2009, a plan for the conservation of sharks, skates and elephant fish promoted by FAO was approved by the national fishery authorities. One of its goals is to preserve the egg-laying zones and nursery areas. This plan will preserve local critical areas.
Detection of just eclosed fish predators			X	It was possible to find recently hatched cockfish, in the stomach

				content of *Pagrus pagrus* (Sparidae). The samples were obtained from local artisanal commercial catches. This is the first record of a species that predates cockfish.
Publications		X		We published a booklet for distribution with the aim of generating understanding in the local community about the conservation of chondhrichthyan fishes. We are also preparing a scientific work about the main results achieved with RSG.

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

The main difficulties that arose during the project were those relating to weather conditions. The strong winds that characterize the region make it difficult perform field trips and underwater census with diving scuba. The only way to tackle this problem is by extending the work schedule. The only way to handle this difficulty is to extend the sampling area and recruit more teams of divers to fill, in those moments when time allows, as much surface as possible.

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

1- Delimitation of the egg–laying area depth. The real minimum depth of sampling was 11 m and the maximum was 20 m. The bathymetric range, in which was recorded the presence of eggs, was 11.8 to 18.5 m. The highest number of eggs found in a field trip was 27.

2. Identification of the egg–laying area width. The west limit of the egg-laying area was located from one perpendicular line from Baliza San Matías to a depth of 20 m. The east limit of egg-laying zone could not be determinated.

3- Identification of the egg cases permanence time in the bottom, from the laying moment till the embryo eclosion. This is possible due to the external characteristics, such as the colour and aspect, of the egg cases. In the laying moment, the cases are light brown. Because of the exposure to the bottom dynamics they turn darker and are partially covered by sediment. The lighter cases have at least 2 months from the laying moment.

4- Identification of empty cases, in the intertidal zone, from skate species not yet identified. The chondrhichthyan species of the San Matias gulf were identified by several bottom trawl surveys for San Matías ground fish community. These surveys usually have a sampling depth range of 20/25 m to 160m. It is probable that the cases belong to small skate species of the genera *Psammobatis* or *Sympterigia*. It is certain that the species is not affected by the industrial fishery of the gulf and that lives in coast zones located out of the bottom trawl sampling range.

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

The local community is particularly sensitive to the natural areas conservation issues. This is because the San Antonia bay (that includes the egg–laying area of cockfish) is a protected natural area. The target of conservation was the migratory coastal zone birds like plovers and red knot. Now we are working with the idea of vulnerability of chondrichthyan fish to intensive fishing pressure and the necessity to improve goals of conservation that include birds as well as fish. Endemism in the area involve the local hippocampus, *Hipocampus patagonicus*, a restricted shore coast habit species. Other important faunal species in the area are birds and marine mammals, like magellanic penguins, killer whale, southern right whales and sea lions. The presence of enigmatic faunal components is of a great value for development of management and conservation plans in this pristine coastal scenery.

Due to an additional financing source, the team organized a community awareness campaign about the vulnerability of chondrichthyans to human impact, either through the effect of industrial and artisanal fisheries or the tourism and the coastal pollution impact generated on populations of chondrichthyans by the destruction of critical habitat (mostly egg-laying areas and breeding or nursery areas). The diffusion and extension projects were directed at all the social actors who belong to the fishing in San Matías Gulf: fishery managers of the resource (government), processor plants of fishery products, crew of industrial and artisanal fishing fleets and recreational fishermen.

Since it began in 2009, the study group of Cartilaginous Fishes, CONDROS, received a property in San Antonio Oeste´s dock for the construction of a laboratory, a cabinet work, library room, exhibition hall. This is due to the experimental work with fishes for scientific purposes. The diffusion material for the community consist on dyptichs, leaflets, cartilaginous fish species posters and a booklet of chondrichthyans biological and conservation information with additional identification sheets with pictures of each species.

5. Are there any plans to continue this work?

The study of cartilaginous fishes realized by CONDROS has been declared of scientific, ecological and productive interest by provincial and municipal authorities. It is expected to continue this work in order to expand the coverage area to achieve one of the main objectives (the geographical delimitation of the cockfish egg laying), and also in order to try to identify what kind of skate the capsules found in the coastal lines belongs to.

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

The results are available to the local community and will be communicated to the scientific community through a paper in which we will include not only fieldwork but also morphometric characteristics of eggs elaborated from samples collected during research surveys and from sampling of catch commercial landings.

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

RSG was used for a year and a half as scheduled. However, because of the length of the projected area and the methodology of scuba diving, it will be necessary to continue and improve the

research efforts. This is because the adverse weather conditions limit the possibility of going into the sea and also difficult the bottom visibility that directly affects the possibility of finding cockfish eggs. The weather conditions in Patagonia are particularly bad for this kind of activity. Only in the 30 % of the year the conditions are optimal.

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	571	506	65	Neoprene was supplied by Nautical department of the Institute.
Field work	3760	3825	65	the difference was applied to field cost
Supplies	80	80		
Travel	124	124		
Others	465	465		
TOTAL	5000			

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

It was very important for us to get a RSG because since it implementation we have improved in characterizing the laying area, increased the biological knowledge and recommended to local authorities about the conservation of this sensitive area of northern Patagonia. In addition, the sampling will continue until April 2010 in order to increase the knowledge of the prospected area, and we will apply a new Rufford Small Grant.

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 RSFG logo was included in the material of diffusion to local fishery community.

11. Any other comments?

Between the city of San Antonio Oeste and Viedma City (that are located at a distance of 185 km) there are over 100 km of coastline absolutely where there is not any human settlement and the level of anthropogenic impact is very low. This unique environment in Patagonia is characterized for being used by species that require special monitoring because of the negative effects that the anthropogenic action can cause (tourism, coastal pollution, fisheries). In the conservation aspect, the area is also an emblematic habitat for mammal species as killer whale, southern right whales and sea lions. The fauna must not only be studied but also put under strict conservation actions to preserve its populations.

One positive fact for the area and the purpose of this RSG study is the recent management action adopted by the provincial fishery authorities to ban the use of the commercial dredge in the San Matías Gulf. It has been documented that the use of commercial dredge for catch benthic molluscs had strongly changed the composition of the benthic ecosystem and biodiversity. This management action will help to preserve the cockfish egg laying area.

Photographic records

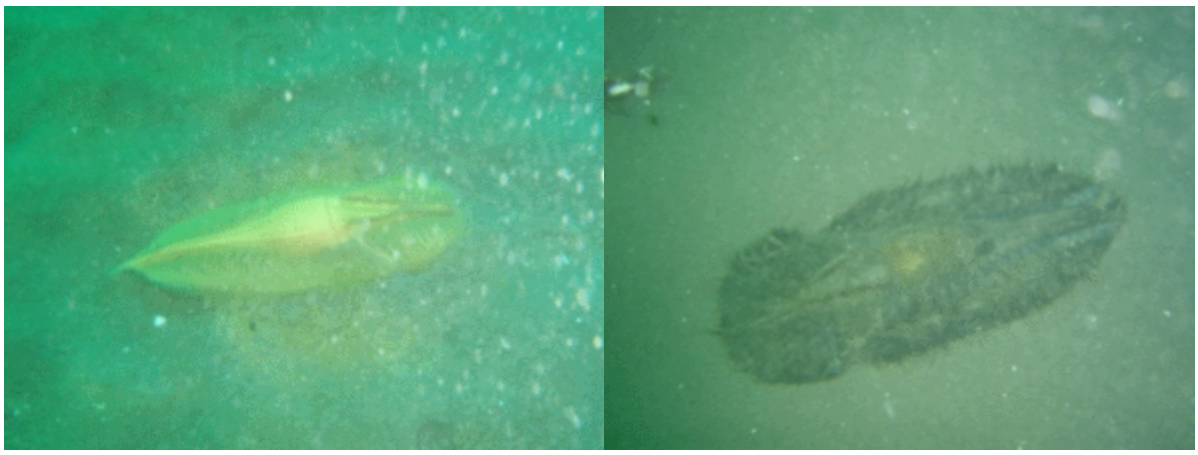
1. - Scientific personal and professional divers doing field activities and analyzing the egg cases.

2. - Equipment utilized for the subaquatic prospection: full face dive mask with incorporated microphone and connected to the command panel, and back inflation style BCD to regulate the

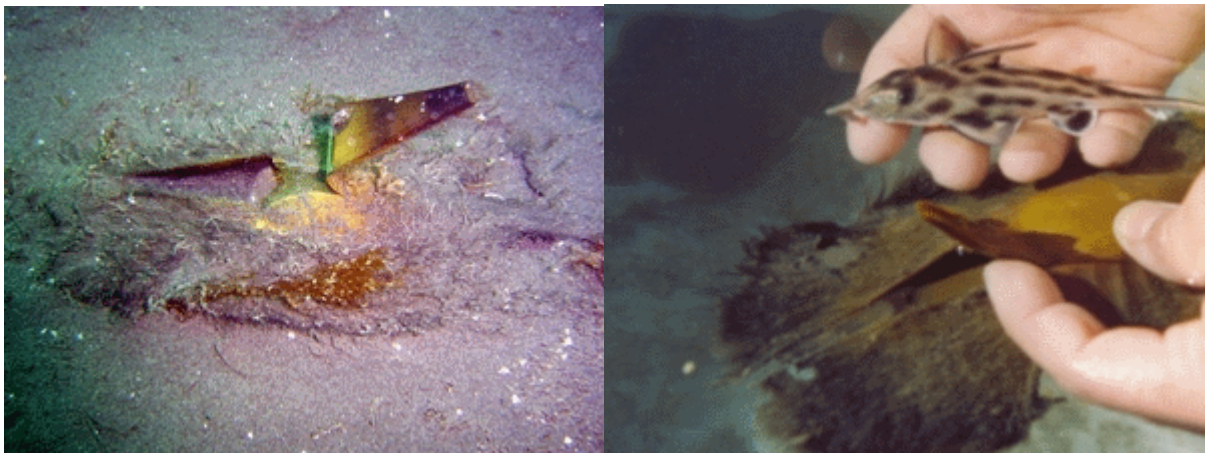
descends depth and the diver ascends time, sledge pulled by the boat at a speed of 1, 2 knots, pickup 4 x 4 and a semi rigid boat with a couple of Mercury motors of 50 HP each.

3.-One-year old *Callorhinchus callorhynchus* predated by a Sparidae, a common specie in the coast zone (from surface to 80m deep). This is the first record of a species that predates cockfish recently hatched.

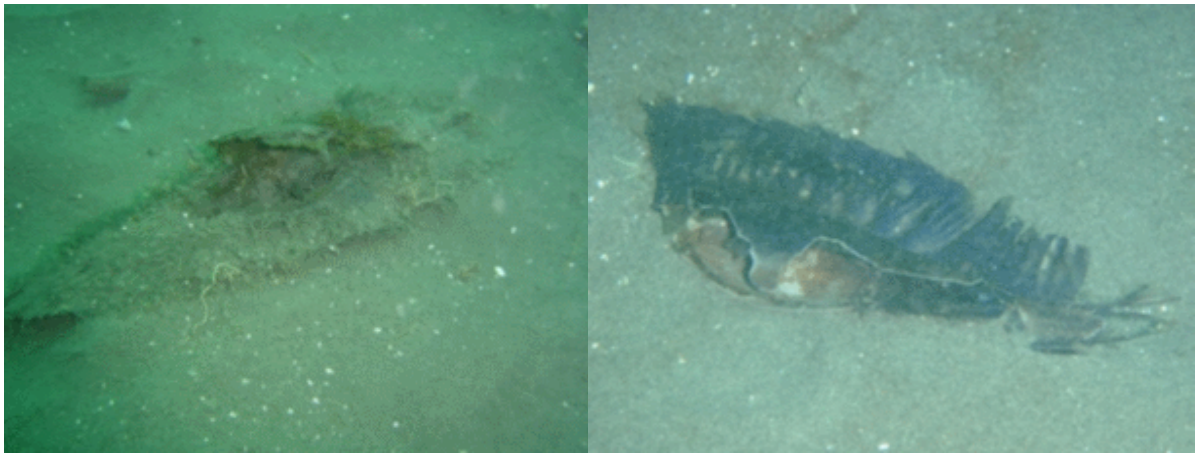
4. - Egg-cases with macrophytes algae as epibionts



5- Egg cases in different growth stages: Left: young egg-case and Right: old egg-case.



7. Egg-case broken by small cockfish and individual recently born, which resembled adult fish.



8. Egg-case attacked by predators

9. Marine mammal's species in the study area: south West Atlantic right whales, sea lions and killer whale.