

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 | Gustavo Adolfo Castellanos Galindo |
| Project title | Fish Tidal Migrations in Mangroves of the Tropical Eastern Pacific (Colombia): Potential Nursery Areas for Fishing Resources |
| RSG reference | 01.05.09 |
| Reporting period | November 2009 – April 2011 |
| Amount of grant | £5399 |
| Your email address | gustavo80@yahoo.com , gcastellanos@uni-bremen.de |
| Date of this report | April 22th 2011 |

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 |
|--|--------------|--------------------|----------------|---|
| Assess the influence of tides and spatial configuration on fish habitat use in intertidal mangrove areas of Bahía Málaga, Colombia, tropical eastern Pacific | | | X | A 1-year sampling campaign in mangrove creeks of Bahía Málaga allowed us to have an accurate picture of what determines fish community organisation at small (spring and neap tides, day and night, low salinity and high salinity areas) and medium temporal and spatial scales (dry and wet season). |
| Participation of undergraduate and master students within the project | | | X | At the beginning of the project one undergraduate student (Gustavo Ramirez) from the local University (Universidad del Valle) participated actively in the field and lab activities. At the mid part of the project two master students from Kenya and Germany (Paul Mboya Tuda and Nathalie Pülmanns) based at the University of Bremen took part of the project. The three students were able to develop their theses within the frame of the project. Information about their theses topics can be found in the extended report. |
| Participation of local people during the project and mutual learning of traditional ecological knowledge and standard scientific knowledge | | | X | Local fishers in Bahía Málaga were involved in the project (four fishers directly involved). We used participatory rural techniques to understand their traditional knowledge on mangrove fish and ancient fishing practices. We showed them the importance of protecting the mangroves that support nurseries for fishing resources |
| Creation of networks with NGOs, environmental agencies and universities | | | X | During the project we built networks with different organisations. We had the support from the local University (Universidad del Valle). There, we worked closely with Professor Efrain Rubio. We also worked with the Leibniz Center for Tropical Marine Ecology and the University of Bremen in Germany. As mentioned above two students from these institutions came to work in Colombia during the course of the |

| | | | | |
|---|--|---|--|---|
| | | | | project. Additionally, we worked closely with the marine programme of WWF and they are now involved in the production of the educative material derived from the project. At the end of the project we had contact with the new park managers informing them about the project and our willingness to provide our results and educative material. |
| Production of educative material to distribute among local villagers and environmental agencies working in similar areas of the Colombian Pacific coast | | X | | This material has suffered some delay in its final production. This is in part due to the time that takes to receive feedback from the local community. We expect to have our booklet ready by the end of the first semester of 2011. |

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

One important unforeseen difficulty was the decrease of the exchange rate of the English Pound to Colombian Pesos. At the time of submitting the proposal the Pound was considerably stronger than when receiving the money. This situation had to be fixed by allocating some funds to other items that were crucial to carry out the project. One last unforeseen difficulty came at the end of the project with the delay in producing the educative material. Right now we are trying to speed up this process so we can have ready the booklets for distribution as soon as possible (end of the first semester of 2011). Other unforeseen difficulties were the common ones when working in the field in remote areas and this were tackled according to the specific circumstances each time.

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

- The project was able to produce the first quantitative study on mangrove fish ecology in Bahía Málaga, and one of the few in the Colombian Pacific coast. The study has shown the great importance that mangroves have for commercially important species (especially snappers and snooks) in Bahía Málaga and the whole Colombian Pacific. The spatial and temporal patterns that are described in this study will likely help decision making for conservation in the area.
- The project was able to gather students from three different nationalities (Colombia, Germany and Kenya) in Bahía Málaga, contributing to their respective studies (thesis) and future careers in marine conservation/biology.
- Although, not yet achieved, I believe that the produced outreach material is likely to produce a high impact at the local and regional level. The booklet will provide novel information on the ecology and traditional knowledge of the most important species found

in mangroves of Bahía Málaga and hopefully raise awareness on the importance of protecting these resources for the new generations.

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

In the Colombian Pacific coast, it is fundamental to work closely with local communities, as they are owners of the land by law. This was the case in this project where artisanal fishers actively participated in our sampling campaigns and in our participatory rural appraisal exercises. With their experience it was possible to solve most of the logistic problems that arise during the sampling activities. We shared closely with some of them on a daily basis and learnt a lot about their lifestyles. These fishers benefit from the project by learning technical aspects about fish taxonomy, biology and ecology. The local communities will benefit from the outreach material that we will distribute among them and we hope that they will use this material to value the wealth that they have in their territory (mangroves and other natural resources) and pass this knowledge to their children.

5. Are there any plans to continue this work?

Yes, I would like to start a process with the recently created park to determine how much (in economic terms) mangrove fish contribute to the local artisanal fisheries revenues. This is a key element that can justify how important is to protect mangroves in Bahía Málaga. We also would like to sample other parts of Bahía Málaga to see if, at a larger spatial scale, there are differences in the nursery value of mangroves for fish. This information will be also relevant for conservation, as it will provide a basis to establish smaller conservation units within the new park. On the long term, I would like to extend this sampling methodology to other areas of the Colombian Pacific where mangroves occur to determine larger ecological patterns in these fish communities.

Finally, as part of my PhD project, I am expecting to start in August 2011 a sampling campaign in northern Brazil (Atlantic Ocean), encompassing the same methodology in mangrove areas. A comparison between mangrove fish communities in Colombia and Brazil is the core topic of my PhD project.

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

I have already presented the preliminary results of this project at a National Meeting of Marine Science (Senalmar) in November 2010 (oral presentation). In March 2011, I attended the Student Conference on Conservation Science in Cambridge, UK and there I presented a poster related to a critically endangered fish species (goliath grouper), which was found as a juvenile in Bahía Málaga during our sampling activities. In May 2011, the undergraduate student and I will give a talk at the Colombian Ichthyologist Meeting. The talk will deal with the feeding patterns of a commercially important snapper that was one of the most important species found in mangroves of Bahía Málaga. In 2012, I am planning to attend the Second international Symposium on Mangroves as Fish Habitat that will be held in Colombia. I expect to present there, the results of the project in Bahía Málaga.

At the local level, once the education booklet is produced, I will travel to the study area and will disseminate the project results at the main towns. I am trying to coordinate this activity with the new park authorities in order to enhance the number of people that will benefit from this information.

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

December 2009 – April 2011. The project still needs to complete the production of the educative material that was initially planned. There was an initial delay in the start of the project due to problems with bank transfers here in Colombia. The sampling phase was also extended a few more months to complete a year-round sampling in the area and have more representative results.

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 |
|---|-----------------|---------------|------------|--|
| 1. Salaries and wages | | | | |
| 1.1 Field assistant (undergraduate students) | 491 | 0 | + 490.68 | This money was re-distributed among other items. Nevertheless, the undergraduate student received everything necessary to develop his undergraduate thesis. |
| 1.2 Local guide | 654 | 1494.05 | - 840.05 | This value significantly increased because the fisher (Willington Aguirre) rented us his boat and outboard motor during our field trips (8 months). He also served as local guide. |
| 2. Transportation | | | | |
| 2.1 Terrestrial transport (Cali-Buenaventura-Cali) | 109 | 240.01 | - 130.96 | The actual amount spent was higher due to the increase in the number of trips made to the study area (8 trips compared to the 5 initially planned) |
| 2.2 Maritime transport (Buenaventura-Bahia Malaga-Buenaventura) | 218 | 488.12 | - 270.02 | The actual amount spent was higher due to the increase in the number of trips made to the study area (8 trips compared to the 5 initially planned) |
| 2.3 Maritime transport within Bahia Malaga (fuel) | 356 | 569.6 | - 213.6 | Instead of 100 gallons of fuel, we used 160 during our 8 field trips. |
| 3. Lodging | | | | |
| | 785 | 523.2 | + 260.8 | We stayed 80 effective days in the field distributed in 8 monthly field trips. Initially I had planned to stay 120 days. |
| 4. Meals | | | | |
| | 1,176 | 784.0 | + 392 | We stayed 80 effective days in the field distributed in 8 monthly field trips. Initially I had planned to stay 120 days. |
| 5. Equipment | | | | |

| | | | | | |
|--|-----------------------------------|------|----------------|-------|--|
| 5.1 | Portable outboard engine (2.5 hp) | 640 | 0 | 40 | This item was not purchased due to the risk of having this equipment at our study area. Navigation by us would have been difficult due to the bathymetry of the area and the risk of thieves. It was decided to invest this money in renting a boat and outboard engine (40 hp) from our local guide that had experience navigating inside the area and in mangroves creeks. |
| 5.2 | Block nets (2) | 425 | 755 | - 330 | The price of the nets was considerably increased because of difficulties importing the nets from a Brazilian manufacturer. The nets were then bought from a Colombian manufacturer (INDUMAR) that offered higher prices. |
| 6. Community outreach material production | | | | | |
| | | 545 | 545 | 0 | This item is still to be spent. |
| Total | | 5399 | 5399.03 | | (1 pound = 3212.75)* |

** The total amount of money received in my bank account was \$ 17'344.259 Colombian pesos. This amount of money was divided by the amount of pounds requested to RSGF to calculate the exchange rate at that time. When the project was submitted to RSGF, the English Pound had an exchange rate of \$ 3668 Colombian pesos. All the items in the budget suffered from this difference and increased the initially planned amount of money.*

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

From the academic point of view, I expect to work on different manuscripts in this and the next year to submit to peer-reviewed scientific journals and complete my PhD studies.

Looking at the awareness and outreach perspectives for the conservation of mangrove nursery areas and fisheries resources in Bahía Málaga, I feel that the outcomes of the project have a very high potential to influence and guide decision making and the elaboration of the first management plans in the newly established park. I would like to be involved in these activities. I would also like to suggest the park to initiate a research programme in mangrove areas that can continue some of the activities that were developed during the project. This could help them to monitor fisheries resources in the area.

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 at each of the project presentations made in national and international conferences. The logo will appear as the main sponsor of the educational material that is pending for production. In the peer-reviewed publication derived from project, the support from RSGF was acknowledged.