

## 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](mailto:jane@rufford.org).

Thank you for your help.

**Josh Cole, Grants Director**

Grant Recipient Details	
<b>Your name</b>	Elizabeth Campbell
<b>Project title</b>	Distribution and abundance of Boto, <i>Inia geoffrensis</i> and Tucuxi, <i>Sotalia fluviatilis</i> in Yarinacocha lagoon, Peru.
<b>RSG reference</b>	13299-1
<b>Reporting period</b>	12 months
<b>Amount of grant</b>	£6000
<b>Your email address</b>	<a href="mailto:eli.campbell@gmail.com">eli.campbell@gmail.com</a> / <a href="mailto:elizabeth@prodelphinus.org">elizabeth@prodelphinus.org</a>
<b>Date of this report</b>	June 2014

**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
Estimate density of both Boto and Tucuxi in Yarina lagoon, Ucayali		√		Density estimations were possible for both species, Inia sample size was reduced limiting how reliable estimates are.
Find possible hotspots of both species in Yarina lagoon			√	Hotspots were found for both species.
Find peak hours of activity of both species in Yarina lagoon			√	
Log acoustic data of both species with C-POD		√		CPODS were deployed to assess acoustic activity along with visual surveys. Although they were deployed for all seven field trips, only two of these had successful recordings (more than 24 hours long) to analyse diurnal patterns from May, June, July 2013 had each 26, and 42 hours. Other recordings were shorter than 24 hours, or did not log the data correctly.

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

Yarina has fluctuating petrol prices which caused unexpected expenses for the team and occasional strikes in town adjacent to lagoon. Strikes would make obtaining petrol difficult. Strikes were usually announced 1 day prior which made planning around them difficult. When field trips and strikes were at the same time, we reduced the amount of transects per day to cover all days in Yarina. We also bought petrol in advance in case strikes happened later on during our field excursions.

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

*1. Detection probability and group size*

Both species had a lower effective strip width than expected. As previously mentioned, transects were conducted in the middle of the lagoon, with 400 m on both sides. Most of the observations were done within 100 m perpendicular distance from the boat.

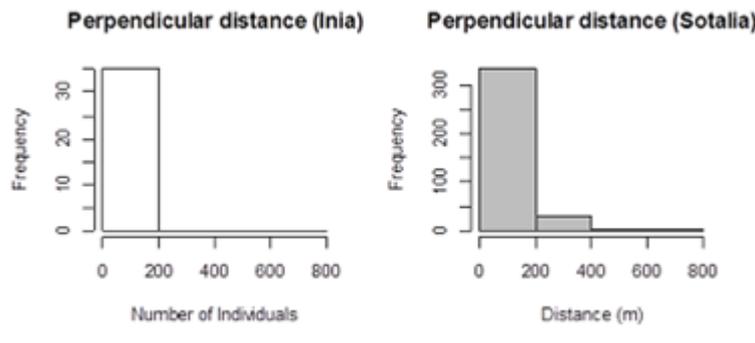


Figure 1. Histogram represents the distribution of perpendicular distances to sightings made from line transects in Yarinacocha lagoon.

A total of 554 *Sotalia* observations were recorded, 385 of these had detection distances estimated, of which 259 were a distance of 100 m or less (67%). *Inia* had a total of 51 observations, 29 of these had distance estimations and 29 were within 100 m (100%).

Group sizes for both species varied. *Sotalia* had larger groups (range = 1–8, mean = 2.26, SD = 1.57) than *Inia* (range=1-4, mean=1.46, SD=0.85). Both species had higher frequency of observations where individuals were alone or partnered.

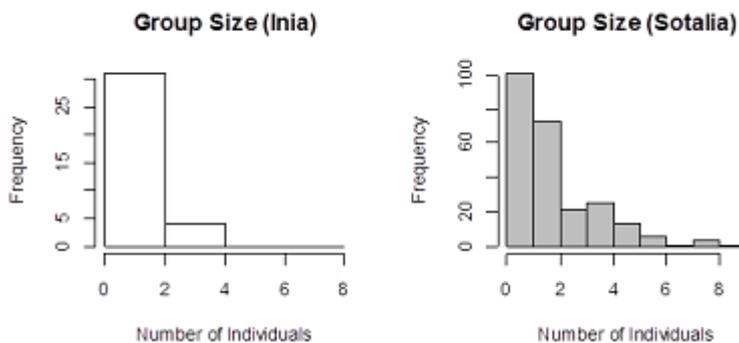


Figure 2. Histogram represents the distribution of group size in both species. Range in *Inia* was half of *Sotalia*. Most sightings were of individuals or couples in both species.

## 2. Hotspots and density

Both species presented areas with higher densities. Transect numbers 4, 5, 7, 11-16 had the highest number of observations (Fig 8) Densities for these areas were also high, number 16 had the highest with 11.90 *Sotalia* individuals per km<sup>2</sup>. Transect numbers 4 and 10 had high densities as well, 10.76 and 10.05 per km<sup>2</sup> respectively. Transect number 6 had the lowest amount of individuals, 0.66/km<sup>2</sup> (See table 1). Overall density was calculated at 102 individuals (SD=3.08, SE=0.75).

In the case of *Inia*, transect numbers 4, 5, 10, 13, 15, 16 had the highest number of observations (Fig 7). Densities did not fluctuate as much as *Sotalia*, with the exception of transect number 3, 4, 7, 17 densities were lower than 1 individual per km<sup>2</sup> (Table 1). Transect 4 had the highest density with 2.87/km<sup>2</sup>. Overall density was calculated at 12 individuals (SD=0.76, SE=0.19).

Both species presented higher densities in transect number 4, 10, 13, 16.

Table 1 Area, width and density of each transect, as well as total for lagoon for both species.

Transect Number	1	2	3	4	5	6	7	8	9
Area (km <sup>2</sup> )	0.63	0.58	0.67	0.75	0.78	0.70	0.82	0.84	0.79
Width (m)	667	589	667	776	793	900	889	942	780
<i>Sotalia</i>	4.15	2.37	5.74	10.76	6.58	0.66	4.25	5.53	4.38
<i>Inia</i>	0	0.79	1.44	2.87	0.66	0.66	1.82	0	0
Transect Number	10	11	12	13	14	15	16	17	Total
Area (km <sup>2</sup> )	0.58	0.48	0.49	0.52	0.53	0.76	0.70	0.55	11.17
Width (m)	601	453	479	523	613	734	679	504	
<i>Sotalia</i>	10.05	4.31	7.31	6.32	5.64	9.47	11.90	2.75	102.45
<i>Inia</i>	0.58	0.86	0	0.32	0.75	0	0.46	1.03	12.23

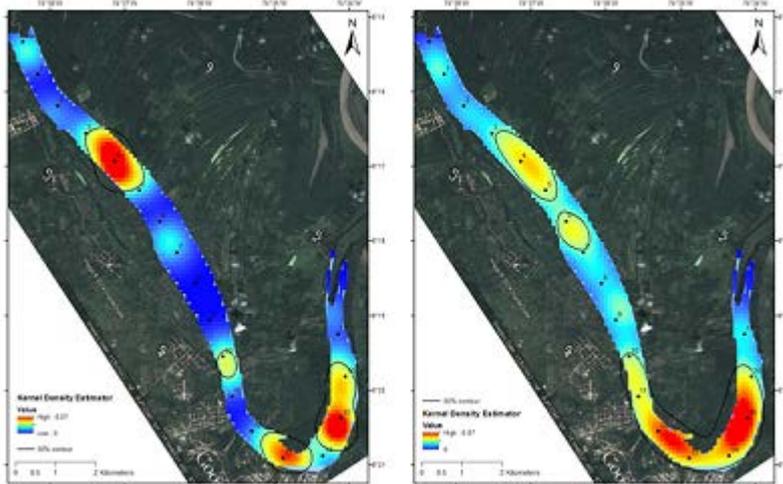


Figure No 3 Hotspots *Inia* (Left) *Sotalia* (right)

### 3. Seasonality and diurnal activity

The number of *Sotalia* individuals observed in Yarinacocha lagoon depended on what month (GLMM,  $\chi^2_{1,5} = 10.503$ ,  $p < 0.001$ ), time of day ( $\chi^2_{1,5} = 17.311$ ,  $p < 0.001$ ) and transect number ( $\chi^2_{1,5} = 12.064$ ,  $p < 0.001$ ) observers were in and was influenced by an interaction between transect number and month ( $\chi^2_{1,6} = 12.334$ ,  $p < 0.001$ ). *Inia* did not present a significant interaction or relationship with any variable ( $\chi^2_{1,8} = 0.0348$ ,  $p = 0.852$ ).

More observations of *Sotalia* were made during the morning (Figure 10), with most being seen at 10:00 ( $n=93$ ,  $SD=1.48$ ,  $SE=0.13$ ). Time with lowest observations was at 17:00 ( $n=10$ ,  $SD=0.94$ ,  $SE=0.18$ ).

*Inia* observations did not see so much variance, time with most observations was at 13:00 ( $n=9$ ,  $SD=0.53$ ,  $SE=0.06$ ) followed by 9:00 ( $n=8$ ,  $SD=0.37$ ,  $SE=0.03$ ). Time with lowest observations was at 16:00 ( $n=1$ ,  $SD=0.17$ ,  $SE=0.03$ ).

*Sotalia* had more observations in August ( $n=109$ ,  $SD=0.43$ ,  $SE=0.13$ ) while *Inia* had more individuals in April ( $n=13$ ,  $SD=0.42$ ,  $SE=0.05$ ).

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

This was the first project team members developed in Pucallpa. We wanted to involve as many local community groups. Team had initial meetings with two governmental bodies: the Municipality of Yarina (in charge of lagoon legislation) and the Ministry of Production (in charge of fisheries). We found that most participants were very enthusiastic about presentations and project. Many of the boat operators had recommendations on how species management could improve and showed interest in being trained in more responsible dolphin-watching techniques.

Community benefitted by increasing knowledge on species they frequently see, but do not know much about. This will improve the quality in the tours they provide to lagoon visitors. Although we only had one meeting with younger children, they benefitted by learning and feeling connected to their local biodiversity. Government officials were invited to participate in all activities related to community outreach. The team met with a total of 116 people to both introduce and discuss project or to give information on river dolphins.

*Table 2: Summary of all workshops and meetings in Yarinacocha, Pucallpa organized by team members*

Public	Date	Attendees	Subject	Materials
Boat association	Aug 16 <sup>th</sup> 2013	14	RSGF project: description, objective, methods, what we expect	Leaflets
	Nov 19 <sup>th</sup> 2013	32	General biology of boto and tucuxi	Leaflets
	Jan 30 <sup>th</sup> 2014	40	Yarina diversity: river otters, amazon manatees, and Paiche	
Local government- Municipality of Yarina	Jun 16 <sup>th</sup> 2013	4	RSGF project: description, objective, methods, what we expect	Project proposal
	Aug 12 <sup>th</sup> 2013	3		
Local government- Ministry of Production (Fisheries)	Aug 12 <sup>th</sup> 2013	3	RSGF project: description, objective, methods, what we expect	Project proposal
Young children-located at Saint Joseph church, Yarinacocha, Ucayali	Feb 3 <sup>rd</sup> 2014	20	Interactive presentation about river dolphins, river otters, amazon manatees and paiche	Cut-outs of amazon manatee and boto

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

*DENSTIY ESTIMATIONS* will continue in Yarinacocha lagoon with some modifications in methodology to improve accuracy and sample size.

**EDUCATION** We have talked with boat operators to continue education. They showed interest in participating in a workshop where training would include other river fauna, such as the Amazon manatee and river otters as well as learning about the Amazon ecosystem. We also want to engage with other audiences such as university students, fishermen and younger children while maintaining contact with boat operators. We plan to include surveys to boat operators and fishermen about threats and knowledge of river dolphins.

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

The project's results will be presented and report will be given to local governments that participated in project from the beginning. Report has a section with recommendations on how the information generated can be applied to species management.

The results will also be exposed to boat operators so they can use the information generated to improve tours and dolphin-watching activities with tourists.

Elizabeth was accepted into MSc Conservation and Biodiversity programme at University of Exeter in September 2013, data collected will be used for her research project.

**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 for a year, beginning in July ending in July.

**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
Travel+Lodging	1960	1963.6	3.6	An extra trip was added to the project, a total of 5 field excursions.
Boat	1090	1097.3	7.3	
Food	1080	1117.7	-37.7	
Supplies and report dissemination	760	856.6	-96.6	
Others (printing, education, report dissemination)	1110	833.4	276.6	Extra money will be used in field trips that continue research project.
<b>TOTAL</b>	6000	5828.5	181.6	1GBP=1.6 USD

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

Yarinacochoa is a lagoon that is exposed to many threats; human population is growing which brings more contamination and noise pollution to dolphin habitat. The creation of a management plan for both species is essential for its conservation in this region. River dolphins could be used as umbrella species and protect what is left of Yarinacochoa's biodiversity.

With river dolphins there is still much to do. A photo-identification catalogue would be excellent to see if dolphins are residents of lagoon, or if they move around. Density estimation could also be expanded to two close lagoons also connected to Ucayali River where human interaction is far less. This would increase the knowledge on how many dolphins inhabit the Ucayali basin.

**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?**

We printed 1,000 river dolphin leaflets and 1,000 cut-outs that were distributed during the educational workshops with boat operators. These leaflets had general information on both species and recommendations for dolphin-watching responsibly. During all the talks and presentations, the Rufford Small Grants Foundation was mentioned as one of the collaborators of the project and the logo was shown.

We also produced 30 key chains for the fishermen that worked and participated in presentations



Figure 4 Leaflets and keychain designs produced for project.



Figure 5 Sotalia observations in February 2014



*Figure 6 Environmental education with children of Pucallpa city February 2014*



*Figure 7 Environmental education with boat association in and August 2013 and February 2014*