

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	Mbalassa Mulongaibalu
Project title	Fish Migrations and Fisheries resources in the River Ishasha – Lake Edward water system in Virunga (ViNP) and Queen Elizabeth National Parks (QENP).
RSG reference	9420 - 1
Reporting period	March 2011 to March 2012
Amount of grant	£6000
Your email address	Mbalassa2003@yahoo.fr
Date of this report	23 April 2012

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
Identify Essential Fish Habitats (spawning, breeding and nursery areas) for fish migrations and seasonal refuges			<input checked="" type="checkbox"/>	Major Essential Fish Habitats located within the study areas have been identified and mapped. The fulfilment of this objective has got key contribution from the Local Ecological Knowledge (LEK) (questionnaires) that has been confirmed by number of recaptures and ground proof samplings in majority of the identified areas. At the completion of the research, I expect to identify and map more habitats even far beyond the research areas around the lake and tributaries considering the current trend of the reported recaptures.
Understand seasonal movements and migrations timings		<input checked="" type="checkbox"/>		The LEK information that was collected represents so far an essential part of this objective. A broader understanding will be emphasised by joining the LEK and the ongoing mark-recapture experiment results (at the end of the research).
Estimate migration extent along the river & tributaries and around the lake		<input checked="" type="checkbox"/>		The LEK information that was collected represents so far an essential part of this objective. I expect that the recapture reports from the ongoing mark-recapture experiments will help us to get clear picture of the migrations extent.
Study and understand key environmental and limnological parameters vital in Essential Habitats along the river and around lake		<input checked="" type="checkbox"/>		Though the information collected through LEK already allows a tentative understanding of some key environmental factors, additional measures are needed and work still being conducted to get sufficient data that could assist for better understanding/conclusion.

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

2.1 Delay in equipment acquisition and additional research funds

- The funds needed for the study have not been readily available to allow the purchase of all research related equipments at once. This has resulted into some delay in the starting of some of key fieldwork activities such as tagging experiments as initially planned. Given that the research was designed to be carried out into two different methods, including the

collection of Local Ecological Knowledge (LEK) on fish ecology and migrations, and the tagging experiments; this was tackled by starting with the collection of information on the LEK around the research areas, before the tagging programme started.

2.2 Fieldwork related challenges

- There was interruption of fishing activities, thereby research activities just few days after I started the first Tagging Experiment (July-August 2011). This was due to cholera outbreak at the research areas. Which did not allow me to continue with project activities as planned for that trip.
- High concentrations of the hippopotamus (along the river: some sites previously selected have been found invaded by hippos and this compelled the team to look for new sites with the same ecological characteristics, some new sites have been found at very long distances,
- In addition, many stretches along the river have become impassable by either boat or vehicle. This has forced the research team to walk long distances through thick forest gallery with cumbersome equipments, and turned out to be very tiring and time consuming.

2.3 Remoteness of the research areas

- The study sites being located in protected areas, with very minimal access, due to new conservation regulations, socioeconomic activities are very limited. This has got important implications on the increasing living cost in these areas and thereby escalating research related costs; – prices of fuel (vehicle and boat) and other basics are very high. No petrol stations nearby and fuel is supplied by a few individuals, who are more often biased by the provenance of the customers (more expensive to townsmen). On the other hand, due to the increased living costs around the areas (all basics come from outside the areas, apart from fish) and the fact the field assistants rely utmost on their fishing activities, given the extent of work and relatively long time spent for the research activities, they requested for the increase of their allowance (to 30\$ ≈ 19£) than the budgeted amount (twenty 20\$ ≈ 13£).

2.4 Field assistants

The research was originally budgeted to use six field assistants (local fishermen) but given the major types of fishing techniques used, namely beach/drag net that requires at least about twelve people to pull the net and the cross sectional river barriers where the traps were fixed to catch ascending and descending fish along the river, that requires fishermen experts in the technique; this has found the research team extended up to about 14 field assistants. This was partly tackled by allowing the team members to use the rest of the fish from the sampling catches (allowed size) a part from *Clarias* and *Barbus* specimens, so that they could sell and distribute the money after the field work.

2.5 Boarder harassments

The research designated to be carried out in the transboundary water resource appears to be generating harassments from some junior customs officers. This has compelled me to give up the sites near the boarder and select others with the same ecological characteristics and that could easily be accessible.

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

- 1) The first maps have been produced showing and locating the identified Essential Fish Habitats (EFH) used by the migratory and other fish species as spawning, breeding and nursery areas and the seasonal refuges along the river and in and around the lake;

- 2) Seasonal movements and estimation of migration timing: based on the LEK collected information, it has been found that the intensive upstream migration movements of *Clarias gariepinus* and *Barbus altianalis* are generally observed during the first four days of the starting of the heavy rains in wet seasons of April and September following the increase of water level. More upstream migration movements are also observed during the heavily rains in between the wet seasons which are generally occurred in the mid-April and mid-September following the increase of water level. The downstream migration movements are generally observed from late May to mid June and in December when water starts to recede from flooded vegetated areas around the river and lake, lakeside and riverside wetlands and following the increase of temperature in the flooded areas and wetlands. These patterns are commonly used by wild felines (lions, leopards, hyenas) in the protected areas and locals to catch the ascending/ descending fish using machetes and spears as well as setting up cross sectional barriers with baskets (local traps) in the rivers in order to capture the ascending / descending migrating *Clarias* specimens.

- 3) - Lakeside and riverside wetlands, flooded vegetated areas around the river and lake (i.e. seasonal refuges), vegetated parts of river mouths and littoral zone have been identified among major Essential Fish Habitats (spawning, breeding and nursery) for *Clarias gariepinus* and other fish species such as *Oreochromis* species and *Protopterus* species. Their important role in maintaining the fisheries productivity has commonly been recognized at the community level. Ishasha River and other lake tributaries such as Ntungwe, Bizibibi around the study areas have been found be used by *Clarias gariepinus* and other fish species (*Oreochromis* spp. and *Protopterus* spp.) as migratory routes connecting them between spawning/nursery grounds (lakeside and riverside wetlands, flooded vegetated areas and the Lake.

River channels and river mouths of Ishasha and Ntungwe Rivers as well as littoral zone of the lake have been identified as main Essential Fish Habitats for *Barbus altianalis* around the study areas.

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

The research and related activities (information generation, data collection, sensitisation and awareness) were fully and completely implemented with the help of local communities. The research project has got the involvement and in-kind support from the local leaders and local NGOs/CBOs such as 'Innovation pour le Développement et la Protection de l'Environnement (IDPE)', Amis de la Forêt et de l'Environnement pour le Développement (AFED), Union des Pêcheurs du Nord Kivu (UPENOKI), PADERU just to mention the few. These were assisting in sensitising the fishing communities to support the research through information and experience sharing and the reporting of the tags on tagged fish that were recaptured by different fishermen across the lake and along the rivers. During sensitisation sessions around the landing sites, I was generally helped by local leaders including Beach Management Unit (BMU) Chairmen, area Fisheries Officers and other related services. The fishing (sampling) was carried out by local field assistants (fishermen). During interviews on the LEK, I was always assisted by two to three experienced fishermen for interpretation. Tags recovery: at each landing site (17 landing sites in total) around the lake, BMU chairmen and/or Fisheries Officers have willingly accepted to collect the information on the recaptured fish tags and send it to me through SMS, before I travel for each next trip experiment.

The joint involvement and participation of the two local nationals (Congolese and Ugandan) in research activities has led to unexpected outcomes, these include awareness and feeling for common and shared resources. By working together with both Congolese and Ugandan locals, there was creation of awareness and feeling of common shared resources for both nationals, especially following the ongoing mark-recapture experiments. Locals were generally excited to discover that fish have no border; when they could recapture the fish that have been tagged from one country's side at the opposite side (country) and vice versa. This has raised the awareness and feelings of common resources in locals from both countries; unlike previously when locals from the two countries thought that fish movements in this shared natural resource was limited to in-country waters.

Transfer of technology between the locals from the two neighbouring countries: some fishing techniques used in sampling were unknown by either one or other nationals. These include, the use of beach/drag-net (seines) that was generally unknown to Ugandan fishermen in one hand, and in the other hand, the construction of cross-section barriers along the river, that was also not much known by Congolese fishermen, their joint participation in the research has allowed them to learn these techniques from each other.

Increase of understanding and cooperation between the fishermen and the rangers from the two countries: by working together, the fishermen and rangers from the two countries always discussed and made understand each other about some different issues/regulations that were always a source of conflicts between them; since the two adjoining Protected Areas (PA) are managed by two non harmonized (different) policies (from two different countries).

Creation of friendships between the research team members from the two countries: many team members got friends from neighbour country and being kindly received whenever the team could cross to any of the two countries.

5. Are there any plans to continue this work?

At the completion of my PhD programme (2013), I plan to continue with the project. Given the lessons learned during this project, in addition to the fact that no much research activities have virtually been conducted during the postcolonial period to support fisheries management in the lake, I plan to initiate and spearhead the institutional collaboration between the Congo Wildlife Authority (Institut Congolais pour la Conservation de la Nature –ICCN) that manages the Lake Edward as it is entirely located within the Virunga National Park, the Uganda Wildlife Authority (UWA), part of the lake being located within the Queen Elizabeth National Park and my affiliate Institution (State University of Bukavu) in order to set up a research section that could be based in fisheries research in the lake and its tributaries. That could permanently permit to collect biodiversity and ecological data that could support the lake fisheries management and at the end inform recommendations for policies in both countries in regard to the ecosystem conservation and community fisheries management.

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

The thesis will be made available in various libraries that will easily be accessible to other researchers and students. At the end of the research, two workshops (one in Congo, and one in Uganda) are planned inviting all the stakeholders (local fishing communities, Beach Management Unit Chairmen, Fisheries Officers, Park Managers, local leaders) involved in the research to provide

them with the feedback of the research findings and recommendations. Papers are planned to be published in peer review journals for the reach of other researchers, students and fishery managers. Being obviously the first comprehensive study on fish migrations in the region, it is hoped that this research, along with the methodology will become an essential reference for researchers and students interested in fish migrations/ecology and fisheries studies in the region.

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 from March 2011 to March 2012. The RSG was generally used as previously planned. However, the remaining balance from some budget sections (see below) will continue to be used according to their respective allocations into the budget since the study is still being conducted with more samplings and tagging experiments.

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
Fyke nets	63	63	0	
Minnow traps	113	179	- 66	The extra expenditure occurred owing to changes in prices between the budgeting and purchasing periods
Canoe & engine hiring	315	315	0	
(Nets shipment) Local travels & driver	201	126	75	Fyke nets were supposed to be bought and shipped from abroad; fortunately they were found and bought locally. This fund was then reallocated to local travels and driver allowances.
Fine T-Bar Anchor Tags (TBF) & related equipment	2137	2384	- 247	There was change in prices between the budgeting and purchasing periods. There was also some additional expenditure such as shipment fee that was missed out in the original budget.
Fishermen reward for recaptured tagged fish	377	31	346	Recapturing tagged fish is a continuous process; this fund was paid to fishermen whenever they report and bring the tags. As the tagging experiments are still being conducted, the current balance from this fund section will continue to be paid for further recaptures.
Field assistants/local fishermen	151	365	- 214	The number of field assistants and their allowance has increased following the extent of work and the

				duration of sampling period related to research activities on the ground as stated in sections 2.3 and 2.4 above.
Workshops & meetings, publications et dissemination.	1260	423	837	Only part of this fund section has so far been used, The remaining balance will continue to be used for more meetings and workshops to be organized in the course of the project (see section 6 above).
Field work trips	1006	1006	0	
Fuel (canoe & vehicle) and maintenance	377	694	- 317	The major extra expenditure was due to the ever escalating prices of fuel. Additionally, we have done many unexpected movements by both boat and vehicle around the lake and along tributaries for sensitisation and to record geographical coordinates wherever recaptures were reported around and beyond the research areas.
Total	6000	5586	414	

The price listed above are in £, with the exchange Rate: 1£ = 1.59 USD, and 1£ = 3578 UGX

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

At the end of the research, when the understanding of fish migration patterns and identification of migration essential habitats happen, it would be easy to develop adaptive strategies for fishing communities who depend on the rivers and lake for their livelihoods. There is also a need to establish a common integrated river basin management program between Democratic Republic of Congo and Uganda. Pragmatically, research may begin with a very limited focus but once the information required to make communities/stakeholders move effectively to manage the fisheries resources it would be easy to identify how to make any future support economically viable, socially and politically acceptable, and effective in remote areas. Thus, we intend to explore opportunities for new funding to address any emerging critical communities and fisheries development issues in the region.

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?

The RSGF logo was used in the sensitisation posters that have been produced and distributed around all the landing sites across the lake and in all related offices in both countries. It was also used at all my presentations including classes and seminars both in Uganda (Makerere University) and DR Congo (State University of Bukavu and Shalom University of Bunia).

11. Any other comments?

I am very grateful for receiving the 1st Rufford Small Grant. Though the fish migration studies are known to be expensive and demanding, the RSG support was very important for facilitating me to carry out effective research activities, and has helped to fulfil my aim of acquiring appropriate skills in the field of biodiversity and conservation from which fishing communities and scientists in the region would largely benefit. I wish and hope to be able to get the RSG support again in the near future.