

The Rufford 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.

Thank you for your help.

Josh Cole, Grants Director

Grant Recipient Details	
Your name	Pedro López Del Castillo
Project title	Watershed Conservation in Cuba: Bio-monitoring, Training and Environmental Education II
RSG reference	13039-2
Reporting period	Whole study
Amount of grant	£ 6 000
Your email address	pldelcastillo@nauta.cu & ffturquino@enet.cu
Date of this report	March th23, 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
Bio-monitoring		✓		In progress.
Environmental Education			✓	
Training to the Head Office of Protected Areas, Coffee Enterprises and Farmers			✓	
To increase the Collection of Freshwater Fauna in Museum of Natural History Tomás Romay			✓	

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

N/A

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

Bio-monitoring

We are still working in the relationship between aquatic insects and its microhabitats with new data of different sample points inside of Sierra Maestra Mountain Range (SMMR), so increasing the baseline of knowledge on this topic. We have also been working a whole year in the book "The State Art of the Freshwater Fauna in Mesoamerican and West Indies" specifically, "Chapter Cuba". We included parts of the results obtained with the support of the Rufford Foundation. As well, we are increasing the Collection of Freshwater Fauna with new registers for several species. I have been invited to participate in the II Latin-American Congress of Aquatic Macro invertebrates to be held in Mexico April 7th-11th 2014. There I will also share the achievements of the projects.

Environmental Education

We carried out similar activities like the previous project, which included paintings and theatre competitions among primary schools' students but now reaching seven communities by the end of the project. On this stage we selected two schools within the protected areas from Pico Caracas and Palmarito. Besides, we have also selected five schools placed in Turquino National Park and Yara Watershed where we have developed several Watershed Conservation Activities. Talks were related to knowledge of species of the flora and fauna of each community (e. g. endemic snails of Palmarito FR; birds, reptiles, amphibious and species of trees endemics or threaten inside the Redlist in Turquino N.P. and Pico Caracas FR)

Training:

Our team was very satisfied with this topic because we could surpass our training goal. In this stage we were working in training according to the needs of conservation in every Protected Areas with the objectives of mitigating the stressing factors, mainly directed and oriented to Flora and Fauna Enterprise, Coffee Enterprise, Forestry Service and Farmers.

In order to share and exchange knowledge about this topic we extended the training to the Head Institute of Hydraulic Resource in Granma province, Research Institute "Jorge Dimitrov" and the

Earth Planning Center focused on Biomonitoring, Ecology of Freshwater Systems and Watershed Conservation.

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

The communities involved in the Project (two communities in Pico Caracas and Palamarito Protected Areas respectively, five in Turquino National Park and Yara watershed) have greatly participated in the cleaning of rivers, planted trees along of river banks, developed talks, made painting expositions with issues related to conservation of watersheds and biodiversity. The main benefit of the communities has been the increasing of awareness and knowledge referred to conservation of biodiversity. The communities have also benefitted with better agriculture practice to protect the soil, a healthier practice of burning to do the smallholding, coffee grower diminished the application of pesticide and fertiliser and the most important benefit achieved by the communities is to contribute to a better life style inside the communities involved in the project.

5. Are there any plans to continue this work?

Yes, of course. After these fruitful work experiences with first and second Rufford Small Grant, we plan to continue increasing the work (in space and time) as well as to carry out new conservation actions in long-lasting term. We will keep the objectives and tasks of this project related with watersheds conservation specifically on training and environmental education, biomonitoring and forest enrichment; if a Rufford Booster Grant it is approved.

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

We have gradually presented the results of this project in meetings of the Society of Agriculture Workers in town, meeting of protected areas on Turquino National Park, workshop of conservation organized by National Office of Flora and Fauna Enterprise, as well as, the book "The State Art of the Freshwater Fauna in Mesoamerican and West Indies".

We also shared the results with "Ciencia en su PC" an electronic magazine with regional scope in eastern Cuba. Another way to share results of the project was XVIII International Congress of Mesoamerican Society to Biology and Conservation held in Habana September 2013 (in pre-congress short course of freshwater fauna, bio-monitoring and watershed conservation held in Granma province). We plan to share the results that are now being processed in specialised magazines under "peer review" and popular publications. Besides that, we will keep participating actively in meetings and workshops.

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 over 12 months from February 2013 to February 2014

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
Laptop (first it is broken)	500	500		
Desktop	800	800		
Electric Generator (first it is broken)	300	100	-200	I repaired the generator
Allowance to identify specimens in Santiago de Cuba	1000	1100	+100	
Theatre materials	300	300		
Environmental education materials	400	400		
Working materials	500	500		
Printing services	300	300		
Shipping cost	200	200		
Transport to field areas	800	900	+100	
Food for worker and snack to students	900	900		
TOTAL	6 000	5 800		

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

Our team believes the main steps are to continue the actions of conservation on Cuban Watersheds, for example:

- To continue the increasing of activities related with training and environmental education in other watersheds inside of SMMR with an ecosystem approach applying the experience acquired and the methodology that has proved to work well in the current and previous project.
- To increase the forest health of the poor sub-basins through enrichment of the forest with their own endemic species in each locality. For this will be necessary to make several nursery seeds in SMMR.
- To follow-up the processing of the data and to publish its results in scientific and popular magazines.
- To share the results in meetings and workshops.
- To continue the researches referred to bio-monitoring, systematics and ecology of freshwater fauna and their applicability into conservation of watersheds.
- To create an Internet website referred to watershed conservation for screening all tasks and experiences carried out.
- To secure that the updated information referred to watershed conservation be applied in the protected areas to update its Management Plans.
- To continue working on the book related with Cuba freshwater fauna and watershed conservation.
- To apply for a Rufford Booster Grant to widen the activities in Watersheds Conservation in all Sierra Maestra Mountain Range. These actions and tasks will be assumed with an Ecosystem Approach, this means that we will be greatly focused in reaching results in a long-term.



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?

Naturally, in this second stage the RSGF logo was included in all our presentations (e.g. meetings and workshops), as well as in all lectures and talks in schools, communities inside of SMMR, Coffee Enterprises and Flora and Fauna Enterprise.

11. Any other comments?

We are very thankful for the support Rufford Foundation has granted to us.

Appendix

Checklist of two groups of aquatic insects (Mayflies and Caddiflies), in several collecting points from different streams of Sierra Maestra Mounting Range, summed by monitoring methods.

The endemic species are with an asterisk. In bold the new localities reports.

Monitoring methods:

- 1- Direct collect in Riffles (15 stones)
- 2- Direct collect in Pools (15 stones)
- 3- D-net in Riffles (We took tree replicate of 30x30cm)
- 4- D-net in Sand (We took tree replicate of 30x30cm)
- 5- D-net Packet of leafs (We took one replicate of 30x30cm)
- 6- D-net Removing of the vegetation bank (3 mts)

YARA WATERSHED		Monitoring methods						Total
EPHEMEROPTERA (Mayfly)		1	2	3	4	5	6	
BAETIDAE								
1	<i>Americabaetis naranjoi</i> (Kluge, 1992) *						4	4
2	<i>Cloeodes inferior</i> Kluge, 1991 *		4		1	1		6
3	<i>Cloeodes superior</i> Kluge, 1991 *		12		177	3	5	197
4	<i>Falceon alcarraze</i> Kluge, 1992 *			25	0			25
5	<i>Falceon longifolius</i> (Kluge, 1992) *			6	0	2	3	11
6	<i>Falceon planifrons</i> (Kluge, 1992) *	161		339	13		19	532
7	<i>Falceon nikitai</i> McCafferty & Lugo-Ortiz, 1994	5		146	55	8	45	259
8	<i>Falceon cf planifrons</i>	1						1
9	<i>Falceon sp</i>			2				2
CAENIDAE								
10	<i>Caenis cubensis</i> Malzacher, Naranjo, González & Kluge, 2007*		5		3	5	2	15

	LEPTOHYPHIDAE						
11	<i>Tricorythodes cubensis</i> Kluge & Naranjo, 1990 *		1		36		37
12	<i>Tricorythodes grillators</i> Kluge & Naranjo, 1990 *	1	1		2	1	5
13	<i>Tricorythodes montanus</i> Kluge & Naranjo, 1990 *		1		14	4	6
14	<i>Tricorythodes sacculobranhis</i> Kluge & Naranjo, 1990 *	5	379	92	88	27	9
	LEPTOPHLEBIIDAE						
15	<i>Farrodes bimaculatus</i> Peter & Alayo, 1971 *		42		14	18	23
16	<i>Hagenulus (Careospina) baconaoi</i> Kluge, 1994 *	2	3	1			0
17	<i>H. (C.) hespera sierramaestrae</i> Kluge, 1994 *		19	21	2		11
18	<i>Hagenulus (Hagenulus) morrisonae</i> Peter & Alayo, 1971 *	22		4			
19	<i>Hagenulus (Poecilophlebia) pacoi</i> Kluge, 1994 *					10	
20	<i>Hagenulus (Traverina) oriente</i> Kluge, 1994*		1				
	TRICHOPTERA (Caddisfly)						
	GLOSSOSOMATIDAE						
21	<i>Campsiophora mulata</i> Botosaneanu, 1977*	266	2	105			
22	<i>Glossosomatidae sp</i>	3	63	4			
	HYDROPTILIDAE						
23	<i>Alisotrichia alayoana</i> Botosaneanu, 1977 *	16		68			
24	<i>Alisotrichia y</i>	2		106			
25	<i>Alisotrichia sp prov</i>			6			
26	<i>Oxyethira sp</i>	1	2				
27	<i>Zumatrichia sp</i>	29		19			
28	<i>Hydroptilidae sp</i>		6				
	PHILOPOTAMIDAE						
29	<i>Chimarra sp1</i>			3			
	XIPHOCENTRONIDAE						
30	<i>Xiphocentron cubanum</i> (Banks), 1941*		3				

	HYDROPSYCHIDAE							
31	Calosopsyche cubana (Flint), 1962*	36		46	1			83
32	Macronema ?	2		4				6
33	Smicridea (Smicridea) comma Banks, 1924	27		82	1			110
34	Smicridea sp1			2				2
	POLYCENTROPODIDAE							
35	Antillopsiche sp 1 Botosaneanu 94		2					2
36	Cernotina sp		3		1		8	12
	CALAMOCERATIDAE							
	Phylloicus chalybeus (Hagen), 1861*		19			10	11	40
	LEPTOCERIDAE							
37	Nectopsyche cubana Banks, 1938				7		11	18
	ODONTOCERIDAE							
38	Marilia scudderi Banks, 1924*			1	1			2
	HELICOPSYCHIDAE							
39	Helicopsyche spp near comosa kinsolver 1964		18	1				19
40	Helicopsyche hageni.	4	21	6	28		1	60
41	Helicopsyche y		13					13
	Total abundance by monitoring methods	583	620	1089	444	89	163	2988
	Total species by monitoring methods	17	22	23	19	11	16	

		Monitoring methods						Total
	NAGUA WATERSHED	1	2	3	4	5	6	
	EPHEMEROPTERA (Mayflies)							
	BAETIDAE							
1	<i>Americabaetis naranjoi</i> (Kluge, 1992)						6	6
2	<i>Cloeodes inferior</i> Kluge, 1991		1		7	2		10
3	<i>Cloeodes superior</i> Kluge, 1991 *				7	3		10

4	<i>Falceon alcarraze</i> Kluge, 1992	10	2	16	9			37
5	<i>Falceon longifolius</i> (Kluge, 1992)			2	8			10
6	<i>Falceon planifrons</i> (Kluge, 1992)	186	3	769	12	14	27	1011
7	<i>Falceon nikitai</i> McCafferty & Lugo-Ortiz, 1994	13	19	69	42	87	404	634
8	<i>Parcloeodes lilliputian</i> Kluge, 1991		1		50	12		63
	CAENIDAE							0
9	<i>Caenis cubensis</i> Malzacher, Naranjo, González & Kluge, 2007				10	20		30
	LEPTOHYPHIDAE							0
10	<i>Tricorythodes cubensis</i> Kluge & Naranjo, 1990 *		11		113	23	1	148
11	<i>Tricorythodes grallators</i> Kluge & Naranjo, 1990 *				2	12	21	35
12	<i>Tricorythodes montanus</i> Kluge & Naranjo, 1990 *		1		2			3
13	<i>Tricorythodes sacculobranhis</i> Kluge & Naranjo, 1990 *		124	2	50	11	30	217
	LEPTOPHLEBIIDAE							0
14	<i>Farrodes bimaculatus</i> Peter & Alayo, 1971 *		3			12	5	20
15	<i>Hagenulus (Careospina) baconaoi</i> Kluge, 1993 *	1	22	11	7		2	43
16	<i>H. (C.) hespera sierramaestrae</i> Kluge, 1993 *	25	89	103	91	76	108	492
17	<i>Hagenulus (Hagenulus) morrisonae</i> Peter & Alayo, 1971 *	38		15				53
18	<i>Hagenulus (Poecilophlebia) pacoi</i> Kluge, 1994					4		4
19	<i>Hagenulus (Turquinophlebia) sp n</i>		1					1
	TRICHOPTERA (Caddisflies)							0
	HYDROBIOSIDAE							0
20	<i>Atopsyche (Atopsaura) vinai</i> Sýkora & Botosaneanu, 1973*	1		1				2
	GLOSSOSOMATIDAE							0
21	<i>Campsiophora mulata</i> Botosaneanu, 1977*	413	35	206				654
22	<i>Glossosomatidae</i> sp	4	13	1				18
	HYDROPTILIDAE							0
23	<i>Alisotrichia alayoana</i> Botosaneanu, 1977 *	14		141				155
24	<i>Alisotrichia</i> y			30				30
25	<i>Alisotrichia</i> sp1			2				2
26	<i>Orthotrichia</i> sp		1					1
27	<i>Leucotrichia</i> sp	3		72				75
	XIPHOCENTRONIDAE							0
28	<i>Xiphocentron cubanum</i> (Banks), 1941*	1	6					7

	HYDROPSYCHIDAE							0
29	Calosopsyche cubana (Flint), 1962*	69		66				135
30	Smicridea (Smicridea) comma Banks, 1924	30	1	18	1		1	51
31	Hydropsychidae sp	1						1
	POLYCENTROPODIDAE							0
32	Cernotina sp		3				3	6
	CALAMOCERATIDAE							0
33	Phylloicus chalybeus (Hagen), 1861*				2	6	9	17
	LEPTOCERIDAE							0
34	Nectopsyche cubana Banks, 1938		1		3	2	12	18
	ODONTOCERIDAE							0
35	Marilia scudderi Banks, 1924*				2			2
	HELICOPSYCHIDAE							0
36	Helicopsyche spp near comosa kinsolver 1964		7		2			9
37	Helicopsyche hageni Banks, 1938		6					6
38	Helicopsyche sp2		9					9
39	Helicopsyche sp1		1					1
	Total abundances by monitoring methods	809	360	1524	420	284	629	4026
	Total species by monitoring methods	15	23	17	19	14	13	

