The Rufford Foundation
Final Report

Congratulations on the completion of your project that was supported by The Rufford 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	Milica Lukač
Project title	Population structure and vulnerability of the threatened fish species *Telestes metohiensis* from karstic streams in Bosnia and Herzegovina
RSG reference	18769-1
Reporting period	November 2015 - November 2016
Amount of grant	£ 4959
Your email address	milica.lukac3@gmail.com
Date of this report	24.12.2016.

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
Distribution and population size of *Telestes metohiensis* in existing waterways				In streams foreseen to the project we confirmed presence of striped pijor (Opačica, Pribitul and lower course of Vrijeka). In watercourses Obod and Ljubomirski potok we founded only specimens of *Delminichthys ghedaldii*. We plan to expand research on karst fields in whose streams has also previously noted the presence of striped pijor.
Habitat description, including pH waters, temperature, oxygen (concentration and saturation), electrical conductivity and turbidity.				We measured the parameters of the water that we specify. Water quality in all water streams corresponding to the first class of water quality. Example for Opačica in supplement.
Population structure based on morphological variation				We photographed all the individuals that we captured, determine sex and hit points for geometric morphometry. Statistical data processing is underway. This data will be published in scientific journal.
DNA sampling for genetic analyses for the future work.				We took part of the dorsal fin for DNA analysis from each photographed individual. Based on these analyzes in future work we will have data on the genetic structure of population, which is very important from the conservation aspect. Integrating multiple data will further be used for evaluating the evolutionary potential of natural populations and identification of management units for

				protection of the species.
Raising public awareness of the unique karst springs and underground streams ecosystem by emphasizing of the endemic and vulnerable striped pijor				We informed the public about our activities, which we carried out during the last period. We have designed a web site that is regularly updated news (http://www.telestesmetohiensis.rs.ba/index.php/sr/). We have designed and printed promotional material that we shared on the presentations, workshops and other events. This segment of the project was successful. We are especially pleased that we cover different age categories and profiles in our awareness campaign.

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

During the project we had a few difficulties. The biggest was the weather conditions which in certain months were quite unstable. During extremely heavy rainfall, we have not had access to certain streams, because the entire field was under water (March 2016). We conducted field work in November 2015, April and December 2016. Also, we had difficulty to obtain a fishing licence, which is necessary for electrofishing. That was the reason why we conducted our last field work in December 2016. Pribitul stream was frozen so we were unable to catch fish.

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

1. We determined the presence of striped pijor in existing watercourses Opačica, Pribitul and Vrijeka - Dabar field.

2. We established the physical and chemical characteristics of water streams and found that the classification of water belong to the first class

3. We have worked on raising awareness about the protection of endemic and rare species in the unique habitats of the karst areas of eastern Herzegovina

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

We have connected with local fishing society whose members give us information about the presence of striped pijor in certain streams during different seasons. We also get information about accessibility streams during bad weather conditions. We pointed out to them the harmful effects of invasive species that knowingly or unknowingly entered into watercourses of karst fields. During our campaign, we met with a number of non-governmental organisations, representatives of the authorities, students and other citizens. Many of them are not informed of how important it is to protect rare and endemic species and their habitats, nor that Bosnia and Hercegovina is very rich in such species. Our contribution was that we were informed them about it at least in the domain of our project.

5. Are there any plans to continue this work?

We plan to continue monitoring of the existing and other potential streams (which are many) in eastern Herzegovina. In order to achieve this, we will also apply for the 2nd Rufford Small Grant. Expansion of the area in which we monitor and determine the genetic structure of the population in the coming period is necessary to determine the status of endangered species as well as propose a plan of conservation.

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

The Rufford Foundation organised the first Balkan Rufford conference in Banja Luka, Bosnia and Herzegovina, "Nature knows no boundaries", where we participated and presented our project.

Lukač, M., Mandić, M., Bilbija, B., 2016. Vulnerability and conservation importance of the endemic fish species *Telestes metohiensis* in Bosnia and Herzegovina. Book of Abstracts from Rufford Small Grants Conference in Bosnia and Herzegovina "Nature knows no boundaries", March 21-22, Banja Luka, Bosnia and Herzegovina.

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

The grant was used over a period of 13 months (November 2015 – December 2016). We needed more time than anticipated because of the difficulties that we had during the project

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
Photo camera and tripod (1 piece)	700	800	-100	We covered the difference with money for FTA cards
GPS	151	193	-38	The difference was covered with money for FTA cards
Web site design	450	500,25	-50,25	Hosting of website (**£**50,25)
Brochures and advertising material	968	968	0	Fully spent
Field work, travel expenses (fuel)	700	700	0	Fully spent. We have one less field work. Because of the decline of the pound, we would not be able to cover the costs that we anticipated.
Accommodation and food at the time of fieldwork	800	800	0	Fully spent. We have one less field work. Because of the decline of the pound, we would not be able to cover the costs that we anticipated.
Whatman FTA cards (cards for space- and time-saving collection, archival storage, and isolation of genomic DNA-2 packages)	200	0	+200	We did not bought because the method of DNA isolation from blood has not proved to be successful as of fins. We used it to cover minuses for other items.
IntelliCal Ammonia ISE Analysis Package, 1m	690	690	0	Fully spent
Fee	300	300		Spent to cover minuses in budget from other items, and reduction of salaries during the filed trips.
Total	4959	**4951,25**	+7,75	

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

It is very important to continue research on a wider territory and to determine the presence of striped pijor in other streams of karst fields of eastern Herzegovina. Hence, to determine the precise distribution of the population and the potential communication via underground or surface water. Also, to determine the genetic structure of populations on existing and new patterns. It is also important to determine the presence of allochthonous invasive species in existing watercourses. The data obtained by the proposed project would provide necessary information for monitoring the impact of various factors on the chosen localities and the species in order to identify appropriate management actions and to measure their effectiveness in our future work.

10. Did you use The Rufford Foundation logo in any materials produced in relation to this project? Did the RSGF receive any publicity during the course of your work?

We used The Rufford Foundation logo in presentations, our promotive materials and web site. Thanks to that The Rufford Foundation is popularized among all target groups. Especially for students who are potential candidates for the application of new projects.

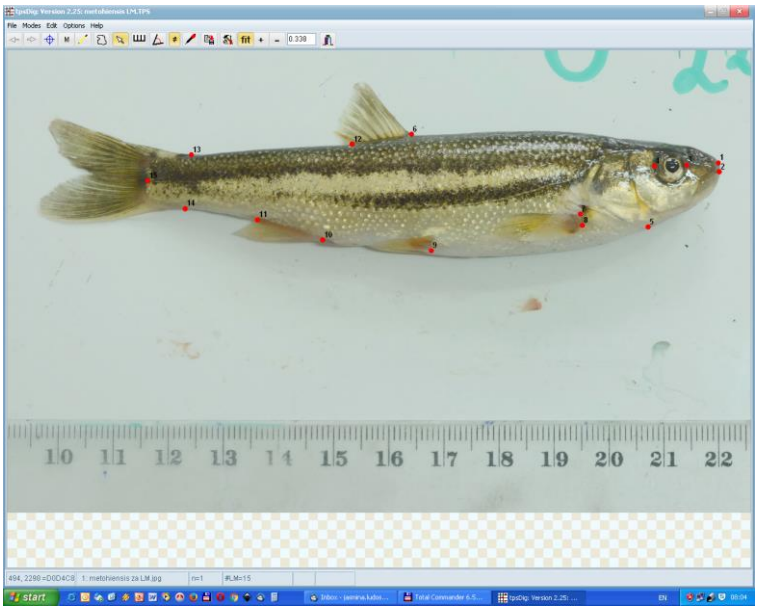
11. Any other comments?

My team would like to express gratitude to The Rufford Foundation for recognizing the importance of our project. It was a great pleasure to work on this project. We hope that our cooperation will continue because there is still much to be done.

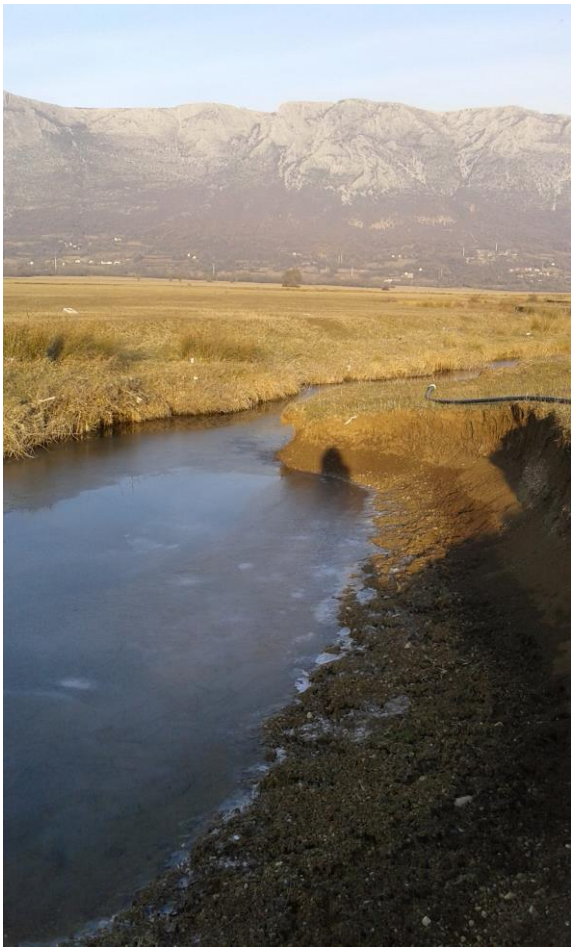
Supplement

Physical and chemical parameters of Opačica (December 2016)

Parameter	Value
Temperature (°C)	3,4
Electrical conductivity (µS)	457
Turbidity (NTU)	1,62
Oxygen concentration (mg/L)	12,05
Oxygen saturation (%)	94,3
pH	7,88



Landmark-based geometric morphometrics

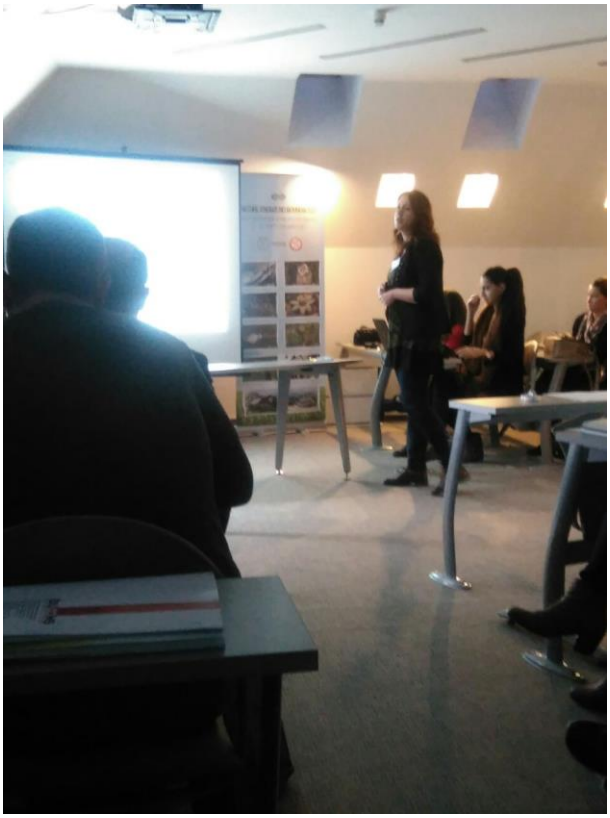


Opačica (December 2016)

Opačica – electrofishing (December 2016)

Captured specimens (about 40) from Opačica (December 2016)

Frozen Pribitul (December 2016)



Presentation at Rufford conference in Banja Luka (March 2016)

Science festival in Banja Luka