

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	Species boundary identification of endemic cyprinid <i>Telestes metohiensis</i> using DNA taxonomy
RSG reference	22035-2
Reporting period	April 2017 – April 2018
Amount of grant	£ 4937
Your email address	milica.lukac3@gmail.com
Date of this report	16.04.2018

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
Define the taxonomic units, habitats and areas of striped pisor using data on species boundaries obtained by molecular markers.				Based on DNA taxonomy, we determined the specimens from Nevesinjsko field (Zalomka river) as <i>Telestes metohiensis</i> . Specimens from the Dabar field (<i>Opačica, Pribitul and Vrijeka</i>) are identified as <i>Telestes dabar</i> . Thus, precise delimitation of the species enable us to determine their localities and habitats. This is an important step of establishing conservation units and the implementation of a right management plan. We need to expand research territory on the other fields in Eastern Herzegovina.
Adjusting the parameter measurements of habitats				The activities of measuring the physical and chemical parameters of water (as important indicators of the condition of the watercourses) are continued.
Evaluate genetic and morphological variation of populations				Molecular (mitochondrial DNA and nuclear DNA) and morphometric markers (based on geometric morphometry) have been used to quantify genetic and morphological variability of populations. Results of the population structure will be published in scientific journal.
Sampling of invasive non-native fish species.				We sampled a few specimens of the chub and trout in the Zalomka River. The same markers will be used for quantifying genetic diversity in order to perform an evaluation of its evolutionary potential and competitiveness
Raising public awareness				We had various activities: presentations for students of biology and ecology, exhibits and presentations at the science festival

				for students of elementary and secondary schools, local fishing societies. The new promotional material is also printed and distributed to all participants at workshops and lectures
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2. Please explain any unforeseen difficulties that arose during the project and how these were tackled (if relevant).

Bad weather conditions, heavy rainfall and drought were the biggest problems. Due to unpredictable weather conditions, it is difficult to plan activities for field work. Since we have established cooperation with local fishermen, who inform us about the condition of watercourses, it is much easier for us to plan and optimise our activities

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

1. We established that the Dabar field is inhabited by *Telestes dabar*, and the field of Nevesinje is inhabited by *T methohiensis*. Therefore, this is a confirmation of allopatric distribution of these species and possibly a high endemism of *T. dabar*. We reached these conclusions by analysing the sequence for two mitochondrial (cytochrome b, cytochrome c oxidase subunits 1) and one nuclear gene (*s7* ribosomal protein gene introns). Recently described new species, *Telestes dabar* was recognised using morphological comparisons of isolated geographical populations of fishes identified earlier as *Telestes methohiensis* and that was confirmed by our molecular analyses.

2. Continuation of watercourses condition monitoring by measurement of physical and chemical parameters of water. The measured parameters are compared between different watercourses and during different seasons. This allows us greater insight into the fluctuations of external environmental factors and habitat status.

3. Raising public awareness of the unique karst springs and underground streams ecosystem by emphasising of the endemic and vulnerable *Telestes methohiensis* and *T. dabar*. Presentations, workshops, promotional materials, conferences, Science festival, website and social networks are just some of the ways that we presented the problem of protecting endemic fish species of eastern Herzegovina to state institutions, non-governmental organisations, local communities, students, fishing societies and the general public.

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

Local fishing societies and local communities as well are important links in informing and educating the public about the importance of the endemic cyprinid fishes. The mutual exchange of information, which so far works very well, is inevitable in achieving the ultimate goal. This information will help us to enhance conservation efforts of the species through education and awareness campaigns. Their most

important benefit is to preserve natural rarity, such as endemic species and unique karst ecosystems.

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. Expansion of the area in which we monitor and determine the 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?

Results of our work will be: published in papers in scientific journals; presented during the lectures for students and local communities and presented to the scientific public at conferences. We already participated in the 1st Southeast European Ichthyological Conference (SEEIC 2017) in Sarajevo: "Molecular variability and identification of *Telestes metohiensis* (Steindachner, 1901) and *Telestes dabar* Bogutskaya, Zupancic, Bogut & Naseka, 2012" (by authors Lukač M., Francuski Lj., Dekić R., Milankov V.).

On the 7th Science Festival in Banja Luka we participated with promoting our scientific research work and presented one of the endemic fish species of eastern Herzegovina - *Telestes dabar*. This was a good opportunity to get to know the official state institutions with our work, because the festival was organized by the Ministry of Science and Technology of the Republika Srpska.

We regularly update the activities on our website realized during the project:
<http://telestesmetohiensis.rs.ba/index.php/naslovnna>

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 12 months (April 2017 – April 2018). This period was long enough to implement most of the planned activities

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
DNA analysis	868	868	0	Fully spent
Sequencing	695	695	0	Fully spent

Field work, travel expenses (fuel)	700	700	0	Fully spent
Accommodation and food at the time of fieldwork	1000	1000	0	Fully spent
Fee	300	258	+42	Part of the fees we used for the cost of hosting and creating a new website
Laptop	800	709	+91	With this difference we also cover creating of a new website
Promotional material	400	400	0	Fully spent
Laboratory expendables	174	174	0	Fully spent
New website and hosting	0	133	0	Due to platform problems, we had to create a new website. It is covered from fees and laptop (42+91)
Total	4937	4937	0	

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

In order to complete distribution, we aim to expand study localities presumably inhabited by *Telestes metohiensis* and *Telestes dabar*. This is an important step to identify clear species boundaries and establish conservation units. We also are planning to continue detecting the presence of allochthonous invasive species in existing watercourses. We have already sampled several individuals of invasive species in the Zalomka River (Nevesinjsko field). Determination of its evolutionary potential is in progress. Our goal is to point out, through various educational activities, the negative impact of invasive species on indigenous populations, as well as on the entire ecosystem. 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 Rufford Foundation receive any publicity during the course of your work?

The Rufford Foundation logo was used (according to the instructions received from the RSGF) in presentations, promotive material and website.

11. Please provide a full list of all the members of your team and briefly what was their role in the project.

Branka Bilbija, MSc –activities at field work (sampling, measurement of physical and chemical parameters of water) and work in laboratory

Maja Mandić, MSc -activities at field work (sampling, measurement of physical and chemical parameters of water) and educational activities

12. Any other comments?

We want to say big thanks to the Rufford Foundation for allowing us to do so much so far. By the way, we do not plan to stop here. As we have already pointed out, there are other sites in eastern Herzegovina that are unexplored and there are indications of the presence of these species. In order to continue our path to protecting these endemic and rare species and ecosystems, we hope for further cooperation.

Promotional materials





Science festival



Presentation to students in
Banja Luka



Zalomka River, Nevesinjsko
field