

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. 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 jane@rufford.org.

Thank you for your help.

Josh Cole, Grants Director

Grant Recipient Details

Your name	Emina Šunje
Project title	Distribution and Conservation of Endangered Prenj Black Salamander (<i>Salamandra atra prenjensis</i>) in Bosnia and Herzegovina and Establishment of Long Term Monitoring
RSG reference	12728-1
Reporting period	June 2013 – May 2014
Amount of grant	6.000,00 GDP
Your email address	eminabih@yahoo.com ; sunje.emina@gmail.com
Date of this report	04.05.2014

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
Define the distribution (areal) of <i>S. atra prenzensis</i> in Bosnia and Hercegovina		X		<p><i>Salamandra atra prenzensis</i> is active 3.5 months per year. 31 day in total were spent on Mt. Prenj and Mt. Čvrsnica in order to collect biological data of the species. We detected the presence of the salamander in two new localities on Mt. Čvrsnica and one new locality on Mt. Prenj.</p> <p>Because of extensive field work on those two mountains and a lack of resources (working staff and additional vehicle for simultaneous analyses on other mountains) we only spent 5 days in total for further distribution analyses on Mt. Treskavica and Mt. Maglić (two mountains were preliminary distribution model analyses suggested potential presence of the species). No individuals were registered on these two mountains during 5 days of observation. We strongly believe that <i>Salamandra atra prenzensis</i> inhabits these mountains but in a smaller density. Further and more extensive analyses must be conducted.</p>
Conduct several biological analyses and provide new scientific data			X	<p>Several data for the following studies are collected:</p> <p>Ecological studies: registered GPS coordinates of the localities; analyses of sex ratio and measurement of abiotic factors (humidity, dew point, temperature in the habitat) using data loggers.</p> <p>Each individual was photographed and measured (10 measurements + body temperature of each individual is taken)</p> <p>Food preferences studies: 40 stomach flushes and 107 fecal samples were collected. Insect detected in the stomach flushes are determined. We also determinate soil insects collected in five traps in the field. Molecular analyses of the fecal samples will be conducted at the University of Grenoble (France) using</p>

				<p>next generation sequencing (NGS) since the designed molecular approach used at the University of Salzburg was unsuccessful.</p> <p>Reproductive studies: Seven pregnant females and one male are under observation at the ZOO center of Zagreb. So far, only one female gave birth to one individual. All collected females are pregnant which was confirmed by ultrasound analyses.</p> <p>Toxin samples were taken from 64 individuals to study its active substances. Analyses of toxins are currently conducted at the University of Salzburg</p> <p>Testing for Chytridiomycosis: 144 individuals of salamanders and five other amphibians sampled on the fields (<i>R. dalmatina</i>, <i>M. alpestris</i>, <i>B. variegata</i>, <i>B. bufo</i> (2x)) were tested on fungal diseases (Chytridiomycosis) and all of them were negative for the disease.</p> <p>123 Samples of tail tissue were collected for phylogenetic analyses. An extensive and detailed report on this work has been provided in the report submitted in October 2013.</p>
Define conservation units and establish a long term monitoring system			X	<p>Salamanders found on Mt. Prenj must be treated as separate conservation units of the population detected on Mt. Cvrznica. These two mountains are divided by a big river (Neretva) and it is clear that the ongoing evolutionary processes between these two populations are different. Ecological factors and habitat also slightly differ on these mountains. Monitoring will be done in two occasions per year for 10 days. This occasion will serve as a gathering place for the whole established team</p>
Raise public awareness and involvement of local people through promotional lectures at the University of Sarajevo, Banja		X		<p>In Sarajevo, Mostar and Banja Luka we managed to attract in students that joined us in several field trips.</p> <p>A great collaboration has been established with Goran Šukalo, Mr.sc (University of Banja Luka) and Benjamin Jusić, Bsc. (University of Mostar) for further projects and activities. Thanks to</p>

Luka, Mostar and high school of Konjic				these lectures, we managed to connect a team of herpetologists over BiH that is currently collaborating together with HHD: HYL ¹ on a big project (protection of <i>Proteus anguinus</i> in BiH) Promotional lectures were planned to be conducted additionally in two small local communities: Jablanica and Foča. Because of a lack of feedback from these local communities we didn't conduct educational lectures there. Because of this issue we partially achieved this objective.
Leaflet preparation and print (2000 copies)			X	Leaflets have been distributed during the lectures and through partner institutions.

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

We encountered several difficulties. One of them concerns communication and involvement of local community in smaller cities (Konjic, Jablanica and Foča). Unfortunately even after extensive advertising and invitations sent to several NGOs in Konjic and Jablanica we had a small interest in participation and lack of answers for the need of organisation of educational lectures. Finally, since Konjic and Jablanica are close cities 20 km away from each other, we decided to organise only one lecture for both communities in the high school of Konjic.

Because the lack of time and additional vehicle as well as working staff, we did not conduct the lecture in Foča. Because of the same reason we could not make extensive distribution analyses on Mt. Maglić and Mt. Treskavica simultaneously during the most active period of the salamanders. We used the highest activity period of the salamander (July and end of August) to collect biological data for several studies of the species on mountains: Prenj and Čvrsnica which we know are inhabited by the species.

Before starting with the project we were not aware of the huge minefields on mountains: Prenj, Čvrsnica, Treskavica and Maglić. In order to conduct safe field work we purchased GPS coordinates from mine firms in BiH.

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

Field investigations partially clarified *Salamandra atra* distribution in BiH, which is crucial for preparing the proposition for protection and monitoring of established habitat areas that will be suggested to local government. BiH is starting the preparations for entering in EU and one of the first things will be to prepare the Natura2000 sites for species listed in Habitat Directive, appendix IV, which is the case of *Salamandra atra*. However, considering that *Salamandra atra aurorae* is listed on appendix II, *Salamandra atra prenjensis* could have a similar signal function for the local government in the designation of critical Natura2000 habitats.

After the analyses of collected data, the doubtful subspecies status of *Salamandra atra prenzensis* should be finally accepted in the scientific community. Collected data will result in at least six scientific papers which will lead to the acceptance of the subspecies status, further leading to the possibility of listing *Salamandra atra prenzensis* on appendix II of Habitat Directive. We established collaboration with the University of Salzburg where we compared the morphological data taken from Austrian individuals (individuals collected in the vicinity of Salzburg) versus morphological data collected during field work of this project. The molecular approach used for analyses of collected fecal samples at the University of Salzburg was not successful which led to the establishment of further collaboration with the University of Grenoble (Prof Dr Pierre Taberlet) where the fecal samples will be analysed using next generation sequencing (NGS). The whole work will result in a PhD dissertation of Emina Šunje already agreed with the University of Zagreb starting from September 2014.

Field work and data collection gave opportunity for several students to get involved in the project and motivate them to dedicate their careers for such studies. Educational lectures conducted over BiH undoubtedly formed new, and strengthened old collaborations between NGOs and Universities of different entities in BiH (post war division of BiH in Federation of BiH and Republika Srpska (RS)). This resulted in forming a team of herpetologists over BiH currently working together on two projects in collaboration with HHD Hyla¹ from Zagreb. These projects concern the protection of the *Proteus anguinus* and *Pelobates fuscus* in BiH.

Together with the staff of the Veterinary Faculty of Sarajevo I conducted for the first time in BiH Chytridiomycosis analyses using real time PCR. This experience now enables the staff of the Faculty to conduct independently these analyses for future projects concerning amphibian protection. In this matter a strong collaboration with the faculty has been established!

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

During the project we produced 2000 leaflets dealing with details about our project in Bosnia and Herzegovina. All of the leaflets have been distributed during the four lectures (Banja Luka, Konjic, Sarajevo and Mostar), press releases, through the universities and during our field trips (in local communities around the mountains). Local communities were very surprised that someone is performing such research on this unusual species. A bigger part of participant didn't know the existence of this salamander and this caused immense interest. In many remote places this was their first indication that the nature that surrounds them their whole lives is very unique and that it needs to be protected.

Student community was quite impressed with the project. They actively participated in field work and they decided to dedicate their BSc thesis on herpetological subjects. Students that participated in field work are: Igor Jurić (University of Mostar), Saudin Merdan (University of Mostar), Maja Bradarić, Adnan Zimić, Tanja Šipilović, Adis Čokić and Boris Stjepanović (University of Sarajevo).

Scientists from Bosnia and Herzegovina and Croatia strengthen regional cooperation and reduce past war consequences. We think that the team that is formed has managed to fulfil the goals and we hope that cooperation will become even stronger during further projects.

5. Are there any plans to continue this work?

In the summer of 2014 we will certainly conduct further and extensive distribution analyses on Mt. Maglić and Mt. Treskavica in order to try to register the species on these mountains.

During field work we found several dead and sick individuals which we collected. We set up a collaboration with the Veterinary Faculty in Sarajevo and with Prof Frank Pasmans from the Laboratory of Veterinary Bacteriology and Mycology of the Clinic for Exotic Animals by the Faculty of Veterinary Medicine of Ghent University (Belgium). Since these samples were negative for Chytridiomycosis and Rana virus, we will try to identify the cause of this sickness in the upcoming period by collecting more sick individuals this year.

After this short-term project it is planned to submit a bigger project in order to conduct a large-scale regional project for conservation and monitoring of *Salamandra atra* in the Balkans. In period of 2-3 years we would prepare a regional action plan for conservation of this amphibian species and its habitats. We plan to involve public as much as possible especially in providing data related to distribution of *Salamandra atra* in Serbia and Montenegro. Public awareness will be raised through educational lessons during which we will introduce the community with the importance of this species and its conservation. The idea is to involve public and encourage them to share their data regarding the distribution by uploading them on an internet site which would be designed just for this purpose.

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

Results of our work will be sent to the national nature protection offices in Banja Luka (for the Republika Srpska entity) and Sarajevo (for the Federation entity). Results will be held by all three partner universities (Banja Luka, Sarajevo and Mostar) for further conservation use. Final report will be translated into Bosnian, Croatian and Serbian and made available on internet. Most of the results of this project will be published in scientific journals. Upon publishing the papers, we will contact IUCN to propose and check the possibilities for the transfer of *Salamandra atra prenjensis* from appendix IV to appendix II of Habitat Directive.

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

The grant was used over a period of 1 year (May 2013 – May 2014) as anticipated in the project proposal. Some of the activities were reorganised due to the established collaboration with the University of Salzburg and Veterinary Faculty of Sarajevo after the approval of the grant from RSGF. We decided to conduct the Chytridiomycosis analyses at the Veterinary Faculty of Sarajevo which performed these kind of analyses for the first time in BiH. Thanks to the approved funds from RSGF, the Veterinary Faculty of Sarajevo is now capable of independently conducting Chytridiomycosis analyses for further upcoming projects for amphibian conservation in BiH. If RSGF approves, the remained budget will be used for field trips in summer of 2014 (for further distribution analyses on Mt. Maglić and Mt. Treskavica; visiting locations on Mt. Prenj and Mt. Čvrsnica to collect sick individuals and for monitoring purposes as well as collecting more data from data loggers that are still on the field on these two mountains and to return the collected pregnant females and male back to the field).

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
May 2013 – June 2013: Educational: lectures: Banja Luka, Sarajevo, Mostar, Konjic Costs for fuel, road toll, accommodation	420	305.59	114.41	Educational lectures were supposed to be held additionally in two other small local communities: Jablanica and Foča. For reasons explained in the previous section of the report we organised lectures in four communities (Sarajevo, Mostar, Banja Luka and Konjic)
Trip to Zagreb for equipment purchase - – costs for fuel, road toll and daily allowances – food and drink)	349	130	219	In the initial plan, costs were calculated for our partner from HHD: HYLA ¹ (Zagreb) - Dušan Jelić who was prevented to come and assist the first field trip and bring the purchased equipment from Zagreb for field work needs. The change in plan resulted in a field trip to Zagreb to take the ordered equipment and attend the meeting with Dušan Jelić to establish the methodology for upcoming field work and get a training on new equipment usage
Field trips (car costs): 28. – 30.06.2013 mt. Prenj 06- 10-07.2013 mt. Prenj 19 – 23.07.2013 mt: Prenj 27 – 28.07.2013 mt. Prenj 31.07. 2013 – mt. Prenj 06. – 08.08.2013 mt. Cvrsnica 10. – 11.08.2013 mt. Cvrsnica 16 – 17.08.2013 mt. Cvrsnica 18. – 20. 08.2013 – mt. Treskavica 21. - 23.08.2013 – mt. Prenj 24. – 26.08.2013 – mt. Cvrsnica 28 - 30.08.2013 – mt.	736	650	86	In the initial plan we calculated expenses for six field trips for two cars. Finally for all the field trips we used only one car and avoided road tolls. We successfully conducted 14 field trips in total. The amount of initially planned fields rose because of the need to collect fecal samples (collaboration with the University of Salzburg). The collection of fecal samples required that collected salamanders stay closed in boxes on the field for four days after which we had to revisit these location to collect the fecal samples and free the captured

¹ HHD: HYLA – Hrvatsko Herpetološko Udruženje: Hyla (Croatian Herpetological Association: HYLA)

Cvrsnica 05. – 06.09.2013 – mt. Maglić 07. – 09.09.2013 – mt. Prenj				individuals (details given in the report of October 2013)
Daily allowance (food and drink x 40 days of field x 4 persons)	2080	721.57	1358.43	I dramatically overestimated the costs for drinks and food because of lack of experience. Instead of planned 40 days in the field we had 36
Costs for mine field GPS coordinates	0	184.17	184.17	In order to conduct safe field trips we purchased GPS coordinates for mine fields for mountains: Prenj, Cvrsnica, Maglic and Treskavica.
Transportation of pregnant females to Zagreb	750	130	620	The initial plan was to observe the pregnant females in a specialised room made for these purposes equipped with: terrariums, air condition etc. (750 GBP calculated in the initial budget). In the agreement with our partner HYLA ¹ we concluded that the best is to transfer the animals in the facilities of the ZOO centre of Zagreb where reproduction analyses are still conducted and individuals are still under observation
Equipment for Chytridiomycosis analyses (<i>Batrachochytridium</i> <i>dendrobatidis</i> detection)	65	1.668,8 2	1.603,82	The initial plan was to conduct the analyses of Chytridiomycosis in collaboration with the Laboratory of the National Museum of Hungary in order to avoid the costs for chemicals and just pay the shipping of samples to the Laboratory. As the project was proceeding we concluded that the best is to introduce these kind of analyses to the staff of the Veterinary Faculty of Sarajevo and enable them to conduct independently Chytridiomycosis analyses for further projects concerning amphibian research and protection in BiH. For this reason we purchased the chemicals by our own. These analyses are the first of such kind conducted in BiH!

Digital scale	100	100	0	/
Morphological instruments	30	30	0	/
DATA loggers (HOBO and Kestrel) and PCE-IR thermometer	714	841	127	In the initial budget we did not encounter the costs of the infrared thermometer (PCE-IR) to measure the body temperature of the animals for conducting ecological studies (study established after the approval of the Grant)
Equipment for stomach washing and food preferences analyses	20	100.72	80.72	We underestimated the costs for this activity since, in the initial budget, we didn't encounter the costs for the boxes in which we had to store the animals during field work until they gave fecal samples (activity agreed upon the establishment of the cooperation with the University of Salzburg after the approval of the Grant by Rufford) – lack of experience before starting project activities
Photo camera instead of tent planed in the initial budget	100	377.35	277.35	In the initial budget we calculated the costs for the tent (100GBP) which we purchased from our own budget and order the photo camera instead
Other equipment (tools for insect traps, 5x gas for cooking, 1x hiking shoes, 1x 80l backpack, 1x flashlight, 1x walking sticks, 1x set of cooking dishes, duct tape and batteries for GPS and flashlight)	0	368.28	368.28	In the initial budget we did not encounter this equipment since we planned to purchase it from our own budget. Since there were major changes in initial plans for the budget, we used part of funds to purchase the listed equipment mandatory for field work
Leaflet preparation and print (2000 pieces)	630	354.36	275.64	We printed 2000 pieces instead of 3000 (as it states in the initial budget) since we didn't conduct educational lectures in Foča and Jablanica.
TOTAL²	6.000	5961.86	38.14	

I would spend the rest of the money for additional field work planed in summer 2014 (further distribution analyses on mt. Treskavica and mt. Maglic; collecting sick animals and data loggers **from**

² For currency exchange we used data provided by Raiffeisen Bank (<https://www.raiffeisenbank.ba>) for conversion rate of currency given on the date of: 03.05.2014

Prenj and Cvrstica as well as conducting field work for monitoring purposes and returning collected animals –pregnant females - back to the field).

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

First important step has now been made. We have successfully initiated a formation of a herpetological team in Bosnia and Herzegovina consisted of two focal point experts from two regions: Banja Luka – mr.sc. Goran Šukalo (Biology department, University of Banja Luka) and Mostar – Benjamin Jusić (University of Mostar). We registered the first herpetological association “ATRA” on a state level which enables us to submit project proposal for herpetology studies in BiH. This team will now be strengthened with Bachelor and PhD students to build a team that can conduct research and monitoring actions during 2014-2016. Next important step is to determine the best localities for setting up long term monitoring by creating areas for capture-mark-recapture research. A GIS data base should be made to serve as a base for the research but should also be made public for all interested parties. Through regional round tables we plan to gather the team from all surrounding countries to try to work on the development of regional *Salamandra atra* Conservation Action Plan.

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?

RSGF logo was used during the project in the educational leaflets that were handed to interested parties (example of leaflets are given in the first report of June 2013).

RSGF Logo was also used in the lectures held in Banja Luka, Sarajevo, Konjic and Mostar to point out the grant and the work of the Foundation. During the lectures we introduced the RSGF to the students as we hope them to be potential future beneficiaries. Example lecture presentation is given in the first report (June 2013). After all three lectures we have sent out press releases about the project. During this we have also used the RSGF logo.

Logo was used according to the instructions received from the RSGF.

11. Any other comments?

I wish to thank RSGF for the amazing opportunity to work on this project and help to start the conservation of *Salamandra atra* and its habitats in Bosnia and Herzegovina. This project was the first big project I had the chance to lead; it opened immense possibility and thanks to its realisation and established collaborations, we managed to successfully register the first Herpetological Association in BiH: “ATRA” on a state level. From now on, this association will be principally involved in solving all problems related to the lack of existing data and resources for qualitative studies concerning the research, monitoring, and protection of BiH herpetofauna. As the president of “ATRA”, I am particularly interested in defining and establishing regulations regarding Natural Resources management in the country.

Thanks to this grant I will be enabled to submit a PhD dissertation on the performed work. With analyses of distribution data we can now include all of the analysed areas in NATURA2000 network protected areas due to the status of *Salamandra atra* in Habitat Directive. *Salamandra atra* could serve as an umbrella species to conserve the whole ecosystem.

Because of lack of experience and the constant change in the dynamic of the project, which resulted in setting up collaboration with institutions such as the University of Salzburg and Veterinary Faculty of Sarajevo, there were major changes in the budget use compared with the initial predicted budget submitted in the application form of the project. I am confident, and strongly believe, that the presented changes in the budget use, raised the quality and impact of this project in fulfilling its objectives and raising its importance for the state of Bosnia and Hercegovina. Thank You again for the opportunity you gave me. This experience was a milestone in my career choice!