

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	Adnan Zimić
Project title	Assessing the Distribution and Conservation Status of the Pannonian Crested Newt, <i>Triturus dobrogicus</i> ssp. <i>macrosoma</i> , in Bosnia and Herzegovina
RSG reference	18787-1
Reporting period	July 2014 – November 2015
Amount of grant	£4700
Your email address	adnan.zimic@gmail.com
Date of this report	12 November 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
1. define distribution of the species			x	Field studies have shown that <i>T. dobrogicus</i> inhabit the entire area of Bosnian Posavina (Western, Central and Eastern part of Posavina). So far, we known to have 11 populations (localities) in B&H. We found five new and confirmed six sites. The largest number of sites has central Posavina (5), while the western and eastern Posavina count the same number of sites (3). The biggest number of individuals has been found on the locality of Čardak (n = 10), while in other locations we found only one individual of this species. Four individuals were found dead on road. On a larger number of localities/habitats (n = 10) we did not confirmed presence of <i>T. dobrogicus</i> . We did not confirmed the existence of the species at only three known localities from literature data (see: 2 nd question, last paragraph). However, we can proudly say that distribution is known for the first time in B&H.
2. Extinction Assessment Risk			x	After known species distribution it is possible to define and assess the threat and risk extinction of species on the basis of <i>B criteria</i> (based on the geographical distribution). We can now certainly claim that taxon is endangered species on a state level: EN [B1+2ab (i, ii, iii)] which is

				<p>very close to extinction.</p> <p>If the literature data were also taken into the calculation, the result would be the same. Since the amount of literature data is very scarce, and some of them are questionable because of potential misidentification, they are not taken into calculations.</p> <p>However, genetic analysis should be undertaken to determine whether these populations belong to clean or hybrid taxa. On this basis, we can discuss on even greater risk of extinction.</p>
3. List of amphibians and reptiles from investigated areas (Posavina)			x	<p>Besides <i>T. dobrogicus</i> we noted the existence of 10 species of amphibians: <i>Bombina bombina</i>, <i>Pelobates fuscus</i>, <i>Hyla arborea</i>, <i>Bufo bufo</i>, <i>Bufo viridis</i>, <i>Rana dalmatina</i>, <i>Pelophylax kl. esculentus</i>, <i>Pelophylax lessonae</i>, <i>Pelophylax ridibundus</i> and <i>Lissotriton vulgaris</i>. The most frequent species of amphibians is <i>P. fuscus</i> that in some localities reaches with frequency of over 50% of all amphibians. Species of interest <i>T. dobrogicus</i> frequency ranges from 0% to 4% (depending on the habitat type), which makes it one of the rarest amphibian taxon in the area of Bosnian Posavina.</p> <p>Number of recorded species of reptiles is eight: <i>Anguis fragilis</i>, <i>Lacerta viridis</i>, <i>Podarcis muralis</i>, <i>Natrix natrix</i>, <i>Natrix tessellata</i>, <i>Coronella austriaca</i>, <i>Zamenis longissimus</i> and <i>Emys orbicularis</i>. Because of the small number of data frequency of reptile species in the populations could not be determined.</p>

<p>4. Raise public awareness through promotional lectures</p>		<p>x</p>	<p>Education of students was conducted in July and August 2016 at the Faculty of Science, University of Sarajevo (Central B&H), where the number of visitors-students was 20, and at the Bioengineering Faculty of University of Bihać (northern B&H) with a 23 student-visitors. We made a presentation of the whole project, with previously known results of the work. One of the focus of presentation was to motivate the students to biological and conservation research, and we can say that the result was positive based on a number of issues and questions that we have received and demand of promotional and educational leaflets about the project.</p> <p>Promotional lectures were planned to be conducted additionally in Banja Luka and Bijeljina. 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.</p>
<p>5. Give ecological and morphological description of the B&H populations</p>		<p>x</p>	<p>All individuals were dormant using MS222 (Ethyl 3-aminobenzoate methanesulfonate salt), measured and have taken picture of the ventral body side. Total of 16 individuals were measured, and the greatest number of observed individuals was the area of Čardak (n = 10). For each individual we measured: the total body length, standard body length, tail length, the length of the front and rear extremities. Dead individuals on the road could not be measured</p>

			<p>because of their body condition. The largest measured specimen was 165.1 mm with a weight of 16.5 g which represents the second largest caught individual of this species. This large individual caught <i>in situ</i> may indicate optimal conditions of the habitat. <i>Wolterstorff Index</i> for females (30.1 to 52.4) and males (50.7 to 56.3), and ventral and lateral coloration now indicate it is a pure <i>T. dobrogicus</i> populations, but to truly establish this statement, it is necessary to do genetic analysis. Taken ecological features include taking three basic parameters after each captured individual: temperature of the air, soil temperatures, humidity and temperature of the body. For each individual we have taken the data on microhabitats preferences and sex. Due to the small number of caught individuals we partially achieved this objective.</p>
<p>6. Define anthropogenic impacts and threats to survival</p>		<p>x</p>	<p>Dead individuals found on the roads indicates that the species is very sensitive when it comes to road infrastructure. Some water bodies are in the process of drying during the process of eutrophication (eg. Čardak, Okanovići). In the area Gromiželj (Laketića vir) we didn't find individuals of this species even after extensive time searching and setting traps. This is due to influence of introduced fish population by the locals. In the area Laminci we noted just few individuals in larvae stage after extensive time searching, which can also be the cause of recently</p>

				introduced fish populations.
7. Leaflet, notebooks and t-shirt preparation and print			x	Leaflets and notebooks have been distributed during the lectures and through partner institutions and during the field studies to local people. T-shirts received all the participants and volunteers of the project <i>dobrogicus</i> .

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

One of the main problems was to find a place for camping. The whole area of Posavina is almost turned into arable land. Besides the urban areas, there are almost no meadows on which it would be possible to make camp. Therefore, one of the research priorities was to find a place for camping which was time-consuming.

Second problem was inaccessible terrain. Many water areas are impassable due to large quantities of water or densely covered vegetation (e.g. invasive non-native species like *Amorpha fruticosa*).

The third problem is that many wetlands surfaces are mine polluted and some of those areas are potentially good for the species occurrence. Because of the flooding that occurred in 2013, some minefields have spread. Therefore, we were limited with space and we used only those fields where mines have not been reported. In order to conduct safe field work we purchased GPS coordinates from mine firms in B&H.

Because the lack of time and additional vehicle as well as working staff and small interest we did not conduct the lecture in Banja Luka and Bijeljina.

It should be mentioned that only three localities (from literature data) remained with no confirmation: (1) site Tavna (easternmost data), (2) Brčko-Zabrđe and (3) The Banja Luka field (southernmost data), which should be confirmed on future field researches. However, the existence of *T. dobrogicus* in these areas (especially Banja Luka field) is very questionable because this areas have different types of habitats (transitional form of lowland and mountain ecosystems), which may point to the wrong identification of the species (eg. replacement with *Triturus macedonicus*, or *Ichthyosaura alpestris*).

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

(1) Field investigations clarified *Triturus dobrogicus* 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. B&H 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 *Triturus dobrogicus*.

(2) Now we now know some basic and new environmental factors that are necessary for this species to survive strictly in researched areas and now we have a lot of information which can be compared in coming studies.

(3) We managed to contact expertise for genus *Triturus*, promote knowledge with team, students and local people and have information that could be contributed to knowledge of the conservation status of this species in Bosnia and Herzegovina.

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

We had directly spoken with local inhabitants during the field investigation. It is surprising that all of them did not know anything about this species, or never saw one - even the people that lives in homes that are really close to *T. dobrogicus* habitats. People were surprised when we provided them education leaflets and when they saw captured individuals during the field activities.

Students were impressed with the project and that was the reason to involve the bigger number of participants in our field studies which reflected in better promotion and education. Students were mostly from Banja Luka and Sarajevo University, interested in herpetofauna or they were curious about our research methods. Except our team, students and graduates that participated in field works are: Smiljan Tomić Bsc, Dino Pećar Bsc, Berina Vrhovac, Mima Bašić, Bsc, Damir Bakija, Himzo Sinanagić, Ademir Duraković Bsc, Velid Aganović and Ognjen Cihorić Bsc.

5. Are there any plans to continue this work?

Future plans generally include ecology researches of all amphibian species in these agriculture lowland areas. Even we achieved our goals with this project, we need to continue with monitoring of known populations and plan to monitor the few best selected populations of *T. dobrogicus* in B&H and to conduct genetic analysis (for example in locality of Čardak). The greatest plan is to collect as much information as we can get in order to define true conservation status of all amphibian species in

Posavina area of Bosnia and Herzegovina. One of the main priorities would be diet preferences of amphibian species in these areas. Given the fact that they inhabit agricultural ecosystems, the crucial importance is to know what do they eat (pests?) and to take advantage of such information to a future protection of these species.

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

We plan to continue with lectures as long as we have promo material from this project. The official BHHU ATRA web-page (www.bhhuatra.com) and Facebook page (<https://www.facebook.com/bhhuatra>) was made in order to inform the public in a timely manner. We are updating pages with interesting and new facts, our field trips and other ongoing due to the *T. dobrogicus* and Posavina researches. We will present our results in 9th scientific conference "Students encountering science" with international participation that will be held on 23rd November 2015, in Banja Luka. In addition, we also present our project at the Rufford Small Grants Conference in Bosnia and Herzegovina (also in Banja Luka, 21 March 2016). After the conferences we will write paper on *T. dobrogicus* known distribution in B&H. Additionally, we made a short movie about *T. dobrogicus* (<https://www.youtube.com/watch?v=jLBLLeDsDPg>).

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 from a period of 1 year as anticipated in the project proposal. According to plan, except some small changes in fieldtrips dates, grant was used from November 2015 to November 2016. During the winter time in 2015 we prepare everything for the field trips, education programme and ex situ conservation. Most of the field trips were done during the spring time, from March to June 2016. The education was moved during the field trips and after them (July and August 2016). Ethological researches in captivity were made during the whole year from March to September 2016.

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
First field trip Sarajevo – Semberija (Bijeljina – Dvorovi – Velino Selo – Bosanska Rača – Vršani)	130	150	-20	Meanwhile, we added two more research sites: (1) <i>Gromiželj</i> and (2) <i>Balatun</i> - because of the presence of suitable habitats.
Second field trip Sarajevo – B. krajina (B. Dubica – B. Kostajnica – B. Krupa – Bihać – Nacional park „Una“)	222	72	+150	We did not have a lot of expenses because we had connected to herpetologist as a member of my team who lives in the area and who has been researched it. He also did education lecture of the project (Mima Bašić, Bsc).
Third filed trip Sarajevo – Posavina (western part: B. Dubica – Gradina Donja – Međeđa – Orahova – Gradiška – Srbac – Bardača – Banja Luka)	190	190	0	-
Fourth field trip Sarajevo – Posavina (central part: Banja Luka – Srbac – Laminci – Bosanska Gradiška)	145	150	+5	-
Fifth field trip Sarajevo – Posavina (eastern part: Šamac – Gradačac – Orašje – Brčko)	123	134	-9	-
Road-toll (50 GBP x 6)	300	228.5	+71.5	Road-toll was a little overrated.

Terrarium with equipment (filters, air pump, etc.)	600	600	0	
Plastic washballs for larvae (20 GBPx5)	100	100	0	-
Kestrel 4500 Weather Meter	196	110	86	The hand lamp was broken during field research we had to buy a new one, so we did not buy Kestrel and we used the old one that we already had.
Kestrel AAA batteries	10	14.5	-4.5	-
Field equipment for morphological measurements	20	20	0	-
Tent (3 people size)	80	80	0	-
Trap materials	20	20	0	-
Plastic boxes (0,3 GBP x 10)	30	30	0	-
Photo camera	450	450	0	-
Headlamp batteries	20	26.7	-6.7	-
Daily allowance (food, drinks) (15 GBPx3pers onsx40days)	1800	1624	+176	-
Leaflet, T-shirts and Notebooks preparation (design)	400	400	0	-
Leaflet, Notebook, T-shirt print	280	280	0	-
Total	5116	4665.7	448.3	

- £800 additional budget funded by CHS - Hyla, Croatia and most of this budget was combined with this one.
- If RSFG approves, extra money will be spent for conducting the rest of educational lectures (gas expenses) that are planned by project.

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

Our next step, that I mentioned before, is to define areal all amphibian species in Bosnian Posavina because: (1) this is an area with the highest amphibian biodiversity level in B&H; and (2) its habitats are under the largest anthropogenic pressures in B&H. In order to define species areal, it is necessary to do additional fieldwork studies

and to know possible hybrid zones for some species (e.g. genus *Bombina* and *Triturus*).

Another important step is to define status of amphibians in food chains in these areas, especially in agroecosystems. Through the education of local people, we will try to change the awareness on the importance of amphibians in agroecosystems and promote amphibians as a solution in integrated pest management systems which may result with progressive reduction of the use of chemical substances (pesticides) that has significant negative effects of amphibian's populations and whole food chain in these habitats.

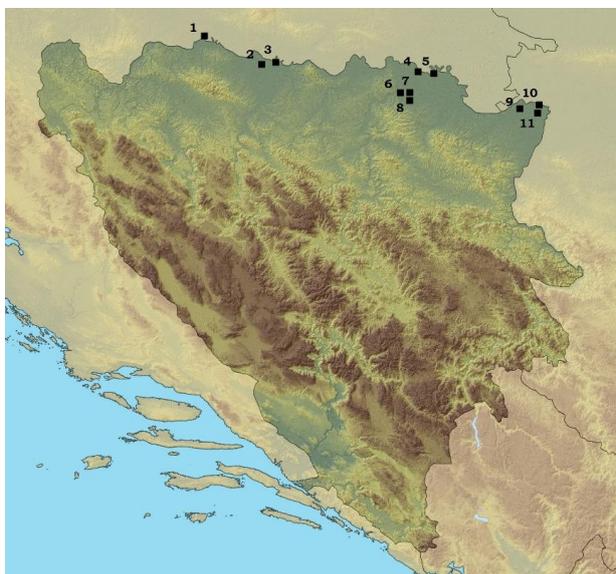
10. Did you use The Rufford Foundation logo in any materials produced in relation to this project? Did the RSGF receive any publicity during the course of your work?

The Rufford Foundation logo was used (according to the instructions received from the RSGF) with: (1) printed leaflets, (2) T-shirts, (3) notebooks, (4) on the web-page, (5) power point presentations and will be used on future conference posters and presentations. We also used logo on the short film that we made about *T. dobrogicus* (<https://www.youtube.com/watch?v=jLBLLeDsDPg>).

11. Any other comments?

I would like to thank The Rufford Foundation for this huge opportunity. Me and my team members learned and discovered a lot of new and interesting things. This was my first project that I had a chance to lead and it opened many doors for me.

With this, The Rufford Foundation help me and my team as a biologists with advanced research and help me to promote herpetology research in Bosnia and Herzegovina. Thank you again for the opportunity you gave us!



T. dobrogicus distribution in B&H