

Final Evaluation Report

Your Details	
Full Name	Ana Ćurić
Project Title	Pelobates project - Giving wildlife a second chance: restoring and protecting lowland freshwater habitat and its biodiversity
Application ID	29272-B
Grant Amount	£8,233
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Date of this Report	27 th August 2021

1. 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
Restoration of vernal pond				<p>One vernal pond habitat is created in nearby forest. This pond was predicted for Salamandridae and Ranidae, amphibian species, with the focus species <i>Triturus dobrogicus</i> (IUCN – NT, Natura2000), as well as for dragonflies preferring sheltered freshwater habitats. Unfortunately for our target species, wild boar used it as their mud pool.</p>
Pond restoration - permanent pond creation				<p>After all planned flora and fauna research, gathering all physical and biological data and recommendations for the pond restoration, with many delays caused by pandemic, the final preparation and habitat restoration was done in June and July 2021. Since the temporary pond (restoration area) is under the water during spring, and also the soil is humid in the late spring, early summer, autumn and warm winter periods, we recognised that the best period for the restoration will be the middle of the summer. The land is then dry and there is a big chance for all fauna to be saved if dug up. Animals are in their summer dormancy period but still active during feeding period in early mornings or in the evening.</p> <p>A 3-ha restoration plot (pilot pond) has been determined (Fig. 9) after gathering all necessary data, together with all formal and legal documentation. The constructor was given all necessary instructions for the depth and shape of the pond. Firstly, all 3 ha of the plot has been mulched (Fig. 12), since the <i>Typha latifolia</i> (Fig. 11) occupied the whole pilot pond in 100 % density. After mulching, the procedure of restoration included digging the 1.5</p>

			<p>ha of pond with slight slope of terrain and depth difference from the edge to the centre of about 2 – 2.5 m (radius of 250 m) (Fig. 10, 13, 14). The central part of the pond was dug deeper to the clay soil layer, to ensure water presence as long as possible and to stop the <i>Typha</i> rhizome spreading (no adequate soil and deep water will stop the rhizome spreading) (Fig. 10, 14). The upper humus soil was used for local agricultural land as a natural fertiliser. The process of restoration took 5 days. The restoration plot is prepared for the next spring season and after the pond is formed in early spring, the data loggers will be installed for future monitoring. After the pond restoration, the constant monitoring needs to be done each season. We expect the first phase of habitat recovery and establishment of pond in spring 2022.</p>
<p>Legal protection of Čardak locality as one of the rare and important wetland habitats</p>			<p>During the whole project, since 2014, we recognised the Čardak site, Modriča municipality, as one of the rare and important wetlands in Bosnia and Herzegovina that still has a chance of maintaining its main purpose. During the 7 years analysing the water level, temperatures, precipitation on the monthly level, unfortunately one of the bad results is that the level of eutrophication went high, influenced by lack of precipitation and drainage of Tolisa River. This left an oxbow, dating back to the early 80s, that is suffering a great anthropogenic pressure from wastewater, herbicide and pesticide pollution, no constant fresh water and <i>Thypha</i> vegetation burning. All these activities are speeding up the process of eutrophication. Since the area of the oxbow is 3 ha, thanks to all the research and data we collected not only in the Čardak locality but through whole Posavina region, we saw a great chance of usage of as the pilot area for one of the first complex restorations of this type of wetland in Bosnia and</p>

			<p>Herzegovina. This important and endangered habitat type provides a great biodiversity richness and represents the living, breathing, feeding and overall, survival of many threatened and endangered animal and plant species. All mention above is the reason for this wetland deserving the protection status. During this project we collected all necessary data, had the important meetings with authority and locals regarding legal protection, and we submitted the proposal to the authority. The next step requires writing the final scientific study for the proclamation of the future new wetland protected area and the engagement of authorities. In Republic of Srpska, Bosnia and Herzegovina, in the lowland area of Posavina region, there are only three areas that are protected: The Una River as a nature park, the Tišina Pond as a protected habitat and the Gromiželj Wetland as a protected habitat. This will be a great opportunity for the expansion of protected and saving one more endogenous aquatic habitat.</p>
Establishing of small research site			<p>Not only within this project, but during all 7 years working on this site, with our activities, we connected students from two main universities in Bosnia and Herzegovina (Banja Luka and Sarajevo) and different NGOs, organising variety of research at the focus area. The benefit was educating students, collecting data from which several BSc and MSc thesis were written, and papers published. In the near future, when the area formally gets its protected status, the obligation will be to monitor the site and the universities will have an opportunity to be the part of its future research and monitoring of the site regarding biology, ecology, geology, hydrology, chemistry and many others scientific fields.</p>
Flora and fauna research			<p>All planned flora and fauna (herpetofauna, ornitofauna,</p>

			<p>entomofauna and terifauna) research was done in 2020 and 2021. Short, detailed reports are uploaded on Rufford platform in August 2020 and August 2021 where you may find all crucial and necessary research results. Full reports will be used for writing the most important next document – the study for protection of Čardak locality.</p> <p>Mycology: Fungi research was done during the camp in June 2020. Since the area does not contain characteristic habitat conditions for fungi growth, with poor forest diversity and meadow habitats, low humidity and high summer temperatures, the additional research were not priority at this part of the project. During the 3-day camp research 15 species from three phyla were found in the woodland area, near pond and near channels.</p> <p>Botany: A total of 15 invasive alien species were found in the area of research, where we need to stress out surprisingly small number of individual plants: the annual fleabane (<i>Erigeron annuus</i>), a North American plant species, and black locust (<i>Robinia pseudoacacia</i>), also a North American tree species. The most important plant species determined at the Čardak region are water foxtail <i>Alopecurus geniculatus</i>, butcher's broom <i>Ruscus aculeatus</i> and yellow flag <i>Iris pseudacorus</i>. The total of found plant species at the researched region is 168. Also, ten different habitat types were determined.</p> <p>Entomofauna: Field research of insects was conducted, which primarily included dragonflies and butterflies. This research registered a total of 16 species of dragonflies, 82 species of butterflies, as well as 58 species of beetles and other insects. Three registered species are listed in Annexes II and / or IV of the European Union Habitats Directive, and</p>
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			<p>six species are protected in the Republic of Srpska.</p> <p>Of the recorded butterfly species, significant finds are species of wetland habitats such as <i>Idea muricata</i>, <i>Eucarta amethystina</i>, <i>Eucarta virgo</i> and <i>Mythimna turca</i>.</p> <p>During the field research in the Čardak area, one species listed in Annex II of the EU Habitats Directive was registered, the stag beetle <i>Lucanus cervus</i>, and near this area another species, the great capricorn beetle <i>Cerambyx cerdo</i>.</p> <p>Regarding other insects, four groups (Orthoptera, Diptera, Coleoptera, Hemiptera) with 58 species in total were determined. Among the recorded species, there are several alien invasive insect species, such as <i>Harmonia axyridis</i>, <i>Halyomorpha halys</i>, <i>Nezara viridula</i> and <i>Corythucha arcuata</i>, whose abundance in the researched area is significant.</p> <p>Herpetofauna:</p> <p>The focus group of the Pelobates project are amphibians and reptilians, and so far, the total of confirmed species at the Čardak area is 19, which represents one third of all herpetofauna species in Bosnia and Herzegovina.</p> <p>At the site, most endangered reptilian species is European pond terrapin <i>Emys orbicularis</i>, Natura2000 species and NT by IUCN Red List, while the most endangered group are amphibians due to harsh anthropogenic pressure, climate change and high temperatures, which we are witnessing the last couple of years, causing decreasing and disappearing of many local populations of amphibians.</p> <p>Birds:</p> <p>By collecting historical literature data and contemporary field data, we came to the number of 99 recorded bird species on about 150 ha of the investigated area.</p> <p>Species <i>Vanellus vanellus</i> or <i>Nycticorax</i></p>
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			<p><i>nycticorax</i> can still be seen today in the rainy periods of the year when the water level in the ponds are high. Compared to the previous period and the data so far, it is evident that in the last few years no species that directly depend on water have been recorded (grebes, herons and storks, some species of ducks, snipes). Species that are currently appearing in smaller numbers testify to the potential of this bird habitat and the geological (and ecological) past of these terrains - significantly more water, more diverse and lush vegetation, as well as certainly richer food sources.</p> <p>Mammals:</p> <p>Research in the area of Čardak included small mammals from the orders Rodentia - rodents, Eulipotyphla - insectivores, Chiroptera - bats, Lagomorpha - rabbits, Carnivora - carnivores and Artiodactyla - ungulates. Regarding the research of small mammals, not many data is available in the literature for Čardak area.</p> <p>The presence of 11 species were registered in the field research in the year 2020. One of the interesting species found is the Eurasian harvest mouse <i>Micromys minutus</i>, the smallest European rodent whose adult individual's weight is approximately 4 g.</p>
Installing the educational boards and building the small resting area			<p>One board with all brief and important data (Čardak village history, habitat data, biodiversity data, European common spadefoot toad information) and benches by the oxbow and restored pond.</p>
Managing wastewater from houses which ends up in each vernal pond on the site			<p>There is no more influence of the wastewater affecting the restored pond. In the Čardak village every household has its own cesspit which are regularly maintained. Only one pipe with wastewater that was affecting the pilot plot was regulated.</p>
Embracing natural fertilizers (pond muck).			<p>First 600 m³ of mud mulch (humus - fertile soil) was transported on the</p>

			nearby agricultural land owned by the locals. Thus, we provided the first step in reusing the dugout soil as natural fertiliser as part of an idea of investing in locals and locals investing in protection of biodiversity.
Čardak locality protection - legal protection in category V/VI by IUCN.			Our main goal of the project was to go through all needed biological and ecological research and gather all necessary data through field research and literature, physical data of water, soil and habitat in general, legal frames and procedures, to analyse it and provide the best solution for restoring this particular freshwater habitat in Čardak. We will assure that we will deliver all the necessary data to fasten up the proclamation process and to state the legal protection category.
Education of local community			Working on the site almost every month during the season, we made a great connection with the locals. Since the local village is small with small population, it was very easy to talk and include locals in our activities. Four of them have shown a great interest in all future activities protecting the site and its biodiversity by their direct involvement, by ceding the machinery, their private land, and donating for important activities on the site. They all have the same vision of protecting the area and using it in good manners. We also made a great connection with representatives of local municipality, students and researchers who will cooperate in further steps of preparing the needed data for the final study, governmental bodies in charge for legal procedure of protected area proclamation, constructors who did an excellent and neat restoration of freshwater habitat.
First national laboratory in situ			This idea is in process of realisation since 2014 with all our activities done so far at the Čardak site. We aim to influence and to be an example for all universities in Bosnia and Herzegovina to take part of researching directly in the field, and

				we hope we will provide the better conditions for all future student research, especially after proclamation of protected area. We will continue our research on lowland amphibian species, with focus on species <i>Pelobates fuscus</i> , protecting the local biodiversity, science development and students' education.
Rural tourism, photo safari, landscape area of interest				With all our activities during this 2-year project, even under Covid-19 restrictions, we showed the additional possibilities of using the area in the activities such as: rural tourism, photo safari, landscape photography, archaeological research / sites, historical research.

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

Generally, Covid-19 pandemic had a huge impact on the project. We had to take fieldtrips separately, engaged fewer students than we planned, we did not have a chance for all planned meetings with local authority, and for almost a year we had many restrictions concerning lockdowns and not been able to pass from one municipality to another.

Due to pandemic, the prices went higher in every segment, from fuel price to the mechanisation. We also learned that restoration, which includes four types of different vehicles (mechanisation), working hours, cubic of soil, people, site difficulty, soft soil, actually costs 2 or 3 times more that it was said in the beginning (price we used in the budget according to the contacted company in 2019). Even with all the difficulties, we managed to restore the most important part of the old oxbow of Tolisa River.

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

1. We restored the pond in the old oxbow of Tolisa River.
2. Gather new data for five groups of plants and animals. In total 15 fungi species, 168 vascular plant species and 285 animal species (six insect groups, amphibians, reptiles, birds and mammals).
3. Prepared all necessary biological data for the next step – writing the scientific study and legal protection of the Čardak site.

4. Briefly describe the involvement of local communities and how they have benefited from the project.

As mentioned in the timetable, locals were directly engaged in our work. They talked and joined us on almost every field trip, shared their memories, knowledge and old photographs. They are interested in all future activities regarding protection of the site and its biodiversity by their direct involvement, by ceding the machinery, their private land, and donating for important activities on the site. They all have the same vision of protecting the area and using it in good manners.

5. Are there any plans to continue this work?

Yes. We plan to do additional research of the site regarding geology, hydrology and biodiversity, to continue with site restoration and to assist and accompany procedures and proclamation of protected area.

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

The results are shared with the public and locals via media (newspapers, TV, portals), BHHU ATRA web page, Facebook and Instagram sites, meetings and lectures. The project reports are public and also shared with Republic institute for the protection of cultural, historical and natural heritage and they are available on Rufford webpage and ResearchGate. The reports are written to be used and useful as the source of information, recommendations and our experience that we want to share with everyone. Also, the big educational with all important information and our 7-year activities at the site will be available to everyone who visit the Čardak village.

Restoration short teaser video on Facebook and Instagram:

https://m.facebook.com/story.php?story_fbid=4524150220949927&id=631823713515950&viewer=631823713515950&paipv=1

https://www.instagram.com/tv/CSMgb_tIKmt/?utm_medium=copy_link

On our web site:

<https://www.bhhuatra.com/en>

<https://www.bhhuatra.com/en/project/pelobates-fuscus>

<https://www.bhhuatra.com/gallery>

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

The grant was used from the start of the project, October 2019 and finished in September 2021. Mainly, we planned to finish the project after 18 months in March 2021, but with harsh years with many restrictions, lockdowns and national regulations due to Covid-19, most of activities changed regarding the timescale, meetings, fieldtrips, number of researchers and students at the field, as well as the process of restoration – the available machinery and much higher prices in general. Overall, we managed to comply and follow all the project activities with minor corrections and at the end, we are completely satisfied with the outcome.

8. Budget: 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. It is important that you retain the management accounts and all paid invoices relating to the project for at least 2 years as these may be required for inspection at our discretion.

Item	Budgeted Amount	Actual Amount	Difference	Comments
Administration costs (bank conversion, agreements taxes, pay-out conversions, accountant)	896	896		Amount fully spent.
Papyrology taxes for needed cadastral documentation	45	45		Amount fully spent.
Educational boards and resting area	313	613	+300	More amounts spent than predicted. The extra money from Item Wastewater is used for covering the costs of Item Educational boards and resting area
Wastewater small system construction (digging + pipes)	448	150	-298	Since there was only one waste household water pipe running into the target (pilot) plot, only part of money was used to manage the wastewater. The other amount has been shifting for paying the constructor to build three outdoor benches with concrete grounding and iron/wooden body.
Batteries (headlamp, hand lamps, entomology pyramid, thermometer, Kestrel, Garmin, measuring scale, digital calliper)	90	90		Amount fully spent.
Hand nets x2	45	45		Amount fully spent.
Cutting Typha	135	135		Amount fully spent.
Truck for muck transport	896	896		Amount fully spent.
Excavator + driver (16 h)	1344	1344		Amount fully spent.
Data logger station - construction material x3	135	135		Data loggers' stations with data loggers will be reinstalled in spring 2022

				after the pond is naturally formed.
Daily allowance for education (food, local transport) x10	180	180		Amount fully spent.
Mini photo camp 1 day + exhibition (printing costs)	90	90		We also made an online photo exhibition at https://www.bhhuatra.com/gallery
Minicamp for 15 students + 3 mentors 3 days	628	479	-149	With the help from local society with free camping space and premises rental, we saved almost 150 £. We used part of unspent money for hiring the recording firm for aerial videos and photographs in phases of preparing and restoration of water habitat with drone.
Drone filming		131	+131	Additional activity. We used part of unspent money for hiring the recording company for aerial videos and photographs in phases of preparing and restoration with drone. We realised that, before the restoration, it would be necessary to define the exact area of digging based on the most dense and green <i>Typha</i> vegetation (the wettest part), to see if there are water residues (bad for excavator machinery because it may get stuck), and to monitor the restoration process and progress, and to use these videos and future ones, together with all videos taken so far, for preparing short movies about the Pelobates project, its development regarding species and habitat conservation and restoration.

Allowance for field research and writing the report for proclamation study - botanist	180	180		Amount fully spent.
Allowance for field research and writing the report for proclamation study - mammal researcher	180	180		Amount fully spent.
Allowance for field research and writing the report for proclamation study - ornithologist	180	180		Amount fully spent.
Allowance for field research and writing the report for proclamation study - entomologist	180	180		Amount fully spent.
Project team travel from Sarajevo (Sarajevo-Čardak-Sarajevo) x5	205	206	+1	Amount fully spent. Small difference is equalized through total travel costs.
Entomologist (Zagreb-Čardak-Zagreb) 580km x2	287	287		Amount fully spent.
Okt, Nov, Dec 2020 (BL-Čardak-BL) 300km x2 per month	126	125	-1	Amount fully spent. Small difference is equalized through total travel costs.
Jun, July, Aug, Sep 2020 (BL-Čardak-BL) 300 km x3 per month	358	351	-7	Amount fully spent. Small difference is equalized through total travel costs.
Mar, Apr, May 2020 (BL-Čardak-BL) 300km x3 per month	269	269		Amount fully spent. Small difference is equalized through total travel costs.
Jan, Feb 2020 (BL-Čardak-BL) 300km x2 per month	126	120	-6	Amount fully spent. Small difference is equalized through total travel costs.
Oct, Nov, Dec 2019 (Banja Luka-Čardak-Banja Luka) 300km x2 per month	180	182	+2	Amount fully spent. Small difference is equalized through total travel costs.
Bus tickets (Banja Luka-Šamac-Banja Luka) x40	717	706	-11	Instead of bus and national transportation the car was used instead (better solution in pandemic situation)
Total	8233	8195	-38	

Additional Budget Comment:

The rate of conversion to Pounds Sterling used in this project was taken from NLB Razvojna Banka, Banja Luka on date 29.07.2019: **1 GBP=2.18 BAM**

The medium of exchange rate for conversion to Pound Sterling used for final calculation is used from UniCredit Bank, Banja Luka on date 25.08.2021: **1 GBP = 2.29 BAM**

The budget was rearranged and adjusted due to small differences. Also, slight differences were caused by currency conversion, constant price growth influenced by global pandemic and different course during two years of project.

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

Next important step is to work on legal protection of the Čardak locality. These steps requires engagement of additional reserchers, Ministry of Spatial Planning, Energetics and Ecology, Republic institute for the protection of cultural, historical and natural heritage and Čardak Municipality. Whitin this project we gathered important biological data and elaborates that are needed for writing a study for protection of locality Čardak. The second, but most important step, is to continue restoration of the ponds, old oxbow of Tolisa River, in future years. We hope that with this first step and with results we are expecting, we will gain local and governmental trust and support in protection and restoration of whole Tolisa River oxbow in Čardak.

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

Yes, the logo was used, and the Rufford Foundation has been promoted within Pelobates project and known for its great purpose and work.

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

In total 14 researchers were conducting the field research and species determination during the implementation of the Pelobates project together with 14 students from Universities of Banja Luka and Sarajevo.

Ana Ćurić MSc, herpetologist, project leader. Field work and species determination. Elaboration.

Emina Šunje MSc, herpetologist. Field work and species determination.

Adnan Zimić MSc, herpetologist. Field work and species determination.

Toni Koren PhD, entomologist. Field work and species determination. Elaboration.

Dejan Kulijer, entomologist. Field work and species determination. Elaboration.

Mihajlo Vujić, entomologist. Species determination.

Jelena Šeat MSc, entomologist. Species determination.

Slobodan Ivković MSc, entomologist. Species determination.

Dejan Radošević, mammalian researcher. Field work and species determination. Elaboration.

Jovica Sjeničić, ornithologist. Field work and species determination. Elaboration.

Sara Potkonjak MSc, botanist. Field work and species determination. Elaboration.

Smiljan Tomić MSc, mycologist. Field work and species determination.

Nedim Jukić MSc, mycologist. Species determination.

Bojana Vukašinović MSc. Lecturer and educator.

12. Any other comments?

I would like to thank Rufford Foundation and its team, not only for the support in these 7 years of work in nature conservation activities, but for respecting all proposed project ideas, for trust, and for full understanding in 2020 and 2021 during the pandemic situation caused by Covid-19. Also, great thank to all team members, students, locals and constructors who contribute to this project.