

Final Evaluation Report

Your Details	
Full Name	Ana Ćurić
Project Title	Pelobates project – steps forward for habitat integrity and species diversity
Application ID	37476-D
Date of this Report	20 th December 2023



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
Habitat restoration				Following the lessons learned from our initial pond restoration project in 2021, we embarked on the rejuvenation of another pond within the same oxbow. Drawing from our experience, we identified the summer period as the optimal time for restoration. The land is dry and there is a big chance for all fauna to migrate if dug in the ground. Animals are in their summer dormancy period but still active during feeding period in the early mornings or in the evenings. In 2023, the soil was quite moist during the whole year and the central parts of most of the oxbow had been under the water. Consequently, the restoration was adapted, with a deliberate decision to leave certain underwater areas untouched. While we have a great cooperation with the local constructor, we agreed to conditions through the signed contract that in the summer 2024, when the soil is dry, the mechanisation will remove one more layer to deepen the slopes of the restored pond. In 2023 a 0.35 ha* restoration plot has been determined, while choosing between two municipality own plots, using all formal and legal documentation, collected data from research and monitoring, and the ground level water status. The construction team received strict instructions regarding the required depth and shape of the pond. Initially, the entire 0.35 ha plot was mulched, addressing the 100 % density occupation by <i>Typha latifolia</i> and <i>Rubus idaeus</i> in the pilot pond. Following the mulching process, the restoration procedure involved excavating a 0.3 ha pond with a gentle slope and a depth variance from the edge to the centre ranging from 2 - 2.5 m. The central part of the pond underwent a deeper excavation, reaching the clay soil layer to ensure water presence as long as possible and to stop the Typha rhizome spreading (no adequate soil and



	deep-water will stop rhizomes spreading). This time, the upper humus soil was used for: 1) levelling the edges of the restored pond and nearby slopes, 2) filling up the illegal dump in the Čardak facility nearby the oxbow, and 3) enhancing local agricultural land by using it as a natural fertiliser. The process of restoration took 4 days in total during 2023 and, as mentioned, one more layer will be removed in 2024 by the constructor team. The restoration plot is prepared for the next spring season. In the early spring, the students will also include this pond in the annual monitoring. Due to previous data from the first pond monitoring, the ideal phase of habitat recovery and establishment of pond will be formed by the end of spring 2024. The formed habitat with all vegetation and animals will be finalised in spring 2025. * A correction is needed in the previous calculation for the restored surface of the first waterbody in 2021 and the proposed second restoration. The accurate surface area restored in 2021 is 0.6 ha, and for 2023, it is 0.35 ha. The error in the initial statement indicated an area of 3 ha, but upon cross-referencing with QGIS, Google Earth, and cadastral data, the correct
Hydrology and geology research	All planned research activities were successfully conducted in 2022. A concise and detailed report has been uploaded to the Rufford platform in December 2022, encompassing essential research results. The comprehensive reports, derived from a combination of literature reviews and field research, served as the foundation for the study aimed at the protection of the Čardak locality. The research efforts covered hydrology and geology, involving the meticulous collection and synthesis of all pertinent data. The protected area is a lowland area of Bosnian Posavina with a very low slope. The terrain is slightly inclined to the northeast, in the direction of the outflow of water towards the main recipient, that is, the Sava River. The altitude ranges between 95 and 100 m asl and on the site between 98 and 99 m asl. In geotectonic terms, the area is located within the Miloševac depression with the Tolisa depression, which, together with the Gradačac



	block is separated by the Raiska River fault
	zone from the neighbouring Modriča. Trebovac
	and Tinia blocks. This fault zone led to the
	lowering of the terrain and the formation of the
	Milešovas depression as the southern part of
	the Sava Basin. It is assumed that Ousternany
	The sava basin. It is assumed that Qualemary
	sediments were brought down doing me iduit
	Zone and brought into contact with the
	Eocene. The Rajska River faults to software belongs to
	The seismically active faults together with the
	Slavonski brod fault s, i.e., the Sava Basin. The
	area belongs to the alluvial plain of the sava
	River and its tributary Iolisa. Fluvial lanatorms are
	aominant, especially the accumulation type.
	The depression or subsidence of the ferrain in
	which water is occasionally retained, i.e., it has
	the characteristics of a marsh area, is in the
	form of a narrowed ring - oxbow and extends in
	the northwest-southeast direction. In the centre
	of the ring there is a slightly higher terrain called
	Ada. The toponym itself indicates that the
	terrain along the entire perimeter of the oxbow
	is occasionally under water. The lowest
	depression pockets are located in the north-
	western part, and this is where the longest
	retention of water is recorded. Regarding the
	hydrological conditions during the field visit in
	October 2022, it can be stated that the main
	teature is the lack of water, caused by a long-
	term drought in most of the summer and
	disconnected oxbow from the main Iolisa River
	stream. Based on the presented climatological
	indicators in the last 10 years, an increasing
	number of extreme phenomena have been
	recoraed, primarily droughts, and then floods. In
	the precipitation regime, more trequent storms
	with short-term with intense rains are possible. All
	projections indicate an increase in air
	remperatures in the coming period and an
	increase in the trequency of hot weather
	waves. All those tactors will adversely attect the
	protected area, in terms of lack of water (both
	surface and underground) and unreliable
	reeaing regimes.
Additional	During spring 2023, an additional biological
activity:	camp with a tocus on student education was
Research	organised at the Cardak locality. The initiative
	and coordination were led by the Association of
"Cardak-	Biology Students in Bosnia and Herzegovina, in



Modriča 2023"	collaboration with our project team, the Herpetological Association in Bosnia and Herzegovina, and the Society for Research and Protection of Nature. This educational camp received support from the Municipality of Modriča, the Local Community Čardak, and various private donors who generously contributed to the cause. Students were researching the most important animal groups in this locality: amphibians and reptiles (herpetofauna), birds (ornithofauna) and bats (chiroptera). Various catching and research methods were tested and shown to students: specific nets for all three groups, bat sound recordings of echolocation calls, trapping, capture-mark-recapture method, recognising birds by their song, animal traces, DNA sampling, swab sampling, etc. All of these methods were carried out in a way to prevent any animal harness and stress.
Monitoring - Students engagement for restored pond monitoring	While not originally the primary focus of the project, organising educational activities, such as the small-scale biological camp, has proven to be a crucial undertaking. This facet of the project will need to be factored into future plans for both the initially restored pond and the second restoration. In the 2023 monitoring phase, assessments of the restored pond and herpetofauna were conducted during both early and late spring, providing valuable insights for ongoing and future conservation efforts. Mentors and students had prepared several methodologies for monitoring different herpetofauna species. The working methodology involved manual capturing and the application of trap setting methods for monitoring amphibian and reptile species in the local waterbodies including restored one, which serves as the main habitat for various species from these groups. The trapping method used to record the presence of species of interest and other members of the fauna, as well as to estimate the number of populations. During the research, the presence of eight herpetofauna species was recorded, all of which belong to the class Amphibia (Bombina bombina, Triturus dobrogicus, Lissotriton vulgaris, Bufo bufo, Rana dalmatina, Pelobates fuscus, Pelophylax sp., and Hyla arborea).



		using the trapping method, the presence of 11 individuals of <i>Triturus dobrogicus</i> and 10 individuals of <i>Lissotriton vulgaris</i> was documented, while through visual observation and manual capturing, 17 individuals of <i>Pelobates fuscus</i> were recorded in period of 30 th March to 2 nd April 2023 (three days). Considering the research time (late March and early April), it still represented a hibernation period for some species, there was no presence of <i>Emys</i> <i>orbicularis</i> , which has been confirmed to be present at this site in previous years. Unfortunately, despite many years of education and drawing attention to the importance of these unique waterbodies, someone stocked the restored pond Prussian carp (<i>Carassius gibelio</i>) right after the first restoration in spring 2022, which, in this habitat of specific biodiversity, represents the predator. Following the initial monitoring of the restored pond in spring 2022, a significant population of European pond turtles was present in the restored pond. These turtles serve as effective natural predators for the introduced fish. Due to the presence of these turtles, the project opted not to incur additional efforts and costs associated with relocating the Prussian carp. The natural balance facilitated by the European pond turtles offered a sustainable solution to managing the introduced fish population. Next year, monitoring showed that there was a smaller number of caught Prussian carp fish, but those individuals that survived grown up to 5 cm. With the implementation of "NO FISH INTRODUCING" signs around the pond, we expect that there will be no more introductions of fish, and by the next spring, we will have the result of the introduced fish population – which will be crucial for planning the next steps of actively relocating the fish from the pond, if needed.
Mapping and zooning the area for the purpose of protection		The mapping and zoning process for the narrow proposed area, aimed at habitat protection, has been successfully completed. Mapping and zoning include field activities, collecting existing documentation and geographical backgrounds and collaboration with locals and municipality to collect all necessary data for drafting the spatial plan maps. With all the data collected so far and during this project four



		 maps have been prepared. Prepared maps: 1) Proposed protected area border topographic map. 2) Proposed protected area border map physical map. 3) Administrative affiliation map. 4) Land purpose topographic map. 5) Land purpose physical map. 6) Relief and hydrography map.
Study for habitat protection		Throughout this project, we gathered all important and needed data, conducted crucial meetings with both authorities and local stakeholders to discuss legal protection considerations. Subsequently, we have submitted a formal proposal to the relevant authority. The impending next step involves initiating the procedural measures for proclaiming the proposed new wetland protected area and engaging with the authorities to advance this process. In Republic of Srpska, Bosnia and Herzegovina, in the lowland area of Posavina region, there are only three wetland 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. 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.
Museum exhibitions		The museum exhibitions are focused on the umbrella species <i>Pelobates fuscus</i> , delving into its habitat and life cycle. To enhance the interactive experience for visitors, realistic 3D models of a tadpole and two adults, rendered in natural size, were designed, 3D-printed, and painted. These models serve as engaging focal points within the exhibition, complemented by



	informative posters, rollups, and actual museum
	specimens to provide a comprehensive and
	immersive eveloration of the Delebates fuerous
	inimersive exploration of the relobates toscos
	and its ecological context.
	The exhibitions were set up in Museums of
	Republic of Sroska (Bania Luka) and The
	National Museum of Bosnia and Herzegovina
	(Sarajevo). The opening of the first exhibition
	was in Sarajevo, in the National Museum of
	Bosnia and Herzeaovina, on 7th April 2023 and
	the second exhibition took place in the Museum
	of Republic of Stocky in Rania Luka with and
	of Republic of Sipska in Banja Luka, with ana
	opening on 4 th July. The authors of the exhibition
	are Ana Ćurić and Adnan Zimić, and designer is
	Vania Lazić.
	The concept of the exhibition was to prosent
	the Overse of work within all farmers in a single
	ine y years of work within all four main projects
	tunded by The Rufford Foundation and other
	partners. Each project highlighted its main and
	most important goals and results, accompanied
	by authentic photography. A short promotional
	by domentic photography. A short promotional
	and educational movie was streamed,
	teaturing an all-round sound effect to give
	visitors an idea of the vocal and harmonious
	sounds of amphibians and birds at the Čardak
	and similar localities
	The third part of the exhibition featured on the
	process of European common spadetoot toad
	development and metamorphosis. Interactive
	displays allowed all visitors to observe samples
	of tadpoles from embryo to metamorphosed
	frag geoemognied by guthentic pictures
	ing, accompanied by dumentic pictures
	presenting the highlighted developmental
	phases. The entire process was also presented
	on a specially designed roll-up.
	The fourth part of the exhibition included 3D
	models of male and female adult individuals as
	models of male and remaie adult individuals, as
	well as the largest taapole tound in Boshia and
	Herzegovina (14 cm). The fifth part of exhibitions
	show other animal species present in the same
	habitat as Pelobates fuscus
	In the sixth part important information about
	the area sized and an area of a set a set of the literation of the set of the
	ine species enaangerea category (national,
	regional, European, and global) was presented.
	There was also a scent display where all visitors
	could understand why the European common
	spadefoot toad has its national (and regional)
	name "Carlie toad"
	Finally, at the end of the exhibition circle,



		promotional material was presented to further promote and raise awareness about the projects and their valuable contributions. After the first exhibition, in collaboration with BHT (Bosnian national television) we filmed a short documentary. <u>https://www.youtube.com/watch?v=IBKvI9zXq- U</u> Also, many TV and news portal reporters were at the opening of the exhibition. This is one of the videos filmed during the opening of the exhibition in Banja Luka: <u>https://www.youtube.com/watch?v=1Ihxim2rBss</u>
Designing and placing mini educational boards on-site		The design for the mini educational boards has been successfully completed. Further ideas and content for the main boards are suggested in the forthcoming Study for Habitat Protection. However, the installation of all planned educational boards is currently impeded until the area officially undergoes the protection procedure. At present, it is only possible to have installed an informational board without highlighting signs or the name of the area planned for protection.
Educational lectures and project promotion at Universities of Sarajevo, Banja Luka, Mostar and Tuzla		we nave successfully established connections with various stakeholders, including representatives from the local municipality, students, researchers, and governmental bodies responsible for the legal procedures associated with the proclamation of a Protected Area. Additionally, a collaborative partnership has been established with construction team, creating a network that enhances the project's effectiveness and ensures a comprehensive approach to the various aspects involved in the conservation initiative and future activities. In order to achieve the goals and tasks of this project, we have organised two presentations at five different universities in Bosnia and Herzegovina: University of Tuzla, University of Mostar, University of Sarajevo, Universities of Banja Luka. Presentations lasted about an hour on each University, with an overview of the main place of the project realisation, essential features of the studied frog species <i>Pelobates</i> <i>fuscus</i> , research methods, results of previous work and projects, and explanation of different ways of all possible involvements of students. Generally, considering the number of enrolled



	students, it can be said that student response and attendance was positive and that they were highly interested in all the aspects of the project, which has been proven with their engagement in the monitoring field trips during year 2023.
Editing three short movies with video material	Three short movies were prepared, and they will be shared one by one each month, with aims to promote the project effectively, particularly during the winter period. The videos will serve as engaging and informative tools to generate interest and awareness about the initiative across various official channels.
Engagement of locals in restoration work	Woking on the site almost every month during past couple of years, 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.

2. Describe the three most important outcomes of your project.

- a) Restoration of the second pond in the old oxbow of Tolisa River.
- **b)** All necessary biological data is prepared for the next step legal protection of the Čardak site.
- c) Promotion of 9 years of the project through very successful museum exhibitions in two important museums of Bosnia and Herzegovina (Republic of Srpska and Federation of Bosnia and Herzegovina entity).

3. Explain any unforeseen difficulties that arose during the project and how these were tackled.

 Due to pandemic, the prices went higher in every segment – from fuel price to the mechanisation. Even after the peak of pandemic, the prices continued to rise due to inflation in Bosnia and Herzegovina. This affected our work, while we had to agree with all project participants and partners to accept the proposed honorarium as per the contract and to restrict our restoration work to smaller area than mainly planned (we planned to restore double of previously restored), design and video editing to lower professional quality.



- Weather conditions during last couple of years were satisfying for habitat function, but for the restoration process, the soil was too humid even during the late summer. Because of that, the contract/agreement with the constructor was signed to finish the restoration process by the end of the summer in 2024.
- The proclamation of the protection area is a procedural step that will be led by the Republic Institute for the Protection of Cultural, Historical, and Natural Heritage. As part of this process, the institution is tasked with preparing a schematic protection study. This study will subsequently undergo a series of requisite procedures outlined by the Law of Nature Protection of the Republic of Srpska. This legal framework ensures a comprehensive and thorough assessment of the area's significance and the necessary measures for its protection. The last step is voting at the Government of Republic of Srpska for the Protected area proposal and finalising the Decision on the Declaration of a Protected area by Ministry of Spatial Planning, Construction and Ecology. This process can take up to several years, and it depends on each institution annual plan and Municipality of Modriča.
- The installation of planned mini educational boards is not possible until the area enters the protection procedure. It is also a double cost. It is only possible to have installed main informational board and other important signboards without highlighting logos or the name of the area planned for the protection.

4. Describe the involvement of local communities and how they have benefitted 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, 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. Up to this point, they have actively engaged and made significant contributions across various aspects as detailed above. Their involvement has been integral to the successful progress and implementation of the project, from research activities to community outreach, legal procedures, and collaborative initiatives with local institutions and stakeholders. 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 continue with site restoration efforts, supporting the proclamation of the protected area, and maintaining collaboration with students for educational purposes demonstrate a commitment to the long-term success of the project. Additionally, we will continue to be monitoring the herpetofauna and wetland, in conjunction with the restored ponds, together with our students.



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

The results are shared with vide public and locals via media (newspapers, TV, portals, videos, interviews, shows), BHHU ATRA web page, Facebook, X 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 web page 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 info board with all important information and our, so far, 9-year activities at the site will be available to everyone who visit the Čardak village.

On our web site: https://www.bhhuatra.com/en

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

https://www.bhhuatra.com/gallery

https://twitter.com/bhhu_atra

Other links: https://www.youtube.com/watch?v=IBKvI9zXq-U

https://www.youtube.com/watch?v=11hxim2rBss

https://mondo.ba/Magazin/Zanimljivosti/a1230092/Zaba-cesnjarka-izlozba-Muzej-<u>RS.html</u>

https://m.facebook.com/photo.php?fbid=596840569153862&set=a.55136287703496 5&type=3&locale=bs_BA

https://fablab.ba/fabjob/2023/08/zaba-cesnjarka

https://www.instagram.com/p/Cqn-7YOLVSg/?hl=en&img_index=1

https://www.facebook.com/BHHUATRA/videos/pelobates-project-teaserpogledajtekratki-teaser-o-pelobates-projektu-kojeg-impl/5024310840916709/

https://m.facebook.com/BHHUATRA/videos/uklju%C4%8Dite-zvuk-za-boljido%C5%BEivljaj-u-prethodnoj-objavi-mo%C5%BEete-saznati-%C5%A1ta-je-dos/1126086167947366/?locale=hi_IN

https://pogled.ba/novosti/dio-posavine-dom-cak-trecine-vodozemaca-i-gmazovau-bih/214776



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

To encourage national government and local government to use and promote the area that needs to be protected.

Next important step is to work on implementation of proclamation of protected area and to animate and encourage the future manager of protected area, together with Municipality of Modriča how to manage the area with all our suggestions regarding gained knowledge and experience. All suggestions and information collected so far will be needed to talk through and agree to the first steps in protection and usage of this wetland at the Čardak locality. These steps require engagement of project researchers, manager, Ministry of Spatial Planing, Energetics and Ecology, Republic institute for the protection of cultural, historical and natural heritage, Čardak village and Modriča Municipality, together with engaged NGOs. Within all these projects we gathered important biological and geological data for a study for protection of locality Čardak and its wetland. The second, but most important step, is to continue restoration of the wetland - ponds, old oxbow of Tolisa River, in future years. We hope that with this first steps and with expected results, we will gain local and governmental trust and support in protection and restoration of whole Tolisa River oxbow in Čardak.

8. 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 the foundation in Bosnia and Herzegovina and region is known for its great purpose and work.

9. Provide a full list of all the members of your team and their role in the project.

In total 30 people from Banja Luka, Sarajevo and Modriča were actively taking a part conducting variety of above-mentioned goals for the best implementation of the Pelobates project.

Ana Ćurić MSc, herpetologist, project leader. Fieldwork, species determination, museum exhibition preparation, educational material preparation, editor, protection study final author.

Adnan Zimić MSc, herpetologist. Fieldwork, species determination, museum exhibition preparation, monitoring expert and mentor.

Goran Panić BSc, of geology, geologist and hydrologist. Fieldwork. Elaboration.

Dijana Gvozden Sliško, PhD student, spatial panning. Field work, mapping, GIS.

Ajla Berberović BSc, of biology. Lecutrer, museum exhibition preparation.

Jovana Herceg Bsc, of biology. Promotion, education, field work and monitoring.



Bojana Vukašinović, MSc. Lecturer and educator.

Amina Agić BSc, of biology. Lecturer, fieldwork and monitoring.

Students: Aleksandra Babić, Mia Dejanović, Rejna Kolašinac, Tatjana Vojinović, Elvis Čivljak, Kristina Hinić, Jovana Novaković, Sanja Đukić, Darko Zečević, Alana Hankić, Jovana Savić, Vojo Milanović, Hamid Tahirović.

Museum curators: Nataša Kovačević, Branislav Gašić, Milenko Đorđević, Azra Bečević-Šarenkapa.

Jovica Sjeničić BSc, of ecology. Local help, field work.

Vanja Lazić, exhibition designer.

Milenko Đaković, "Đaković" s.p. – constructor.

FabLab – 3D printing.

Damir Bakija – 3D models realistic painting.

10. Any other comments?

I would like to thank The Rufford Foundation and its team for the support in the last 9 years of work in nature conservation activities, and for respecting all my proposed project ideas, for trust and great cooperation. Also, great thank to all team members, students, locals and constructors who contribute to this project.