# Final Evaluation Report

| Your Details | |
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| **Full Name** | Tijana Nikolic |
| **Project Title** | European ground squirrel conservation - habitat networks for open grassland wildlife in agricultural settings |
| **Application ID** | 27898-1 |
| **Grant Amount** | £4725 |
| **Email Address** | nikolic.tija@gmail.com |
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**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 |
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| Transfer of population monitoring result in practical conservation solutions | | | | This objective is fully achieved. We have analysed the relationship between land use and climate change and the habitat distribution and occupancy of all mapped European ground squirrel - EGS local populations with GIS tools, machine learning and statistical methods. The summary of the results which we obtained is that the future potentially suitable areas are in north-western part of Vojvodina, especially with simulated increase of open grassland at the expense of crop production. Further, by overlapping projected areas with previously developed Conservation Zones we managed to identify future zones of conflict of two sectors – agriculture and open grassland conservation. |
| Evaluation of the population status and monitoring of the occupancy trend of mapped habitats | | | | This objective is fully achieved. We registered a total of 38 sites with deterioration of habitat condition, 52 with same habitat condition, 34 with improvement in colony size, no presence of colonies on 25 previously active sites, 10 reactivated sites (four of which were in use only as transit areas), nine sites converted to new land use type and eight new mapped sites. We covered area of agricultural landscape in the northern Serbia - Vojvodina: Srem, Banat and Bačka administrative units. Data gathered about local colony distribution and habitat occupancy and condition under this project are available on-demand in the form of an Excel file. The map of occupied areas is |

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| | | | | shared with institutions in charge of nature protection in the country. The data and the data analysis will be fully available to researchers in form of scientific publications. |
| Create a network of associates within the local community of Vilovo and Lok | | | | This objective is partially and fully achieved, at the same time. Namely, we did not, as proposed, work with local community in Vilovo and Lok – Southern Bačka, but with local community and Public enterprise in Northern Bačka, due to Covid-19 restrictions. We had one online lecture, email communication with locals and made (trailer first plus later 10 min) documentary that is/will be used for communication with public, institutions and the scientific community. |
| Agreement for EGS of the representatives of NGOs, Institute for Nature Conservation of Vojvodina Province and the Academia | | | | Based on results of the field work done as part of this and previous Rufford projects, we developed a general agreement about relocation strategy/procedure, what to do in case of colony harassment and habitat usurpation and how to form new colonies, all of which will be presented in joint care plan and programme, as part of our advocacy activities. |

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

1. Problem with planned activities with local communities of Lok and Vilovo due to Covid-19 – this was not possible due to the fact that lockdown and social distancing prevented in-person communication and work in the field with local communities of Vilovo and Lok – southern Bačka. Instead, we were active online and started working with local community and one conservation oriented public enterprise (Palić-Ludaš) in another region – northern Bačka. Second, we decided to make a trailer and a short documentary to disseminate our achievements, current and future activities by presenting them via online channels and, in post-pandemic world, on different occasions.

2. Problem with equipment – we had difficulties during field work with the number of available live traps for colony size assessment. The problem was soon solved with acquiring new set of raw material and manufacturing live traps by ourselves, in accordance with manufacturer's recommendation and after a series of consultations with experienced researchers. The main reason why we decided to

make our live traps for field work is related to price issue of buying the live traps from Hungary and importing them. The second reason was related to our joint decision to buy colour markers and applicator for the next year colony relocation. In the scenario of buying and importing live traps in Hungary and colour marker and applicator from France, the total expense would be beyond the planed budget (planed budget here referring to the reorganised budget and activities due to Covid-19).

3. Bad weather conditions – as the project started in August 2019, by the end of our working season (late October 2019) there were fewer days with compatible weather conditions for colony and habitat assessment. However, due to very efficient and intensive field work during August and September 2019 and following spring (as much as it was possible due to Covid-19), we managed to provide update of habitat occupancy distribution and population status needed.

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

**1. Obtained results of the second (first was in 2014) regional EGS open grassland habitat assessment in agricultural landscapes in Vojvodina, as the basis for development of EGS and open grassland conservation**. This project-initiated update of EGS local colony distribution and open grassland habitat condition. We gathered information directly from the field and provided concrete data about specific habitat conditions in three sub-regional landscapes (Srem, Banat and Bačka), as well as different conditions and conservation issues in those sub-landscapes. We used a research design that included 19 previously identified potential Conservation Zones belonging to different regional sub-landscapes. Field work was conducted from August to October 2019 and May to October 2020. Results of this research provide a basis for general recommendations for development of specific sub-regional measures of open grassland conservation within identified zones in agricultural landscapes. It is vital that conservation measures are tailored to specific Conservation Zone characteristics of the three regional Administrative Units if they are to succeed. Therefore, all Conservation Zones that differ in compositional and structural characteristics should be assessed separately. The summary of the results which we obtained show we have the same conditions on 52 sites and improvement on 34 sites, while deterioration took place on 38 sites. As for habitat condition, we noted the following issues: medium to severe vegetation succession in around 20 localities, nine sites with local waste deposition, several localities had fires from local burning (large scale issue with local farmers' crop management), three localities were converted to arable land and two are now in use for water management (area in use for new water channel construction). One locality is potentially threatened by road construction. We confirmed that two colonies on two artificial field are still stable: one on a small sports airfield and one on a football field.

**2. Developed joint conservation Agenda for EGS and open grassland conservation.** As part of project activities, we organised one round table and one workshop with representatives of the Institute for Nature Conservation of Vojvodina Province (Public), Academic Society for Nature Conservation and Bird Protection and Study Society of Serbia (NGOs), University of Novi Sad and University of Belgrade (Academia), Palić-Ludaš (Public). After these, we developed the joint initiatives

aimed at open grassland and biodiversity conservation in agricultural landscapes with special focus on EGS as umbrella and flagship species, based on results of conducted research under this project. This project enabled us to make a basis for transfer of our monitoring data to practical conservation solutions. The very first joint activity will happen in 2021, when we will work together on one colony relocation in northern Bačka region. We agreed to draft a care plan and programme for this and to set up long-term monitoring on previously restored grassland sites on the border with Hungary.

**3. Raised level of interest of local community about the conservation of open grasslands and awareness of the potential for their active involvement.** Important part of project activities was our communication with local communities and the general public. Given the context of Covid-19 restrictions, it was very successful. The most productive was the period after our online presentation (https://www.youtube.com/watch?v=83H7lfAEk0A.) as part of the series "Nature and Species Protection" on Bird Protection and Study Society of Serbia YouTube channel. During this conversation and presentation, we discussed the importance of biodiversity conservation, concrete benefits from open grassland biodiversity conservation, and roles which EGS has in ecosystems. Once they heard we were previously working a lot with communities from Central Banat during our very first Rufford project, they showed interest to work with us in the field. Furthermore, in cooperation with our colleagues from BioSense Institute and Academic Society for Nature Conservation we gathered material first for trailer and then for a 10-minute documentary. The benefits of this movie are the fact that it is and will be too available to the general public, researchers and students, for increasing knowledge and awareness of open grassland conservation, and mobilising people for providing active support to our efforts.

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

We have communicated with many people from wider areas of Vojvodina and specifically from northern Bačka. In our online communication we realised that there are many volunteers who are nature lovers and would like to be engaged in framed activities and help us in the field. The most interesting communication was with one family of four from northern Bačka who were keen to participate and help in performing scientific research, through providing their assistance in the field. For example, for them our shifted focus to northern Bačka is a great chance to be involved since they regularly visit the area for pleasure. Also, we were contacted by students of biology and ecology who would also like to work with us in field and who are from different local communities across Vojvodina. Those students also offered us their contact and expressed interest to initiate more joint work within their communities. Unfortunately, more active work was impossible due to Covid-19 restrictions. Nevertheless, since we have planned many more activities for the next season, we plan to involve people who contacted us and those that will contact us. The plan is to have them to help us in our field work, in this way they will learn about the methodology for the study we have and what new tools and technology we are using, how and why we collect data, and of course issues in open grassland conservation, especially in agricultural landscapes.

**5. Are there any plans to continue this work?**

We plan to continue our work, and now supported by our three sectorial agendas that is the direction all of us will follow. The first activity is joint work with Public Enterprise Palic-Ludaš who have already prepared a new habitat for EGS. In the area of *Subotička Peščara* - Subotica Sands this PE managed to revitalise a total of 400 ha. They started this conservation project in 2014 and are currently alternating mowing and grazing management on restored sites. This year (2020) Institute for Nature Conservation of Vojvodina Province evaluated it and agreed that the revitalisation was successfully completed, and that targeted habitat of 25 ha for EGS is dominated by fescue *(Festuca pseudovina)* and represent area of good quality for EGS population. As managers have done their part and are ready to continue working, we decided to draft a joint care plan and programme. We plan to start monitoring of this targeted habitat, collect information on vegetation condition (plant ecology and remote sensing – by use of UAV), colony relocation from clover field and animal marking (tags, radiometry), monitoring and mapping new habitat occupancy. Furthermore, since this will be the first relocation ever in Vojvodina region, we are planning to collect genetic data from local colonies across region of Vojvodina next season. This will represent valuable data set for any future regional EGS conservation activities.

Also, we plan to promote our activities online with a short movie and of course, in post-pandemic world, on different gathering-occasions.

In the 5-year timeframe we will do an update on local population distribution and open grassland conditions.

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

Results of this project has been promoted at local, regional and international level.

1. We disseminated information at regional level through online presentation and round table with locals and general public. (Local level and regional level)

2. Project activities and results were discussed with relevant institutions - Institute for Nature Conservation of Vojvodina Province, whose personnel supported us and participated in a joint agenda aimed at conservation of open grassland biodiversity in agricultural landscapes. Finally, we organised a workshop when we made concrete remarks and conclusions on advocacy of this work. (Regional level)

3. Project activities and results showing habitat associations were presented in the form of talk presentation, at the *Festival of Ecology* of British Ecological Society, an online conference in December 2020. We also plan to submit a manuscript on these topics to a peer-reviewed journal(s). (International level)

4. Project activities and results will be disseminated using BioSense website (new one in development), where one webpage is specifically dedicated to the projects related to EGS, acknowledging the support of Rufford Foundation and providing further links to Rufford's webpage (regional and international level)

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

The project started as planned in August 2019 and lasted for 12 + 4 months. Due to Covid-19 lockdown and restrictions we were not able to follow the project proposal timeline.

**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 |
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| Educational brochure (100 pieces | 150 | 150 | | Because we were not able to organize a group visit to the EGS sites, the funds were used to making the movie that will be publicly available; this amount was used to cover studio costs for the movie. |
| T-shirt (35 pieces) | 250 | 250 | | Because we were not able to organize a group visit to the EGS sites, the funds were used to making the movie that will be publicly available. |
| GPS tracker (4 pieces) | 600 | 1446 | +85 | Due to Covid-19 we reorganized our budget to obtain essential equipment e.g., ear tags to mark animals, raw material to make live traps. |
| Field vehicle (use per day * 65) | 700 | 700 | | |
| Food and drinks for round table and workshop (app. 100 pieces) | 400 | 400 | | |
| Field meals and accommodation (1300 app. 260 pieces) | 1700 | 796 | -904 | Since field work was done in a constricted timeframe, the funds were transferred to obtaining vital equipment |
| Petrol for transportation of school kids and teachers in field (192-204 | 200 | 200 | | Because we were not able to organize a group visit to the EGS sites, the funds were used for |

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| l, 2 cars) | | | | making the movie that will be publicly available |
| Petrol for transportation (1875 l, 4 cars) | 1875 | 1837 | -38 | Due to all conversion, cost was less then anticipated. |
| **Totals** | 5875 | 5779 | -96 | The actual cost of the project was 96.42 £ lower than initially planned, this will be used next season for field expenses. |

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

The most important next steps after are:

I group – research dissemination and lab activities.

- Promote the concept of Conservation Zones and EGS as indicator of open grassland habitat condition at expert, public and state institutions in charge of nature conservation, in publications.

- Continue with modelling experiments of land use and climate change impact on EGS and open grasslands.

II group – local scale field activities.

- Drafting and finalizing care plan and programme.
- Relocating targeted colony and working jointly with local communities.
- Focus research on following adaptation, stress level and behaviour of relocated animals.
- Monitor habitat characteristics in detail on revitalise area of Subotica Sands.

III group – landscape scale field activities

- Sample DNA on local EGS population across region in Vojvodina for landscape genetic analysis the following season.

**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?**

RF logo was used and promoted at following occasions: in the project educational trailer and short movie, at the talk presentation at the British Ecological Society Conference – *Festival of ecology* (December 2020) and at project webpage at different online communication channels, during online talk at Bird Protection and Study Society of Serbia YouTube channel. Rufford support was highly acknowledged on all occasions, round table and workshop meetings with the public institutions, NGOs, scientists, experts.

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

The team had 4 members:

**Tijana Nikolic** – project coordinator
Tijana Nikolić (project coordinator) was involved in all activities from scratch to realisation. Tijana Nikolić mapped local populations in Central Banat and in northern Bačka. She presented the EGS and open grassland conservation as well as project activities on Bird Protection and Study Society of Serbia YouTube channel. Also, she communicated with local community in northern Bačka.

**Maja Arok** – project assistance
Arok Maja mapped local populations in Srem, on the mountain of Fruška gora. Maja Arok worked on project administration in our NGO.

**Nada Ćosić**- species expert
Nada Ćosić mapped most of local populations in southern Banat (area with largest number of colonies). Also, Nada Ćosić was in charge for tailor making live traps and involved in documentary movie work.

**Dimitrije Radišić**– field expert
Dimitrije Radišić mapped all local populations in southern Bačka, all northern and 40% of populations in southern Banat. Dimitrije Radišić organized the round table with representatives from Palić-Ludaš public enterprise and prof. Duško Ćirović in northern Bačka.

The all 4 team members are wildlife biologists or ecologists and experienced field researchers.

Tijana Nikolić and Maja Arok organized the workshop.
Tijana Nikolić and Dimitrije Radišić run all lab experiment work.
Tijana Nikolić, Maja Arok and Nada Ćosić presented at the workshop meeting.

All members were active in work on the documentary and care plan and program drafting.

We were supported by active participation of Oliver Fojkar, president of our NGO Society and person who was shooting and collecting material for the trailer and documentary, our colleague and PhD student Lea Milinski supported us for the field work, all the activities we had were in consultation with professor Duško Ćirović, (Laboratory for animal ecology and geography, Faculty of Biology, University of Belgrade) and Jadranka Delić (Provincial Institute for Nature Conservation of Vojvodina Province). Plus, Bojana Ivošević from BioSense Institute started working with us on microhabitat quality assessment by use of UAV and all these activities related to use of new tools and techniques in biology and ecology are kindly supported by online consultation by experts from Wageningen University and Research. Bojana Ivošević, Maja Arok, Nada Ćosić and Tijana Nikolić with porf João Valente prepared and present our work on *Festival of Ecology* in December 2020.

**12. Any other comments?**

We greatly appreciate the cooperation of Prof. Duško Ćirović from the University of Belgrade (Serbia) who supported us along the way of all our EGS projects and Lea Milinski for unconditional support in field. Also, we would like to highlight the cooperation with Prof. João Valente from Wageningen University and Research (the Netherlands) and Ivošević Bojana from University of Novi Sad (Serbia) who performed UAV monitoring and analysis of the data, and who are the co-authors of the abstract and talk presented at BES *Festival of Ecology* 2020. We would also like to express our greatest gratitude to experts providing letter of references to this project proposal: Milan Ružić, Dr Gabor Csorba and Hegyeli Zsolt. And finally, we would like to thank The Rufford Foundation, without whose support to this and previous EGS project our efforts to contribute to open grassland and EGS protection would be impossible to initiate, and effectively and efficiently conduct.