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SUCCESSFUL REINFORCEMENT OF THE EUROPEAN SOUSLIK BY GREEN BALKANS NGO IN "SINITE KAMANI" NATURE PARK, BULGARIA

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Abstract: The European Souslik is an important component of the diet of protected bird and mammal species. This is a threatened species whose population and distribution area have been shrinking in its entire range. Translocation is often used to restore the species' distribution and abundance. Unlike Central Europe, there is only scarce experience in the implementation of Souslik translocation activities in SE Europe and the Balkans.

The current work presents the results of the Souslik reinforcement program implemented by Green Balkans in Sinite Kamani Nature Park in the period 2010-2014. The process of reinforcement took part in the Karakyutyuk area within a total area of 43,71 ha. The Souslik colony in this area should therefore be considered critically endangered. The natural habitats of the area were restored, clearing off the shrubs and enhancing the vegetation cover. The pastures were maintained through extensive sheep grazing. Thus, through these direct reinforcement activities, a total of 292 individuals were released during the period 2010-2014. The animals were trapped in threatened or deteriorated habitats, outside the territory of the Nature Park. As a result of the successful activities, the colony expanded from 215 holes of Sousliks, only 65 of which active in 2010, to a total of 1120 holes (879 active) in 2014.

The future maintenance of the habitats would guarantee the sustainability of the Souslik populations in Sinite Kamani NP. The reinforcement method could also be applied in other suitable territories, being further enhanced to secure greater efficiency in the specific environment.

INTRODUCTION

The European Souslik (*Spermophilus citellus*) is found in poorly structured populations (often called "colonies" in Bulgaria) in open, uncultivated woodless habitats in Central Europe and the Balkans (Koshev, 2012*c*). Typical of this species is the annual cycle including a long hibernation period lasting for some 6-7 months.

In the second half of the 20th C, the European Souslik was reported to be a pest animal, which marked the beginning of a systematic campaign to combat this species (Koshev, 2008; Coroiu *et al*., 2008). This was also a period of intensification of agriculture and stock breeding. Thus, its abundance and range in Europe has suffered a severe decline. The European Souslik has gone extinct in Germany and Poland. Its abundance has drastically decreased in the Czech Republic, Slovakia, Moldova, Northern Greece, and Macedonia (Koshev – unpublished data; Coroiu *et al*., 2008). There is a clear range shrinking trend in Bulgaria (Koshev, 2009; Koshev, 2012*c*; Stefanov and Markova, 2009; Stefanov, 2015), as most probably the species has gone extinct in the southwest part of the country (Koshev, 2008).

Usually, the European Souslik (*Spermophilus citellus*) inhabits pastures (72%) and the major threats to the population in Bulgaria include pasture degradation, overbuilding, intensification of agriculture, interruption of biological corridors, and flooding (Koshev, 2008; Koshev, 2009).

The European Souslik is a major food resource for a number of endangered raptors and mammals such as Eastern Imperial Eagle (*Aquila heliaca*), Saker Falcon (*Falco cherrug*), Golden Eagle (*Aquila chrysaetos*), Steppe Polecat (*Mustela eversmanni*), Marbled Polecat (*Vormela peregusna*), etc.

For all these reasons, the European Souslik is declared a protected species, being listed in: IUCN Red List as "vulnerable"; Convention on the Conservation of European Wildlife and Natural Habitat (Bern Convention) - Appendix II – Strictly protected fauna species; Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora – Annex 2 and 4. The species is also listed in Annex 2 to the Biological Diversity Act of 2002 and the Red Data Book of Bulgaria in the "vulnerable" category (Stefanov, 2015).

The territory of Sinite Kamani NP is partially or entirely overlapping with Kamenets-Grebenets SPA (BG0002058) and Sinite Kamani SCI (BG0000164). The species is determined as being of unfavorable conservation status in Sinite Kamani SCI (BG0000164) (Koshev, 2013), which calls for the implementation of urgent conservation measures.

In the territory of Sinite Kamani NP, the Souslik went extinct in the late 1980s and early 1990s. This extinction was mostly due to the abandonment of extensive farming, hence the disappearance of the grass habitats suitable for the species. At the same time, the Souslik is relatively abundant in the flat vicinities of the park,

where the species inhabits mainly abandoned arable areas. Within these habitats the species is particularly vulnerable because of the risk of plowing, which would destroy the Souslik colonies.

The various methods of translocation (introduction, reintroduction, re-stocking, reinforcement, etc.) of Sousliks and Prairie Dogs are often used to preserve such rodent species in Europe and North America (Dullum *et al*., 2006; Balaz *et al*., 2008; Matějů *et al*., 2010; Matějů *et al*., 2012; Tokaji *et al*., 2012; Brenner and Millesi, 2014; Próchnicki, 2012; Lobbova and Hapl, 2014), as these practices have been further enhanced (Gedeon *et al*., 2011*a,b*).

Several Souslik reintroduction projects have been taking place in Bulgaria, being implemented in the Kotel Mountain and "Vitosha", "Balgarka", and "Vrachansky Balkan" Nature Parks (Koshev, Arangelov – unpublished data).

In 2010, a program for the restoration of the European Souslik was launched in the territory of Sinite Kamani Nature Park, aimed at recovering the species as a valuable representative of the Park's fauna (also providing food resources for the rare birds of prey inhabiting the Park), and, at the same time, preventing the mortality of individuals inhabiting "habitats at risk", situated beyond the boundaries of the nature park.

MATERIALS AND METHODS

Brief description of the physico-geographical features of Sinite Kamani Nature Park

Sinite Kamani Nature Park, covering an area of 11 380 ha, is situated in the vicinities of the town of Sliven, falling within the territory of the Eastern Balkan Mountain. The Park's altitude varies from 300 to 1181 m a.s.l. (Balgarka Mount). The weather typical of the area is temperate continental climate with prevailing transfer of air masses from the Atlantic Ocean and frequent distant continental and Mediterranean incursions, also influenced by the Black Sea. The estimated absolute temperatures range from +41° C to -21° C. The mean maximum was recorded in July (15,1 ° C), while the mean minumum was in January (-2,9 ° C). The earliest snow cover date is around November 2nd, while the latest date when snow cover disappears is in early March. The average precipitation is about 600 mm. The maximum precipitation is in May, and the minimum - in August. The area is characterized with NW and N winds. The local wind "Bora", also known as "the Sliven wind", is typical of this region. In the summer, the local mountain-plain wind ("night breeze") blows at the foothills of the mountain and along the river valleys, changing its direction – oriented toward the mountain slopes during the daytime, and toward the valley at night.

The northern slopes of the Park are covered with vast Beech forests, while the southern ones are furrowed by ravines and gorges. The vegetation in this part of the park is scarce, mainly represented by single trees - Sessile oak, Beech, etc (Anonymous, 2003).

Reinforcement of the European Souslik in the Karakyutyuk area, Sinite Kamani Nature Park

The activities envisaged within the program were implemented for a period of 5 years - from 2010 to 2014, as the individuals were captured in the vicinities of Sliven (at about 200 m a.s.l.) and released in three target habitats in Sinite Kamani Nature Park.

This paper presents the reinforcement in the Karakyutyuk site (N 42° 44' 15,11''; E0 26° 18' 17,53'', about 930 m a.s.l.) implemented in a total area of 43,71 ha. The reinforcement of the European Souslik was carried out in line with the regulations of IUCN/SSC (2013) and the guidelines by Hapl *et al*. (2006).

The preliminary genetic and cytogenetic analyses show that the source and release sites belong to the same genetic line (Říčanová *et al*., 2013; Chassovnikarova *et al*., 2015)

Selection of suitable catching localities

The selection of suitable catching localities was based on the identification of suitable donor colonies to be used as a source of individuals. The team surveyed the Souslik colonies within a perimeter of about 30 km to the south of Sliven – in the area of the villages of Zlati Voyvoda, Sotirya, Krushare, Samuilovo, Topolchane, Kamen, Gergevets, and Rechitsa district. Preference was given to areas harboring huge Souslik densities, as well as areas "at risk" – e.g. situated along busy roads (with confirmed high mortality of Sousliks); abandoned uncultivated areas facing the risk of being ploughed up or deteriorated in terms of habitat quality.

The relative population abundance of donor colonies was identified through the linear transect method (Koshev, 2012*a, b*), recording active Souslik holes. Following the extrapolation of the data over the entire area of the colonies, their approximate density and the number of individuals that could be caught without causing any negative effect on the population were estimated.

After the initial selection, a final survey was carried out on May 2nd-3rd, 2010. Based on this survey, the following donor Souslik colonies were identified:

а) Pastures situated in the vicinities of Rechitsa district (town of Sliven);

б) A golf-course near the pastures of Rechitsa district. Being abandoned in 2013, the golf-course is getting overgrown with shrub vegetation. Hence, the Souslik density in this habitat is decreasing, which calls for the implementation of urgent measures to preserve the species.

в) Pastures near the village of Topolchane (used in 2014). These pastures harbor some of the highest densities of Sousliks in the country; yet, they are situated near a main road with heavy traffic causing high mortality of Sousliks. Souslik catching took place in the areas along this busy road (Fig. 1. *c*).

Capturing, measuring, marking, transportation, and release of individuals

Two types of live traps were used: live traps for rats with a bait (e.g. an apple) and live trap "Donsky type" (Fig. 1. *d, h*). The capturing of individuals was done in a way to secure heterogeneity of the group in terms of age and sex, in order to achieve successful and sustainable survivorship of the Sousliks in the new territories. Juveniles, underweight individuals, as well as animals with external parasites and skin disorders were released back into their colonies.

Field data forms were filled in for every individual, including date, time, donor colony, release site, weather conditions, and somatometric indicators, such as body measurements, weight, sex, and estimated age in four classes. The age classes were split in four major groups: Juv. – juveniles, Ad. – adults, and Subadults, as the latter included Juv./1st year and Ad./1st year individuals. The Sousliks were marked with standard *Felixcan* microchip transporders. The temporary marking was done by dying the fur with a hair colorant – females on their backs and males on their heads and necks. Thus, the released Sousliks could be distinguished from the individuals in the colony.

Captured individuals were placed in transportation boxes (Fig. 1. *h*) and transported to the release sites on the day they were caught to minimize any impact and stress. All related activities and manipulations were performed in the presence of a veterinarian, observing the antiseptics and disinfection rules and requirements.

Preparing the reinforcement locality

The selected release area – the Karakyutyuk site, harbors a small Souslik population of almost critically low abundance. In order to restore grass habitats suitable for Sousliks, the shrub vegetation in the selected reinforcement locality was cleared off through trimmers and brush cutters (Fig. 1. *a, b*). The excessive vegetation was removed outside the restored territory. Thus, the shrub and tree overgrowth of more than 60% coverage was reduced to less than 5% with only single shrubs left. No plants of conservation significance and shrubs and young trees with bird nests were removed during the implementation of this activity. The cleared territories are managed through extensive sheep grazing and mechanical maintenance (Fig. 1. *g, f*). Seeds of leguminous plants (mostly clover) were spread to improve the nutritional value of the habitat.

Artificial 80 cm deep holes were dug at an angle of 45° in the release sites through a motor drill (Fig. 1. *a*). These holes provide shelter for the Sousliks, thus reducing stress levels and possible loss of individuals caused by predator attacks. After a certain period of time, Sousliks turn these holes into real burrows.

Piles of seeds were left at certain places near these holes, in order to provide food for Sousliks in the early days of their adaptation period.

The individuals were released at dusk, on the same day they were caught, in small groups of about 5-6 individuals, placing an individual in each preliminary

dug hole. The entrance to the hole was closed with a big tuft of grass to prevent the escape of animals during the night hours. The next morning, the entrance of each hole was re-opened and the Sousliks were put to constant observation.

To survey the presence of potential predators, camera traps were set up in key locations, recording feral dogs, foxes, etc. Supplementary feeding sites were established to divert the predators' interest from the Sousliks.

Guards were provided in the reinforcement area to monitor the behavior of the individuals, chase predators away, etc. After a certain period of time, monitoring was implemented once a week.

The results of the reinforcement were evaluated by counting active (inhabited) and inactive Souslik holes, which can be used as an indirect indicator of the relative abundance of Sousliks (Koshev, 2012*a, b*).

RESULTS AND DISCUSSION

At the launch of this activity in the spring of 2009 and 2010, the relative population abundance was estimated based on the number of Souslik holes in the Karakyutyuk site. In 2010, some 215 holes were recorded as many of them were inactive. Observations from the previous year (2009) showed that only 30 to 40 holes were active during the last season. Not more than 3-4 individuals used to be recorded in the territory during binocular observations.

There has been no survey on the number of holes used by a single individual. There are cases when several individuals share the same burrow to hibernate. According to a survey carried out by Straka (1961), the average number of holes used by a single individual is 13. Assuming these figures reliable, it could be concluded that the Souslik colony in the Karakyutyuk site consists of only 10 to 20 individuals and is therefore critically endangered.

a **b**

Fig. 1. Preparing the reinforcement locality, capture and release of individuals. *Further details are provided in the text.*

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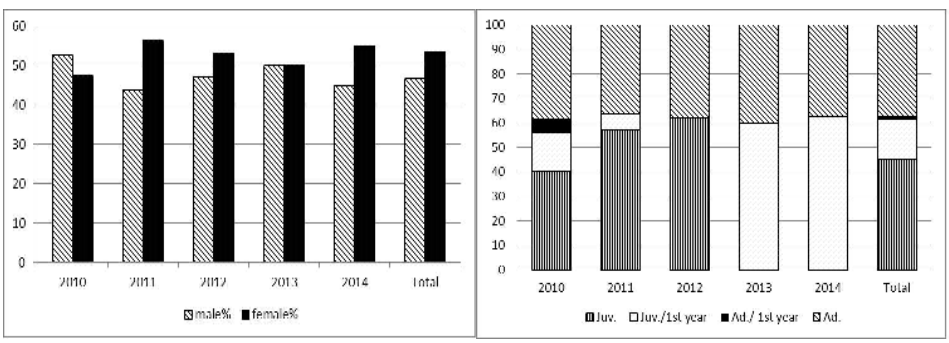
Demographic structure of released individuals during the five years of reinforcement

During the five-year period of the program, a total of 292 individuals were caught and selected for reinforcement. Most of the Sousliks were captured in the first three years - 242 individuals. After the initially recorded success of the reinforcement, the release of individuals continued in the following years (Table 1).

Table 1. Description of the Sousliks released during the five years of reinforcement in the Karakyutyuk site, Sinite Kamani Nature Park. *Further details are provided in the text.*

Year	Periods of releasing	Male	Female	Juv.	Juv./ 1st year	Ad./1st year	Ad.	Total
2010	7 – 22.07.	30	27	23	9	3	22	57
2011	30.06. - 23.08.	52	67	68	8		43	119
2012	25.06.-25.07.	31	35	41	-	-	25	66
2013	19.08.	5	5	-	6	-	4	10
2014	28.6.- 22.7.	18	22	-	25	-	15	40
Total	**28.6-23.08**	**136**	**156**	**132**	**48**	**3**	**109**	**292**

The estimation of the sex index for the entire period shows that females prevailed, accounting for 53,4% of the individuals, compared to males - 46,6%. Male prevalence was recorded only in the first year, while in 2013 both sexes were equally represented (Fig. 2. a).



a **b**

Fig. 2. Sex (*a*) and age (*b*) ratio (in %) of the Sousliks released in the Karakyutyuk site (Sinite Kamani Nature Park)

Most of the released individuals were juveniles (45,2%) and adults (37,3%). The other group - Subadults (Ad./juv/1st year), accounted for only 17,4% of the total number of Sousliks (Fig. 2. *b*).

The implemented activities resulted in a considerable increase in the relative population density of the Souslik colony in the Karakyutyuk site (Fig. 3).

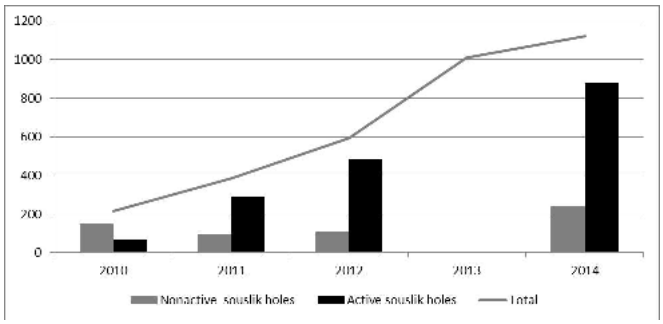


Fig. 3. Number of Souslik holes (active and inactive) in the Karakyutyuk site during the five-year reinforcement period (2010-2014)

Prior to the European Souslik reinforcement activity, in 2010 a total of 215 Souslik holes (65 active and 150 inactive) were recorded in the Karakyutyuk site. In 2011, as a result of the implemented activities, the number of holes was 385 (288 active and 97 inactive), in 2012 - 594 holes (486 active and 108 inactive), in 2013 - 1008 holes, and in 2014 - 1120 Souslik holes in total (879 active and 241 inactive).

In 2014, the number of Souslik holes increased by some 520% compared to 2010. With the active holes, providing a more precise picture of the relevant population abundance of the species, there was an impressive increase by 1352% compared to the numbers recorded in 2010 prior to the release of the first individuals.

The Souslik population in the region has considerably increased its area, occupying successfully more territories (Fig. 4).

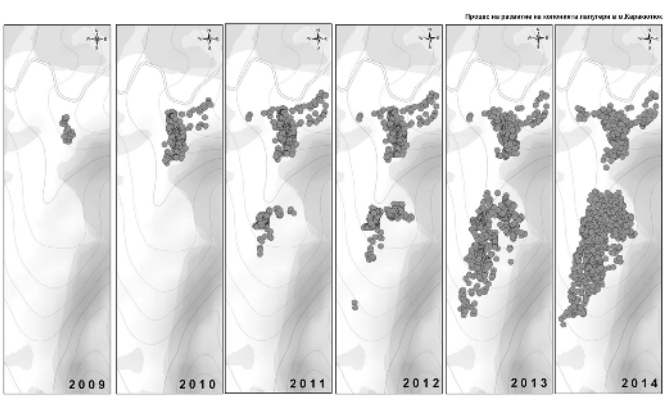


Fig. 4. Spatial growth of the Souslik colony in the Karakyutyuk site (Sinite Kamani Nature Park) achieved through the release of individuals

Reintroduction biology is a rapidly growing but relatively young discipline (Tokaji *et al*., 2012). Translocating European Sousliks has become a popular conservation tool (Gedeon et al., 2011*b*), as in the past 35 years significant experience in European Souslik reintroduction was acquired in Central Europe. Thus, for example, during the European Souslik reintroduction projects carried out in the Czech Republic, Slovakia and Poland since 1989, more than 3,200 European Sousliks were reintroduced at 15 sites or used for reinforcement of 5 populations. Reintroductions can be considered successful at 7 sites, where settlement and reproduction of the released individuals were observed. At other 7 sites reintroductions failed and the result of reintroduction is still unknown at one. Results of reinforcements are unclear at all 5 sites (Matějů *et al*., 2010; Matějů *et al*., 2012).

The first trial to capture, transport and release a number of individuals of European Sousliks (*Spermophilus citellus*) in Hungary was carried out in the '80s. According of Tokaji *et al*. (2012) since that time, more than 250 translocation actions have been organized with different aims. During these decades methods have been developed in many ways from simple impressions to scientific experiments (Tokaji *et al*., 2012).

At the same time, many reintroduction programs did not work successfully in Central Europe. Lobbová *et al*., (2012) show examples of dissimilarity in reintroductions implemented at present and in the past. Unlike Central Europe, there is no experience in the implementation of Souslik translocation projects in Southeast Europe and the Balkans. In Bulgaria, several projects have been implemented, translocating European Sousliks in "Vitosha", "Bulgarka", and "Vratchansky Balkan" Nature Parks, as the results of the translocations are still being processed (Koshev, Arangelov – unpublished data). The successfully implemented reinforcement program can be the basis for the realization of similar activities aimed at preserving this species of conservation significance.

CONCLUSIONS

In the Southeastern part of the species' range there is not enough methodical experience in successful translocation of Sousliks. This article presents the results of successful reinforcement of European Sousliks in the Karakyutyuk site, Sinite Kamani Nature Park, with the following major conclusions:

1. The materials and methods used during the implementation of the activities were in conformity with the international and European standards applied in the translocation of Sousliks.
2. Within a five-year period (2010-2014), a total of 292 individuals were captured, measured, and released. The individuals were caught in areas at risk and released within the boundaries of a protected area. The gender index for the entire period was in favor of the female Sousliks. Most of the released animals were juveniles and adults.

3. The Souslik colony expanded and the number of holes in general, including that of the active ones (occupied by Sousliks), increased from 65 in 2010 to 879 in 2014.

Therefore, the reinforcement activity carried out in the territory of the Park can be considered successful. The method can also be applied in other suitable areas being further enhanced to secure greater effectiveness in the specific environment.

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REFERENCES

1. Anonymous. 2003. Management plan of Sinite Kamani Nature Park. Ministry of Agriculture and Forestry of Republic Bulgaria, Agrolesproject Ltd., Sofia, Bulgaria, 350pp.
2. Balaz, I., Jancova, A., Ambros, M. 2008. Restitution of the European Ground Squirrel (*Spermophilus citellus*) in Slovakia. *Lynx*, n. s., 39: 235–240.
3. Brenner, M., Millesi, E. 2014. Reintroducing European ground squirrels: Stress coping in a soft release enclosure. In: Millesi, E. and Hoffmann, I. E. (Eds.). Abstracts from 5th European Ground Squirrel Meeting: Perspectives on an endangered species, 02-05 October 2014, Rust, Burgenland, Austria, pp. 37.
4. Chassovnikarova, Ts., Rovatsos, M., Atanasov, N., Koshev, Y. 2015. Sex chromosome variability of *Spermophilus citellus* (Linnaeus, 1766) in the Southeastern part of the Balkan Peninsula. *Mammalian Biology*, 80 (4): 365-371.
5. Coroiu, C., Kryštufek, B., Vohralík, V., Zagorodnyuk, I. 2008. *Spermophilus citellus*. The IUCN Red List of Threatened Species 2008: e.T20472A9204055. http://dx.doi.org/10.2305/IUCN.UK.2008.RLTS.T20472A9204055.en. Downloaded on 28 November 2015.
6. Dullum, J. L. D., Foresman, K. R.,Matchett, M. R. 2006. Efficacy of Translocations for Restoring Populations of Black-Tailed Prairie Dogs" (2005). *US Fish & Wildlife Publications*. Paper 30. http://digitalcommons.unl.edu/usfwspubs/30
7. Gedeon, C. I., Váczi, O., Koósz, B., Altbäcker, V. 2011*a*. Morning release into artificial burrows with retention caps facilitates success of European ground squirrel (*Spermophilus citellus*) translocations. *European Journal of Wildlife Research*, 57 (5): 1101-1105.
8. Gedeon, C. I., Boross, G., Nemeth, A., Altbäcker, V. 2011*b*. Release site manipulation to favour European ground squirrel *Spermophilus citellus* translocations: translocation and habitat manipulation. *Wildlife Biology*, 17: 97-104.
9. Hapl, E., Ambros, M., Olekšák, M., Adamec, M. 2006. Suslik (*Spermophilus citellus*) reintroduction in Slovakia. Guidelines. State Nature Conservancy of the Slovak Republic, Banská Bystrica, 28 pp.

10. IUCN/SSC. 2013. Guidelines for Reintroductions and Other Conservation Translocations. Version 1.0. Gland, Switzerland: IUCN Species Survival Commission, 57 pp.
11. Koshev, Y. 2008. Distribution and status of European ground squirrel (*Spermophilus citellus*) in Bulgaria. *Lynx* (Praha), n.s., 39(2): 251–261.
12. Koshev, Y. 2009. Distribution, isolation and recent status of European ground squirrel (*Spermophilus citellus* L.) in Pazardzhik district, Bulgaria. *Annual of Shumen University "Konstantin Preslavsky", Faculty of Natural Sciences*, Vol. XIX B6: 97–109.
13. Koshev, Y. 2012*a*. Methods for determining conservation status of European ground squirrel (*Spermophilus citellus*). Project: "Mapping and determining conservation status of mammals in NATURA 2000 network in Bulgaria 2011-2013". Founded by MOEW-Bulgaria and Operational Programme Environment 2007 – 2013. 24pp.
14. Koshev, Y. 2012*b*. Methods for mapping of European ground squirrel (*Spermophilus citellus*). Project "Mapping and determining conservation status of mammals in NATURA 2000 network in Bulgaria 2011-2013". Founded by MOEW-Bulgaria and Operational Programme Environment 2007 – 2013. 8pp.
15. Koshev, Y. 2012*c*.Ecological and ethological characterization of European ground squirrel (*Spermophilus citellus* L.) in model colonies in Bulgaria. PhD thesis summary, IBER-BAS, Sofia, 30pp.
16. Koshev, Y. 2013. Distribution and determining conservation status of European ground squirrel (*Spermophilus citellus*) in Nature 2000 site BG0000164 „Sinite kamani". Project "Mapping and determining conservation status of mammals in NATURA 2000 network in Bulgaria 2011-2013". Founded by MOEW-Bulgaria and Operational Programme Environment 2007 – 2013.
17. Lobbová, D., Hapl, E., Ambros, M. 2012. Are there any efficient methods of ground-squirrel reintroduction programs? Experiences from field work in Slovakia. In: Kepel, A., Konczak, J. (Eds.). IV European ground squirrel meeting. Programme, Abstracts, Participants. 5-7 September 2012, Kamien Slaski, Poland. Polish Society for Nature Conservation „Salamandra", 18pp.
18. Lobbova, D., Hapl, E. 2014. Conservation of European ground squirrel (Mammalia: Rodentia) in Slovakia: Results of current reintroduction programme. *Slovak Raptor Journal*, 8(2): 105–11 2.
19. Matějů, J., Říčanová, Š., Ambros, M., Kala, B., Hapl, E., Matějů, K. 2010. Reintroductions of the European Ground Squirrel (*Spermophilus citellus*) in Central Europe (Rodentia: Sciuridae). *Lynx*, n.s. 41: 175–191.
20. Matějů, J., Říčanová, Š., Poláková, S., Ambros, M., Kala, B., Matějů, K., Kratochvíl, L. 2012. Method of releasing and number of animals are determinants for the success of European ground squirrel (*Spermophilus citellus*) reintroductions. *European Journal of Wildlife Research,* 58 (2): 473-482.
21. Próchnicki, K. 2012. Conservation and reintroduction of the selected compact colonies of the spotted souslik (*Spermophilus suslicus*): an ongoing project and plans for future. In: Kepel, A. and Konczak, J. (Eds.). 4th European ground squirrel meeting. Programme, Abstracts, Participants. 5-7 September 2012, Kamien Slaski, Poland. Polish Society for Nature Conservation „Salamandra", 20pp.
22. Říčanová, Š., Koshev, Y., Říčan, O., Ćosić, N., Ćirović D., Sedláček, F., Bryja, J. 2013. Multilocus phylogeography of the European ground squirrel: cryptic interglacial refugia of continental climate in Europe. Molecular Ecology, 22: 4256–4269.

23. Stefanov, V. 2015. *Spermophilus citellus* (Linnaeus, 1766). In: Golemansky V. (Ed). The Red Data Book of Bulgaria, Volume 2*,* Animals. In internet: http://e-ecodb.bas.bg/rdb/en/vol2/2editorial-board.html
24. Stefanov, V., Markova, E. 2009. Distribution and current status of the European souslik (*Spermophilus citellus* L.) in the Sofia valley and the adjacent areas. Biotechnology & Biotechnological Equipment, 23(2) Special edition: 381–384.
25. Tokaji, K., Váczi, O., Bakó, B., Gedeon, C. 2012. 25 years of translocation programmes on EGS in Hungary. In: Kepel, A. and Konczak, J. (Eds.). 4th European ground squirrel meeting. Programme, Abstracts, Participants. 5-7 September 2012, Kamien Slaski, Poland. Polish Society for Nature Conservation „Salamandra", 17pp.