

Searching for the missing newts: notes on newt distribution in the Iron Gates Natural Park, Danube Gorge, Romania

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Abstract

Newts are in sharp decline in many regions. They have conservation value; thus, their presence is important in natural protected areas. The Iron Gates Natural Park (IGNP) in the Danube Gorge, Romania, is one protected area where, despite its rich general biodiversity, there are only a few old records of newts. However, several newt species are still present in the park. Between 2018 and 2024, we recorded three newt species in 15 distribution points in IGNP: *Triturus cristatus*, *Lissotriton vulgaris* and *Ichthyosaura alpestris*. The most widespread species was *L. vulgaris*. Our data prove that newts are still present in the region, especially in isolated habitats in cold wet valleys, and on mountains or hilltops. Nevertheless, newts remain rare within IGNP in the Danube Gorge area. With few exceptions, they are represented by a small number of individuals restricted to small-size habitats in a narrow area of the park. Although the region is considered a hotspot of research on amphibians, our data indicates how little is known about its fauna.

Profile

Protected area

Iron Gates Natural Park

Mountain range

Banat and Mehedinți

Mountains

Country

Romania

Introduction

Five newt species are present in Romania (*Triturus cristatus*, *Triturus dobrogicus*, *Lissotriton vulgaris*, *Lissotriton montandoni* and *Ichthyosaura alpestris*) (Cogălniceanu et al. 2013). All of them are protected, but the highest conservation value is that of the crested newts (O.U.G. 57/2007). Thus, for natural protected areas, newts have a high conservation value and have been the subject of various studies (e.g., Dobre et al. 2009; Ile & Sucea 2018; Vaissi & Sharifi 2019; Guinart et al. 2022; Covaciu-Marcov et al. 2023). In Romania, newts seem generally well represented (see e.g. Cogălniceanu et al. 2013), although in many other regions they are considered to be in decline (e.g., Denoël 2012; von Bülow & Kupfer 2019; Falaschi et al. 2022). Some parts of Romania, however, such as the southwest, have very few records of newts (see Cogălniceanu et al. 2013). Like other mountain areas in southern Romania (Iftime & Iftime 2010; Covaciu-Marcov et al. 2009a, 2020), the extreme southwest, namely the Danube Gorge, is considered unfavourable for newts because of its steep mountain slopes (Covaciu-Marcov et al. 2009b). Thus, there are only a few records of newts (*T. cristatus*, *T. dobrogicus*, *L. vulgaris*) for the region, which are very old (see Fuhn 1975; Stănescu et al. 2015); some have not subsequently been confirmed (Iftime 2005). Some newt species have not been mentioned in the region since at least 1971 (see Stănescu et al. 2015), even though it is a hotspot of research on the amphibians in Romania (Cogălniceanu et al. 2013). The data form of the Iron Gates Natura 2000 site (which overlaps with the Iron Gates Natural Park (IGNP) and the Danube Gorge), does not mention

Triturus cristatus (Laurenti, 1768), indicating only *Lissotriton vulgaris* (Linnaeus, 1758) (Natura 2000 Standard Data Form ROSCI0206). However, both newt species were included in the IGNP management plan (Management Plan, 2013) as definitely being present, but with the mention that their distribution in the park had not been mapped, as the information was taken from Cogălniceanu et al. 2013. No other newt species were mentioned in the Management Plan (2013), although historical records for *Triturus dobrogicus* (Kiritzescu, 1903) show its presence on an island that was flooded by the creation of the Iron Gates I Dam lake (see e.g. Fuhn 1975) and in the western-most part of IGNP (Cogălniceanu et al. 2013). This absence of records for newts is surprising given that IGNP is a protected area with great biodiversity, and numerous protected species (Rozyłowicz et al. 2019), where species new for Romania continue to be recorded (e.g., Ruicănescu & Dumbravă 2020; Dumbravă & Ruicănescu 2023). Nevertheless, recently a *T. cristatus* individual was recorded in the region, but in a road mortality study, in autumn, near Orșova (Covaciu-Marcov et al. 2022), an area where the species was registered previously (e.g., Fuhn 1975). A little outside the park limit, *Ichthyosaura alpestris* (Laurenti 1768) was also recently identified (Cicort-Lucaciu et al. 2017). Moreover, some newt species (*T. cristatus*, *T. dobrogicus*, *L. vulgaris*, *I. alpestris*) are present in the vicinity of IGNP in Serbia (Vukov et al. 2013; Vučić et al. 2020).

From the literature and available data just outlined, we hypothesized that despite the information regarding their supposed rarity or absence in the Danube Gorge (Fuhn 1975; Iftime 2005; Covaciu-Marcov et al. 2009b; Cogălniceanu et al. 2013; Stănescu et al.



Figure 1 – (a) *Triturus cristatus* and (b) its habitat at Jidoșțița West; (c) *Lissotriton vulgaris* and (d) its habitat at Eșelnița downstream; (e) *Ichthyosaura alpestris* and (f) its habitat at Moldovița / Cărbunari. © Sára Ferenți

2015), newts are present in the region, since they are killed by cars (Covaciu-Marcov et al. 2022), but they have not been searched for in the appropriate places, using appropriate methods and sufficient sampling effort. Thus, our objective was to establish the presence, species composition, and geographic distribution of newts in the IGNP region of the Danube Gorge.

Materials and methods

IGNP, situated in southwestern Romania, largely overlaps with the Danube Gorge, in a mountainous region with diverse habitats, but principally beech forest (Rozyłowicz 2008). We carried out the fieldwork in spring (March–May), in 2018 to 2024, when the newts were in aquatic habitats (Fuhn 1960; Cogălniceanu et al. 2000). Between 2018 and 2019, we only sporadically collected opportunistic observations of newt dis-

tribution. Subsequently, we aimed to realize detailed research on newts in IGNP, starting the field activity on 6 March 2020. Shortly after that, the study was stopped because of movement restrictions due to the COVID-19 pandemic (e.g., Dascălu 2020). These restrictions were softened only at the end of May (e.g., Dascălu 2020) when the newts' aquatic period was near its end (Fuhn 1960; Cogălniceanu et al. 2000). We resumed field activity in the spring of 2021, but even then movement restrictions were in force during nighttime, so our activity was further affected. We made detailed field studies in the spring of 2022 and 2023. In 2023, our activity was once more affected, this time by a landslide that closed the road on the Danube Gorge in spring.

The first step was to map potential newt habitats in IGNP. We thus investigated more than 100 aquatic habitats in IGNP which corresponded with the eco-

Table 1 –Newt distribution localities in Iron Gates Natural Park. Cs - Caraş-Severin County, Mh - Mehedinţi County.

Locality	County	Geographic coordinates	Altitude [m]	<i>Triturus cristatus</i>	<i>Lissotriton vulgaris</i>	<i>Ichthyosaura alpestris</i>
Sfânta Elena	Cs	44°40'57" N / 21°42'27" E	352	-	X	-
Măceşti	Cs	44°47'38" N / 21°39'20" E	585	-	X	X
Gârnic	Cs	44°46'35" N / 21°46'11" E	648	-	X	X
Moldoviţa	Cs	44°47'43" N / 21°41'45" E	604	-	-	X
Gornea monastery	Cs	44°39'50" N / 21°51'31" E	69	-	X	-
Orsova (Coramnic pond)	Mh	44°44'48" N / 22°24'02" E	72	X	-	-
Eşelniţa downstream	Mh	44°43'21" N / 22°21'12" E	140	X	X	-
Eşelniţa upstream	Mh	44°46'21" N / 22°13'52" E	548	-	X	X
Eşelniţa artificial pond	Mh	44°43'25" N / 22°21'09" E	135	-	X	-
Moldoviţa / Cărbunari	Cs	44°48'05" N / 21°42'36" E	431	-	X	X
Jidoştiţa South (near IGNP)	Mh	44°42'18" N / 22°35'07" E	246	X	X	-
Jidoştiţa West	Mh	44°42'58" N / 22°33'13" E	456	X	X	-
Moldova Nouă island	Cs	44°41'55" N / 21°37'14" E	68	-	X	-
Cruşoviţa	Cs	44°40'14" N / 21°48'41" E	115	-	X	-
Mala valley (quarry)	Mh	44°42'15" N / 22°19'57" E	179	-	X	-
Total distribution records				4	13	5

logical requirements of the newt species (*T. cristatus*, *T. dobrogicus*, *L. vulgaris*, *I. alpestris*) that could be present in the region according to the literature (e.g., Fuhn 1960; Cogălniceanu et al. 2000, 2013; Cicort-Lucaciu et al. 2017). Some habitats were visited only once, but others (especially those in which we encountered newts or those which seemed very favourable) were visited several times, usually once during each study year. We collected qualitative data only, aiming only to establish the presence of newts in the region and their geographic distribution. The methods used in the field depended on the habitat. In small-sized habitats with clear water, we observed newts directly from the shores. In larger habitats with turbid water, we captured the newts using round nets mounted on two-metre-long handles, as used in other studies (e.g., Covaciu-Marcov et al. 2006, 2009b; Cupşa et al. 2020). As in previous cases, the nets were used both from the shores and from the water. The captured newts were returned immediately into their habitat following identification.

Results

Although we encountered newts in 15 sites within IGNP, in most of the 100+ habitats investigated we did not register any. The three newt species that we identified in the park (Figure 1) were: *Triturus cristatus*, *Lissotriton vulgaris* and *Ichthyosaura alpestris*. The most common was *L. vulgaris*, identified in 13 sites, and the rarest was *T. cristatus* (Table 1). We found *T. cristatus* and *I. alpestris* in four and five sites respectively. The newts' distributions in IGNP were not uniform. We identified *T. cristatus* only in the eastern areas of the park (Figure 2) and *I. alpestris* only in the northern area. *Ichthyosaura alpestris* was present in the north-western (where it seems more numerous), and probably the north-eastern areas (we identified it just a few kilometres outside the park limit). We did not identify all three newt species together in the same habitat in any

of the 15 sites. *Lissotriton vulgaris* was present both beside *T. cristatus* (three records from the lower altitude sites in IGNP's eastern regions) and beside *I. alpestris* (four records from the higher altitude sites from IGNP's northern regions). At some sites, only one newt species was identified.

In many aquatic habitats, we observed only a few newt individuals. Some habitats (including Eşelniţa upstream and Moldoviţa / Cărbunari) were very small (i.e. less than 10 cm deep, and less than 1m in diameter), and the number of newts was certainly small in those sites. In other cases (Orşova Coramnic pond), on the contrary, the water body was large and deep; thus, the number of newts encountered probably did not reflect the real size of the population. Only one site (Jidoştiţa west) seems to shelter a large number of newts. This is a large wetland, crossed by the park's boundary. It is located in an open area, covered with grassy vegetation, and used as a pasture, but in its proximity (tens of metres) there are beech, hornbeam and oak forests. At least in spring, this site measures several tens of square metres, and has a depth of more than 0.5m; there are many bulrushes on the shores. We did not undertake an exact count of the newts at this site, but judging by the number of individuals caught in just a few nets in this wetland, at the peak of their breeding season, the total population is high.

In IGNP, *L. vulgaris* occupies various aquatic habitat types. The species was present both in large wetlands like Jidoştiţa, and in small forest puddles. It also uses artificial ponds (the excavation in Eşelniţa and the abandoned fishponds near Gornea monastery). *Triturus cristatus* was usually present in larger water bodies. At Orşova, the Coramnic pond is more than 1m deep; it has reeds and bulrushes on the shores but also rich aquatic vegetation. Although we did not observe fish at this site, it seems to be connected with the Danube, as their water levels correlated. In this habitat, newts were encountered only once, at the beginning of a

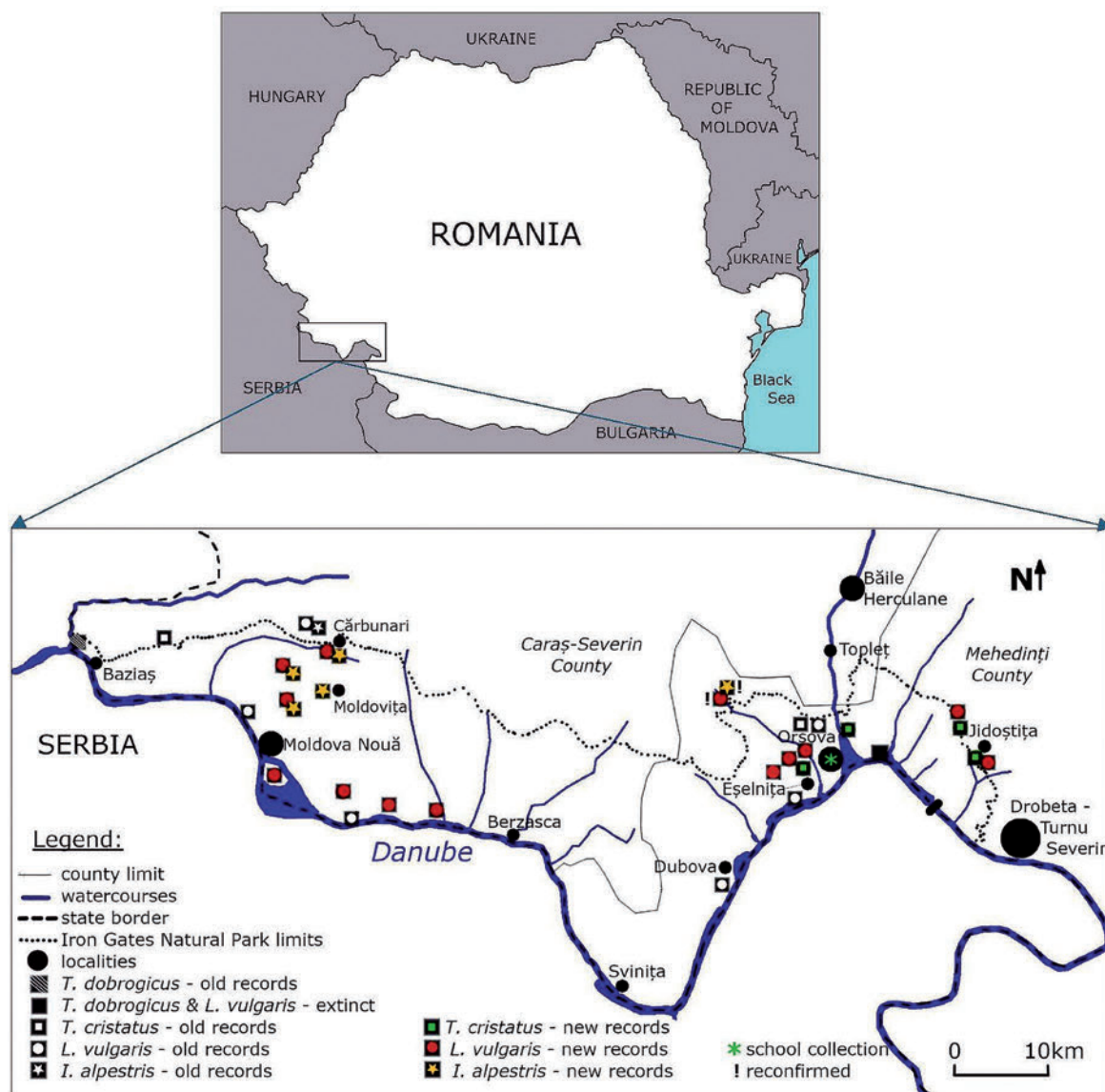


Figure 2 – New and old distribution records of newts in the Iron Gates Natural Park, Romania (old records after Fuhn 1975, Cogălniceanu et al. 2013, Covaciu-Marcov et al. 2022).

cold spring (7 March 2020), near the shores, under bulrushes. The following years, the spring water levels were low, and the bulrushes were outside the water line. Thus, in 2021–2023 we did not encounter newts, although they were probably present in the middle of the pond. This pond has been affected to some extent by human activities, as it neighbours a railway and houses, but it is probably situated in the place of a former natural wetland. The wetland from Jidoștița west provides the typical requirements of the species found here; the other habitats are smaller but permanent and surrounded by forests. Unlike *L. vulgaris* and *T. cristatus*, *I. alpestris* was always encountered in small-sized aquatic habitats, even in wheel ruts.

Discussion

Our results clearly indicate that IGNP shelters three newt species (*T. cristatus*, *L. vulgaris*, *I. alpestris*). In

addition to these, *T. dobrogicus* was recorded previously (Cogălniceanu et al. 2013; Stănescu et al. 2015) but it was not identified during our study. The three species found corresponded to those that could be present in the region according to the literature on their ecological requirements (Fuhn 1960; Cogălniceanu et al. 2000), their distribution in Romania (Fuhn 1960; Cogălniceanu et al. 2000, 2013), and in neighbouring regions (Vukov et al. 2013; Vučić et al. 2020). The idea of newt rarity in the region is not new, but it has only recently been clearly stated (Covaciu-Marcov et al. 2009b). Even in the past, newts were very rarely identified in the area (see Fuhn 1975) or were not detected at all (Ifime 2005). Thus, *T. cristatus* was not identified at all in the Danube Gorge, but the existence of a preserved individual in the collection of a local high school was mentioned by Fuhn (1975). *Triturus dobrogicus* was mentioned only in the eastern end of IGNP, on an island which has since been submerged

by the Iron Gates I Dam Lake, which eliminated that population (Fuhn 1975). However, the species was subsequently recorded at the western limit of the park (e.g., Cogălniceanu et al. 2013; Stănescu et al. 2015). In the IGNP management plan (Management Plan 2013), the newts' distribution is stated as not known in the park, as the information was obtained from the literature (Cogălniceanu et al. 2013). In the Natura 2000 site data form (which overlaps with IGNP), there is no information about *T. cristatus* (Natura 2000 Standard Data form ROSCI0206). In the literature, *T. cristatus* and *L. vulgaris* appeared as not reported in the area for more than 50 years, and *I. alpestris* was not mentioned (Stănescu et al. 2015). Subsequently road-killed *T. cristatus* and *L. vulgaris* were encountered (Covaciu-Marcov et al. 2022). Thus, the majority of the newts' distribution records presented in this paper are completely new. Only the Eşelnița upstream newts had been recorded previously (Cicort-Lucaciu et al. 2017), reconfirmed by us. In the case of Orșova, it is difficult to state whether the record is new or a reconfirmation, as the previous record is based on a specimen preserved in a school collection (see Fuhn 1975).

Unlike the other newts, *L. vulgaris* was more frequently registered in the past in the region (e.g., Fuhn 1975; Cogălniceanu et al. 2013; Stănescu et al. 2015). It has also proved to be the most common newt species in IGNP, which is true for Romania more widely (e.g., Cogălniceanu et al. 2013). The actual distribution of *L. vulgaris* is probably wider than the 13 sites where we encountered it, as in the road mortality study it was also recorded in other areas of IGNP (Covaciu-Marcov et al. 2022).

The habitats populated by newts in IGNP are generally typical for them (Fuhn 1960; Cogălniceanu et al. 2000). For *I. alpestris*, small-sized habitats, even wheel ruts, are characteristic (Covaciu-Marcov et al. 2009c; Naumov et al. 2020; Kopecký 2023). *Lissotriton vulgaris* was the least demanding in terms of preferred habitat type or size, as found in other studies (Rannap et al. 2012). *T. cristatus* preferred larger habitats, again echoing findings in other regions (Skei et al. 2006). All newt species generally used natural habitats, but they were also present in artificial habitats, as in other cases presented in the literature (e.g., Ile & Sucea 2018; Naumov et al. 2020, 2023). All newt aquatic habitats are situated inside or close to forests, which are important terrestrial habitats for these species (e.g., Müllner 2001; Vuorio et al. 2013).

Lissotriton vulgaris had the largest altitudinal distribution in IGNP, while *I. alpestris* was present at higher altitudes, a fact consistent with their requirements in Romania (Fuhn 1960; Cogălniceanu et al. 2000, 2013). However, *I. alpestris* was identified below 500 m (431 m), which is lower than the usual altitude in Romania (Cogălniceanu et al. 2000), but not as low as in some Romanian regions (Covaciu-Marcov et al. 2009c). What is slightly unusual is the presence of *T. cristatus* at an altitude of only 72 m at Orșova. This is

the only region in IGNP where the species was repeatedly mentioned in the past (e.g., Fuhn 1960, 1975; Cogălniceanu et al. 2013; Stănescu et al. 2015), based on an individual from a school collection (see Fuhn 1975). The Orșova region still seems suitable for *T. cristatus*, as it was encountered in the pond in Coramnic, at Eşelnița (5 km west of Orșova), and between them as a road-killed individual (Covaciu-Marcov et al. 2022). The altitude at Coramnic is very low for this species, probably one of the lowest in the country. Previously, in western Romania *T. cristatus* was recorded only above 120–150 m (see e.g. Covaciu-Marcov et al. 2006, 2007, 2008), but in western Romania at such altitudes there are plains (Covaciu-Marcov et al. 2006, 2008, 2007), while at Orșova there are steep rocky slopes. The variety of the terrains at this altitude probably explains the presence of *T. cristatus* at such low altitudes, as in the case of other species from different groups, both in the Danube Gorge (e.g., Paşcovschi 1956; Iftime 2005; Covaciu-Marcov et al. 2009b) and in neighbouring regions (e.g., Ferenti & Covaciu-Marcov 2018; Groza et al. 2021). Moreover, *T. cristatus* has been recorded at lower altitudes in Bulgaria (Naumov et al. 2023).

The two *T. cristatus* females from the pond in Coramnic (Orșova) present some chromatic characteristics of *T. dobrogicus*, a fact mentioned for this species in other regions in Romania (Covaciu-Marcov et al. 2008), suggesting possible hybridization. The pond is situated only 30 m from the Danube, where 10 km downstream a *T. dobrogicus* population was present in the past on Ada Kaleh Island (Fuhn 1975), and a known hybrid population is present nearby in Serbia (Vučić et al. 2020). For hybridization in these two individuals to be confirmed, genetic analysis is needed. Another individual with typical *T. cristatus* morphology but with some *T. dobrogicus* chromatic characters was identified at Jidoștița west, at an altitude of 456 m. This site is situated only 10 km (in a straight line) from the Danube. At Eşelnița downstream, identification was recorded at 140 m, an altitude normal for *T. cristatus* in other regions in Romania too (Covaciu-Marcov et al. 2006, 2007).

The information on newt distribution in IGNP has solved an old issue. Nevertheless, the data should be considered incomplete because of the large area of the park (e.g., Rozyłowicz et al. 2019) and the COVID-19 pandemic, which made it impossible to survey the park in its entirety. And the question still remains: why are newts rare in the area, at least compared with other regions? The answer is that appropriate aquatic habitats are rare because of the relief (Covaciu-Marcov et al. 2009b). However, at least at Orșova, there is an old *T. cristatus* metapopulation which still stubbornly survives, despite the Iron Gates dam lake, roads, and other forms of human impact. But the question is for how long it can survive, because the only sustainable population of *T. cristatus* in IGNP seems to be at Jidoștița. At Eşelnița downstream, however, we

identified each year just one female (probably the same one), but in 2023 it was absent. Thus, this is a relict of a former population, probably affected by the human activities in the region. Close to Eşelnița downstream, there are ruins of former industrial activities, where an artificial aquatic habitat was colonized by newts as recently as 2023, after the cessation of human activity; we did not encounter these individuals in previous years. *T. cristatus*, at least at Eşelnița, was probably subject to intense human pressure in the past. So, will the newly identified newt populations close to the Danube disappear because of human activity? This seems less probable because, at least at Eşelnița, at the time of our study human activity had ceased. Also, in other cases, the presence of *T. cristatus* was explained by landscape characteristics, such as the distance to the nearest populated pond or the number of nearby ponds (Priol et al. 2023; Schleimer et al. 2024).

Climate change presents a great danger for newts nowadays; it appears to affect numerous amphibian species (e.g., Corn 2005; Alves-Ferreira et al. 2022; Mi et al. 2023), including in Romania (Popescu et al. 2013). In southern Romania, the summers seem increasingly hot and dry (Dragotă et al. 2011; Prăvălie 2013, 2014; Prăvălie et al. 2016), a fact that will certainly affect the newts further. During the study, we investigated more than 100 aquatic habitats which appeared to be suitable for newts, but newts were absent from most of them, although other amphibians were identified. This indicates that newts are rare in the region and were probably rare in the past, before they were affected by the Iron Gates I Dam and other human activity (including road mortality). In this context, the responsibility of IGNP in maintaining the newt populations becomes even greater. Our data do not solve the problem of newt distribution, but they do prove their presence. Thus, IGNP should aim to complete the distribution data, not least because newts are protected (O.U.G. 57/2007). Because at the majority of sites we observed only a few newts, studies of population sizes could be made in the future, at least in larger habitats.

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