

## NOTES ON THE HERPETOFAUNA OF THE "DEALUL CIOCAȘ - DEALUL VIȚELULUI" NATURA 2000 SITE (ROMANIA)

*Daniel-Ștefan Ghiurcă, Ciprian Sorin Roșu*

**Key words:** Dealul Ciocaș - Dealul Vițelului, Natura 2000 Site, Romania, amphibians, reptiles, distribution, conservation

### INTRODUCTION

The site of community interest ROSCI0056 "Dealul Ciocaș - Dealul Vițelului" is a natural protected area located in the central part of Romania and overlapping in a proportion of 99% with the birds protection area ROSPA0082 Bodoc-Baraolt Mountains.

The Natura 2000 network is a European system of protected natural areas (Natura 2000 sites) comprising a representative sample of wild species and natural habitats of community interest. It was established not only for the protection of nature, but also for the preservation of these long-term natural resources, to provide the necessary resources for socio-economic development. It aims to protect biodiversity and ensure sustainable development in the European area by protecting the key elements of both natural habitats and plant and animal species. The protection of Natura 2000 species and habitats is also a good reason for preserving other species (often in need of protection) coexisting with those declared protected. Its efficacy is the subject of many studies: ecological (e.g. Klaučo et al. 2013, Votsi et al. 2012), socio-economical (e.g. Cruz et al. 2011), integrated management (e.g. Walentowski et al. 2013), etc., highlighting the importance of this network, but also the problems it faces. While the Romanian Natura 2000 network is quite effective in covering the protected species as compared to the European general situation (Trochet & Schmeller 2013), mapping the distribution of protected species within and around sites remains of paramount importance in assessing them and increasing the effectiveness of the sites' protective function (see, e.g., Hartel & von Wehrden 2013). In this paper we address the issue of within-site and around-site distribution of amphibians and reptiles for the "Dealul Ciocaș - Dealul Vițelului" Natura 2000 site.

### MATERIAL AND METHODS

#### Area description

The protected natural area was mentioned for the first time in the Covasna County Council Decision no. 47/1998, on natural protected areas and

natural monuments in Covasna County, when it was identified under the names Dealul Ciocaș (2 ha) and Dealul Vețer (5 ha). In the Decision no. 39/2001 regarding the temporary regime of protection of the goods from the county natural heritage is called the Csókás-Veczer Complex Reservation with an area of 1385 ha. Nature protection activity in this area has not been developed, except for producing of some panels by the Pro Natura Foundation together with APM Covasna and their placement on the ground. Due to the infrastructural isolation, the area is the least visited, a very small number of tourists venture to this edge of the Baraolt Mountains, even though the Baraolt Mountain ridge is well marked and reaches up to the Veczer cliff. The area is outside the usual tourist routes, probably due to the lack of attractive elements, as well as a high gloss of water, bathrooms, rough and arid terrain. Most tourists come from Brașov County, but they are limited to the left side of the Olt River, access road from Ariușd being in poor condition. The area present interest especially to biologists, geologists and archaeologists, offering a wide range of scientific values. From the botanical point of view, rare species grow in the flora of the county or even nationally. It is the only site in Covasna County with many steppe species that vegetate in very good conditions at this altitude. The most valuable plant association is the *Amygdalus nana* associated with *Prunus spinosa* on the steep slopes of Ciocaș hill and Vițelului hill. Ornithologists have identified habitats for bird species that, along with the rest of the Baraolt Mountains, have allowed the area to be included on the list of avifaunistic protection sites (SPA Bodoc-Baraolt Mountains). Invertebrates, especially insect fauna, are of particular interest, lepidopters and curculionids of the area being studied in more detail.

### RESULTS AND DISCUSSIONS

The herpetofauna in this area is incompletely known: Fuhn (1960) mentions *Lissotriton vulgaris*, *Triturus cristatus*, *Bombina variegata*, *Bufo viridis*, *Rana dalmatina* and *Pelophylax ridibundus* in Sfântu Gheorghe, *Lissotriton vulgaris*, *Pelobates fuscus*, *Pelophylax ridibundus*, *Rana dalmatina* and

*Rana arvalis* in Reci, *Triturus cristatus* and *Hyla arborea* on the Olt superior valley and Bod; *Hyla arborea*, *Pelophylax ridibundus* and *Rana temporaria* in Prejmer, *Pelophylax ridibundus* in Hărman; Fuhn & Vancea(1961) mentions *Lacerta agilis* and *Anguis colchica* in Sfântu Gheorghe, *Lacerta agilis* in Reci; all the localities mentioned by Fuhn (1960) and Fuhn & Vancea (1961) are outside the limits of the study area, but relatively close; Ghira et al. (2002) mentions the species *Triturus cristatus*, *Bombina variegata*, *Bufo bufo*, *Bufo viridis*, *Hyla arborea*, *Pelophylax ridibundus*, *Rana temporaria*, *Lacerta agilis*, *Anguis colchica*, *Natrix natrix*, *Coronella austriaca* and *Vipera berus* in Ariuşd, locality which is located on the western boundary of the site; *Salamandra salamandra*, *Lissotriton vulgaris*, *Triturus cristatus*, *Ichthyosaura alpestris*, *Bombina variegata*, *Pelobates fuscus*, *Bufo bufo*, *Bufo viridis*, *Hyla arborea*, *Pelophylax ridibundus*, *Rana temporaria*, *Rana dalmatina*, *Rana arvalis*, *Emys orbicularis*, *Lacerta viridis*, *Lacerta agilis*, *Podarcis muralis*, *Anguis colchica*, *Natrix natrix*, *Natrix tessellata*, *Coronella austriaca*, *Elaphe longissima* and *Vipera berus* for the localities Sfântu Gheorghe and Reci, placed near the study area; Cogălniceanu et al. (2013a, b) indicate old and new points for the amphibians and reptiles species in the studied area, but the points was previously reported by Fuhn (1960), Fuhn & Vancea (1961) and Ghira et al. (2002).

Of all the amphibians and reptiles species identified in “Dealul Ciocaş - Dealul Viţelului” Natura 2000 site, special attention was paid to the priority species of Annex 3 of the OUG 57/2007 included in the standard form. This species are: *Triturus cristatus* and *Bombina variegata*.

For the *Triturus cristatus* species, the overall tendency for conservation status is rather less favorable. We identified only 3 ponds where we found this species, on the trail in the eastern boundary of the area from artificial animal pond to the north (T2), in the area of some arranged springs and on the way from Ariuşd to the eastern boundary of the site (T4), where we identified a few specimens in two relatively large ponds at the edge of the forest. We think that the populations of *Triturus cristatus* are quite small, probably because of the lack of favorable habitats to this species. Threats for this species are related to: the deterioration or disappearance of reproductive habitats (living area) and pasturage in the area of breeding and living habitats. The species *Bombina variegata* is present in most of the transects investigated by us and seems to be rather abundant (from ca. 515 m a.s.l. to ca. 632 m a.s.l.), with large enough areas for favorable habitats to this species. We have identified some breeding sites of this species, most of them being found on the way from Ariuşd to the eastern boundary of the site (T4). It seems that there are no major threats to

*Bombina variegata*, but some negative impact can be related to the deterioration or disappearance of reproductive habitats (living area) and pasturage in the area of breeding and living habitats. These habitats of the *Bombina variegata* species are mostly disturbed by domestic animals, the water level is fluctuating and there is a high turbidity.

Other species of amphibians are the beneficiaries of the same type of habitat as the one in which we found the species declared as priority in this area: *Bufo viridis*, *Hyla arborea*, *Pelophylax ridibundus* and *Rana temporaria* (Table 3). Of these, *Rana temporaria* is the most common one, being found in most of the transects crossed over the “Dealul Ciocaş - Dealul Viţelului” Natura 2000 site (T1-T5, T8).

Our surveys found very few reptile species: one lizard - *Lacerta agilis* and one snake - *Natrix natrix*. The reptiles we found, all occur within the protected area or upon its limits. The species *Lacerta agilis* is widely distributed and locally abundant, but is not well represented in terms of number of the specimens. *Lacerta agilis* is present in the area, from ca. 495 m a.s.l. to ca. 632 m a.s.l. The grass snake (*Natrix natrix*) was relatively widespread, being found especially in the very few slow-flowing brooks which are found on the surface of the area, but also in man-made ditches and in the meander of the river Olt, which is included on the boundaries of the protected area.

## CONCLUSIONS

We conclude that “Dealul Ciocaş - Dealul Viţelului” Natura 2000 site is quite poor in both amphibian and reptile species. The main threats related to the amphibian species (*Triturus cristatus* and *Bombina variegata*) for which this site was declared are: non-motorized vehicles, sheep and cattle intensive pasturage, drought, reduction or loss of habitat characteristics and storage of household waste. Some of the steps we can take to reduce these threats are: restricting in the period of the amphibian species reproduction (March-July) of the access to the pond area of non-motorized vehicles, prohibiting or regulating pasturage and passing of domestic animals on the surface of the area, maintaining existing aquatic habitats and, if possible, creating new ones and prohibition of waste disposal on the roadside and on the edge of the water. Overall, we can say that adequate protection of the species (*Triturus cristatus* and *Bombina variegata*) for which the protected area has been declared may be beneficial for many other amphibian and reptile species.

## ABSTRACT

Our investigations regarding herpetofauna of Dealul Ciocaş - Dealul Viţelului Natura 2000 Site

were made in the year 2015. In the studied region we identified 6 species of amphibians: *Triturus cristatus*, *Bombina variegata*, *Bufotes viridis*, *Hyla arborea*, *Pelophylax ridibundus*, *Rana temporaria* and 2 reptile species: *Lacerta agilis* and *Natrix natrix*. Of these species, the best represented in terms of geographical distribution are: *Bombina variegata*, *Rana temporaria* and *Lacerta agilis*. Their distribution within an around the Dealul Ciocaș - Dealul Vițelului Natura 2000 Site is discussed, together with ecological data, correlating these with the local climate influences and endangering factors of the species.

## REFERENCES

1. BOGDAN, H. V., ILIEȘ, D., COVACIU-MARCOV, S. D., CICORT-LUCACIU A. Ș., SAS, I., 2011 - Contributions to the study of the herpetofauna of the western region of the Poiana Ruscă Mountains and its surrounding areas. North-western Journal of Zoology 7(1): 125-131;
2. BOGDAN, H. V., ILIEȘ, D., GACEU O., 2013 - Conservation implications on present distribution of herpetofauna from plain areas of the Western Banat region, Romania. North-western Journal of Zoology 9 (1): 172-177;
3. COGĂLNICEANU, D., AIOANEI, F., MATEI, B. , 2000 - Amfibienii din România. Determinator. Editura Ars Docendi, Bucharest, 100pp. [in Romanian];
4. COGĂLNICEANU, D., BĂNCILĂ, R., SAMOILĂ, C., HARTEL, T., 2008 - The current distribution of herpetofauna in the Maramureș County and the Maramureș Mountains Nature Park, (Maramureș, Romania). Transylvanian Review of Systematical and Ecological Research 5: 189-200;
5. COGĂLNICEANU, D., SZÉKELY, P., SAMOILĂ, C., IOSIF, R., TUDOR, M., PLĂIAȘU, R., STĂNESCU, F., ROZYLOWICZ, L., 2013 - Diversity and distribution of amphibians in Romania. ZooKeys 296: 35-57;
6. COGĂLNICEANU D., ROZYLOWICZ L., SZÉKELY P., SAMOILĂ C., STĂNESCU FLORINA, TUDOR M., SZÉKELY DIANA, IOSIF R., 2013 - Diversity and distribution of reptiles in Romania. ZooKeys 341: 49-76;
7. COVACIU-MARCOV, S. D., CICORT-LUCACIU, A. S., ILE, R. D., PASCONDEA, A., VATAMANIUC, R., 2007 - Contribution to the study of the geographical distribution of the herpetofauna in the north-east area of Arad county in Romania. Herpetologica Romanica 1: 62-69;
8. COVACIU-MARCOV, S. D., CICORT-LUCACIU, A. Ș., SAS, I., MOȘU, A. G., TOTH, B., 2008 - Contributions to the knowledge of the composition and geographical distribution of the Western Maramureș County herpetofauna. Herpetologica Romanica 2: 27-36;
9. COVACIU-MARCOV, S. D., CICORT-LUCACIU, A. Ș., DOBRE, F., FERENȚI, S., BIRCEANU, M., MIHUȚ, R., STRUGARIU, A., 2009 - The herpetofauna of the Jiului Gorge National Park, Romania. North-Western Journal of Zoology 5(1): S01-S78;
10. CRUZ, A., BENEDICTO, J., GIL, A., 2011 - Socio-economic benefits of Natura 2000 in Azores Islands – a case study approach on the ecosystem services provided by a Special Protected Area. In: Proceedings of the 11th International Coastal Symposium, 1955-1959. Szczecin, Poland. Journal of Coastal Research, SI 64: 1955-1959;
11. CRUZ-SÁENZ, D., MUÑOZ-NOLASCO F. J., MATA-SILVA V., JOHNSON J. D., GARCÍA-PADILLA E., AND WILSON L. D., 2017 - The herpetofauna of Jalisco, Mexico: composition, distribution, and conservation. Mesoamerican Herpetology 4: 23-118;
12. EKSILMEZ H., ALTUNIŞIK A., ÖZDEMİR N. , 2017 - The Herpetofauna of Karçal Mountains (Artvin/Turkey). Biological Diversity and Conservation 10/1:1-5;
13. FREITAS M. A., VIEIRA R. S., ENTIAUSPENETO O. M., SOUSA S. O., FARIAS T., SOUZA A. G., MOURA G. J. B., 2017 - Herpetofauna of the Northwest Amazon forest in the state of Maranhão, Brazil, with remarks on the Gurupi Biological Reserve. ZooKeys 643: 141-155;
14. FUHN, I., 1960 - Amphibia. In: Fauna R.P.R., Vol.14, fasc.1. Editura Academiei R.S.R., Bucharest. [in Romanian];
15. FUHN, I., VANCEA, ȘT., 1961 - Reptilia. In: Fauna R.P.R., Vol.14, fasc.2. Editura Academiei Române. Bucharest. [in Romanian];
16. GHERGHEL I., STRUGARIU AL., GHIURCĂ D., CICORT-LUCACIU AL. ȘT., PRICOP E., 2008 - The herpetofauna from the Bistrița river basin (Romania): geographical distribution. North-Western Journal of Zoology, Vol. 4, Suppl.1: 69-101;
17. GHIRA I., VENCZEL M., COVACIU-MARCOV S., MARA G., GHILE P., HARTEL T., TOROK Z., FARKAS L., RACZ T., FARKAS Z., BRAD T., 2002 - Mapping of Transylvanian Herpetofauna, In: Nymphaea. Folia naturae Bihariae XXIX, p. 145-201, Oradea;
18. GHIRA I., 2006 - Reptile și amfibieni, Centrul de Inițiativă pentru Mediu, Cluj-Napoca;
19. GHIURCĂ D., MUNTEANU ANCA, FENERU F., 2003 - Some herpetological observations in Piatra Craiului National Park. Research in Piatra Craiului National Park, vol. I: 273-274;

20. GHIURCĂ, D., ROȘU, S., GHERGHEL, I., 2005 - Preliminary data concerning the herpetofauna in Neamț county (Romania). *Analele Universității din Oradea, Fascicula Biologie* 12: 53-62;
21. GHIURCĂ D., RANG C., ROȘU S., 2006 - Preliminary data concerning the herpetofauna in Bacău county. *Studii și cercetări, Biologie* 11: 91-98, Univ. Bacău, Bacău;
22. GHIURCĂ D., GHERGHEL I., ROȘU G., 2009 - Contribution to knowledge of the distribution of herpetofauna in Tarcau Mountains (Romania). *AES Bioflux* 1 (2): 73-79;
23. GHIURCĂ D., ROȘU S., 2017 - Contribution to knowledge of the distribution of herpetofauna in Nemira Mountains. *Studii și comunicări*, nr. 25: 92-97;
24. HARTEL, T., VON WEHRDEN, H., 2013 - Farmed Areas Predict the Distribution of Amphibian Ponds in a Traditional Rural Landscape. *PLoS ONE* 8(5): e63649;
25. IFTIME A., 2003 - Observations upon the fishes, amphibians and reptiles of the Piatra Craiului National Park and surrounding areas. *Research in Piatra Craiului National Park* 1: 267-272;
26. IFTIME, A., GHERGHEL, I., GHIURCĂ, D., 2008 - Contribution to the knowledge of the herpetofauna of Bacău county (Romania). *Travaux du Museum National d'Histoire Naturelle „Grigore Antipa”* 51: 243-253;
27. IFTIME, A., IFTIME, O., 2010 - Herpetofauna masivului Ciucaș și starea sa de conservare. *Ocrotirea Naturii, serie nouă* 46: 123-130. [in Romanian];
28. IFTIME, A., IFTIME, O., 2011 - Note on the herpetofauna of the Vâlcan mountains and their foothills (Southern Carpathians, Romania). *Travaux du Museum National d'Histoire Naturelle „Grigore Antipa”* 54(2): 513-521;
29. IFTIME, A., IFTIME, O., 2014a. - Notes on the herpetofauna of the Leaota Mountains, a “wildlife corridor” area. *North-Western Journal of Zoology* 10 (Supplement 1): 33-37;
30. IFTIME, A., IFTIME, O., 2014b. - Notes on the herpetofauna of the Leaota Mountains, a “wildlife corridor” area. *North-Western Journal of Zoology* 10 (Supplement 1): 44-50;
31. KLAUČO, M., GREGOROVÁ, B., STANKOV, U., MARKOVIĆ, V., LEMENKOVA, P., 2013 - Determination of ecological significance based on geostatistical assessment: a case study from the Slovak Natura 2000 protected area. *Central European Journal of Geosciences* 5(1): 28-42;
32. LEMOS-ESPINAL J. A., SMITH G. R., WOOLRICH-PIÑA G. A., CRUZ A., 2017 - Amphibians and reptiles of the state of Chihuahua, Mexico, with comparisons with adjoining states. *ZooKeys* 658: 105-130;
33. MARTIN T., GUILLEMIN M., NIVET-MAZEROLLES V., LANDSMANN C., DUBOS J., EUDELIN R., STROUD J., 2017 - The herpetofauna of central Uzbekistan. *Amphibian & Reptile Conservation* 11(1) [General Section]: 93-107 (e140);
34. PETRESCU, A., PETRESCU, I., RĂDULEȚ, N., IFTIME, A., BAN, C., 2004 - Date faunistice preliminare din zona viitorului Parc Național Defileul Jiului. Oltenia, *Studii și Comunicări, Științele Naturii* 21: 229-240. [in Romanian];
35. POP, O. G., MURARIU, D., DANCIU, M., IFTIME, A., VEZEANU, M., IONESCU, D.T., RAKOSY, L., ȘTEFĂNUȚ, S., FLORESCU, F., PĂTRULESCU, A., 2007 - Piatra Craiului National Park – Natura 2000 site. Editura Universității Transilvania, Brașov;
36. SOS, T., 2007 - Notes on distribution and current status of herpetofauna in the northern area of Brașov county (Romania). *North-Western Journal of Zoology* 3(1): 34-52;
37. STRUGARIU, A., SĂHLEAN, C. T., HUȚULEAC-VOLOSCIUC, M. V., PUȘCAȘU, M. C., 2006 - Preliminary data regarding the distribution of reptilian fauna in Suceava County (Romania). *North-Western Journal of Zoology* 2(1): 39-45;
38. TROCHET A., SCHMELLER D. S., 2013 - Effectiveness of the Natura 2000 network to cover threatened species. *Nature Conservation* 4: 35-53;
39. TUDOR, M., CRĂCIUN, N., BURLACU, L., 2004 - Preliminary report on herpetofauna of the becoming National Park “Jiului Gorge”. Oltenia, *Studii și Comunicări, Științele Naturii* 21: 269-272;
40. VOTSI, N. E., MAZARIS, A. D., KALLIMANIS, A. S., ZOMENI, M. S., VOGIATZAKIS, I. N., SGARDELIS, S. P., PANTIS, J. D., 2012 - Road effects on habitat richness of the Greek Natura 2000 network. *Nature Conservation* 1: 53-71;
41. WALENTOWSKI, H., SCHULZE, E. D., TEODOSIU, M., BOURIAUD, O., VON HEßBERG, A., BUßLER, H., BALDAUF, L., SCHULZE, I., WÄLDCHEN, J., BÖCKER, R., HERZOG, S., SCHULZE, W., 2013 - Sustainable forest management of Natura 2000 sites: a case study from a private forest in the Romanian Southern Carpathians. *Annals of Forest Research* 56(1): 217-245.

#### AUTHORS' ADDRESS

GHIURCĂ DANIEL - ȘTEFAN, ROȘU CIPRIAN SORIN - „Ion Borcea” Natural Sciences Museum of Bacău, Alea Parcului 9, Bacău, Romania, e-mail: [danielghiurca@gmail.com](mailto:danielghiurca@gmail.com); [sorin\\_roshu@yahoo.com](mailto:sorin_roshu@yahoo.com).



Figure 1. General map of the “Dealul Ciocaș - Dealul Vițelului” Natura 2000 site. Transects are shown in red and numbered as in Table 1



Figure 2. *Triturus cristatus*, adult, T4 (transect 4),  
photo Daniel Ghiurcă



Figure 3. *Bombina variegata*, adult, T2 (transect 2),  
photo Daniel Ghiurcă





Figure 4. *Hyla arborea*, adult, T4 (transect 4), photo Daniel Ghiurcă



Figure 5. *Rana temporaria*, adult, T4 (transect 4), photo Daniel Ghiurcă

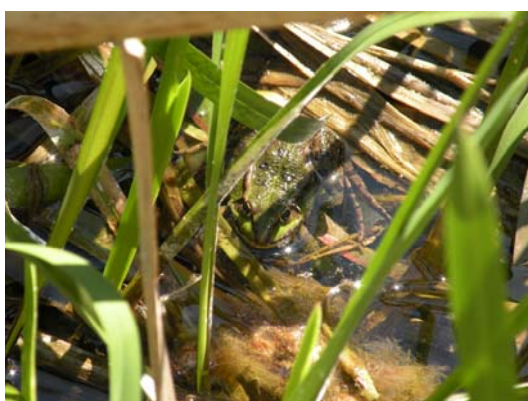


Figure 6. *Pelophylax ridibundus*, adult, T6 (transect 6), photo Sorin Roșu



Figure 7. *Lacerta agilis*, adult, T6 (transect 6), photo Sorin Roșu

Table 1. Transects with coordinates and description

Transect with numbers as in Fig. 1	Coordinates	Altitude / Length	Description
1. Way from Araci to Ariușd (T1)	From 45°47'56.43"N 25°39'44.74"E to 45°46'56.63"N 25°40'18.75"E	496 m - 617 m / 5,1 km	Deciduous forest (beech), pastures, arable land
2. Trail in the eastern boundary of the area from artificial animal pond to the north (T2)	From 45°46'33.23"N 25°41'56.22"E to 45°47'10.73"N 25°41'36.38"E	564 m - 632 m / 2,7 km	Deciduous forest (beech), pastures
3. From the center of the area at the forest edge to the north (T3)	From 45°46'43.82"N 25°41'14.62"E to 45°47'11.30"N 25°41'30.49"E	546 m - 602 m / 2,6 km	Mixed forest (beech and pine), pastures, arable land
4. Way from Ariușd to the eastern boundary of the site, then to the center (T4)	From 45°46'43.85"N 25°40'43.04"E to 45°46'34.02"N 25°41'52.47"E	508 m - 606 m / 4,2 km	Deciduous forest (beech), mixed forest (beech and pine), pastures
5. Trail from Podu Oltului to the western border, then to the central area of the site (T5)	From 45°45'32.44"N 25°41'50.03"E to 45°46'23.97"N 25°41'50.82"E	513 m - 626 m / 4,3 km	Mixed forest (beech and pine), pastures, arable land
6. Artificial channel from Podu Oltului to the south-east border of the site (T6)	From 45°45'35.76"N 25°41'57.63"E to 45°45'40.98"N 25°42'06.88"E	497 m - 508 m / 1 km	Mixed forest (beech and pine)
7. The meander of the Olt River in the southwest of the site (T7)	From 45°45'25.24"N 25°39'38.59"E to 45°45'26.11"N 25°39'57.63"E	494 m - 497 m / 2,4 km	Pastures
8. Trail from Podu Oltului to Ariușd in the southern area of the site	From 45°45'25.24"N 25°41'32.56"E to 45°45'44.03"N 25°41'37.44"E	505 m - 597 m	Mixed forest (beech and pine), pastures, arable land

Table 2. Distribution of recorded species in transects

Species	Distribution in investigated sites	Observations
<i>Triturus cristatus</i>	2, 4	Relatively rare
<i>Bombina variegata</i>	1, 2, 3, 4, 5, 8	Relatively widespread
<i>Bufo viridis</i>	1, 2, 4	Relatively rare
<i>Hyla arborea</i>	2, 4	Relatively rare
<i>Pelophylax ridibundus</i>	6, 7	Relatively widespread in characteristic habitats
<i>Rana temporaria</i>	1, 2, 3, 4, 5, 8	Widespread, frequent
<i>Lacerta agilis</i>	1, 2, 3, 4, 5, 6, 7, 8	Widespread, frequent
<i>Natrix natrix</i>	2, 3, 4, 6, 7	Relatively widespread

Table 3. The occurrence of reproducing amphibians in different types of water bodies in “Dealul Ciocaș - Dealul Vițelului” Natura 2000 site

Species	Slow-flowing brooks	Small, temporary ponds	Large, permanent ponds	Man-made ditches
<i>Triturus cristatus</i>	-	+	-	+
<i>Bombina variegata</i>	+	+	-	+
<i>Bufo viridis</i>	+	+	-	-
<i>Hyla arborea</i>	-	+	-	-
<i>Pelophylax ridibundus</i>	-	-	+	+
<i>Rana temporaria</i>	+	+	-	+