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## TERRESTRIAL VERTEBRATES OF DOBROGEA – ROMANIA AND BULGARIA

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**Abstract.** The authors report the state of the terrestrial vertebrates of Romanian and Bulgarian Dobrogea. Five amphibian species, eight of reptiles, 159 of birds and 39 mammals species were inventoried. Some of them are characteristic to the steppe areas, in which Dobrogea is included, and others (as amphibians) have a limited distribution, around water flows, pools and lakes. Some of the observed or collected species have populations which can be compared in the two parts of Dobrogea, while the others (e.g. *Crocidura suaveolens*, *Mesocricetus newtoni*, *Microtus arvalis*) have populations more numerous in the Bulgarian Dobrogea, this thing indicating that there are several undamaged habitats and a low anthropic pressure than in the Romanian one.

**Résumé.** Dans le cadre du contrat de collaboration roumaino-bulgare des années 2008-2009, soutenu par les Ministères de la Recherche Scientifique des deux pays, on a étudié les vertébrés terrestres de la Dobrogea roumaine (départements de Tulcea et Constanța) et de la Dobrogea bulgare (départements de Silistra et Dobrich). Au cours des deux années on y a observé, prélevé ou inventorié (sur la base des informations de terrain) un nombre de 211 vertébrés terrestres: 5 espèces d'amphibiens, 8 de reptiles, 159 d'oiseaux et 39 de mammifères. Les amphibiens y sont les vertébrés avec la plus réduite biodiversité, le plus grand nombre d'espèces appartenant à la classe des oiseaux. Pour chaque espèce on a précisé le statut de protection, les amphibiens figurant dans les annexes des OUG 57/2007 de la législation roumaine concernant la conservation de la biodiversité et de la loi no. 77/2002 de la législation bulgare, tandis que sur le plan international – dans les annexes de la Directive 92/43 EEC sur la conservation des habitats naturels, de la faune et de la flore sauvage. Les autres espèces de vertébrés jouissent d'une protection légale similaire, sauf un petit nombre d'espèces sans statut actuel de protection. Sur la base des résultats des observations et des prélèvements, nous considérons que l'état des écosystèmes de la Dobrogea bulgare est plus proche de l'état naturel, que ceux de la Dobrogea roumaine. Cette situation se reflète dans les populations (plus nombreuses en Bulgarie) de certaines espèces de vertébrés, ce qui prouve la valeur de ces espèces en tant que bioindicateurs, dans le cas de la Dobrogea roumaine la pression anthropique étant plus forte sur les écosystèmes naturels. Dans les deux pays des aires protégées existent, mais leurs superficies peuvent croître, afin d'agrandir leurs chances de constituer des refuges, pour conserver le fond faunistique de quelques espèces rares ou périlicées: *Mesocricetus newtoni*, *Spermophilus citellus*, *Mustela eversmanni*, *Vormela peregusna* etc.

**Key words:** amphibians, reptiles, birds, mammals, inventory, habitats, conservation.

### INTRODUCTION

Between 2008 – 2009, a Romanian – Bulgarian co-operation project was carried on in order to study the vertebrates of both parts (Romanian and Bulgarian) of Dobrogea, financed by the Ministers of Scientific Research of both countries. The team of specialists were from „Grigore Antipa” National Museum of Natural History – București (Bucharest) and „Konstantin Prelavsky” University – Shumen and Museum of Natural Sciences from Varna.

Our main interest was focussed on birds and mammals, but in our field trips we also observed and gathered information on amphibians and reptiles from the local people.

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English translation by Mihaela Barcan Achim.

If the largest part of the studied area (counties Tulcea and Constanța, in Romania, and Dobrici and Silistra, in Bulgaria) is considered a steppe area from the biogeographical point of view, from the same point of view we cannot avoid the Pontic area. Under these circumstances of a large diversity of the relief (Hercynic Mountains of northern Dobrogea, hills and channels in limy structures, and the cliffs of loess from the East of the studied area) we also deal with different climatic influences and, as a consequence, with a large diversity of ecosystems. Murariu et al. (2009) asserted:

„In the past, Dobrogea was characterized by a vegetal coat with xerophilous grasslands: *Stipa*, *Festuca*, *Diplachne*, *Agropyrum*, *Centaurea*, *Artemisia* etc. The area with grassy vegetation alternated here and there with bushes formed of xerophilous shrubs (*Prunus spinosa*, *Evonymus europaeus*, *Crataegus monogyna*, *Ligustrum vulgare*) with rare forest patches (*Quercus pedunculiflora*, *Q. pubescens*, *Ulmus foliaceus*, *U. procera*, *U. ambiguus*, *Acer tataricum*, *A. campestre*, *Pinus* sp. etc.). Today, most of the grasslands are fallowed, and the bushes and a part of the steppe forests are cut in order to create a proper land for agriculture, on larger and larger surfaces. The steppe begins right at the littoral level and stretches up to 50 – 100 m altitude. Here and there, an area with a transfer vegetation between lawns and forests can be identified, i.e. the so-called forest steppe area, between 200 – 300 m altitude.”

Important data about Dobrogean's vertebrates, especially on small mammals as well as on hunting species published many authors, starting with Hogguer (1879) and continuing in the 20<sup>th</sup> century with Simionescu (1922), Lepși (1929), Călinescu (1931, 1934), Oprescu (1936). But most articles about vertebrates from Dobrogea were published in the second half of the 20<sup>th</sup> century by: Ausländer et al. (1957 a, b), Dumitrescu et al. (1958), Hellwing et al. (1960), Suciuc et al. (1962), Dumitrescu et al. (1962-1963), Hamar et al. (1963), Dumitrescu et al. (1965), Barbu et al. (1965), Băcescu et al. (1965), Popescu (1968, 1972), Popescu et al. (1968), Schnapp (1968, 1971), Solomon (1968), Vasiliu et al. (1968), Boguleanu (1969), Iana (1970, 1973), Marcheș (1970), Valenciuc et al. (1970, 1971), Valenciuc et al. (1973), Popescu et al. (1974), Atanasova (1987), Răduleț (1994, 1996, 2005), Răduleț et al. (1996).

In first decade of the 21<sup>st</sup> century we can mention the contributions of Murariu (2000, 2006, 2007, 2008), Angelescu (2003), Peshev et al. (2004), Atanasova et al. (2009), Gospodinova et al. (2009), Koshev (2009).

Besides the interest of the Romanian-Bulgarian mixed team of specialists in the observation and in the identification of vertebrates, we also estimated the effects of the anthropic pressure on them, knowing that there already are some protected areas on the Romanian and Bulgarian territories, necessary for protecting the plant and animal endemic species, rare or threatened.

#### MATERIAL AND METHODS

Besides the field trips and observation noting on vertebrates, we also collected, measured and weighed them, and then we released them, especially the birds and bats. We also studied their paths through grass and their tracks on sand and wet soil, the openings of the rodent galleries, the hills and droppings; some birds were studied using the field glasses, and others were identified by their song.

Studied areas (Fig. 1):

- from Romanian Dobrogea – Măcin, Greci, Cerna, Celic Dere, Isaccea, Niculițel, Babadag, Slava Cercheză and Sarichioi – from Tulcea County; - Hârșova,

Horia, Târgușor, Cernavodă, Peștera, Băneasa, Canaraua Fetii and Hagieni – from Constanța County – with endemic or rare floral and faunal elements, of Ponto-Mediterranean, Ponto-Balkan, Ponto-Panonic origin, etc, which influenced the decisions of creating protected areas within the “Natura 2000” ecological network, as areas of special avifaunal protection (SPAs) or sites of community interest (SCIs).

- from Bulgarian Dobrogea – Dobrich, Dobrichka, General Toshevo, Kavarna, Krushari, Shabla and Tervel from Dobrich County, and Shrebarba lake, Dulovo, Tutrakan, Alfatar, Glavnitza and Malak Preslavetz from Silistra County where the forests account for 23 % of the whole territory of the county. Natural plantations of oak, cerris oak, hornbeam and the like are prevalent. Also, here there are some SCIs (Durankulak Lake, Shabla-Ezerets Lake and Kaliakra Complex, other surfaces from the same areas being SPAs, and have different codes in the Bulgarian legislation).

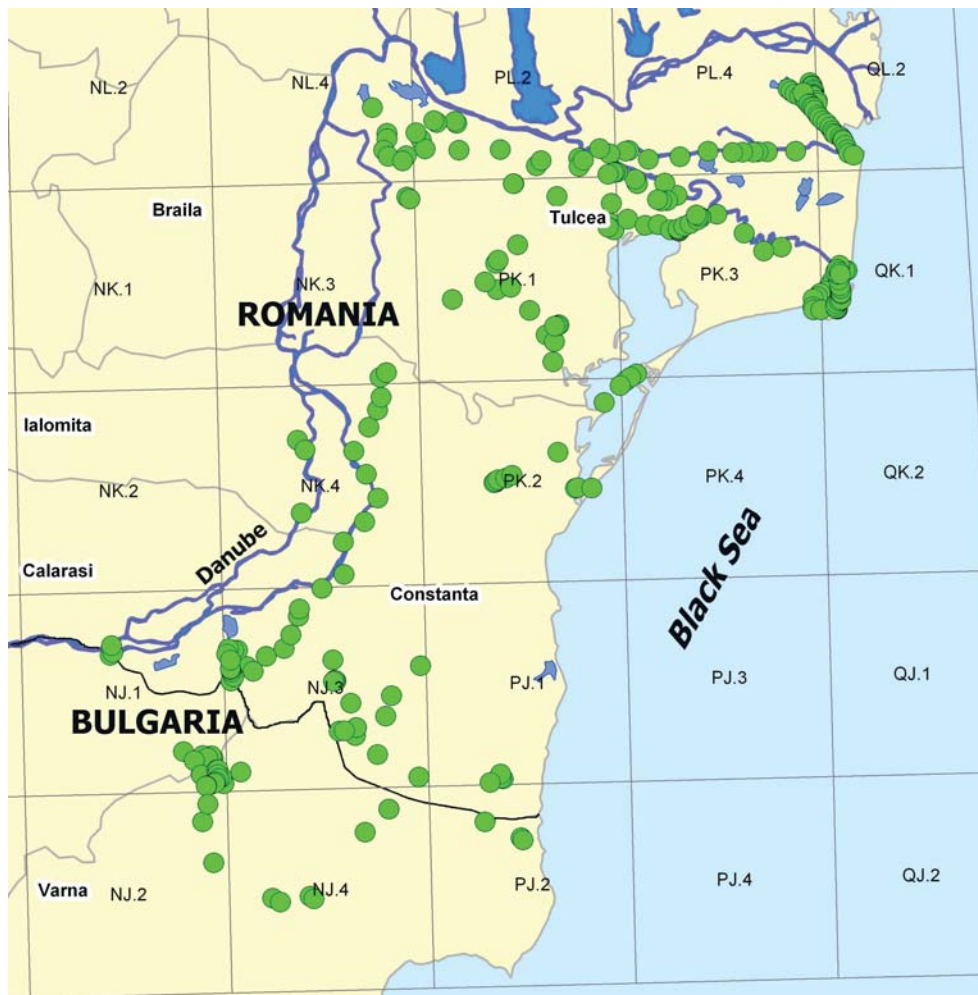


Fig. 1 - Survey points from Romanian and Bulgarian Dobrogea (U.T.M. quadrants 50x50 km).

## RESULTS AND DISCUSSIONS

## AMPHIBIANS (Class AMPHIBIA)

Although they are not completely adapted to the terrestrial life, being dependant on the water presence, at least for reproduction, the amphibians succeeded in adopting some strategies for surviving in steppe areas, thus colonizing the land since billion of years ago. Within the ecological conditions of Dobrogea, some amphibians withdraw in stone cracks, holes in the ground or in the mud of the few rivers, pools and lakes of the region, for hibernating. But, no matter where they spend winter, in spring they go to the water surfaces – even there are temporary pools appeared after the snow melting, where they lay eggs.

We do not expect to occur a large specific diversity of amphibian in Romanian and Bulgarian Dobrogea, because there are a few wet areas and rare and very rare water flows. Excepting the Danube in the western, northern and North-Eastern Romanian Dobrogea, there are rare water flows which often are dried in summer: Valea Jijila, Valea Sulucului, Taița River where there is a dam, near Horia locality, which accumulates a large quantity of water, then Telița, Valea Roștilor, Topolog, Ciucurova, Slava, Casimcea, Mahomencea, Hamangia, Ceamurlia, Urluia. The most important lakes are: Bugeacului, Oltina, Răzoarele, Corbu, then Nuntași, Babadag, Golovița, excluding Razelm-Sinoe lakes and the littoral ones (Tașaul, Siutghiol, Techirghiol).

In Bulgarian Dobrogea, the hydrographic network is more limited, water accumulations (e.g. on Suha Reka) and lakes (Srebarna, Shabla, Durankulak) are more important.

Thus, from the studied area we can name as representatives of the amphibian species:

*Bombina bombina* (L., 1761) occurs in the entire Romanian and Bulgarian Dobrogea, where the pools form, even they are temporary. The simple preservation of some wet areas, with unpolluted water may allow the numerical improvement of the populations, smaller and smaller along the last decades, because of the anthropic pressure.

*Pelobates fuscus* (Laurentus, 1768) has the hind legs short and strong, with a shovel-like widened inner metatarsal tubercle, for digging easier in the ground. Romanian name is “broasca de pământ” (“ground frog”), because, both in summer and in winter it hides in the ground; for hibernation it digs deeper. When the weather is warm, it can be seen only at night, when it goes out from shelter for foraging. Also, this species recorded important numerical decreases of its populations, and it is considered a species of community interest (Cogălniceanu [in Făgăraș et al.], 2008).

*Pelobates syriacus balcanicus* Karaman, 1928 has the biology and habits of the previous species, from which it differentiates by the much widened metatarsal tubercle (almost double), flattened frons and a vertical pupil in light. It is rarer than *P. fuscus*, and the northern limit of its distribution is the South of Romania.

*Hyla arborea* L., 1758 shelters on the leaves of the humid grassy and it even climb the trees, where it can be remarked only when it utters its well-known sounds. It is included in the list of the species of community interest.

*Bufo viridis* L., 1768 is less pretentious (among amphibians) to the water quality and it is not disturbed by the man's presence, but numerous individuals are victims, being crushed by cows, cars, and even by man, during the night.

Amphibian species, observed and reported by us, are included in the annexes of the Directives of the Habitats, with the plant and animal species of community interest and whose conservation needs the declaration of some special conservation areas.

## REPTILIANS (Class REPTILIA)

There are species to whom the conditions from the Romanian and Bulgarian Dobrogea are optimum, just by the steppe regime, with less precipitations, with frequent sunny places and rocks.

*Testudo graeca ibera* Pallas, 1814 was occurred in fallow places, with spontaneous gramineae, but also in forests, and protection belts. They are hardly observed in the wild. They accidentally come out along the path. In spring and in autumn they can be observed during the breeding dances, because they hit each other the carapaces, giving the impression that somebody is breaking stones. It is a threatened species because the ornaments from the yellow carapace, bordered by black spots, is interesting for those who are very fond of "original" night lights, ash-trays etc. That is why, besides the statute of endangered species by the human, dog, cat and boar pressure, it is also protected by the interdiction of any kind of trade (CITES Convention to which Romania adhered in 1993).

*Emys orbicularis* (L., 1758) is strictly bound to the presence of the fresh waters (it rarely goes in the brackish ones) and that is why its populations are isolated in Dobrogea. As a matter of fact, the preferred food lives in water: earthworms, snails, tadpoles, fishes.

Cogălniceanu (2008) asserts that the common slider, *Trachemys scripta*, escaped from aquaria, is competitive in the wild, competing with the native one, occupying the same habitats and looking for the same food sources.

*Lacerta agilis* L., 1758 prefers the steppe areas, being observed in the edge of the roads and paths, at the limit between the agricultural cultures and the commons. It is not protected.

*Lacerta viridis* (Laurenti, 1768) was observed along the valleys, with a steppe vegetation and rarely in the woods and in agricultural lands. It is important in the trophic relations of the ecosystems of Dobrogea because it feeds on coleopterans, orthopterans, dipterans, hymenopterans, other smaller lizards. It is not protected but the anthropic pressure endangers its life.

*Podarcis taurica* Pallas, 1841 is considered a Balkan endemic species, preferring the humid areas and the forest skirts. It has an important role in the ecosystems' trophic relations of Dobrogea, feeding mainly on injurious insects, myriapods, araneae. It is included both in the Romanian and Bulgarian legislation of animal protection.

*Coluber caspius* Gmelin, 1789 is characteristic to the rocky grassy slopes, but it also has been seen and caught along the valley from the base of Dealul Consul, South-West of locality Izvoarele. It is subjected to the wrong beliefs on snakes, local people trying to do their best in killing them, especially because they feed on poultry. We consider that the statute of endangered species and the trying to convince people that it mainly feeds on rodents, probably it is a chance in preserving this species in the faunal fund of the Romanian and Bulgarian Dobrogea.

*Natrix natrix* (L., 1758) is frequently occurred, mainly around the households with cattle sheds and near waters, being an excellent swimmer. It is not protected, and in some areas it is captured for its skin, for morocco-leather tanning. This interest in this species might endanger it.

*Vipera ammodytes montandoni* Boulenger, 1904 was observed on the sunny slopes of the Măcin Mountains National Park, with a grassy vegetation, rare bushes of *Crataegus* and *Prunus*, but with a rocky substratum, for refuges when endangered and for protected places for hibernation. It is captured for its venom necessary in pharmacy. Over-exploitation of the individuals made it to be considered an endangered species (Iftime, 2005). It is protected in Bulgaria, by the Law no 77/2002 of implementing the Directives of the Habitats.

But we can assert that all reptiles have a protection statute and are included in the red lists of some protected areas (e.g. Red List of Măcin Mountains National Park), in OUG 57/2007 (Romanian Governmental Ordinance no 57/2007) on the protected natural areas to preserve wild flora and fauna's natural habitats) or in the annexes of some international conventions.

#### BIRDS (Class AVES)

The birds from the Romanian and Bulgarian Dobrogea are subjected to important anthropic influences, both by the industrial and agricultural activities and by the modifications of the habitats, but especially by the wind farms. In northern Dobrogea, there are some wind turbines, some of them functional, others mounted for the future necessities, but in the Bulgarian Dobrogea there are hundreds of wind turbines, forming real armies, reaching 60 m high, among whose propellers birds of all dimensions can fly. The risk is greater during migrations, Dobrogea being a very important line, both for reaching the Danube Delta and for their travel to North, to the Siret Valley, in spring, and backwards, in autumn. Therefore, from the perspective of enlarging the using of the equipments for generating unconventional electric power, monitoring programs on the birds' flight or on the impact of the wind farms on ornithofauna would be necessary. Even a negotiation with the managers of these wind farms is also necessary in order to stop them temporarily (1 h) when the bird flocks come around the wind turbines, during migration period. In the Bulgarian Dobrogea such kind of bird monitoring station already exists, with permanent records of the flight direction, especially around the wind turbines, for finding the eventual corps or injured birds. In addition, the Bulgarian ornithologists (Viktor Vasilev, in verbis) noticed that the migratory bird flocks observe from the distance the presence of the wind farms and then, they either change the fly direction or fly higher for avoiding the impact with the new constructions, at least during the day.

Table 1

List of the bird species observed in the Romanian and Bulgarian Dobrogea (in 2008 and 2009 and their protection status).

Species	INTERNATIONAL					ROMANIA		BULGARIA	
	Country	European Threat Status	EC Bird Directive	Bern Con.	Bonn Con.	RGO 57/2007	RBVRO	Biodiversity Act	Bulgarian Threat Status
1	2	3	4	5	6	7	8	9	10
<i>Tachybaptus ruficollis</i> (Pall., 1764)	Ro	S	-	II	-	4B	-	A3	V
<i>Podiceps cristatus</i> (L., 1758)	Ro	S	-	III	-	-	-	A3	V
<i>Podiceps grisegena</i> (Bodd., 1783)	Ro	S	-	II	-	-	-	A3	E
<i>Phalacrocorax pygmaeus</i> (Pall., 1773)	Ro	V	I	II	II	3	V	A2, 3	E
<i>Phalacrocorax carbo sinensis</i> (Blum., 1798)	Ro	S	-	III	-	-	-	-	-
<i>Pelecanus onocrotalus</i> L., 1758	Ro	R	I	II	I/II	3	V	-	-
<i>Pelecanus crispus</i> Bruch., 1832	Ro	V	I	II	I/II	-	cE	-	-
<i>Botaurus stellaris</i> (L., 1758)	Ro	(V)	I	II	II	3	-	A2, 3	E
<i>Ixobrychus minutus</i> (L., 1766)	Ro Bg	(V)	I	II	II	3	V	A2, 3	E
<i>Nycticorax nycticorax</i> (L., 1758)	Ro	D	I	II	-	3	V	-	-
<i>Ardeola ralloides</i> (Scop., 1769)	Ro	V	I	II	-	3	-	-	-

Table 1 (continued)

Species	INTERNATIONAL					ROMANIA		BULGARIA	
	Country	European Threat Status	EC Bird Directive	Bern Con.	Bonn Con.	RGO 57/2007	RBVRO	Biodiversity Act	Bulgarian Threat Status
1	2	3	4	5	6	7	8	9	10
<i>Egretta alba</i> (L., 1758)	Ro	S	I	II	-	3	E	-	-
<i>Egretta garzetta</i> (L., 1758)	Ro	S	I	II	-	3	cE	-	-
<i>Ardea cinerea</i> (L., 1758)	Ro Bg	S	-	III	-	-	-	A3	V
<i>Ardea purpurea</i> (L. 1766)	Ro Bg	V	I	II	II	3	E	A2, 3	E
<i>Platalea leucorodia</i> L. 1758	Ro	E	I	II	II	3	-	-	-
<i>Plegadis falcinellus</i> L. 1766	Ro	D	I	II	II	3	E	-	-
<i>Ciconia nigra</i> (L., 1758)	Ro	R	I	II	II	3	V	-	-
<i>Ciconia ciconia</i> (L., 1758)	Ro Bg	V	I	II	II	3	V	A2,3	V
<i>Cygnus olor</i> (Gm., 1789)	Ro Bg	S	-	III	II	-	-	A2,3	V
<i>Anser anser</i> (Swinhoe, 1871)	Ro	S	-	III	II	5C	-	A3	E
<i>Anas strepera</i> L., 1758	Ro	V	II	III	II	5C	-	-	-
<i>Anas platyrhynchos</i> L., 1758	Ro	S	-	III	II	5D	-	A4	-
<i>Anas querquedula</i> L., 1758	Ro	V	-	III	II	5C	-	A4	V
<i>Tadorna tadorna</i> (L., 1758)	Ro	S	-	II	II	3	V	A2, 3	V
<i>Tadorna ferruginea</i> (Pall., 1764)	Ro	V	I	II	II	3	cE	A2, 3	cE
<i>Circus gallicus</i> (Gm., 1788)	Ro	R	I	II	II	3	V	A2, 3	V
<i>Circus aeruginosus</i> (L., 1758)	Ro Bg	S	-	II	II	3	-	A2, 3	E
<i>Accipiter gentilis</i> (L. 1758)	Ro	S	-	II	II	3	-	A3	E
<i>Accipiter nisus</i> (L., 1758)	Ro	S	-	II	II	-	-	A3	E
<i>Buteo buteo</i> L., 1758)	Ro Bg	S	-	II	II	-	-	A3	S
<i>Buteo rufinus</i> (Cretzschm., 1827)	Ro Bg	(E)	I	II	II	3	-	A2, 3	V
<i>Aquila pomarina</i> Brehm, 1831	Ro Bg	R	I	II	II	3	V	A2, 3	V
<i>Aquila clanga</i> Pall., 1811	Ro	E	I	II	II	3	cE	A2, 3	cE
<i>Aquila heliaca</i> Sav., 1809	Ro Bg	E	I	II	II	3	cE	A2, 3	R
<i>Hieraaetus pennatus</i> (Gmel., 1788)	Ro	R	I	II	II	3	cE	A2, 3	V
<i>Falco tinnunculus</i> L., 1758	Ro Bg	D	-	II	II	4B	-	A3	-
<i>Falco subbuteo</i> L., 1758	Ro Bg	S	-	II	II	4B	-	A3	V
<i>Falco vespertinus</i> (L., 1766 )	Ro Bg	V	-	II	II	3	V	A2, 3	cE
<i>Falco cherrug danubialis</i> Kleinschm.,1939	Ro	E	-	II	II	3	cE	-	-
<i>Perdix perdix</i> (L., 1758 )	Ro Bg	V	I/II/III	III	-	5C 5D	-	A4	-
<i>Coturnix coturnix</i> (L., 1758)	Ro Bg	V	-	III	II	5C	-	A4	-
<i>Phasianus colchicus</i> L., 1758	Ro Bg	S	-	III	-	5C 5D	-	A4	-
<i>Fulica atra</i> (L., 1758 )	Ro Bg	S	-	III	-	5C 5D	-	A4	-
<i>Galinula chloropus</i> (L., 1758)	Ro Bg	S	-	III	-	5C	-	A3	-
<i>Haematopus ostralegus</i> L., 1758	Ro	S	-	III	II	3??	V	A3	cE
<i>Himantopus himantopus</i> (L., 1758)	Ro	S	I	II	II	3	E	A2, 3	E
<i>Recurvirostra avosetta</i> L., 1758	Ro	Lw	I	II	II	3	V	A2, 3	E
<i>Charadrius dubius curonicus</i> Gmel., 1789	Ro	(S)	-	II	II	-	-	A3	V
<i>Vanellus vanellus</i> (L., 1758)	Ro	(S)	-	III	II	-	-	A3	V
<i>Limosa limosa</i> (L., 1758)	Ro	V	II	III	II	-	-	A3	-
<i>Philomachus pugnax</i> (L., 1758)	Ro	(S)	I/II	III	II	-	-	A3	-
<i>Tringa totanus</i> (L., 1758)	Ro	D	II	III	II	-	-	A2, 3	cE
<i>Tringa ochropus</i> L.,1758	Ro	(S)	-	II	II	-	-	A3	E

Table 1 (continued)

Species	INTERNATIONAL					ROMANIA		BULGARIA	
	Country	European Threat Status	EC Bird Directive	Bern Con.	Bonn Con.	RGO 57/2007	RBVRO	Biodiversity Act	Bulgarian Threat Status
1	2	3	4	5	6	7	8	9	10
<i>Tringa glareola</i> L., 1758	Ro	D	I	II	II	3	-	A3	-
<i>Larus cachinnans</i> Pall., 1811	Ro	S	-	III	-	-	-	-	-
<i>Larus melanocephalus</i> Temm., 1820	Ro	S	I	II	II	3	E	A3	V
<i>Larus ridibundus</i> L., 1766	Ro Bg	S	-	III	-	-	-	A3	E
<i>Larus minutus</i> Pall., 1776	Ro	D	-	II	-	3	-	A3	-
<i>Larus ichthyaetus</i> Pall., 1773	Ro	S	-	III	-	-	-	-	-
<i>Sterna hirundo</i> (L., 1758)	Ro	S	I	II	-	3	-	A3	E
<i>Sterna sandvicensis</i> Lath., 1787	Ro	D	I	II	II	3	cE	A3	E
<i>Sterna albifrons</i> Pall., 1764	Ro	D	I	II	II	3	E	A3	E
<i>Chlydonias hybrida</i> (Pall., 1811)	Ro	D	I	II	II	3	-	A3	V
<i>Chlydonias niger</i> (L., 1758)	Ro	D	I	II	II	3	-	A3	cE
<i>Chlydonias leucopterus</i> Temm., 1815	Ro	S	-	II	-	-	-	A3	-
<i>Columba palumbus</i> L. 1758	Bg	S	I/II/III	III	-	5C 5D	V	A4	-
<i>Streptopelia decaocto</i> (Friv., 1838)	Ro Bg	(S)	-	III	-	5C	-	A4	-
<i>Streptopelia turtur</i> (L., 1758)	Ro Bg	D	II	III	-	5C	-	A4	-
<i>Cuculus canorus</i> L., 1758	Ro Bg	S	-	III	-	-	-	A3	-
<i>Ous scops</i> (L., 1758)	Ro Bg	(D)	-	II	-	4B	-	A3	-
<i>Athene noctua</i> (Scop., 1769)	Ro Bg	D	-	II	-	4B	-	A3	-
<i>Strix aluco</i> L., 1758	Ro Bg	S	-	II	-	-	V	A3	-
<i>Asio otus</i> (L., 1758)	Ro Bg	S	-	II	-	-	-	A3	-
<i>Caprimulgus europaeus</i> L., 1758	Ro	(D)	I	II	II	3	-	A2, 3	-
<i>Apus apus</i> (L., 1758)	Ro	S	-	III	-	-	-	A3	-
<i>Tachymartus melba</i> L., 1758	Ro Bg	(S)	-	II	-	-	-	A3	-
<i>Alcedo atthis</i> (L. 1758)	Ro Bg	D	I	II	-	3	-	A2, 3	-
<i>Merops apiaster</i> L., 1758	Ro Bg	D	-	II	II	4B	-	A2, 3	-
<i>Coracias garrulus</i> L., 1758	Ro Bg	V	I	II	II	3	-	A2, 3	-
<i>Upupa epops</i> L., 1758	Ro Bg	D	-	II	-	4B	V	A3	-
<i>Jynx torquilla</i> L., 1758	Ro	D	-	II	-	4B	E	A3	-
<i>Dendrocopos syriacus</i> (Hemp. & Ehr., 1833)	Ro Bg	(S)	I	II	-	-	-	A2, 3	-
<i>Dendrocopos major</i> (L., 1758)	Ro Bg	S	-	II	-	-	-	A3	-
<i>Dendrocopos medius</i> (L., 1758)	Ro Bg	S	I	II	-	3	-	A2, 3	-
<i>Dendrocopos leucotos</i> (Shp. & Dress., 1871)	Ro	S	I	II	-	3	-	A2, 3	V
<i>Dendrocopos minor</i> (Brehm, 1831)	Ro	S	-	II	-	-	-	A3	-
<i>Dryocopus martius</i> (L., 1758)	Ro	S	I	II	-	3	-	A2, 3	V
<i>Picus viridis</i> L., 1758	Ro	D	-	II	-	4B	-	A3	-
<i>Picus canus</i> (Gm., 1788)	Ro	D	I	II	-	3	-	A2, 3	V
<i>Melanocorypha calandra</i> (L., 1758)	Ro	(D)	I	II	-	3	-	A2, 3	E
<i>Calandrella brachydactyla</i> (Leis., 1814)	Ro	V	I	II	-	3	-	A2, 3	V
<i>Galerida cristata</i> L., 1758	Ro Bg	(D)	-	III	-	-	-	A3	-
<i>Lullula arborea</i> (L., 1758)	Ro Bg	V	I	III	-	3	-	A2, 3	-
<i>Alauda arvensis</i> L., 1758	Ro Bg	V	II	III	-	5C	-	A3	-
<i>Riparia riparia</i> (L., 1758)	Ro	D	-	II	-	-	-	A2,3	-

Table 1 (continued)

Species	INTERNATIONAL					ROMANIA		BULGARIA	
	Country	European Threat Status	EC Bird Directive	Bern Con.	Bonn Con.	RGO 57/2007	RBVRO	Biodiversity Act	Bulgarian Threat Status
1	2	3	4	5	6	7	8	9	10
<i>Hirundo rustica</i> L., 1758	Ro Bg	D	-	II	-	-	-	A3	-
<i>Delichon urbica</i> (L., 1758)	Ro Bg	S	-	II	-	-	-	A3	-
<i>Cecropis daurica</i> (L., 1771)	Bg	S	-	II	-	-	-	A3	-
<i>Ptyonoprogne rupestres</i> Scop., 1769	Bg	S	-	II	-	-	-	A3	-
<i>Anthus campestris</i> (L. 1758)	Ro Bg	V	I	II	-	3	-	A2, 3	-
<i>Anthus trivialis</i> (L. 1758)	Ro Bg	S	-	II	-	-	-	A3	-
<i>Motacilla flava flava</i> L., 1758	Ro Bg	S	-	II	-	4B	-	A3	-
<i>Motacilla flava feldegg</i> (Mich. 1830)	Ro Bg	S	-	II	-	4B	-	A3	-
<i>Motacilla alba</i> L., 1758	Ro Bg	S	-	II	-	4B	-	A3	-
<i>Luscinia luscinia</i> (L., 1758)	Ro	S	-	II	II	-	-	A3	-
<i>Luscinia megarhynchos</i> Brehm, 1831	Ro	(S)	-	II	II	-	-	A3	-
<i>Saxicola rubetra</i> (L., 1758)	Ro Bg	S	-	II	II	-	-	A3	-
<i>Saxicola torquata rubicola</i> (L., 1766)	Ro	(D)	-	II	II	-	-	A3	-
<i>Erithacus rubecula</i> (L., 1758)	Ro Bg	S	-	II	II	4B	-	A3	-
<i>Phoenicurus phoenicurus</i> (L., 1758)	Ro Bg	V	-	II	II	4B	-	A3	V
<i>Phoenicurus ochr. gibraltariensis</i> (Gm., 1789)	Ro Bg	S	-	II	II	4B	-	A3	-
<i>Oenanthe oenanthe</i> (L., 1758)	Ro Bg	S	-	II	II	-	-	A3	-
<i>Oenanthe pleschanka</i> (Lepechin, 1770)	Ro	(S)	-	II	II	3	V	A2, 3	E
<i>Oenanthe hispanica</i> (L., 1758)	Ro	V	-	II	II	-	-	A2, 3	-
<i>Turdus merula</i> L., 1758	Ro Bg	S	II	III	II	-	-	A3	-
<i>Turdus philomelos ericetorum</i> Brehm, 1831	Ro Bg	S	II	III	II	5C	-	A3	-
<i>Acrocephalus schoenobaenus</i> (L., 1758)	Ro	(S)	-	II	II	-	-	A3	V
<i>Acrocephalus scirpaceus</i> (Herm., 1804)	Ro	S	-	II	II	-	-	A3	-
<i>Acrocephalus arundinaceus</i> (L., 1758)	Ro	(S)	-	II	II	-	-	A3	-
<i>Hippolais pallida elaeica</i> (Hemp.& Ehr.,1833)	Ro	(V)	-	II	II	-	-	A3	-
<i>Hippolais icterina</i> (Vieil., 1817)	Ro	S	-	II	II	-	-	A3	V
<i>Sylvia nisoria</i> (Bechst. 1795)	Ro Bg	(S)	I	II	II	-	-	A2, 3	-
<i>Sylvia communis</i> Lath. 1787	Ro Bg	S	-	II	II	-	-	A3	-
<i>Sylvia atricapilla</i> (L. 1758)	Ro Bg	S	-	II	II	-	-	A3	-
<i>Sylvia curruca</i> (L. 1758)	Ro Bg	S	-	II	II	-	-	A3	-
<i>Phylloscopus sibilatrix</i> (Bechst. 1793)	Ro	(S)	-	II	II	4B	-	A3	-
<i>Phylloscopus collybita</i> (Vieil., 1817)	Ro Bg	(S)	-	II	II	4B	-	A3	-
<i>Muscicapa striata</i> (Pall., 1746)	Ro Bg	D	-	II	II	-	-	A3	-
<i>Parus caeruleus</i> (L. 1758)	Ro Bg	S	-	II	-	-	-	A3	-
<i>Parus major</i> L., 1758	Ro Bg	S	-	II	-	-	-	A3	-
<i>Aegithalos caudatus</i> (L., 1758)	Ro Bg	S	-	III	-	-	-	A3	-
<i>Panurus biarmicus ruscicus</i> (Brehm, 1831)	Ro	(S)	-	II	-	4B	-	A3	-
<i>Sitta europaea</i> Wolf, 1810	Ro Bg	S	-	II	-	4B	-	A3	-
<i>Remiz pendulinus</i> L., 1758	Ro	(S)	-	III	-	4B	-	A3	V
<i>Oriolus oriolus</i> (L., 1758)	Ro Bg	S	-	II	-	4B	-	A3	-
<i>Lanius collurio</i> (L., 1758)	Ro Bg	(D)	I	II	-	3	-	A2, 3	-
<i>Lanius minor</i> (Gm., 1788)	Ro Bg	(D)	I	II	-	3	-	A2, 3	-

Table 1 (continued)

Species	INTERNATIONAL					ROMANIA		BULGARIA	
	Country	European Threat Status	EC Bird Directive	Bern Con.	Bonn Con.	RGO 57/2007	RBVRO	Biodiversity Act	Bulgarian Threat Status
1	2	3	4	5	6	7	8	9	10
<i>Lanius senator</i> L., 1758	Ro	D	-	II	-	-	-	A3	-
<i>Garrulus glandarius</i> (L., 1758)	Ro Bg	(S)	-	III	-	5C	-	45	-
<i>Pica pica</i> (L., 1758)	Ro Bg	S	-	III	-	5C	-	A4	-
<i>Corvus frugilegus</i> L., 1758	Ro Bg	S	-	III	-	5C	-	A4	-
<i>Corvus monedula</i> (Vieil. 1817)	Ro Bg	(S)	-	III	-	-	-	A4	-
<i>Corvus corone</i> L., 1758	Ro Bg	S	-	III	-	5C	-	A4	-
<i>Corvus corax</i> L., 1758	Ro Bg	(S)	-	III	-	4B	E	A3	-
<i>Sturnus vulgaris</i> L., 1758	Ro Bg	S	-	III	-	5C	-	A4	-
<i>Passer domesticus</i> (L., 1758)	Ro Bg	S	-	III	-	-	-	45	-
<i>Passer montanus</i> (L., 1758)	Ro Bg	(S)	-	III	-	-	-	A3	-
<i>Passer hispaniolensis</i> (Temm., 1820)	Ro Bg	(S)	-	III	-	4B	-	A3	-
<i>Fringilla coelebs</i> (L., 1758)	Ro Bg	S	I 9	III	-	-	-	A3	-
<i>Carduelis carduelis</i> (L., 1758)	Ro Bg	(S)	-	II	-	4B	-	A3	-
<i>Carduelis chloris</i> (L., 1758)	Ro Bg	S	-	II	-	4B	-	A3	-
<i>Carduelis cannabina</i> L. 1758	Ro Bg	S	-	II	-	4B	-	A3	-
<i>Coccothraustes coccothraustes</i> (L., 1758)	Ro Bg	S	-	II	-	4B	-	A3	-
<i>Emberiza calandra</i> (L., 1758)	Ro Bg	(S)	-	III	-	4B	-	A3	-
<i>Emberiza citrinella</i> (L., 1758)	Ro Bg	(S)	-	II	-	-	-	A2, 3	-
<i>Emberiza melanocephala</i> Scop., 1769	Ro	(V)	-	II	-	4B	-	A3	-
<i>Emberiza schoeniclus</i> (L., 1758)	Ro	S	-	II	-	-	-	A3	-
<i>Emberiza hortulana</i> L., 1758	Ro	(V)	I	III	-	3	-	A2, 3	-

Abbreviations: European Threat Status: E - Endangered, V - Vulnerable, R - Rare, D - Declining, L - Localized, Ins. - Insufficiently Known, S - Secure, (S) - Status provisional, W - Category relates to winter population;

EC Bird Directive Annex I, Annex II, Annex III; Bern Convention Appendix I, Appendix II; Bonn Convention Appendix I, Appendix II

Protection statute: (RGO, with annexes) = Romanian Government Ordinance No. 57/2007, on the regime of the protected areas, conservation of the natural habitats, of wild flora and fauna:

A3-RGO 57/2007 = bird species whose conservation needs the establishing of the areas of special avifaunal protection; A4B-RGO No. 57/2007 = bird species which need strict protection; A5C-RGO No. 57/2007 = bird species of community interest whose hunting is allowed; A5D-RGO No. 57/2007 = bird species of community interest whose commercialization is allowed; A5E-RGO No. 57/2007 = bird species of community interest whose commercialization is allowed in special conditions.

RBVRO - Red Book of Vertebrates of Romania; Ro-Romania; Bg-Bulgaria;

From a total of 159 observed bird species, only 57 are protected by the international legislation (included in the annexes of the Bird Directives - 79/409/EEC (*European Economic Community*) or in national legislation. In Romania, 32 bird species are protected by the Red Book of Vertebrates and 99 species by the Romanian Government Ordinance No. 57/2007, on the regime of the protected areas, conservation of the natural habitats, of wild flora and fauna with annexes. In Bulgaria, 145 bird species observed in the field are protected by the Biodiversity Act (Tab. 1).

From the list above, most of the species are included in the annexes of the Bird Directive 79/409/EEC for the conservation of wild birds and in the national legislations (Romanian and Bulgarian) for the biodiversity conservation.

#### MAMMALS (Class MAMMALIA)

As regards the mammals, Murariu et al. (2009) reported 39 species of the orders Insectivora (5), Chiroptera (8), Lagomorpha (1), Rodentia (15), Carnivora (8) and Artiodactyla (2), discussing the evolution tendencies of each population, threatening category and protection statute in the international and national legislation. Our studies focused on collecting small mammals and on observations on those ones middle- and large sized. We returned in the same place several times for observing the birds and mammals, as in Suha Reka (Fig. 2 and fig. 3, left). In the same area, we found hills and galleries of *Spalax leucodon*, without results in catching one specimen (Fig. 3, right).

However, setting about 50 snap traps in Romanian and Bulgarian Dobrogea several small mammal species were caught as it was presented in



Fig. 2 - Suha Reka Valley. Left: The bridge under which bats roosted and the passage of Passeriformes passed (2008). Right: The same bridge with the net, to inventory birds and bats (2009). (Photos: D. Murariu)



Fig. 3 - Left: Underbridge roost for bats and birds in Suha Reka Valley. Right: A gallery of *Spalax leucodon* and a snap trap set at the entrance; also in Suha Reka Valley (2009). (Photos: D. Murariu)

figures 4 and 5. From the first station, 4 species were caught (Fig. 4) and among them, the most common species seemed to be *Apodemus sylvaticus*. *Apodemus agrarius* is also important because it usually prefers humid places, a rare habitat in Dobrogea, excepting few creeks and rivers (e.g. Telița). *Dryomys nitedula* lives mostly in afforested areas and it is the only door mouse species occurred in Dobrogea.

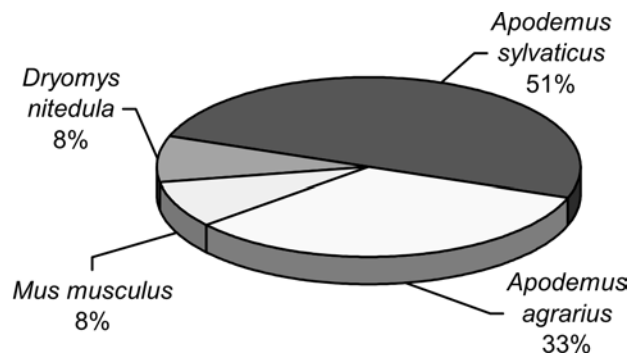


Fig. 4 - Four small mammal species collected from Celic Dere – Tulcea county (Romania, 2008).

In the Bulgarian stations (Bejanovo and Durankulak, figs 6 and 7) specimens of eight small mammal species were caught, only *Apodemus sylvaticus* (11) and *Apodemus agrarius* (10) being common with the Romanian part, also with a large number of individuals (Fig. 5). But *Crocidura suaveolens* was the dominant species. *Microtus arvalis* (6) and *M. subterraneus* (1) were less represented. *Mesocricetus newtoni* (1) is in its preferred steppe habitat (Fig. 7, right)

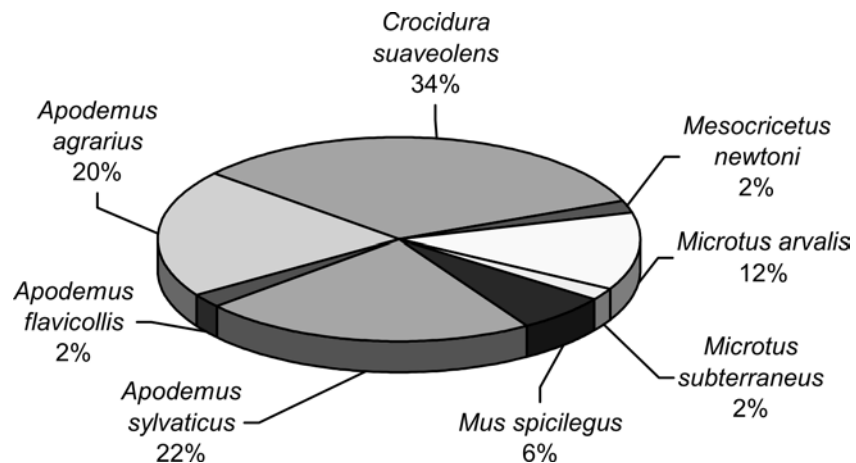


Fig. 5 - Eight small mammal species collected from Bejanovo and Durankulak (Bulgaria, 2009).



Fig. 6 - Reserve food for winter gathered by *Mus spicilegus*, close to Bejanovo (2009). (Photo: D. Murariu)



Fig. 7 - Two steppe habitats of collecting small mammal species from Bejanovo (left) and Durankulak (right) – Bulgaria (2009). (Photo: D. Murariu)

*List of the mammals reported from the Romanian and Bulgarian Dobrogea  
(2008 and 2009)*

Order INSECTIVORA Bowdich, 1821

Family Erinaceidae Bonaparte, 1838

*Erinaceus concolor* Martin, 1838

Family Talpidae Gray, 1825

*Talpa europaea* Linnaeus, 1758

## Family Soricidae (Gray, 1821)

*Sorex araneus* Linnaeus, 1758  
*Neomys fodiens* (Pennant, 1771)  
*Crocidura suaveolens* (Pallas, 1811)

## Order CHIROPTERA Blumenbach, 1779

## Family Rhinolophidae Bell, 1836

*Rhinolophus ferrumequinum* (Schreber, 1774)  
*Rhinolophus mehelyi* Matschie, 1901

## Family Vespertilionidae (Gray, 1821)

*Myotis myotis* (Borkhausen, 1779)  
*Plecotus auritus* (Linnaeus, 1758).  
*Miniopterus schreibersii* (Kuhl, 1819)  
*Pipistrellus pipistrellus* (Schreber, 1774)  
*Hypsugo savii* (Bonaparte, 1837)  
*Nyctalus noctula* (Schreber, 1774)

## Order LAGOMORPHA Brandt, 1855

## Family Leporidae Gray, 1821

*Lepus europaeus* Pallas, 1778

## Order RODENTIA Bowdich, 1821

## Family Sciuridae Gray, 1821

*Spermophilus citellus* (Linnaeus, 1766)

## Family Myoxidae Gray, 1821

*Dryomys nitedula* (Pallas, 1779)

## Family Cricetidae Rochebrune, 1883

*Mesocricetus newtoni* (Nehring, 1898)

## Family Arvicolidae Gray, 1821

*Arvicola terrestris* (Linnaeus, 1758)  
*Microtus* (= *Pitymys* Mc Murtrie, 1831) *subterraneus* (de Selys-Longschamps, 1836)  
*Microtus arvalis* (Pallas, 1779)  
*Ondatra zibethicus* (Linnaeus, 1766)

## Family Muridae Gray, 1821

*Apodemus sylvaticus* (Linnaeus, 1758)  
*Apodemus flavicollis* (Melchior, 1834)  
*Apodemus agrarius* (Pallas, 1771)  
*Rattus norvegicus* (Berkenhout, 1769)  
*Mus musculus* Linnaeus, 1766  
*Mus spicilegus* Petényi, 1882

## Family Spalacidae Gray, 1821

*Spalax leucodon* Nordmann, 1840

## Family Zapodidae Coues, 1875

*Sicista subtilis* (Pallas, 1773)

## Order CARNIVORA Bowdich, 1821

## Family Canidae Gray, 1821

*Canis aureus* Linnaeus, 1758

*Vulpes vulpes* (Linnaeus, 1758)

## Family Mustelidae Swainson, 1835

*Meles meles* (Linnaeus, 1758)

*Martes foina* (Erxleben, 1777)

*Mustela putorius* (Linnaeus, 1758)

*Mustela eversmanni* Lesson, 1827

*Vormela peregusna* Gldenstaedt, 1770

## Family Felidae Gray, 1821

*Felis silvestris* Schreber, 1777

## Order ARTIODACTYLA Owen, 1848

## Family Suidae Gray, 1821

*Sus scrofa* Linnaeus, 1758

## Family Cervidae Gray, 1821.

*Capreolus capreolus* (Linnaeus, 1758)

Among the 39 mammal species, some of them have a protection statute, mentioned in the Red Book of the Vertebrates of Romania, others in OUG 57/2007 on the regime of the protected natural areas, conservation of the natural habitats, of wild flora and fauna, in the annexes of the Law no 103/1996 (completed and modified) of the hunting fund and game protection in Romania, or in the annexes of the international conventions (ex., Habitat Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora).

### Conclusions

1. The terrestrial vertebrate fauna from Romanian and Bulgarian Dobrogea is an important part of biodiversity with 5 species of amphibians, 8 of reptiles, 159 of birds and 39 of mammals.

2. We consider that the amphibian fauna has reduced species diversity, mainly because Dobrogea is inhospitable by its steppe regime, without a rich hydrographic network, and the species reported by us (some of them terrestrial) are present along a few rivers, pools and lakes, where they can lay eggs.

3. From the 8 reptile species, some of them (e.g. *Emys orbicularis*) depend on the water presence, while others (*Testudo graeca*, *Lacerta agilis*, *Coluber caspius*, *Vipera ammodytes montandoni*) prefer the steppe habitats, with sunny slopes and xerophilous vegetation.

4. Ornithofauna of Romanian and Bulgarian Dobrogea includes species characteristic to the steppe areas (*Coturnix coturnix*, *Merops apiaster*, *Galerida cristata*), but also some aquatic species (*Cygnus olor*, *Anas platyrhynchos* etc.), to

which water accumulations and lakes of the studied area are refuges, foraging and nestling places.

5. From mammals, the following species are characteristics to the Dobrogea steppe: *Spermophilus citellus*, *Mesocricetus newtoni*, *Sicista subtilis*, *Spalax leucodon*, *Mustela eversmanni*, *Vormela peregusna*, which seem to have optimum populations for considering them elements of the biodiversity of the area, according to our observations and results.

6. For each reported species we mentioned the present protection statute in the national legislation (Romanian and Bulgarian), in the annexes of the international conventions on the conservation of the natural habitats, of the flora and fauna, or in the annexes of the special directive for birds.

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#### VERTEBRATELE TERESTRE DIN DOBROGEA ROMÂNEASCĂ ȘI BULGĂREASCĂ

##### REZUMAT

În cadrul contractului de colaborare româno-bulgară pe anii 2008 – 2009, finanțat de Ministerele Cercetării Științifice din ambele țări, s-a desfășurat studiul vertebratelor terestre din Dobrogea românească (județele Tulcea și Constanța) și din Dobrogea bulgărească (județele Silistra și Dobrich). În cei doi ani, au fost observate, colectate sau inventariate pe seama informațiilor din teren, un număr de 211 specii de vertebrate terestre, după cum urmează: 5 specii de amfibieni, 8 de reptile, 159 de păsări și 39 specii de mamifere. Amfibienii sunt vertebratele cu cea mai redusă biodiversitate în zona cercetată, cele mai multe specii fiind din clasa păsărilor. Pentru fiecare specie este pecizat statutul de ocrotire, amfibienii figurând în anexele OUG 57/2007 din legislația românească de conservare a biodiversității și ale Legii nr. 77/2002 din legislația bulgărească, iar la nivel internațional – în anexele Directivei 92/43/EEC asupra conservării habitatelor naturale, a faunei și florei sălbatice. De aceeași legislație se bucură și celelalte vertebrate, doar câteva fiind fără statut actual de ocrotire. Pe seama rezultatelor observațiilor și a colectărilor apreciem că starea ecosistemelor din Dobrogea bulgărească este mai apropiată de aceea naturală, decât în Dobrogea românească. Această stare se reflectă în mărimea diferită a populațiilor (mai mari în Bulgaria), aceluiași specii de vertebrate, probându-se și valoarea acestor specii ca bioindicatori, în cazul Dobrogei românești fiind o mai mare presiune antropică asupra ecosistemelor naturale. În ambele țări există arii protejate, dar suprafețele lor pot fi extinse, pentru creșterea șanselor de refugii și păstrare în fondul faunistic al unor specii rare sau periclitate: *Mesocricetus newtoni*, *Spermophilus citellus*, *Mustela eversmanni*, *Vormela peregusna* etc.

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