

ASPECTS CONCERNING THE DIVERSITY OF VERTEBRATE FAUNA ON THE PRUT VALLEY REGION - ARGUMENTS FOR A TRANSBOUNDARY NATURE RESERVE

Constantin ION, Ștefan R. ZAMFIRESCU and Iordache ION

“Al. I. Cuza” University Iași, Faculty of Biology, Bd. Carol I 20A, 700505 Iași, Romania,
costin_zoo@yahoo.com; zamfi@uaic.ro; ioni@uaic.ro

Abstract. The Prut River on Romanian territory flows on a distance of 704 km and forms a long border with the Republic of Moldova and Ukraine. The Prut Valley represents an important corridor for migratory birds and some species of fish. There are approximately 1380 species of plants. In some areas were found fossils of Quaternary animals, contemporaneous with primitive man. Actual fauna of invertebrate and vertebrate is very diverse in a large diversity of habitats. Were identified 34 species of fish, 15 species of amphibians, 14 species of reptile, more than 270 species of birds and 61 species of mammals, in entire basin of Prut River. In the area of the frontier there are 90 nature reserves of which 62 on the Romanian territory and 28 in Republic of Moldova. Strictly, along the Prut Valley, there are 13 protected areas of biological importance. The great floristic, faunistic and landscape diversity represent relevant arguments for designating the Prut Valley a transboundary nature reserve, which would act as a northward extension of the Danube Delta Biosphere Reservation.

Keywords: Biodiversity, Prut Valley, Natural Areas.

Rezumat. Aspecte privind biodiversitatea Văii Prutului - argumente pentru o Rezervație Transfrontalieră. Râul Prut curge pe o distanță de 704 km pe teritoriul României și formează granița cu Republica Moldova și Ucraina. Valea Prutului reprezintă un coridor important pentru păsările migratoare și pentru câteva specii de pești. Biodiversitatea este, în general, bogată și diversă. Au fost semnalate 1380 de specii de plante. În câteva zone au fost găsite resturi ale unor specii fosile datând din Cuaternar, contemporane cu omul primitiv. Fauna actuală cuprinde o imensă diversitate de animale nevertebrate și vertebrate ce populează o mare diversitate de habitate. Fauna de vertebrate include: 34 specii de pești; 15 specii amfibieni; 14 specii reptile; peste 270 specii de păsări; 61 specii de mamifere, în întreg bazinul Prutului. Rezervațiile naturale din zona de graniță sunt 90, din care 62 pe teritoriul românesc și 28 pe teritoriul Republicii Moldova. Marea diversitate floristică, faunistică și peisagistică pledează pentru transformarea Văii Prutului într-o rezervație transfrontalieră. Ea se va constitui, în fapt, într-o continuare a Rezervației Biosferei Delta Dunării.

Cuvinte cheie: Biodiversitate, Valea Prutului, Arii Naturale.

Introduction

The Prut River forms the natural border between Romania and Republic of Moldova in the East, and Ukraine in the North-East. It represents a biological large area with a great diversity of ecosystems.

The Prut River flows in the Danube River on the north side of the Danube Delta Biosphere Reservation and the Prut Valley through its geographical position is an extension of this Biosphere Reservation.

The Prut River has its origins in the Carpathians Mountains (Cernahora-Ukraine), covers a distance of 939 km, but on Romanian territory flows on a distance of 704 km. The Prut River generally flows from north – west to south – east and in its lower course, from north to south. The Prut River flows into the Danube near Reni, to the east of the Galați City. The Middle Prut borders to the east the Plain Moldavian Plateau, from Darabani to Țutora, and the plain of the Middle Prut, near Sculeni. Downstream, lays the Central Moldavian Plateau, the Hills of Tigheciu and the Plain of Southern Moldova. (Mihăilescu, 1994).

On the Romanian territory, on the right side the Prut River collects 248 small rivers with 4451 km of length. The main tributaries in the Middle Basin are: Ghireni, Volovăț, Bașeu, Vilia, Lopanic, Racovăț, Ciugur, Jijia. The River Jijia flows parallel to the Prut River on a distance of 66 km until the confluence at Gura Bohotin. The lower course of the Prut is from the Gura Bohotin until to the confluence to the Danube River, at Reni. In this sector, the river receives the following tributaries: Prutețul, Gura Văii, Sărata, Copăceana, Elanul, Recea, Hulubățul, Oita, Grumezoaia, Gâsla, Barboși, Mălăești, Horincea.

Among the natural lakes in the Prut Valley (Romanian Part) we mention: Belev, Manta, Rotunda, Dracile, Brateș that are connected to the river through numerous marshes (Romanescu *et al.*, 2005). The Prut River forms a large river meadow which periodically becomes a swamp, especially in spring.

The most important artificial lake in the Prut Valley is at Stâncă Costești that is 70 km long and it has a surface of 14000 ha. Other artificial lakes can found in the lower course of the river: Cârja, Mața-Rădeanu, Vlășcuța, Pochina, Vlădești which offer shelter for a large number of birds and also to some economically important fish species.

The aim of the our work is to present an actual situation of the presence of the species on the Prut Valley and to show which species are protected by the European Laws in order to make an image of the area importance for conservation. Our results complete those published by Ion & Ion (2008).

The Prut Valley represents an important corridor for the migration of birds and certain species of fish. Many wetland habitats represent faunal concentration areas that also include invertebrates, amphibians and reptiles. In the area of the frontier there are 90 nature reserves of which 62 on the Romanian territory and 28 in Republic of Moldova. Strictly, along the Prut Valley, there are 13 protected areas of biological importance.

Here were identified 1380 species plants, 61 vegetal associations (Tofan & Chifu, 2002). The wooden vegetation is represented by forests and riverside coppice. The rest of the Prut Valley is covered with large areas of lawns and crops. *Schivereckia podolica*, present on the rocks from Stâncă Costești Barrage has here, the western limit of the species area. Some plants from Prut Meadow are endemic for Romania: *Asparagus pseudoscaber*, *Cardamine glanduligera*, *Centaurea angeliscui* (Chifu *et al.*, 2006).

Here were discovered some animal fossil rests which lived in Quaternary Period: the Cave Bear, the Cave Lion, the Woolly Rhinoceros, the Mammoth and so on (Bejenaru, 2002).

In the recent past (four decades ago) the natural ecosystems were affected through draining, embankments, cutting down of the riverside forests, the construction of the dam, fisheries, accumulation lakes had a negative impacts on the flora, vegetation and fauna.

Material and Methods

For the observations in field we used: 10 x 50 binoculars; 40x 60 fieldscope; foto camera; G.P.S.; ornithological mist-nets (approximately 100 m long), herpetological hook; amphibian traps.

The observations were made between 2000-2008. Previous observations were also carried out, but they were sporadically. Our research was concentrated especially on the vertebrate fauna. We present in the paper only data about the species presence and frequency. The population size of some species of birds and mammals must be verified in the future, in the actual context of climatic changes and human impact.

The field trips were made in all seasons.

The studied area comprises not only the Prut Meadow but also the nature reserves of counties of Romania and the Republic of Moldova. These reservations (90) are situated in the counties bordered by the Prut River (Botoșani, Iași, Vaslui, Galați from România and Briceni, Edineț, Rîșcani, Glodeni, Fălești, Ungheni, Nisiporeni, Hincești, Leova, Cantemir, Cahul from the Republic of Moldova). The field observations were completed by the bibliographic sources, especially for the fish and mammalian fauna.

Results and Discussion

The ichthyofaunistic research carried out in the sector of the Prut River situated on Ukrainian territory (from the source until it enters in Romania) showed the presence of fish species characteristic to the ecological zone of the Trout (*Salmo* sp.) situated in the mountains. These species are: the Brook Trout (*Salvelinus fontinalis*), the Brown Trout (*Salmo trutta fario*), the Minnow (*Phoxinus phoxinus*) and the Spirlin (*Alburnoides bipunctatus*). Also in the Ukrainian sector of Prut, the following species were found: the Mediterranean Barbell (*Barbus meridionalis petenyi*), the Bullhead (*Cottus gobio*), the Siberian Sculpin (*Cottus poecilopus*) and the Rainbow Trout (*Oncorhynchus mykiss*) (Popa, 1962; Popa, 1976).

In the portion of the river from where it enters Romania (Dorofteana) to where it flows into the accumulation lake at Stâncă Costești 34 species of fish were identified, among which only six of real economical value. These species are: the Asp (*Aspius aspius*), the Common Carp (*Cyprinus carpio*), the Wels Catfish (*Silurus glanis*), the Prussian Carp (*Carassius gibelio*), the Pikeperch (*Stizostedion lucioperca*) and the Bream (*Abramis brama*). Approximately 84% is represented by species with low economical value like the Common Gudgeon (*Gobio obtusirostris*), the Common Bleak (*Alburnus alburnus*), the Bitterling (*Rhodeus sericeus*) and the Spined Loach (*Cobitis taenia*).

Upstream from the accumulation lake we point out the presence of the following fish species with economical value: the Common Bleak (*Alburnus alburnus*) in proportion of 88%, the Barbell (*Barbus barbus*) 3%, the Common Chub (*Leuciscus cephalus*) 1.5%, the Asp (*Aspius aspius*) 0.24% and the Pikeperch (*Stizostedion lucioperca*) 0.24% (Usatâi, 2004; Usatâi *et al.*, 1999).

Downstream from the accumulation lake at Stâncă Costești, eight species of real economical value were fished: the Prussian Carp, the Asp, the Silver Bream (*Blicca bjoerkna*), the Barbell (*Barbus barbus*), the Sneeep (*Chondrostoma nassus*), the Wells Catfish, the Perch (*Perca fluviatilis*) and the Pikeperch.

In the river sector between Fălcu to the confluence with the Danube (the plain zone), economically valuable fish species were identified such as: the Bream (*Abramis brama*), the Common Roach (*Rutilus rutilus carpathorossicus*), the Common Carp, the Pikeperch, the Wells Catfish and the Orfe (*Leuciscus idus*). As species with low percentage we mention: the Perch, the Common Bleak, the Common Bullhead (*Cottus gobio*).

A notable fact is that the Common Rudd (*Scardinius erythrophthalmus*) suffers a range regression, in the last years. Few individuals are found in the old meanders that are isolated through the dike which was constructed along the Prut River and in some of the ponds. This species is replaced by populations of the Common Roach (*Rutilus rutilus carpathorossicus*) which is abundant both in the river but especially in the flooded meanders and in the retention basins.

Due to the intensive fishing in the accumulation lake (Stâncă Costești) the Common Bream is in a numerical regression. The Common Carp is constant in numbers due to the young specimens which escape from the intensive breeding ponds. The

Pikeperch abundance is increasing because it began to be rare in ponds and retention basins.

The Streber (*Aspro streber*) forms numerous populations located in the portion of the river with calm, deep water and a rocky bottom. In autumn, 10-12 individuals per day can be caught with a fishing rod.

The modifications in habitat characteristics caused by the construction of the Stâncă Costești Lake (Vasiliu & Ion, 2000) meant that the zone of the Barbell and the zone of the Carp moved upstream. These zones reach actually at dam of Stâncă Costești.

In the retention basins from the Stâncă Costești Lake that were constructed it is carried out a controlled farming of certain fish species: the Grass Carp (*Ctenopharingodon idella*), the Silver Carp (*Hypophthalmichthys molitrix*), the Bighead Carp (*Aristichthys nobilis*) and the Black Carp (*Mylopharyngodon piceus*). Together with these species, a significant increase in numbers shows the Topmouth gudgeon (*Pseudorasbora parva*) and the Prussian Carp. The Prussian Carp reproduce naturally in the Prut River (Vasiliu & Ion, 2000; Usătai *et al.*, 1999).

Many years ago the waters of the Prut River were a very good environment for the reproduction of species that migrated from the Danube. The sturgeons and the Black Sea Shad (*Alosa pontica*) went upstream until Stâncă Costești. Nowadays, the Black Sea Shad disappeared, but from time to time we can find the Sterlet (*Acipenser ruthenus*). More common is a hybrid between the Sterlet and the Beluga Sturgeon (*Huso huso*), named Bester. This hybrid is fertile and it is reared in the fishing ponds from the Republic of Moldova. The Stellate Sturgeon (*Acipenser stellatus*) disappeared 40 years ago. In 2000 a Russian Sturgeon (*Acipenser guldenstaedti*) was captured during the summer flood at Berza, 30 km downstream from the dam of the Stâncă Costești Lake (Vasiliu & Ion, 2000). Also, the Caspian Shad (*Alosa caspia*) have showed a numerical regression during the last years (Oprea *et al.*, 2008b).

The Burbot (*Lota lota*) has a special situation: due to the fact that it is a nocturnal predator he spends the day in veritable underwater burrows and it is very hard to catch. For this reason it is considered a rare species. In winter (December-January) this species undergo reproductive migrations in the upper course of the river, reaching the setting down lake in front of the turbines. It was found that in during big river floods, the Burbot abandons its burrow and can be frequently captured.

The Crucian Carp (*Carassius carassius*) and the European Mudminnow (*Umbra krameri*) disappeared from the study area. The Weather Loach (*Misgurnus fossilis*) and the Tench (*Tinca tinca*) are rare species in pools and ponds of the Prut River.

The Whiteye Bream (*Abramis sapo*) and the Silver Bream (*Blicca bjoerkena*) reproduce in pools and migrate into the river. The Silver Bream remains for the most part of the year in the pools, but the Whiteye Bream returns to rivers. Because it lives in a fast flowing environment it has a pointy snout (it digs in the sand to look for chironomid and ephemeropter larvae). The individuals which remain in pools have a classical shape.

The Streber (*Aspro streber*) has not been found for almost 20 years. Now, it can now be found in the trenches made by sand excavation, in front of the water intakes from the Prut River and in the banks with diorite sand (Ion & Vasiliu, 1997).

Also, in the last decades the Sneeep, the Common Vimba and the Barbell have become very rare (Oprea *et al.*, 2008b). We suppose that the reduced food resources registered in the last years represent the cause for the present rareness of species.

In Stâncă Costești Accumulation Lake the following fish species were found: the Wells Catfish and the Pike as rare species; the Common Bleak is numerically constant and represents the basic food for predatory species (the Pikeperch, the Perch); the Silver

Bream, the Common Bream, the Roach and the Crucian form small populations. Towards the tail of the lake exists the Common Vimba (*Vimba vimba*) (Vasilu & Ion, 2000).

As a conclusion regarding fish fauna from the Prut River, we collected data about 44 species of fish (Table 1). The fish populations vary yearly and depend on the dimensions of spring floods, trophic resources and the turbidity of water (if high, the fish tend to migrate to the Danube Delta). Anyway, the fish species frequency is relative constant in Prut River. Recent studies revealed the same number of fish species (Davideanu *et al.*, 2008). Other recent research shows that in the entire basin of the Prut (including tributaries and ponds) live 52 species (Oprea *et al.*, 2008b).

Herpetofauna of Prut Valley comprises 15 species of amphibians and 14 species of reptiles (Table 2).

The Salamander (*Salamandra salamandra*) is very rare in basin or Prut River. It was identified only in the Iași County, in some protected areas: Poieni Cărbunărie, Pârcovaci.

The Yellow-bellied Toad (*Bombina variegata*) is also rare in the studied area, present only in the north of Republic of Moldova and of Romania (Iași and Botoșani Counties). It forms relatively small populations.

The Common Spadefoot (*Pelobates fuscus*) was recently recorded from the Prut Basin (Vasiloiu, 2007). We identified it in the last years in numerous protected areas from the Prut Valley, but the populations are small.

The most frequent species of amphibians are the Marsh Frog (*Pelophylax ridibundus*) and the Common Water-frog (*Pelophylax kl. esculentus*), present in all the wetlands from Prut Valley. Recently were published dates concerning the Pool Frog (*Pelophylax lessonae*) (Vasiloiu (Nicoară), 2007). Our recent studies revealed that this species is common and future researches are necessary to estimate the populations in basin of the Prut River.

The Agile Frog (*Rana dalmatina*) and the Common Frog (*Rana temporaria*) are present in the forest ecosystems with a high level of humidity. The Common Frog is rarer than the Agile Frog, and is present only in north-east of Moldova Plain.

Among forest frogs the rarest is the Moor Frog (*Rana arvalis*). It is present in the north of Botoșani County in: Stuhuosa, Tudora, Dresca protected areas.

The European Pond Terrapin (*Emys orbicularis*) is rare in the border zone between Romania and the Republic of Moldova. The significant populations were registered in the Larga Jijia-Vlădeni zone and in the Lower Basin of the Prut River.

The Slow Worm (*Anguis fragilis*) is present preponderantly in the Middle Basin of the Prut River, but no very frequently (Table 2).

The Green Lizard (*Lacerta viridis*), the Sand Lizard (*Lacerta agilis*) and the Grass Snake (*Natrix natrix*) are common in the Prut Valley.

The Viviparous Lizard (*Zootoca vivipara*) is very rare, discovered recently near Dorohoi (Botoșani County).

The Steppe Runner (*Eremias arguta*) is present only at the Hanu Conachi Reservation (Galați County), where its typical habitat, the sand dunes, exists (Strugariu, 2008, in verbis).

The Dice Snake (*Natrix tessellata*) is rare. Its presence was recorded in the Lower Basin of Prut River, in some protected zones of Galați County: Ostrovul Prut, Potcoava, Tălăbasca and in the region of the Inferior Prut River.

The Smooth Snake (*Coronella austriaca*) is present in forests with rocks. In the Republic of Moldova it is very rare in south at the Plaiul Fagului and Lower Waterside of Prut reservations.

The Aesculapian Snake (*Zamenis longissimus*) was signalled at Pietrosu Dobrovăt Reservation (Iași County) and Plaiul Fagului Reservation – the Republic of Moldova) but these observations are not certain.

The Large Whip Snake (*Dolichophis caspius*) was recently recorded from the Lower Waterside Prut River in the Galați County (Strugariu & Gherghel, 2007).

The Red List of the species of flora and fauna from the border zone Romania-Republic of Moldova includes a rare species of snake: the Blotched Snake (*Elaphe sauromates*) (Oprea *et al.*, 2008a). It was observed in the Inferior Prut River.

The Adder (*Vipera berus*) is very rare, present only in Iași County reservations: Cătălina–Cotnari, Poiana cu Schit, Pietrosu-Dobrovăt, Pădurea Bârnova, Repedea. In the Republic of Moldova was signalled at Plaiul Fagului Reservation.

The Meadow Viper (*Vipera ursinii moldavica*) is endemic for the region. It is present in the protected areas from Valea lui David and Dealul lui Dumnezeu (Iași County).

Avifauna. The existence of a more than 900 km long of the Prut River course, the presence of a large accumulation lake at Stâncă-Costești, the setting-down lake downstream from the dam, the presence of the fish farms, the ponds as well as the river meanders, the existence of the riverside forests and the flood plain, the forest reservations and the protected areas with large meadows situated in the vicinity of the river offer a multitude of habitats for birds, especially for the aquatic ones.

During spring and autumn migrations, many bird species fly along the Prut River and stop here for some periods for feeding. In the winters, when the water does not freeze, many species of aquatic birds remain in the area.

From the approximately 370 species of birds present in Romania, in Prut Valley we recorded more than 270 species. Not all of them are present constantly in the area. Other ornithologists give different results for the bird species of the Prut Valley: 225 (Gache, 2002), 239 (Oprea *et al.*, 2008b) or 222 (Papadopol & Mandru, 1967). Regarding the great number of bird species we present only those which recommend the Prut Valley as huge protected bird area. The presence of some bird species is inconstant (are erratic) during the years and others appear accidentally from Danube Delta Biosphere Reservation in the south of Prut Valley.

The bird species and their status of conservation in Romania are presented in Table 3. It is necessary to discuss the presence of some species, which were signalled in the past, but actually seems to have disappeared from the Prut Valley.

The Freat Northern Diver (*Gavia immer*), the Ruddy Shelduck (*Tadorna ferruginea*), the Dotterel (*Charadrius morinellus*), were signalled in the in the 60's (Ion I. & Vasiliu N., in verbis; Papadopol & Mândru, 1967). The first two species were recorded at the Stâncă Costești Lake. The Ruddy Shelduck was observed in South of Prut Valley. We did not find them in the last years in the Prut Valley. Also, there are some data (Vasiliu N., in verbis; Papadopol & Mândru, 1967) about the presence in the past of some very rare species for Romania (*Mellanita fusca*, *Mellanita nigra*). In the present, they were not signalled in the Prut Valley. We do not exclude some identification errors for these species or to be present in the winter at Stâncă Costești lake.

The Lesser White-Fronted Goose (*Anser erythropus*) appears in the Prut Valley accidentally. Few individuals, isolated, were observed after the year 2000 on the Stâncă Costești Lake, or in the south of the lake.

In the past, the White Pelican (*Pelecanus onocrotalus*) was recorded from the zone of Vlădeni (Papadopol & Mandru, 1967). In the present, the Common Pelican migrate northward in the Prut River Basin, up to the Cârja-Mața-Rădeanu ponds (Vaslui

County) (Ignat, 2008). In 2009 we observed the Common Pelican south of Fălciu town, near the Prut River.

The Bean Goose (*Anser fabalis*) (signalled by Papadopol & Mândru, 1967) was not found in the study zone in our study.

The Imperial Eagle (*Aquila heliaca*), was indentified in the Prut Valley in past (Papadopol & Mândru, 1967; Mândru, 1985; Ciochia, 1992; Ion & Gache, 1992; Gache *et al.*, 1997; Gache, 2002), during the passage or in the breeding period, but our observations did not confirm this record. This species may be erratic in our study zone and, therefore, present only in some years without continuity.

The Red-footed falcon (*Falco vespertinus*) is mentioned in the literature (Papadopol & Mândru, 1967; Mândru, 1985; Ciochia, 1992; Weber *et al.*, 1994; Gache, 2002; Munteanu *et al.*, 2002; Cartea Roșie a Vertebratelor din România, 2005). In the Prut Valley there are proper habitats, trees with empty nests, mainly built by corvids, but our observations doesn't revealed a significant population of the Red-footed falcon. We observed a breeding pair in 2009 at Larga Jijia ponds, at the confluence between Miletin and Jijia rivers. In rest, in the last years the observations concerning this species are sporadically, in the last years and don't confirm a stable population in the Prut Rivers Basin.

Concerning the Lesser Kestrel (*Falco naumanni*), identified in the 60's by Papadopol & Mândru (1967), we don't have any record in the last 20 years.

The Slender-billed Curlew (*Numenius tenuirostris*) was mentioned in some oral communications, in the 60's (Ion I., in verbis), but now it has disappeared from Moldova. In this case, we do not exclude some errors of identification. It is believed that nowadays this is an extinct species in the world (http://www.geocities.com/berkut_ua/selected/curlew.htm).

The Eurasian Eagle Owl (*Bubo bubo*) is mentioned in the Red List of the fauna from Prut Valley by Gache Carmen (Oprea *et al.*, 2008a) in some reservations from Iasi, Vaslui and Galați Counties and by Papadopol & Mândru (1967). We have not found this species in the forests from the Prut Valley. With regard to this species, future investigations are necessary, especially in the breeding period, to elucidate the size of the populations of the Eurasian Eagle Owl in basin of the Prut River.

The Barn Owl (*Tyto alba*) was recorded (Gache, 2002), before 2000, at Vlădeni and Hănești and, in the present, in the Republic of Moldova in the Lowland of the Inferior Prut River. We cannot confirm the presence of species on the Prut Valley, the Romanian part.

The Aquatic Warbler (*Acrocephalus paludicola*) was signalled only one at Larga Jijia in 1999 (Gache, 2002). We cannot confirm the presence of this species after 2000.

The Moustached Warbler (*Acrocephalus melanopogon*) mentioned by Ion (1991), could not be identified in reed beds from the Prut Valey during our study. Some erratic individuals have been observed, probably originating from the Danube Delta.

In 2008, in winter, at the confluence Jijia and Miletin rivers appeared the Horned Lark (*Eremophila alpestris*) (Baltag E, in verbis), which was also signalled in the past in the studied area (Papadopol & Mândru, 1967).

The Cetti's Warbler (*Cettia cetti*) and the Common Rosenfinch (*Carpodacus erythrinus*) have not been recorded in the Prut Valley for the last 20 years. The oral communications of some ornithologists about these species could result from some errors of identification. For the Common Rosenfinch are necessary investigations during the winter season.

Mammals. The mammal species identified in the Prut Valley rise to 61, which is more than half the total number of mammal species found in Romania (99).

Most of the species are rodents (22). The number of species has increased in last 20 years (Popovici & Ion, 2004; Popovici, 2005; Popovici, 2006). Viorica Simionescu identified in the studied zone 16 species of rodents (Popovici & Ion, 2004). Only one recorded species does not appear in the present study: the Ural Field Mouse (*Apodemus uralensis*), which seems to have disappeared from studied zone.

The relatively common rodents of the study area are: *Spermophilus citellus*, *Muscardinus avellanarius*, *Eliomys quercinus*, *Dryomys nitedula*, *Cricetus cricetus*, *Cricetulus migratorius*, *Mycomys minutus*, *Arvicola terrestris*, *Spalax graecus*, *Sciurus vulgaris*, *Apodemus sylvaticus* and *Apodemus flavicollis* (Popovici & Niculăeș, 2005). In the agricultural fields, barns, deposits we frequently found: *Rattus norvegicus*, *Mus musculus*, *Mus spicilegus*, *Apodemus agrarius*, *Microtus arvalis* and *Clethrionomys glareolus*. In wet areas, pools, ponds with lush vegetation, the Muskrat (*Ondatra zibethicus*) makes its burrows.

Two species require the designation of special areas of protection in Romania (1992, Habitats Directive): the Southern Birch Mouse (*Sicista subtilis*) and the Souselik (*Spermophilus citellus*). The Southern Birch Mouse is very rare at Valea lui David, Prut River, Dealul lui Dumnezeu, Mârzești (Iasi County), at Ostrovul Prut, Waterside of Lower Prut (Galați County) and in Waterside Lower Prut (Republic of Moldova). We suppose that the Southern Birch Mouse populations are almost extinct from Prut Valley. The Souselik is constantly present and abundant in the open areas on the Prut Valley, where it finds suited habitats (field with steppe vegetation) for food and reproduction.

The bats that were identified in the Prut basin belong to 15 species, which are strictly protected in Europe, being of community interest: *Eptesicus serotinus*, *Plecotus auritus*, *Nyctalus noctula*, *Pipistrellus pipistrellus* and *Pipistrellus pygmaeus*, *Myotis nattereri*, *Vespertilio murinus*, *Plecotus austriacus*, *Myotis blythii*, *Pipistrellus nathusii*, *Myotis brandtii* (Ifrim & Valenciu, 2006a), *Nyctalus leisleri*, *Myotis daubentonii*. Other recently identified species are: *Pipistrellus kuhlii*, *Myotis dasycneme* and *Barbastella barbastellus* (Ifrim & Valenciu, 2006b). The Rearmouse (*Vespertilio murinus*) is strictly protected in Romania and was identified at: Icușeni, Medeleni, Tătăruși, Uricani, Gârboavele, Tălășmani, the Waterside of the Lower Prut, Ciornohal, in Romania and at: the Waterside of the Lower Prut, Dancu, Ostianova, Seliște, Zbroia, Lunca, Stâncă, Prociumbeni, Cahul, Seliște, Lebada Albă in the Republic of Moldova (Oprea *et al.*, 2008a).

From the Order Lagomophya (rabbits) we found the Brown Hare (*Lepus europaeus*), in great numbers, pursued by hunters in the hunting season and the Rabbit (*Oryctolagus cuniculus*), near the Iasi airport in an area with dry sandy soil. It was also seen at the Victoria Village in caves digging in clayey edges

Only 8 species belong to the insectivore small mammals: The number of species is the same with those identified by Viorica Simionescu, between 1950 - 1983 (Popovici & Ion, 2004; Popovici, 2006), but some species are new for the Prut River Basin and other are not anymore found. The Greater white-toothed Shrew (*Crocidura russula*) have not been observed during our study. As a new species for the zone we mention the Water Shrew (*Nemomys fodiens*). In the Prut Valley, we have identified the following species: *Nemomys fodiens*, *Nemomys anomalus*, *Crocidura leucodon*, *Crocidura suaveolens*, *Sorex minutus*, *Sorex araneus*, *Talpa europaea* and *Erinaceus concolor*. The majority of insectivorous species are relative common in the Prut Valley, but they form small populations. Two of them (the Water Shrew and the Miller's Water Shrew - *Nemomys anomalus*) are very rare in the Prut Valley and, in our opinion; some protective measures should be adopted.

The Hoofed mammals (Artiodactyla) are represented by 5 species.

The Wild Boar (*Sus scrofa*) appears in small populations in the clearings of the riverside forests.

The Elk (*Alces alces*) is a strictly protected species. The presence of the Elk in Prut Valley is sporadic – isolated individuals come from Ukraine and wander for a good period of time in the area, especially in the cold season. Some of them reached Podu Iloaiei (Iași County), Huși (Vaslui County), Vârful Câmpului (Botoșani County), in the 80's. In present, it was occasionally observed in the north-east of Romania.

The Red Deer (*Cervus elaphus*) is rarely found in Prut Valley. One female was seen in august 2006 in a meadow near Prut, in Gorban Village.

The Roe Deer (*Capreolus capreolus*) finds favourable feeding and breeding conditions in the agricultural fields which border the riverside forests.

A spectacular presence in Prut Valley is that of The European Bison (*Bison bonasus*) in the Republic of Moldova, in the Pădurea Domnească Reservation. There are three specimens, which are kept in semi-captivity conditions.

From the Order Fissipeda (carnivores), in the Prut Valley area, nine species of carnivores were observed: the Fox (*Vulpes vulpes*) is a common species in all forests, bush lands, agricultural fields; the Raccoon Dog (*Nyctereutes procynoides*) was observed hunting rodents (it lives an inconspicuous life and the hunters catch it in traps). In addition, we remark the extension northwards of Raccoon Dog and Jackal (*Canis aureus*) populations, from Danube Delta Biosphere Reservation, till wetlands and agricultural fields from Cârja- Mața- Rădeanu area. The Eurasian Badger (*Meles meles*) has a small but constant numbers. It lives in the ravines and riverbanks of the Prut Valley.

The Common Polecat (*Mustela putorius*) and the Weasel (*Mustela nivalis*) are found near houses, in villages.

The strictly protected carnivores of community interest are: the Otter (*Lutra lutra*) and the Wild Cat (*Felis silvestris*). Because the Prut Valley is a frontier zone the access of the hunters is limited, these animals find here a good refuge.

Recently, in 2008, the Wolf (*Canis lupus*), another strictly protected species, was observed in south of the Prut Valley, at Cavadinesti, by foresters, but this record must be confirmed in the future by others observations. Also there are some dates about presence of the Wolf in the Medeleni Forest, near the Prut River, in the middle of the winter. The Wolves, probably, come from the Republic of Moldova., when in the winter is very cold.

The Prut Valley with its great variety of habitats and vast territory represents a natural extension of the Danube Delta Biosphere Reservation. In this area it is preserved a large biodiversity with international significance for the “Natura 2000” network.

Conclusions

In the Prut Valley, we identified:

- 34 species of fish, from which 5 species are protected by European Laws; 2 species are strictly protected in Romania
- 15 species of amphibians, 14 species of reptile, 3 species of amphibians and 3 species of reptiles are strictly protected in Romania; 11 species of amphibians and 1 species of reptiles are protected in Europe;
- More than 270 species of birds; 11 species strictly protected in Romania; 68 of them are protected in Europe.
- 61 species of mammals; 5 species are strictly protected in Romania; 27 species are protected in Europe.

The number of vertebrate species inventoried by us is greater than the one mentioned by literature, but future studies are needed to estimate the population sizes for achieving a clear image concerning the biological conservation of species.

Also it must be confirmed in the future the presence of some species, especially of birds and mammals.

In our opinion, given the great and important diversity of vertebrate fauna, the river meadow of the Prut and the neighbouring nature reserves from Romania and the Republic of Moldova, should be included in a Natural Transfrontalier Park.

Acknowledgments

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Table 1. The ichthyofauna from the Prut Valley.

No. crt.	Species	Presence	Annex 2	Annex 4	Annex 4B
1	<i>Acipenser ruthenus</i>	Rare			
2	<i>Alosa caspia nordmanni</i>	Frequently			
3	<i>Esox lucius</i>	Frequently			
4	<i>Rutilus rutilus</i>	Abundant			
5	<i>Rutilus rutilus heckeli</i>	Abundant			
6	<i>Leuciscus leuciscus</i>	Frequently			
7	<i>Leuciscus cephalus</i>	Frequently			
8	<i>Leuciscus idus</i>	Rare			
9	<i>Scardinius erythrophthalmus</i>	Abundant			
10	<i>Ctenopharingodon idella</i>	Rare			
11	<i>Aspius aspius</i>	Frequently	*		
12	<i>Leucaspius delineatus</i>	Abundant			
13	<i>Chondrostoma nasus</i>	Frequently			
14	<i>Gobio gobio</i>	Frequently			
15	<i>Gobio kessleri</i>	Frequently	*		
16	<i>Gobio albipinnatus belingi</i>	Frequently	*		
17	<i>Barbus barbus</i>	Frequently			
18	<i>Alburnus alburnus</i>	Abundant			
19	<i>Blicca bjoerkna</i>	Abundant			
20	<i>Abramis brama danubii</i>	Frequently			
21	<i>Abramis sapa</i>	Frequently			
22	<i>Vimba vimba vimba</i>	Rare			
23	<i>Pseudorasbora parva</i>	Abundant			
24	<i>Rhodeus sericeus amarus</i>	Abundant	*		
25	<i>Pelecus culturatus</i>	Abundant	*		
26	<i>Carassius carassius</i>	Rare			*
27	<i>Carassius auratus gibelio</i>	Frequently			
28	<i>Hypophthalmichthys molitrix</i>	Rare			
29	<i>Aristichthys nobilis</i>	Rare			
30	<i>Cyprinus carpio</i>	Rare			
31	<i>Cobitis taenia</i>	Abundant	*		
32	<i>Misgurnus fossilis</i>	Frequently			
33	<i>Noemachilus barbatulus</i>	Rare			
34	<i>Silurus glanis</i>	Rare			
35	<i>Pungitius platigaster</i>	Abundant			
36	<i>Stizostedion lucioperca</i>	Frequently			
37	<i>Perca fluviatilis</i>	Common			
38	<i>Aspro zingel</i>	Rare	*	*	
39	<i>Aspro streber</i>	Rare			
40	<i>Gymnocephalus cernuus</i>	Abundant			
41	<i>Lepomis gibbosus</i>	Frequently			
42	<i>Proterorhinus marmoratus</i>	Frequently			*
43	<i>Neogobius kessleri</i>	Frequently			
44	<i>Neogobius fluviatilis</i>	Frequently			

Legend: Presence - present in water of the Prut River Basin, but not in a great number of individuals; abundant - constantly present with significant populations; rare- present only few times (under 10% of our observations) in the collected information about fishing from the Prut River. Annex 2 - Animal and Plant Species of Community Interest whose Conservation requires the designation of Special Areas of Conservation (***, 1992, Habitat Directive); Annex 4 - Animal and Plant Species of Community Interest in Need of Strict Protection (***, 1992, Habitat Directive); Annex 4B - strictly protected in Romania (***, OUG 57/2007).

Table 2. The herpetofauna from the Prut Valley.

No. crt.	Class Amphibia	Presence	Annex 2	Annex 4	Anex 4B
1	<i>Salamandra salamandra</i>	Rare			*
2	<i>Triturus cristatus</i>	Present	*	*	
3	<i>Lissotriton vulgaris</i>	Present	*	*	*
4	<i>Bombina bombina</i>	Present	*	*	
5	<i>Bombina variegata</i>	Rare	*	*	
6	<i>Pelobates fuscus</i>	Rare	*	*	
7	<i>Bufo bufo</i>	Present			*
8	<i>Epidalea viridis</i>	Present		*	
9	<i>Hyla arborea</i>	Abundant		*	
10	<i>Pelophylax ridibundus</i>	Abundant			
11	<i>Pelophylax kl. Esculentus</i>	Abundant			
12	<i>Pelophylax lessonae</i>	Present			*
13	<i>Rana dalmatina</i>	Abundant		*	*
14	<i>Rana temporaria</i>	Present			
15	<i>Rana arvalis</i>	Rare		*	
Class Reptilia					
1	<i>Emys orbicularis</i>	Present	*	*	
2	<i>Anguis fragilis</i>	Present			*
3	<i>Lacerta viridis</i>	Abundant		*	
4	<i>Lacerta agilis</i>	Abundant		*	
5	<i>Zootoca vivipara</i>	Rare		*	
6	<i>Eremias arguta</i>	Rare			*
7	<i>Natrix natrix</i>	Abundant			
8	<i>Natrix tessellate</i>	Rare		*	
9	<i>Coronella austriaca</i>	Present		*	
10	<i>Zamenis longissimus</i>	Rare		*	
11	<i>Dolichophis caspius</i>	Rare		*	
12	<i>Elaphe sauromates</i>	Rare	*		
13	<i>Vipera berus</i>	Rare			*
14	<i>Vipera ursinii moldavica</i>	Rare	*	*	

Legend: Presence - present in water of the Prut River Basin, but not in a great number of individuals; abundant - constantly present with significant populations; rare - present only few times (under 10% of our observations) in the collected information; Annex 2 - Animal and Plant Species of Community Interest whose Conservation requires the designation of Special Areas of Conservation (***, 1992, Habitat Directive); Annex 4 - Animal and Plant Species of Community Interest in Need of Strict Protection (***, 1992, Habitat Directive); Annex 4B - species strictly protected in Romania (***, OUG 57/2007).

Table 3. The protected birds species from the Prut Valley.

No. crt.	Species	Presence	Annex 1	Annex 2
1	<i>Gavia arctica</i>	Rare, in winter	*	
2	<i>Gavia stellata</i>	Rare, in winter	*	
3	<i>Tachybaptus ruficollis</i>	Present		*

No. crt.	Species	Presence	Annex 1	Annex 2
4	<i>Phalacrocorax pygmaeus</i>	Rare	*	
5	<i>Pelecanus onocrotalus</i>	Rare	*	
6	<i>Botaurus stellaris</i>	Rare	*	
7	<i>Ixobrychus minutes</i>	Present	*	
8	<i>Nycticorax nycticorax</i>	Abundant	*	
9	<i>Ardeola ralloides</i>	Present	*	
10	<i>Egretta garzetta</i>	Present	*	
11	<i>Casmerodius albus</i>	Present	*	
12	<i>Ardea purpurea</i>	Present	*	
13	<i>Ciconia nigra</i>	Rare	*	
14	<i>Ciconia ciconia</i>	Present	*	
15	<i>Plegadis falcinellus</i>	Present	*	
16	<i>Platalea leucorodia</i>	Present	*	
17	<i>Cygnus Cygnus</i>	Rare, in winter	*	
18	<i>Anser erythropus???</i>	Rare, in winter	*	
19	<i>Branta ruficollis</i>	Rare, in winter	*	
20	<i>Aythya nyroca</i>	Present	*	
21	<i>Pernis apivorus</i>	Rare	*	
22	<i>Milvus migrans</i>	Rare	*	
23	<i>Milvus milvus</i>	Rare	*	
24	<i>Haliaeetus albicilla</i>	Rare	*	
25	<i>Circus gallicus</i>	Rare	*	
26	<i>Circus aeruginosus</i>	Present	*	
27	<i>Circus cyaneus</i>	Present, in migration	*	
28	<i>Circus macrourus</i>	Rare, in migration	*	
29	<i>Circus pygargus</i>	Rare, in migration	*	
30	<i>Buteo rufinus</i>	Rare	*	
31	<i>Aquila pomarina</i>	Rare	*	
32	<i>Aquila clanga</i>	Rare	*	
33	<i>Hieraaetus pennatus</i>	Rare	*	
34	<i>Falco vespertinus???</i>	Rare	*	
35	<i>Falco tinnunculus</i>	Present		*
36	<i>Falco subbuteo</i>	Present		*
37	<i>Crex crex</i>	Rare	*	
38	<i>Grus grus</i>	Rare, in migration	*	*
39	<i>Recurvirostra avosetta</i>	Present	*	
40	<i>Himantopus himantopus</i>	Rare	*	
41	<i>Phuvalis apricaria</i>	Rare, in migration	*	
42	<i>Charadrius alexandrinus</i>	Rare, in migration	*	
43	<i>Calidris alpina</i>	Rare, in migration	*	
44	<i>Limicola falcinellus</i>	Rare, in migration		*
45	<i>Actitis hypoleucos</i>	Rare, in migration		*
46	<i>Arenaria interpres</i>	Rare, in migration		*
47	<i>Gallinago media</i>	Rare, in migration	*	
48	<i>Tringa glareola</i>	Present, in migration	*	
49	<i>Larus minutes</i>	Rare, in migration	*	
50	<i>Sterna nilotica</i>	Rare, in migration	*	
51	<i>Sterna caspia</i>	Rare, in migration	*	
52	<i>Sterna hirundo</i>	Present	*	
53	<i>Sterna albifrons</i>	Rare, in migration	*	
54	<i>Chlidonias hybridus</i>	Abundant	*	
55	<i>Chlidonias niger</i>	Present	*	
56	<i>Otus scops</i>	Rare		*
57	<i>Athene noctua</i>	Present		*
58	<i>Bubo bubo</i>	Rare	*	
59	<i>Asio flammeus</i>	Rare	*	
60	<i>Alcedo atthis</i>	Present	*	
61	<i>Coracias garrulous</i>	Present	*	

No. crt.	Species	Presence	Annex 1	Annex 2
62	<i>Upupa epops</i>	Present		*
63	<i>Merops apiaster</i>	Present		*
64	<i>Picus canus</i>	Present	*	
65	<i>Dryocopus martius</i>	Rare	*	
66	<i>Dendrocopos syriacus</i>	Present	*	
67	<i>Dendrocopos medius</i>	Rare	*	
68	<i>Dendrocopos leucotos</i>	Rare	*	
69	<i>Melanocorypha calandra</i>	Rare	*	
70	<i>Lullula arborea</i>	Rare	*	
71	<i>Anthus campestris</i>	Rare	*	
72	<i>Luscinia svecica</i>	Rare	*	
73	<i>Sylvia nisoria</i>	Rare	*	
74	<i>Ficedula parva</i>	Present	*	
75	<i>Ficedula albicollis</i>	Present	*	
76	<i>Lanius collurio</i>	Present	*	
77	<i>Lanius minor</i>	Present	*	
78	<i>Emberiza hortulana</i>	Rare	*	

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Table 4. The mammal fauna from the Prut Valley.

No. crt.	Species	Presence	Annex 2	Annex 4	Annex 4 B
Rodentia					
1	<i>Apodemus agrarius</i>	present			
2	<i>Apodemus sylvaticus</i>	abundant			
3	<i>Apodemus flavicollis</i>	Abundant			
4	<i>Arvicola terrestris</i>	Present			
5	<i>Clethrionomys glareolus</i>	Rare			
6	<i>Cricetus cricetus</i>	Rare		*	
7	<i>Cricetulus migratorius</i>	Rare			
8	<i>Dryomys nitedula</i>	Rare		*	
9	<i>Eliomys quercinus</i>	Rare			
10	<i>Glis glis</i>	Rare			
11	<i>Micromys minutes</i>	Rare			
12	<i>Microtus arvalis</i>	Present			
13	<i>Mus musculus</i>	Abundant			
14	<i>Mus spicilegus</i>	Present			
15	<i>Muscardinus avellanarius</i>	Present		*	
16	<i>Ondatra zibethicus</i>	Present			
17	<i>Rattus norvegicus</i>	Abundant			
18	<i>Sciurus vulgaris</i>	Present			
19	<i>Sicista subtilis?</i>	Rare	*	*	
20	<i>Spalax graecus</i>	Rare			*
21	<i>Spalax leucodon</i>	Present			*
22	<i>Spermophilus citellus</i>	Present	*	*	
Lagomorpha					
23	<i>Lepus europaeus</i>	Abundant			
24	<i>Oryctolagus cuniculus</i>	Rare			
Chiroptera					
25	<i>Barbastella barbastellus</i>	Rare	*	*	
26	<i>Eptesicus serotinus</i>	Rare		*	
27	<i>Myotis blythi</i>	Rare	*	*	
28	<i>Myotis daubentoni</i>	Rare		*	

No. crt.	Species	Presence	Annex 2	Annex 4	Annex 4 B
29	<i>Myotis brandtii</i>	Rare		*	
30	<i>Myotis dasycneme</i>	Rare	*	*	
31	<i>Myotis nattereri</i>	Rare		*	
32	<i>Nyctalus noctula</i>	Rare		*	
33	<i>Pipistrellus kuhlii</i>	Rare		*	
34	<i>Pipistrellus nathusii</i>	Rare		*	
35	<i>Pipistrellus pipistrellus</i>	Rare		*	
36	<i>Pipistrellus pygmaeus</i>	Rare		*	
37	<i>Plecotus auritus</i>	Rare		*	
38	<i>Plecotus austriacus</i>	Rare		*	
39	<i>Vespertilio murinus</i>	Rare		*	*
Insectivora					
40	<i>Crocidura leucodon</i>	Rare			
41	<i>Crocidura suaveolens</i>	Rare			
42	<i>Erinaceus concolor</i>	Present			
43	<i>Neomys anomalus</i>	Rare			*
44	<i>Neomys fodiens</i>	Rare			
45	<i>Sorex araneus</i>	Rare			
46	<i>Sorex minutus</i>	Rare			
47	<i>Talpa europaea</i>	Present			
Artiodactyla					
48	<i>Alces alces</i>	Rare			*
49	<i>Bison bonasus</i>	Rare	*	*	
50	<i>Capreolus capreolus</i>	Rare			
51	<i>Cervus elaphus</i>	Rare			
52	<i>Sus scrofa</i>	Present			
Carnivora					
53	<i>Canis aureus</i>	Rare			
54	<i>Canis lupus</i>	Rare	*	*	
55	<i>Felis silvestris</i>	Rare		*	
56	<i>Lutra lutra</i>	Rare	*	*	
57	<i>Meles meles</i>	Rare			
58	<i>Mustela nivalis</i>	Present			
59	<i>Mustela putorius</i>	Present			
60	<i>Nyctereutes procyonoides</i>	Rare			
61	<i>Vulpes vulpes</i>	Present			

Legend: Presence- present in water of the Prut River Basin, but not in a great number of individuals; abundant - constantly present with significant populations; rare- present only few times (under 10% of our observations) in the collected information; Annex 2 - Animal and Plant Species of Community Interest whose Conservation requires the designation of Special Areas of Conservation (***, 1992, Habitat Directive); Annex 4 - Animal and Plant Species of Community Interest in Need of Strict Protection (***, 1992, Habitat Directive); Annex 4B - strictly protected in Romania (***, OUG 57/2007).

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