



**ASPECTS CONCERNING THE BIODIVERSITY'S CONSERVATION IN THE BORDER REGION BETWEEN ROMANIA AND R. MOLDOVA  
(Plenary lecture)**

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**SYNOPSIS**

The Prut River valley represents a natural border between Romania and R. Moldova. This region is one of the poorest for the both countries, the north-eastern part of Romania representing the poorest area of the European Union. At the same time, this territory still preserves a high level of biodiversity due to the border status that permitted a small and strictly checked presence of the people, but also due to the low level of industrial development of the area. During the last years, the human pressure increased, especially on the left, Moldavian, side of the border where exist illegally quarries and intensive deforestation actions, but also high risks for the stability of some aquatic ecosystems, including inside of some protected areas, due to the infrastructure development plans.

The Prut River valley represents a natural border between Romania and R. Moldova. This region is one of the poorest for the both countries, in fact, the north-eastern part of Romania representing the poorest area of the European Union. At the same time, this territory still preserves a high level of biodiversity due to the border status that permitted a small and strictly checked presence of the people, but also due to the low level of industrial development of the area – for decades, the human intervention was represented just by the hydro-technical arrangements, fisheries activities, agriculture and occasionally hunting games.

During the last 17 years, we visited the whole Romanian territory of the Prut River basin several times and covering more than 65 study stations following different aspects of the birds' fauna diversity (Gache, 2002). All this time, we observed the influence of different human activities on the ecosystems and biodiversity, too.

Beginning from August 2007, working through an international team in the project *Mutual management Romania – Republic Moldova for biodiversity conservation on the border between the two countries* (beneficiary being the Environmental

Protection Agency from Iasi County in a large partnership with Romanian and Moldavian authorities and non-governmental organisations), we visited the both sides of the Prut River valley. We were focusing our attention on the all protected areas from this territory, but also on some important perimeters viewing the birds' fauna diversity, in order to evaluate the present status and trends of the birds' fauna and the impact of different human pressure factors on the qualitative and quantitative dynamic of the avifauna in the border region. We tried to evaluate the impact of the climate's evolution (very strong dryness in 2007, impressive flooding phenomenon in 2006 and 2008' summers, practical in the same territory) on the birds' presence and birds' populations' trend in this perimeter.

Nor only because we have access to very good information on the birds' fauna diversity and dynamic in this Prut River basin, covering near the last two decades, but due the Birds' Directive (79/409/EEC) that represents one of the basis of the European Union strategy for biodiversity, the importance of the birds' fauna's monitoring programs increased, too. Numerous studies proved that the birds are very sensitive almost for all kind of external influence on the ecosystems, the birds' population having a negative trend and some bird species disappearing before we can identify the real reason of these reactions. The birds' diversity and populations represent very useful bio-indicators in the evaluation of environment's "health" status and, in fact, the life's quality in a territory. The presence of certainly bird species (included in the Annexe 1 of the Birds' Directive and representing the criteria C1 in the EU' strategy for stopping the biodiversity's decline till 2010) and the birds' effectiveness in one territory represent the principal elements necessary to establish the status of Special Protected Areas (SPA), like part of the Natura 2000 Network. Together with the information about habitats (Annexe 1 of the Habitats' Directive – 92/43/EEC modified through the Directive 92/43/EC), flora's diversity and other animal species (Annexe 2 of the Habitats' Directive), the data on the birds' fauna serve, also, to declare a territory Site of Community Importance (SCI) that will become Special Area of Conservation (SAC).

In the whole basin of the Prut River, we recorded 248 bird species (67% from the Romania's birds' fauna), belonging to 42 families and 12 orders (Sibley & Ahlquist, 1990), From these, at least 139 are bird breeding species in this territory, ones of them very rare breeding species for Romania (*Platalea leucorodia*, *Plegadis falcinellus*, *Limosa limosa*, *Recurvirostra avosetta*, *Himantopus himantopus*, *Luscinia svecica*, etc.). Following the bird species' frequency in the area, we found 60 common bird species (present in the all points of observation), 77 frequently bird species (present near in the all observation sites where the species' suitable habitat exist), 35 rare or relatively rare bird species (present just in specific periods of the year and only in observation sites) and 18 very rare bird species (species recorded few times or just in specific areas during the last 5 – 10 years).

We proposed a list about 81 bird species for the Red List of the Prut River basin, using the Romanian and Moldavian national Red Lists, but also our fieldwork's results – we listed some species that present very small populations or have a constant negative trend during the last decade in this territory. Regarding the threatening risk,

we must notice the presence of 9 critically threatened bird species, 16 threatened bird species and 31 vulnerable bird species.

If we talk about the economical aspects, it is truly that some bird species and groups of bird species can prejudice the human interests, especially, in the agricultural production and fisheries, but when we take the birds' yearly biology and ecology account, we can see that the birds are "setting off" these damages eating, at least during their breeding season, a huge quantity of insects and other animals that can produce bigger economical losses in agriculture, forestry and fisheries. We can include here the fish-eating bird species (pelicans and cormorants), too, because these birds represent hygienically agents and natural selection factors for the fish populations in the fishery ponds.

Despite the high biodiversity and the low level of the human activities on the territory of this hydrological basin before the year 1989, the number and surface of the natural reserves were very small. Slowly and just after this year, the both countries began to designate natural or scientific reserves in this perimeter. In Romania, this interest appeared only after the beginnings of Natura 2000 Network creation like part of European Union Admission Treat (in the chapter regarding the environment).

In this moment, there is no one trans-boundary protected area, each country establishing some protected area perimeters and own laws of administration for it:

- On the Romanian side, in the Prut River basin were designated one natural park ("Lower Meadow of Prut River") and seven Important Birds' Areas – Stanca-Stefanesti Lake and meadow forest, Belcesti Lakes, Ibaneasa-Baseu-Podriga Lakes, Carja-Mata-Radeanu Lakes & Roscani Forest, Jijia and Miletin ponds, Vladesti-Frumusita Prut River valley and Brates Lake (the last two are belonging to the natural park) - (Papp & Fantana, 2008), part of them being included in the Romanian Natura 2000 Network (HG 1284/2007).

- On the Moldavian side of the valley, there exist numerous small natural reserves, but also three scientific reserves: "Plaiul Fagului/Beech's Forest", "Padurea Domneasca/Royal Forest" and the "Prutul de jos/Lower Prut River", covering a total surface about 13,365 hectares. We must notice here the last protected area's territory (about 1,691 ha, published in HG 209/1991) represent part of a larger wetland – the surface is about 19152.5 ha - with Ramsar situ status (no. 1029), under the name "Lakes of the Low Prut River", with the wetland flora and fauna's protection like first priority.

Like a general rule, in the all the natural parks, scientific natural reserves but also the sites of the Natura 2000 Network, the activities can be developed only through an ecological management plan. But, which is the real present situation? It is well known the fact that these two countries are in a transition period, with very different political, economical and social situations.

The biodiversity's long term's management in the border area represent the biggest challenge for the environmental protection authorities. First of all, the protected areas present different status on the two sides of the Prut River basin. For this reason, if on the one side, the natural resources' extraction is strictly controlled, on the other side, the local community or an industrial factory can use all the technical

methods and all kind of machines to extract rock, sand, gravel, reed, wood and other resources. Secondly, there are not survey plans and realistic maps of the protected areas.

In the same time, on the both sides of the river, there are not enough specialists in biodiversity's research field and ecological management, but also the administrative structures of the protected areas are missing. A strong problem, especially, on the left part of the river's basin, is the fact that the available data on the flora and fauna is poor and really old. Recently studies and only for few groups of plants and animals were done just in the three mentioned scientific natural reserves. Or it is truly that in order to elaborate and to implement a good ecological management plan it is necessary to have enough information about the territory's biodiversity, populations' trend and the ecosystems' dynamic, on the human activities' impact, but also, to develop an efficient biodiversity's monitoring program. Urgency, at least for the vulnerable species and those of economical interest, is to develop a census program in order to obtain a correct evaluation of their effectiveness.

If theoretically, in Romania, the management plans for biodiversity's conservation were elaborated for some protected areas and for other ones sites there are specialists that are working to arrange in a appropriate form this plans, the legal way for the ecological management plans' approval is very long and difficult. Between the intermediary authorities, all these management plans seems lost for ever. Practically, no one from the protected areas and Natura 200 Network sites delimited in the Romanian Prut River basin has a functional management plan. In some areas, the biodiversity's conservation presents good or very good level just because the people's access is very low and strictly controlled due the existence of some authorities that have not directly relations with the environmental protection (the border police service or the Romanian Waters Administration) or due the long distances between the villages and these perimeters (for example, in the inferior basin of the river, along a course about 40 kilometres length, the nearest village is at 10 km distance).

In the Republic Moldova, an administration service exists only for the scientific natural reserves, but due the lack of specialists and legislation's ambiguity, the activities of this authority have not enough force to preserve, nor to improve the quality of the biodiversity' status in these protected territories.

The reinforcement of the trans-boundary partnership in order to find the best solutions for the environmental problems and biodiversity's conservation represents one of the challenges included in the present Romanian Governmental Strategies (2005 - 2008). But the daily practice had taught us that the environmental issues are interesting just occasionally for the authorities, especially when is something that can attract negative position from the EU institutions. Till now, there are only two documents that settle the trans-boundary cooperation in environmental issues: the tripartite agreement (signed on the 5<sup>th</sup> June 2000) between Romania, Moldova and Ukraine regarding the cooperation in the Danube Delta and Lower Prut River, respectively, the accord regarding the fishing activities and fish species' protection in the Prut River and Stanca (Romania) -Costesti (Moldova) dam Lake's perimeter (HG

1207/2003). The specialists involved in the monitoring studies of this area assess that it is urgent for the governments of Romania and Moldova to develop a common strategy for the biodiversity's conservation in the trans-boundary region, especially in the context of the Natura 2000 Network implementation in Romania, like eastern border of the European Union.

By other hand, on the both side of the border it is necessary to increase the institutional capacity, to search and employ good specialist in the environmental researches and nature's protection problems, to improve the communication quality at the all levels and to develop a bilateral informational system.

If we look on the environmental legislation, despite the fact that there is place to improve the quality, for the both countries the laws are enough liberally. Romania adopted the all international conventions regarding the biodiversity's conservation and adapted its own legislation to the European Union's legislation. But there are problems to apply the laws in field due the existence of "small doors" opened in the applying norms and the corruption phenomenon. By other hand, the internal pressures (economic through political decisions' way) can affect the initial law through the modification in parliament or done by the government. For example, the Hunting Romanian Law (407/2006) appeared in November 2006, after near ten years of negotiations between different authorities, specialists from universities and environmental non-governmental organisations, was modified in parliament in July 2007 (Law 197/2007) in order to make it more permissive, as we'll see below. A similar example, but on the other legislative way, is the modification of the Romanian Law 452/2001 regarding the protected areas' status and the conservation of the natural habitats, flora and fauna (representing the adaptation of the Birds' and Habitats' Directives) through a Government Urgency Ruling (OUG 57/2007) that, like a norm, must adopted like law in parliament, but there where so many debates in the civil society and different levels of authority that this law still represent a great topic for debates, so, nobody know which will be the final form and when the law will be adopted.

The environmental laws in Moldova Republic still preserve some gaps, but it could be enough to conserve the biodiversity treasure. There are two principal problems: the right laws' applying and complying, the biggest excesses are done by the politicians. Unfortunately, the politicians use not only the existence of two-edged paragraphs to turn the law into their present interest without think about future, but there the laws can be modified or evaded very easy through a simple government's decision (HG, in Romanian language) – for example, through one HG they took out from the national forestry fund wooded surfaces about 140 ha for the use of Presidency and State Office, while through repeated amendments of the Environment Protection Law (1993) and the Protected Areas Fund Law (1538-XIII/1998) there it was possible the oil's extraction in the perimeter of the scientific reserve "Prutul de jos" for the benefit of REDECO Company or to transport on the Moldova Republic's territory the radioactive substances from Kozlodui.

For the both countries, but especially, in Moldova Republic, there is not enough personal to implement the environmental legislation and the corruption still represent

a big problem. Some time and on the both sides of the river basin, we can see that one forest about tens hectares was disappeared and nobody knows when and how it could be happens because there is someone with politic or economic, maybe both, power behind this kind of events. The penalties are, practically, inexistent in this area, so, is necessary not only to improve the legislation's quality but to build an administrative service to apply it correctly, too.

During the last years, the human pressure increased, especially on the left, Moldavian, side of the border where exist illegally quarries and intensive deforestation actions, but also high risks for the stability of some aquatic ecosystems, including inside of some protected areas, due the infrastructure development plans. Let see the principal human activities and its impact on the biodiversity of the Prut River basin.

The deforestation done in the meadow forest and in other wooded areas situated in the neighbourhood, too, represents not only a way to reduce the biodiversity of the region, but also bring great risks for the local community, promoting the conditions of phenomenon like the terrains' gliding, catastrophic flooding or erosion risk. A particular situation we met in the perimeter of the dam lake Stanca-Costesti where, in January 2006, there was completed cut a large surface of the meadow forest that was covering the downstream of the dam's perimeter, on the Moldavian side of the river. The river banks are clayey, so, we assumed than the high danger to be "washed" when the waters' level will increase like was happen few times in the last years. This year, in July's end, the Prut River touched historical waters' level (850 m/s at Stanca-Costesti dam for at least 72 hours), flooding the whole perimeter downstream of the dam and, till now, the consequences could not be evaluated. But the long term threats could be very big for the local community: risk of rapid washing or even breaking of the deforested river banks, the increasing of the water suspensions and water's quality's diminution or changing of the region's micro-relief and micro-climate.

The hydrological arrangements have a very strong impact on the landscape and on the biodiversity of one area. The dams arrangement creating large and deep lakes, the dikes' building that were disconnecting some old branches and meanders from the river bed, the drainages of swampy and marshes territories and the abandonment of some ponds string have a big influence on the biodiversity and on the local community's life, too. These arrangements must give benefits to the people and to the nature's long term equilibrium. The drainage of some large wetland surfaces had good results only at the beginning despite the biodiversity loss; after a period of good agricultural production, the soils became poor and, some times, even salty, so, now, these terrains are used like grazing areas just in the years with high rainfalls. The micro-climate had changed and other natural resources used by the local community were disappeared (hay fields, reed, fish, osier, etc.). In several points of the Romanian Prut River basin, large wetlands disappeared in the last decade due the abandonment and suspension of the maintenance works in some fisheries (some small lakes along the tributary rivers Ghireni, Volovat and Baseu in the northern part of the basin or the complete disappearance of Osoi fishery in the Bahlui River basin).

The ecological restoration of some lost wetlands can bring the solution for the biodiversity's increasing and, also, for the temporary water' stocking during the

flooding periods. Recently, the Romanian Waters Administration (RWA) began to develop a new strategy in order to let more place for the waters. Between one partnership with specialists and institutes from Netherlands, the Prut River Direction developed an ecological restoration project on the Old Jijia River, in Iasi County. After only six month from the project implementation, we recorded 36 bird species during three hours of field observation in the area. The success of this project encourage the public and the local decision factors to develop similar projects but, even if the Romanian protected areas law (462/2001) stipulates that ecosystems resulted of an ecological restoration program become natural reserves, in fact we need enough long term to cover the legal steps in order to obtain this status. So, in this time, there can be happen not-desirable events – hunting games, un-authorized released of the waters (especially to facilitate the fishing activities), etc. – because even the Prut Direction from RWA is the owner of the majority surface of this area, the actual hunting law permit to organise hunting games in a non-protected area without any permission from the land's owner. In September 2007, the hunters were shutting the new appeared aquatic bird species in the territory despite the fact that these species are not listed like present in the old delimited hunting area (before the ecological restoration project's implementation).

The natural resources' extraction but also other human activities, including the tourism and entertaining activities, could affect the biodiversity in the border region if these activities have a wrong administration. Some natural monuments or landscapes can be destroyed, being very fragile (for example, the high rock cliffs and the fossil deposits from the middle part of Prut River basin, in Republic Moldova). In Romania, there are only two sand quarries along the river bed but on the left side of the basin, there are numerous and illegally sand, gravel and limestone quarries. This kind of the natural resources' extraction have a string negative impact on the biodiversity but is dangerous for the general aspect of the landscape, too. The relief of the river bed can be radically modified, especially in the case of high level of the waters and flooding situations. The clay's extraction from the high river banks represents a great threatening factor for the breeding season of bird species like (*Merops apiaster*, *Alcedo atthis*, *Coracias garrulus* or *Riparia riparia*), determining the population's diminution and even the disappearance of some breeding species from the area. The reed's extraction has a long tradition in this border region, the local community respecting the nature' seasonal' laws. But the reed's arson, especially in the spring time, can produce big damages, killing numerous animals and disturbing the breeding season of the birds that are building their nests in the reedbeds' perimeter (grebes, herons, egrets, spoonbills, ibises, geese, swans, ducks, etc.).

The infrastructures' development, especially of the roads and railways network, produces the radical altering of the landscapes and ecosystems, degrading the habitats and, some time, the micro-relief, too. For example, during the last about two years, in the Republic Moldova, appeared the idea to create a railway in the inferior Prut River's basin, nearest the river bed, through the border crossing point Giurgiulesti. This railway is crossing a territory with an incredible biodiversity, including part of the scientific natural reserve "Lower Prut River", that is not legally

(discussing with the people from the area, there seems to be some powerful politicians behind this project). But to build this railway, there were transported and stored a huge quantity of materials in order to support the railway. During this arrangement, large wetland surfaces were covered, important habitats were broken up, destroying birds' breeding and feeding territories, but also fishes' reproduction territories, even this material seems to be not strong enough to assure a real support for the railway, being a mixture of sand and clay, without any rock in its composition. There is other information about a project to develop a road for heavy transport along the flooding protection dike, in the same area that can affect the river bed. In this context, we must notice that the existence of the natural park on the right side of the river can be strongly threatened by this project.

Recently, on the Romanian side of the Prut River, especially in the middle part of the basin (Vaslui County), there were appearing numerous wind measuring systems. This means that there exists interest to build wind farms in those areas, despite the existence of some Natura 2000 sites and protected areas in this perimeter and ignoring the high importance of the birds' migration flyway along the Prut River basin. More than the habitats' changing, these wind farms can represent a high pressure factor for the birds and bats in this territory.

The electrical fishing and the fishing poaching activities represent a problem in some parts of the basin. The electrical fishing is non-selective fishing neither method killing nor only the fishes of all age categories, but other aquatic animals too. More than ten years, in northern part of the basin, the electrical fishing was a current activity of the Moldavian people, so the fishes' diversity recorded a very low level in the beginning of this last decade. The local authorities from the both sides of the river took a strong position and the economical fishing activity was prohibiting for three years in the whole area.

The fishing poaching activities represent a great danger, especially when are done in the fisheries' perimeters. By one hand, some aquatic birds can die in the under-water fixed nets. By other hand, in order to reduce the economical impact of these events, some fisheries' administrations took the decision to dry the ponds from the farms' periphery and, in this way, the all living components of those aquatic surfaces were lost and the birds lost some important feeding territories (for example, the Jijia and Miletin ponds).

Between the risk factors, we must mention also the oscillations of the water's level, normal for the fisheries yearly practices, that affect the biodiversity like a whole and the birds' breeding season, especially, including for some very rare breeding bird species present in the border region (*Platalea leucorodia*, *Recurvirostra avosetta*, *Himantopus himantopus*, *Limosa limosa*, *Chlidonias niger* or *Sterna albifrons*).

The agriculture can represent a source of pollution and the wrong grazing practices determine the habitats degradations and a high mortality rate of the juveniles for some birds that use to build their nests on the ground. During the last years, large agricultural lands were abandoned on the both sides of the border. This can modify the habitats' aspect and structure, determining change of the fauna that use to populate these terrains.

The hunting represent a very strong disturbing factor, especially for the birds and mammals, which can leave the territory, temporary or for ever if the hunting pressure become constantly.

The garbage's deposits are not nor only in-aesthetic in the landscape but produce the environmental degradation through the water's and soils' pollution risk, affecting the all living communities.

At least one part of these human activities could be controlled or eliminate from this border region in order to mention and to improve the quality of the biodiversity's management.

We can assume that the project *Mutual management Romania – Republic Moldova for biodiversity's conservation on the border between the two countries* represent a first step to develop common projects. The financial support of this project was done by the EU through the Phare Program and the Romanian Government. The project permitted to evaluate the present status of the biodiversity in the border region, to identify the problems and to prioritise, to develop a guide of common measures and activities.

Regarding the biodiversity's management, we identified three principal directions of activity. First of all, it is necessary to develop common monitoring projects to have, permanently, actual and appropriate information about the biodiversity' status. The specialists' opinion notice like priority objectives: to identify some representative sites for the Prut river basin's biodiversity; to choice the key-species (threatened and critically threatened species, but also, economical interest species) for the monitoring programs; to elaborate and to develop qualitative and quantitative monitoring programs for the key-species.

Secondly, we try to identify new possible Natura 2000 Network sites and to create some trans-boundary natural reserves in order to improve the biodiversity of the border area. The first concrete action is to delimitate at least one or two trans-boundary protected areas. The premises are very good in some perimeters:

- In the inferior part of the basin, on the Romanian side, there exists a natural park (Lower Meadow of Prut River) where a Life Project is developing now. On the left side, the lakes of the Prut River have Ramsar situ status and there exist a scientific natural reserve (Lower Prut River). The ecosystems and the habitats are various and the fauna is very rich. This territory is sheltering some rare species, included in the annexes of different international conventions regarding the environmental protection.

- In the middle basin of the river, on the right side, the valley represent part of the Romanian Natura 2000 Network like SCI, while, on Moldavian side, there are the other two scientific natural reserves (Beech's Forest and Royal Forest).

- The big dam lake from Stanca (Romania) – Costesti (Moldova) represent the support for a double hydro-electrical power station (with two turbines, one for each country) and the most important wintering area for the aquatic birds in the whole Prut River basin, too. On the top of dam is crossing a principal trans-boundary road, so the whole perimeter is strictly controlled by the border police service and the human pressure has a very low level.

The third action direction is to elaborate and to develop management plans for the all protected areas from the border region, in order to have a sustainable protection of the biodiversity in this territory. For this, it necessary to have survey plans of the protected areas' limits and actual maps, presenting a functional structure of each protected area. In the same time, it is necessary to develop administrative structures for the all protected areas, with a group of specialist in biodiversity's monitoring and management. No at least, there will be different stakeholders and interest groups for each protected territory. The management plans can be elaborate and implement only through the active participation and efforts of all these groups, under the coordination of the specialists. The traditional activities will be developing within the protected territories, but also the eco-tourism and educational activities, too, in periods that permit to respect the biological seasonal rhythms of the nature in order to avoid the biodiversity's degradation. Of course, the management plans will be evaluate and improve periodically, according with the specific conditions and evolution of each protected area.

As we saw during our long period of fieldwork, the local community is not totally listless to the nature's protection issues and in some areas is really opened and indeed manifest positive attitudes for an active participate in the decisional process and for the elaboration of a local strategy for a sustainable development. There is necessary to develop some educational projects for the local communities, to elaborate guides of friendly practices in agriculture, forestry and fishery activities in order to assure a sustainable exploitation of the natural resources, but to develop the eco-tourism in the border region, too.

In conclusion, the Prut River basin still preserves an incredible high biodiversity level and this could be turn into a big opportunity for the local communities in order to improve their life's quality and to take benefit from the biodiversity of the territory, bringing there strong financial support for the sustainable development of one of the last green oasis of the European Union.

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