

## THE ANTHROPIC IMPACT AND OF THE CLIMATE CHANGES ON THE BIRDS FAUNA FROM LUNCA MURESULUI NATURAL PARK

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**Abstract:** *In order to protect birds from their natural areas, were created special areas of birds' fauna importance, to maintain the common heritage of the countries through which these species migrate. Protecting species is a major environmental problem that must be solved at local, national, global, level, on the basis of cross-border agreements and involves the assumption of some responsibilities that will ensure the conservation of birds' habitat, stopping the decline of their populations and even increasing their species number. Among the species that are affected constantly by anthropic activity and by the climate changes in Lunca Muresului Natural Park are included also the birds, that nest in the protected area or are transient here during the migration and depend by the wood environment, from where they procure the food, and the pollution or losses of these wetlands affect the bird population from natural park stretching along the river Mures from Romania's western region.*

**Keywords:** *protected areas, bird fauna, climate changes, human activities*

### INTRODUCTION

Special areas of bird fauna protection have as primarily purpose the protection of bird species and are component part of the Natura 2000 European Network. From those more than 500 bird species inventoried at European level 32% from these species have not a conservation status, being required, and their protection on the territory of the states where they migrate or nest, by the bodies that manage them [1,4]. Decreasing the number of bird species represents a serious threat for the conservation of the natural environment, causing biological imbalances on ecosystems and the extinction of some species.

Conservation of bird species is necessary under current conditions, imposing measures to improve the living conditions of the birds in correlation with the sustainable protection of the habitats [3,6]. The protection measures implemented in these areas must apply to all anthropogenic factors affecting the bird species, aiming the reduction: of habitat destruction, pollution eradication, stopping hunting, trapping birds or their eggs, destruction of nesting areas, urban sprawl, noise pollution [2,].

Protecting the species of birds should aim, both habitats conservation on long term and implementation of the best management of natural resources, as an integral part of world cultural heritage. In Romania are declared in 2007, 108 focus areas for birds' protection, their number reaching to 148 in the year 2011, representing a percent of 15.490% from the country's surface [5,8]. Studies regarding the protected area Lunca Muresului were made long before its establishment in the year 2004, being inventoried over 200 species classified as follows: - Predatory of day and of night; - Wood species; - Seabirds: - Forest species.

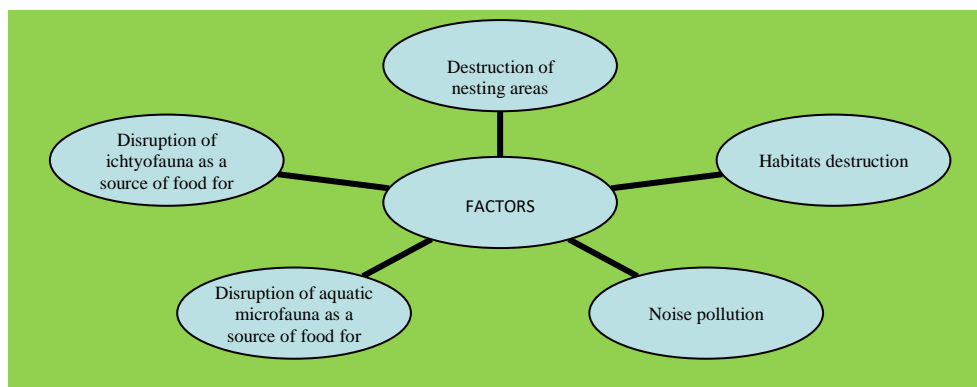
Several years ago according to the studies made in the nineteenth century the number of these species of avifauna was much larger but the numbers were reduced due to climate change, of the anthropic impact on the habitats and reducing of the park areas.

## MATERIAL AND METHOD

The drainage works of the wetlands from the floodplain of the river Mures, the regularization ones of the riverbed, forest deforestation, expansion of some invasive species and also climate changes have considerably reduced the numbers of birds that nest or are transient in this area. From these reasons we undertook a study regarding the bird fauna from the area of Natural Park and the influence of anthropic activities and climate changes on bird flocks.

## RESULTS AND DISCUSSIONS

In Lunca Muresului Natural Park, from the western region of Romania are 206 bird species from which: 41 species are of community interest and are affected by climate changes from the last period of time but also by the anthropic activities that have become more intense in the park area. Although this reservation has a great diversity of bird species, by the works of river regularization, the bird fauna has migrated to calmer areas and without intense anthropic activities. The factors that have determined bird species migration to other areas were: (Figure 1.1.)



**Figure 1 Disruptive factors of habitats leaving by the birds**

The most numerous species of birds that populate the natural park before the hydrological planning works were those amateur of wetlands whose flocks were reduced. Currently in the studied area there are 67 species of wood birds or wetland lovers and 139 forest species, respectively predatory of day and of night.

Species of community amateur of wetlands present in the natural park's area are: Alcedo atthis (kingfisher), White egret (great egret), Ciconia nigra (black stork), Nycticorax nycticorax (night heron).

The forests from Lunca Muresului Natural Park are frequented by the following species of birds: Dryocopus martius (black woodpecker), Lanius collurio (red-backed shrike), Caprimulgus europaeus (nightjar). Among the species of predatory birds that are on the list of birds of community interests in the analyzed protected area are: Aquila pomarina (lesser spotted eagle), Aquila heliaca (Imperial eagle), Pernis apivorus (nest), Milvus migrans (black kite).

Another human activity, which in the past, has led to the disruption of habitats of some forest bird species and of some predatory birds from the protected area, was the cutting of a large area of forest that cover the surroundings of Bezdin monastery. By the forestation carried out in different adjacent areas of the natural park appeared a number of bird species that prefer forest habitats, floodplain forests mixed with oak (*Quercus robur* elm - *Ulmus minor* ash - *Fraxinus excelsior*) and forests - galleries of willow (*Salix alba* and white poplar - *Populus alba*) however, the population and the initial diversity of existing species after studies carried out in 1919 has not

been reached so far. Therefore are necessary measures to contribute to reducing the migration of species to other areas and to increase the flocks by providing favorable conditions in which species to evolve positively.

Another major problem with major impacts on habitats where birds live is the expansion of nesting areas with invasive plant species. In Lunca Muresului Natural Park can be found three plant species that have adverse effects on bird flocks: acacia dwarf (*Amorpha fruticosa*), American maple (*Acer negundo*) and Japanese knotweed (*Fallopia japonica*). These species occupy large areas, of whose expansion and high adaptability to climatic conditions have impacts on ecosystems and habitats, restricting the areas occupied by native species of trees that are preferred by the species from the park. It requires the implementation of measures which to contribute to the knowledge and combating of invasive species that have major impact on the habitats of bird species such as:

*Amorpha fruticosa* (dwarf acacia) an invasive plant widespread particularly in Europe but also in Romania for 50 years, as an ornamental and honey plant but also to reduce soil erosion. It grows spontaneously near the banks, in the wetlands and can survive in extreme weather conditions, including on drought condition and is resistant to low temperatures. It contains a substance called "amorphine" which functions as a natural insecticide, this explains the absence of a large number of natural predators/phytophagous insects that consume the species. So, neither the bird species nest near these bushes, having no sources of food nearby. The only species, from the protected area, consuming dwarf acacia seeds is pheasant (*Phasianus colchicus*). The seeds of *Amorpha fruticosa* are transported from the nearby shore of the river during floods, or by deer, sprinkling them on the hoof, getting to locate also in other areas, led to the expansion of the species. *Amorpha fruticosa* occupies 3.63% from the total area of 17455.2 hectares of protected area and is found mainly near settlements: Bodrogul Vechi, Pecica, Seitin and Sânnicolau Mare.

*Negundo Acer* (American maple) is a tree native from North America being imported into Europe as an ornamental plant. It has grown rapidly in the parks and gardens of Europe, and then in the alluvial areas, along rivers, near roads, being able to adapt even to 1000 m altitude. American maple is expanding rapidly due to high tolerance to different climate conditions, but also because of a remarkable resistance to pollution. Regarding the interaction with other species of plants, American maple grows as density while other species, being suffocated by it, disappear. *Acer negundo* is spread near residential areas: Zadareni, Bodrogul Nou, Nadlac, Pecica and Cenad and occupies 6.21% from the total surface of the protected area.

*Fallopia japonica* (Japanese knotweed) - was brought from Japan to Europe due to the rapid growth, being used to stabilize the coastal eroded areas, as well as decorative plant in botanical gardens, but at short time it has been noticed the fact that, it is harmful for other plant species. *Fallopia japonica* has a high negative impact on flora, causing biodiversity loss: there is a food source for insects, not even in flowering period and doesn't provide shelter for wildlife species, namely for sedentary birds and those that are fleeting. Unlike the other two species of invasive plants, Japanese knotweed occupies in Lunca Muresului Natural Park a reduced territory, below 1 ha near the village Cenad from Timis County.

Another factor that leads to biodiversity loss and to the decrease of the number of birds is climate change, namely the reduction of rainfall quantity that causes floods - a real feast for wood birds. In the year 2006 were recorded the last outflows of jelly of Mures river from across the protected area, and then the phreatic level of the river has decreased year by year. Lack of rainfall and flooding, has led to the creation of an ecological imbalance, so some of wetlands have dried up, and the birds nesting and feeding in those marshes it had to seek other habitats, the population reaching a downward trend.

## CONCLUSION

We can not oppose to climate changes, but in terms of human activities, regularization of Mures riverbed, felling of trees must be made taking into account the strategies on long term that to aim the maintaining of the park's sustainability so that the future generations to can enjoy at least of the same resources that we benefit today preserving unspoiled the flora and fauna biodiversity.

Although in Lunca Muresului Natural Park the avifauna has appropriately adapted to new habitats partially occupied by invasive plants, it should be emphasized the fact that anthropic actions of man, to introduce certain elements of fauna or flora in a certain area can have irremediable consequences for the environment causing bird migration towards quieter areas and the diminishing of the optimum flocks due to degradation of the habitats through modifying the specific ecosystems.

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