

Sorin Geacu, *Dinamica populațiilor de cervide și bovide din fauna României* (The dynamics of the Cervidae and Bovidae populations in the fauna of Romania), Edit. Academiei Române, București, 2011, 322 p., 81 figs., 123 tabs.

The result of a ten-year persistent in-depth research-work, this volume authored by Sorin Geacu, Ph.D., contains a huge amount of original data obtained by field investigation, information supplied by forest authorities and locals. In addition, there is a consistent material which the author found in profile journals, often of limited circulation, hunting fond and forest management files, various reports, etc. The diversity of the archive and library sources studied enabled the reconstruction of the evolution of the cervid and bovid fauna in Romania and the natural and, moreover, human influences that acted upon it.

The first part of this work, *General Problems*, looks at the numerical fluctuations of these populations under the impact of various factors, population behavior and taxonomy of the studied species and subspecies, the importance of the physical-geographical conditions of their habitat and the role played by man in the dynamics of these populations in Romania's fauna.

Investigations have revealed the direct involvement of man in the shrinking or expansion of the areas of some big mammals in this country through hunting, poaching, but also the deliberate release into new habitats – the relocation or reintroduction of native species and the colonisation of foreign species. These aspects were often ignored in the biogeographical literature. No less important are the man-made landscape changes through deforestations, forestry works, overgrazing, the burning of stubbles, mechanisation and chemisation of agriculture, all of which have drastically limited fauna habitats and food sources. Numerous data reflect the consequences of extreme climatic phenomena (snowstorms, heavy snowfalls, frosty winters), or seasonal droughts and floods, the proliferation of predators and of some epizootics that have led to the diminution or even extinction of some populations, affecting the native species, but especially the newly introduced ones.

The second part, which forms the bulk of the volume, deals with spatial-temporal dynamics over the last two centuries of the four cervid species (red deer, fallow deer, roe deer and moose) and of three bovid species (mouflon, chamois and wisent) constantly or sporadically present in Romania. The red deer, the roe deer and the chamois represent major components of the native fauna, the fallow deer and the mouflon being allochthonous. Accurate data report on a little known situation, namely the spontaneous but temporary, penetration of some stray moose individuals in Romania, mainly in its north-eastern part. An extensive presentation is made of the wisent, an animal with historical connotations that had disappeared from this country in the 19th century. A few individuals have lately been reintroduced and they live in large wildlife enclosures.

The main aspects analysed for each species, in their temporal course, have in view the numerical size and spatial distribution over a few characteristic intervals: before and during the First World War; 1918 – 1948; 1949 – 1989 and 1990 – 2006. Since cervid and bovid species are subjected to excessive or illegal hunting, changes of legislation of property regime, public order and other socio-economic aspects registered within the above intervals, the size of their populations was substantially affected.

Apart from analysing the situation in Romania as a whole, regional aspects (in historical provinces, physical-geographical units or counties) and local aspects are also depicted. A detailed presentation of the numerical variation of foreign species released into the wild is made, with highlight on prosperity periods followed sometimes by drastic diminutions and even the extinction of the respective nucleus due to the natural factors, or to intensive poaching related to some historical events. Distinct sub-chapters discuss the 28 extinct fallow deer nuclei, a species that registered major numerical fluctuations after colonisation (peak values in 1987), yet still well-represented in some lowlands and hillsides and the extinct mouflon nuclei, a species which in 2006 preserved only three micro-populations (all in enclosures).

Some native species would migrate from the area of release to neighbouring regions, e.g. the red deer, to Botoșani, Ialomița, Tulcea and Constanța counties. There are also information concerning the penetration of some red deer individuals from Bulgaria in the south of Romania. The roe deer populations would expand naturally to various sections of the Romanian Plain, to some counties of Moldavia and Dobrogea, the Tansylvanian Tableland and Oltenia; also interesting is the formation of some populations „of the fields” adapted to living outside of the forest. Relevant information refer to the chamois population dynamics in various Carpathian massifs, actions of reintroduction or translocation being discussed in detail and supplemented by an analysis of the newly-formed nuclei. In this way, it becomes clear that considerable efforts have been made to rebuild the chamois populations and extend them to all favourable habitats, but the negative consequences of poaching are not overlooked either.

Statistical analyses and a multitude of maps mirror the temporal course of the territorial distribution of cervid and bovid species throughout the country or in certain regions, their colonisation (indication of the place of origin and the places of introduction), spontaneous expansion of some species from the place they had been introduced in, etc.

The wealth of information and especially a complex outline of the relationship between spontaneous evolution and the direct or indirect impact of human activity makes this work a fundamental contribution to the fauna of Romania. The volume ought to be considered an indispensable source of reference in analysing the biogeographical characteristics at the level of the country and of its physical-geographical units. At the same time, it is helpful in substantiating the management of protected areas, the conservation of biodiversity and the protection of fauna, highlighting the need for the correct management of hunting fonds, intervention in case of detrimental natural phenomena and last but not least, outlining the need to control poaching far more effectively and strenuously than it has been done so far.

*Cristina Muică*

Mihaela Sima (2011), *Mineritul și poluarea râurilor în Munții Metaliferi. Aplicații în bazinele hidrografice ale Crișului Alb și Certejului* (Mining and river pollution in the Metaliferi Mountains. Case-study: the Crișul Alb and Certej river basins), Edit. Academiei, Bucharest, 254 p., 4 chap., 175 figs., 34 tables, 210 refs., contents and conclusions in English.

Romanian geography is permanently enriched with modern theoretical and practical studies appreciated by the national and international scientific community. Such a study is due to Mihaela Sima, senior scientific researcher with the Romanian Academy's Institute of Geography. The author has a sound set of knowledge acquired during her student years and enlarged in exchanges of experience and documentation stages in Great Britain, USA and Switzerland.

The present work makes a fresh approach to the Geography of the Environment in Romania. The problems tackled highlight the impact of mining on environmental degradation and opens up new vistas for complex interdisciplinary research into the pollution potential of mining areas in line with the European regulations on environmental protection.

The author's successful achievement is based on a multitude of documentation sources (210 references among which 127 from the international literature), field surveys, accurate mappings and samplings, lots of chemical analyses assayed in profile laboratories), collaboration with international teams and renowned specialists from the Universities of Wales (UK), Zürich (Switzerland) and Chile.

It is for the first time in the Romanian specialist literature that the issue of pollutants, the particularly mining-released non-ferrous metals (copper, lead, zinc, gold and silver) is being considered. These elements have a severe degrading impact on all environmental components (landform, air, water and vegetation), affecting animals, and public health. However, water is a most serious problem because rivers carry the chemical pollutants, basically heavy metals, radioactive substances or contaminated sediments, miles away from their source, impairing also the environment of neighbouring countries.

The aim of this work is to arouse the interest of scientists for studying the impact of any type of mining, with emphasis on the companies' obligation to implement environmental protection standards.

As known, mining in Romania has a millenary tradition, but its extensive development in the 19<sup>th</sup> and 20<sup>th</sup> centuries is the outcome of the industrial and technical-scientific revolutions (1850 and 1960, respectively). In the 1990s, the closure of numerous pits and processing units did considerably reduce mining activities. For all that, pollutants spilling over into the river channels and floodplains (through overflows, waste dumps on tailings dam failures) continue to contaminate soils and vegetation and impair the health condition of terrestrial ecosystems. Therefore, it is imperative to put in place synoptic surveillance and ecologisation measures at all mining and related processing sites.

Chapter One rings an alarm bell regarding the impact of mining on drainage basins. It is a conceptual and methodological approach to this issue and to the dangerously cascading risks entailed by activities in this field for all the natural and human components of an already critically vulnerable environment that continues its precarious existence. The case-study of two basins – Crișul Alb and Certej (a tributary of the Mureș River) represents a model of research.

The detrimental effect of all pollutants and of mining works themselves (building quarries and tailings dams, storing wastes and spilling over residue into the channel) have been changing the morphology of landforms, stream channels and floodplains, a reality illustrated in this volume with pertinent arguments.

Assessments on the level of degradation based on a complex study of geomorphology, geology, climate, hydrology, biogeography, land use, population and economic factors emphasize the natural potential of the Metaliferi Mountains, where mining is a widespread traditional occupation.

Chapter Three provide major methodological theoretical and applied research contributions. Samples collected during field investigations have been accurately analysed in specialist laboratories in terms of current national and international standards. The interpretation of results, correlated with local geological and geographical particularities and with each impaired environmental component and its state of degradation, contribute to the originality of this approach.

The values yielded by quantitative assayings of heavy metal water pollution by repeated samplings during characteristic seasons and over several consecutive years (2004-2008 in the Crișul Alb Basin and 2003-2009 in the Certej Basin) were in some cases exceeded 1 to over 1,000 times the European Community guidelines.

Since the Certej Basin is by far more affected than the Crișul Alb, Mihaela Sima proceeded to deep drillings in order to estimate the waste stored in floodplain sediments. The findings revealed the presence of some 20,000 tons of heavy metals, mostly zinc and lead, that are very dangerous for long-term pollution, moreover so, as under certain weather conditions and water discharge, waste can be dislodged and carried by the Mureș River over significant distances, becoming even a cross-border hazard.

Deficient management of the Certej tailings dams may become a source of accidents, e.g. the event of October 31, 1971 when over 55,000 m<sup>3</sup> of contaminated mining sterile spilled over, leaving more than 100 people dead, numerous others wounded, destroying six apartment blocks, a workers' hostel, the 250-year-old Museum of the Mine, individual households, etc., and significantly modifying the stream channel. It was one of the most dramatic anthropic hazards in the mining areas.

The present study, which highlights environmental imbalances in those areas, is but a beginning for further interdisciplinary studies on this issue. The author underlines the necessity for implementing ecologisation measures and for monitoring environmental quality by modern methods and new technologies in order to assess the level of degradation and the quality of water in mining sites.

The conclusions reached by the present study are applicable to all similar situations, hence the practical and methodological value of this volume, an excellent achievement of Mrs Mihaela Sima. Sincere congratulations.

*Octavia Bogdan*

Viorel Chendeş (2011), *Resursele de apă din Subcarpații de la Curbură. Evaluări geospațiale* (Water resources in the Curvature Subcarpathians. Geospatial assessments), Edit. Academiei Române, București, 339 pages, 9 chapters, 230 figs., 54 tables, contents and conclusions in English.

Present-day research is called to respond to a major challenge, mainly to assess, over a short period of time, existing water resources by means of high-accuracy spatial analysis. The aim is to meet the needs of a society facing a great incidence of hazardous hydro-meteorological phenomena, as well as to manage and protect water resources in an adequate manner. Water and water resources and all related aspects of securing societal needs were among the priority topics discussed at the Rio+20 meeting – the United Nations Conference on Sustainable Development. The Conference held in June 2012 made a firm statement, reiterating the political commitment to work towards sustainable development and strengthen co-operation in matters of water resources management.

The present volume on the above topics is due to an experienced researcher in the use of GIS and hydrology. Viorel Chendeş puts forward a modern methodology of spatial analysis regarding water resources and river regime in line with international research. This methodology represents an improvement of classical methods by establishing river discharge regionalisation relations and some complex indices. In this way, the author could integrate into the GIS analysis the relevant factors in the formation of water discharge and elaborate some statistic-spatial relations that can be applied also to unguaged river basins. This method is of exceptional practical utility in the study of river regime.

In the nine chapters of this work the author elaborates on the theoretical aspects of GIS utilisation, making a complex physico-geographical analysis of the Curvature Subcarpathians, identifying the factors involved in discharge and sediment load and corresponding spatial indices, also analysing average, maximum and minimum flow-rates on the main watercourses of the study area. Chapter one, clearly and synthetically structured, provides the theoretical and methodological framework necessary to using GIS in hydrology. It is actually kind of guide-book to GIS utilisation. As a matter of fact, each chapter makes a detailed presentation of GIS-based operations and functions underlying the present study. The volume represents a valuable and extremely original contribution to the spatial analysis of the physico-geographical factors involved in the formation of river discharge, the author adapting or elaborating a number of very important qualitative and quantitative indices such as, Homogeneous Slope Index; Topographic Position Index; Landform Complexity Index; classification of lithological formations in terms of rock resistance and permeability, etc. These elements have been adapted to and integrated into GIS-related spatial analysis. In this way, the author could develop new spatial correlations between the physico-geographical factors participating in the formation of river discharge and sediment load specific to the Curvature Subcarpathians, also correcting existing relations (e.g. between flow-rates and basin area by including the lithology class and other conditioning factors in the relation). These analyses were based on hydrological data obtained from an impressive number of river-gauge stations (68) situated in the Curvature Carpathians and the limitrophe mountainous or lowland sectors, fact that fully validates the results obtained. Noteworthy is the elaboration of the GIS-based maps of mean specific discharge which rely on the Digital Elevation Model and the calculation of relations between average discharge and altitude, the GIS-related operations made for the purpose being presented in detail. The geospatial data-base produced by the author enabled him to develop some major correlations for analysing maximum and minimum flow-rates and their return period, particularly relevant for suspended sediment load, a very important aspect of water regime in the studied Subcarpathian area. According to estimates, this area features the highest suspended sediment load, reaching elevated values, over 25 t/ha/year, especially in the drainage basins of the Călnău, Râmnicu Sărat and Milcov. In order to identify the physico-geographical variables contributing to sediment formation, the author uses a so-called physico-geographical correlation coefficient, which takes into account several determinants: rock, slope, precipitation, land use, etc. A notable aspect is the critical selection of appropriate indices and indicators and the considerations made on the advantages and disadvantages offered by each of them in terms of the function and purpose of the respective study. The analysis of liquid discharge in the Curvature Subcarpathians, and the assessment of water resources shows the area to hold an intermediate position between its neighbouring mountainous and lowland zones, having the highest suspended sediment load.

The importance of this volume is twofold: scientific and practical, the GIS-based analysis of the physico-geographical factors involved in the formation of discharge representing an original approach of great interest to researchers, practitioner hydrologists, students and decision-makers in water management.

*Mihaela Sima*

