ABSTRACT

Since ancient times, hunting was one of the major occupations of the inhabitants. At the beginning of human existence, it was the main activity which ensures food. Subsequently, the importance in providing food decreased, becoming today essentially a means of recreation, to restore physical and intellectual forces. Also, hunting, by action against some pests, such as prey animals and, especially, stray dogs, is an effective factor to ensure dynamic balance of agricultural and forest ecosystems.

In the **Introduction** of the paper, the author of the doctoral thesis presents, at the beginning, aspects of hunting history, showing that all the peoples of Europe, hunting was considered, at first, a "res nullius", each hunter taking it possible to acquire it freely and unrestrictedly.

Since the fifth century and lasting throughout the feudal period until early modern times, hunting has become a sector and royal right. Gradually, hunting was regulated in all countries with different laws, reaching now to be managed by forest services.

Also in this part of the thesis there is presented the evolution of game, and the factors that determined the increase or decrease of game along the centuries.

Finally, the author presents the main motivational elements of the scientific project represented by the content of the thesis. The author considers necessary to improve the management of the hunting heritage to ensure the conservation and development of this important wealth of Romania.

Chapter I - ***State of research on hunting heritage and its administration in Romania and worldwide***, belongs to the part of the theoretical foundation of the doctoral thesis and is based exclusively on bibliographical sources. In the first part of the chapter that has weight, are presented data of studies conducted by Romanian and foreign researchers on the development and management of the hunting heritage.

The study shows the precariousness of the bibliographic sources on game and hunting in this territory.

The first references on hunting heritage we find at Dimitrie Cantemir in his "*Descriptio Moldavia*", which refers to the wealth of wild animals that wander "back and forth through the woods".

Consistent bibliographic sources on game and hunting in the study area we find in the official documents issued after 1775 (when Bukovina was annexed to the Austro-Hungarian Empire). Of the documents we mention "*Ordering in the Forest*" (1783) and "*Hunting Order*" (1786). These documents and others released after referring to the rights and obligations of landowners, particularly forestry and references to hunting and game. In the late nineteenth and early twentieth century there appeared a series of works on the administration of hunting heritage, "*Die Bukowina*" - Czenowicz Comissionverlag - 1899, Tarouca E. - 1899, Zacharia A. and colab. - 1901 and others. In all the works there are presented particularly valuable data on the variety of game species and especially the number of copies submitted in dynamics.

Numerous investigations have been conducted in the interwar period; they represent many scientific contributions and information to create foundations hunt management (***Botezat E., 1939; 1940 şi 1943, Witting E., 1933; Comşia A, 1940; Nedici Gh., 1940; Philipowicz I., 1937; Volosciuc A., 1932***).

Further research was carried out after 1950 which was primarily related to study of the forest, but also the fauna that inhabits it. We mention the works of authors such as ***Giurgiu V. – 1998; Ichim R. – 1969, 1976, 1990, 1990, 1991, 1994; Cotta V. – 1961, 1962 şi 1963, 2001; Almăşan H. – 1961, 1962, 1963, 1986, 1988, 1989, 1992; Gângă A. – 1993, 1996, 1997, 1999, 2005.***

In their research there was present the need to develop uniform rules management. Recent research showed the stringency of such measures in the new context in which the property is forest and agricultural heritage of Romania, after 2000.

The classification of key wildlife hunting interest in Romania shows that there are 235 species, of which 30 species of mammals and 205 class birds. In mammalian species only one third hunting is permitted, and the wild birds, hunting is allowed only one fourth of their number. The thesis includes the nomination of all species of mammals and birds of interest in hunting with popular and scientific name.

The importance of hunting game and was underlined by many researchers that showed direct and indirect advantages of them. Hunting is important now primarily for their meat and by-products (leather in particular). The existence and practice of hunting determines the development of small industries that provide specialized in equipment, weapons and ammunition. Revenues are obtained through fees charged to foreign hunters.

In addition to economic advantages, hunting is important in that it has indirect advantages: it is an important means of recreation, is an outdoor activity that requires a lot of movement, resulting in a strengthening of the human body, through the hunting of harmful animals and birds it ensures a dynamic balance of forest and agricultural ecosystems, contributing to aesthetic education, whereas the presence of game in the natural landscape provides an additional geographical areas within beauty, helps to cultivate love for nature, and bringing its contribution to sustainable development.

To develop optimal game there are needed three basic elements: *food, rest and shelter. Food* is the main condition for the game to remain in a particular area. Typically, the quantity and quality of food necessary for the game is not constant. Food profiles of species are in a constant dynamics, dependent on specific physiological stages of the organism. There are three types of food, favorite food and basic food. In order to develop normally and with no losses, hunting must have basic food and preferred in all 4 seasons, so in winter, too. In this season it is exposed mostly to the actual losses. For these reasons, human intervention is essential in some hard winters, by providing additional food. Also about food, there are important actions to improve the living environment, which refers to harrowing and sowing land with forest glades valuable plants, where farm forestry preservation of trees that produce seeds and fruits, keeping or breeding of trees or shrubs that produce food in the form of leaves, shoots, buds, nuts (e.g. willow, shock).

Besides food, shelter is very important. The game needs permanent housing, the summer to keep excessive heat or torrential rains, and winter snowstorms and low temperatures. Shelter is an absolute necessity for certain species of game: deer, boar, bear, lynx, leaving the places where the forest has been destroyed.

The third element essential to the existence of game is *quietness*. Most game species are sensitive to noise. However, it was found that most species of game time are familiar with certain sounds. These species bear particularly those sounds that were normal in life and not have caused shortfalls.

The second part of the doctoral thesis including ***Own research, results and their interpretation***.

Chapter II starts this part refers to the ***Objectives, studied material and used research methods***.

The main purpose of the paper is*: Improving management of hunting in the representative area for Romania, Suceava County*.

Among the objectives pursued, the most important are:

1. Identifying the level of scientific research on the situation of hunting heritage and its management in Romania and worldwide;

2. Diagnostic study on game and hunting, and the factors influencing them in the Suceava county. Seek to establish and evolution trend of game populations and their habitats over a long period of time and that forecast may be given;

3. Making a case study on hunting Fund no. 1 Pinu, representative of the Forestry Department Suceava, aiming at the impact of civilization on the game in conjunction with forest issues and what redress there;

4. Forest-genetics restoration of the hunting fund no. 1 Pinu (quality, evaluating the game forest-game measures);

5. Improving management of the hunting property Fund no. 1 Pinu.

Other secondary objectives relate to: What modern measures to improve the situation (in the forest and populations of game) is ahead?; What issues facing the game is free and what influence forest structure and anthropogenic factor in the struggle for existence?; How does man attack on the forest and its surrounding areas the living conditions of the game?; How should action be directed to protect the game and its habitats?

Used research methods were as follows:

1. Methods for gathering information of hunting type;

2. Methods to review the hunting type.

The first group of methods was used:

a) methods for gathering information from bibliographic sources;

b) methods for gathering information from direct field investigations.

For direct inquiries, on the ground, the following specific methods were used:

- ⇨ direct recording
- ⇨ read tracking on snow;
- ⇨ sampling

Where to review methods of hunting type using a set of indicators of economic and technical analysis adapted to field hunting. Thus, methods were used: the *comparison* (in time, space, mixed with special character) division method; *balance* method, statistical *clustering* method, *graphical* method and the *monograph*.

Chapter III deals with ***The natural hunting areal in Suceava County***.

The studied hunting fund is situated in the north-eastern Romania and unfolds between the Siret River and mountain ridges Călimani, Bârgău, Suhard, Rodnei and Maramureşului.

This territory includes a part of the hydrographic basin of Suceava river whole basins Şomuzul Mic and Şomuzul Mare, basin of Moldova river to Drăguşeni and the upper part of Bistriţa river to the village Lunca Broşteni.

The investigated area belongs to two major relief units: mountains covered between 800 and 2279 m (67% of area) and plateau, plus sub-Carpathian hills between 218 and 800 m (33% of area).

From the hydrographic point of view, the collector of the entire network is river Siret, receiving the major tributaries within Suceava county, the rivers Suceava, Moldova, Bistriţa and Şomuz.

The content of the territory studied, some rivers were built during the time for carrying fish ponds (on the rivers Şomuzul Mare and Şomuzul Mic) and accumulation for drinking or industrial water (Rogojeşti, Bucecea, Dragomirna). These accumulations affect the microclimate of the surrounding areas, with some influence on the structure of hunting in the area.

The studied geographical area belongs also to continental climate sector (the eastern) and the moderate continental climate (Western).

The average temperatures vary considerably from southwest to northeast, mainly on conditional altitude change and especially the movement of prevailing air currents.

The annual average temperature has values between 8°C in Suceava Plateau and less than 2°C on the mountain peaks of Rodna, Suhard and Călimani. In mountain areas and in depression areas, average monthly temperatures below 0°C start in November and continue to March. In winter, especially in the very frosty and snowy ones, it requires an additional intervention by providing supplementary food (for deer and wild boar).

As a natural factor regulating the number of game, low temperatures do not act randomly; the first victims are copies of very young, sick, injured and generally weak. Rainfall regime varies by geography. In mountainous areas, rainfall amounts to 1200-1400 mm, and the plateau area and pre-mountainous have a range of 600-900 mm.

Of great importance for some actual game (boar, and deer) are solid precipitation (snow) and their duration. Number of days with snow in the massive mountain ranges from 190 in NV and 40 in the south of the territory. Thickness of snow cover varies between 120-160 centimeters in mountainous areas with altitudes over 1800 m and between 25-30 cm in areas of plateau and river valleys.

Of great importance for the management of hunting knowledge presents the average amount of precipitation during the growth of chicks (from April to June). Correlate those with possible late frosts adversely affect the development of rabbit populations, causing a significant increase in mortality in their offspring.

In the area studied, the sequence to the relief areas and floors make the arrangement as a way of growing closer to that of relief. In this area, forests occupy 74.4% of the total extent.

Forests of pine and pine mixed with deciduous trees are dominant in size occupying 98% of forest area. Of this area 78% is occupied by pine and 22% deciduous. In conifers, spruce is a majority of 84%, followed by fir tree by 15%, the rest being occupied by pine and larch.

Some species of deciduous trees, most areas are occupied with beech with a rate of 71%, followed by oak with 5% and deciduous species of hard and soft at a rate of 24%.

Depending on the types of resorts and types of forest, forest area of the Forestry Department Suceava identified 9 types of forest ecosystems reference.

Study of forest structure after classes age shows that there is a surplus at school age (1-20 years class in particular) and a deficit in large classes over 60 years (in particular class over 100 years). This unbalanced structure is due primarily uncontrolled cuttings and disasters (falls and breaks because of wind and snow).

Chapter IV is an analysis of ***Hunting management situation in Europe, Romania and Suceava County.***

At first is the evolution of international bodies created to guard and preserve hunting sustainability of the sector. Thus, in 1930 was established the International Hunting Council (CIC), coordination problems for hunters. In parallel, in all European countries have established a variety of companies, associations and ONG`s with the stated purpose of protecting wildlife.

In the last two centuries there have emerged many nature reserves for conservation *in situ* of wild fauna and beyond, which is the subject of scientific investigations aimed at conservation and rational management and sustainable populations of game species.

In 1977 was founded the Federation of Associations of Hunting and Wildlife Conservation Community (FNAC) which represents the collective interests of its members and thus of the over 7 million hunters in accordance with the principles of rational and sustainable use of natural resources.

Below is shown the situation in the country the number of hunters and hunter's proportion of the total population. Among European countries, the greatest number of hunters is recorded 1.65 million hunters in France followed by Spain, with 1 million hunters. The proportion of hunters in the total population, at the very top are the Nordic countries (Finland

- 1:17, Norway and Sweden with 1: 27), and the last places - Poland (1:772), Netherlands (1:487) and Romania (1:362).

There were identified 5 geographical areas with specific characteristics in terms of hunting and hunting management: Scandinavian, European-Mediterranean, Anglo-Saxon, Central Europe, and Dutch.

Afterwards it is presented the evolution of hunting management in Romania. Analysis was performed separately on three periods: until 1948, 1949, and 1989 and after 1990 are described differences hunting rights and hunting rights on property management. A special attention is paid to the contents of the Law 407/2006 on the merits of hunting and game protection.

Another issue dealt with in this chapter refers to the diversity of habitats and wildlife hunting interest. Explanation of major plant and animal biodiversity which gives the author refers to the existence of the Carpathians, which functions as a dispatcher of huge air masses influenced by the climate in the north and west Atlantic, east of excessive continental climate and south of climate Mediterranean. Other explanations refer to the lower density of population to western Europe, but especially wisdom predecessors have operated rationally hunting heritage.

And actions are those of colonization and made popular in past periods, in places where some species have reduced in number, have disappeared or have not existed at all. These are pheasants, deer and common deer, chamois and alpine marmot. The chapter concludes with presentation of game in Suceava County.

Suceava County has an area of 305,381 ha productive game, representing 95% of the total area of the county. In this area, 78.4% is covered with forest, which influenced the structure of game species. The total area with hunting potential is grouped in 25 funds whose size varies between 7000 meters and 20,000 meters.

The situation, size class, shows that the share (44.0%) is held by the hunting funds ranging in size between 10,000 and 15,000 ha.

Funds less than 1,000 ha and more than 15,000 hectares have approximately equal weights of 28.0%. The largest size hunting fund is Moldovița - 20,401 ha and the smallest - Dolhasca - 7012 ha.

Class quality of the hunting funds in the forest pens shows wide differences between hunting funds in the diversity of species, number of copies and class quality.

Following the last evaluation, in the Suceava County there were a number of 1995 Carpathian deer, roe deer 100 copies, 1743 deer, 955 wild boars, 120 bears and 3710 rabbits. Among species, the Carpathian stag has several copies in hunting Moldovița Fund - 1200 copies. Creditworthiness of the species shows that the funds are hunting all 4 classes of quality. Most funds have deer hunting included in Class III of quality. The fallow deer is poorly represented in D.S. Suceava; he was only three funds currently hunting: Zamostea, deep, Pătrauți, being classified in class IV of creditworthiness in the main class Ia 2 funds and the Fund Pătrăuți. Rafter, boar and rabbit are present in all 25 funds hunting is mainly categorized in class IV of quality.

Chapter V has the weight of the structure of the doctoral thesis, and includes a ***Case study on management of hunting fund no. 1 Pinu, Forestry Department Suceava***

FV 1 is located Pinu in the south of Suceava, administratively belonging to Broşteni Forestry. On the geomorphologic part, it is engaged in the central group of the Eastern Carpathians, sub Bistrița Mountains.

The unit is predominant slope with different inclination and exhibitions, forests are divided between the minimum altitude of 980 m and a maximum of 1650 m.

According to the Köpen classification, FV Pinu territory falls within the Dfbx climate, characterized by a mountain climate, temperate continental, with maximum precipitation in summer and winter minimum. Average winter temperatures are negative, requiring administration of additional land for hunting food. Average annual rainfall is 909.1 mm. Average snow thickness is 24.2 cm, with an average period of 120 days. The average date of last snow is June 1, late snowfall affecting mainly young deer and the boar.

Type is the major resort and the type of forest in 2333 is 1114 (Norway Spruce stand with *Oxalis acetosella*) on skeletal soils. Fundamental natural-type forest stands are majority, holding 91% of the area.

Structure surface hunting Fund shows that the spruce forests occupy 99% of the area. In the composition tree, 96% belong to the category 0.7-1.0.

The area has a good maturity, the average age of the trees being 72 years, close to physiological maturity. Research has shown that over 90% of forests have been created naturally.

As regards employment in forestry groups, over 86% of land belonging to the functional group II.

FV no. 1 Pinu has a total area of 12,351 ha. Of this area 80% is productive in terms of hunting. 70% of the total area is land occupied by forests.

In the structure by use and owners, 86.6% is owned by the state, and the difference (13.4%) is privately owned. Fund Pinu hunting is generally well equipped with buildings and hunting equipment. In late 2009 there was one house and a hunting lodge, 6 huts in wait, 12 wholesome and 22 bathing 2 high stands.

Between 2001 and 2009 there was a total of 20 mortalities (due to rapacious birds), most specimens of deer. In the same period were obtained 33 hunting trophies, most of them acquired by foreign hunters. Trophies belonged black grouse species - 10, deer - 9; bear - 4; wolf - 5; boar - 4.

Among mammalian species of interest in hunting territory FV Pinu, 17 species were inventoried and 9 species were fixed rate of interest. Collection actions have been harmful species (strolling dogs and cats, crows), with no allowances.

The thesis includes the time limits on categories of quality at 13 species of hunting interest, existing FV Pinu. There are also presented keys of organic diagnosis for major game species.

An important chapter concerns the description of the main species of game in FV no. 1 Pinu. It is about 5 species, the most important being: the common deer, rafter, boar, and blackcock. The description is made analytically, covering all aspects that characterize these species.

A special attention was given to increment calculation and annual lot extracted from the analyzed Hunting Fund. Thus, for the following season, the deer harvest will be of 5 copies, the wilde boar and black grouse, 2 copies each.

Another analyzed issue was the dynamics of the game in the 2004-2009 period, presenting themselves and the causes which led to some fluctuations. It is the evolution and structure of forest stands across FV no. 1 Pinu a significant period was 1969-1999. The structure on age class in the first decades of 1969-1989 showed a pronounced imbalance, age classes over 80% representing only 8-12% of the total. Later, in the last two decades, the situation has taken a positive trend through sound forest management policy. This has positively influenced the evolution game. In the last part of the chapter is calculated the economic efficiency of the hunting activities. The calculations show that in the last analyzed year, the economic results were positive.

The penultimate chapter deals with ***Policies and strategies in hunting management***. In the first part the chapter covers the main elements of policies on fund management

harmonization interference between hunting and forest management. The issues dealt with relate to: game population being within the optimal density, measures to protect forest and wild game, care of game.

Further, there are given directions, strategy and tactics of hunt management including the principles underlying the development of strategies, stages of development in the hunting strategy and structuring the content strategy.

In the final chapter a SWOT analysis is done on the strategic objectives and the strategy of development of Romania in the field hunting in anticipation of 2025.

Last **Chapter, VII,** contains a set of **conclusions** and **proposals** resulting from the research.