

STUDY REGARDING THE EVOLUTION OF THE WILD ANIMALS POPULATIONS FROM SEACA HUNTING FUND (OLT COUNTY)

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Abstract

The prospects for game fauna, edible or non-edible, for game culture or just for bringing their populations under control, are only likely and different from species to species. The purpose of this paper is to follow the evolution of the populations of game fauna in the Seaca No. 4 Hunting Fund (Olt County) in the period 2011–2021, in order to deepen and improve the existing game management. The surface of the game reserve is 8,661 ha and overlaps with 3 protected areas. During the research period, 9 representative species of hunting interest were identified, important from an ecological, economic and aesthetic point of view: 7 mammal species (belonging to 3 orders, 5 families) and 2 bird species (Phasianidae). Of the species of game interest studied, only the European fallow deer (an artificially introduced species), roe deer and red fox showed an increase in the number of animals, their hunting quotas and, therefore, their harvests during the research period. We mention the reduction in the wild boar herds, in spite of the special care taken by the administrator to supplement their food requirements, and the appearance and multiplication of jackals in the area, the multiplication of red foxes and the reduction in the European hare and gray partridge numbers. Comparing the actual and optimum populations in 2021, it can be observed that the actual population of roe deer, red deer and pheasant is close to the optimum population level. Thus, during the research period, the herds of hunting fauna were relatively high and balanced, in accordance with the diversity of the habitats and the large number of facilities for hunting. The need is felt to protect the habitats and further develop the territory where game is taken care of and harvested in the context where the habitats are subject to alarming changes, which affect both the trophic capacity and the shelter needed by the game.

The hunters from the studied hunting fund must maintain a sincere and constructive dialogue with the other actors in the field, in order to be able to take, jointly, the most appropriate measures for the conservation of wild fauna, without harming protected areas, agricultural production, forestry, etc.

Keywords: game animals, Seaca, wildlife management

1. INTRODUCTION

Game fauna (wildlife hunting interest) has a special value due to its biological, educational, aesthetic and economic importance. Hunting, which is as old as the human species, evolved with the development of human society (Dronca, 2007). Romania has a long history of hunting. Traces of the latter, such as the bones of hunted animals in Stone Age settlements and sites in present-day Romania, cave paintings of animals, such as those found in the Cave with Bones, the Muierilor Cave and the Cuciulat Cave, show that people here have been hunting for thousands of years. Although at the beginning of human existence, hunting was the main activity to provide food,

nowadays it has become an effective factor to ensure the dynamic balance of agricultural and forest ecosystems. From the 5th century and continuing into the Middle Ages and early modern times, hunting was only a royal right. Later on, hunting was regulated in all countries by various normative-legal acts, so that today it is of public interest and managed by the forestry services.

In Romania, hunting has been perceived for over 50 years as a rational activity, carried out with the aim of maintaining the ecological balance in nature with a hunting weapon.

This concept has become necessary because the current balance in nature is no longer a natural balance in the true sense of the word, but a balance maintained in a state of relative stability by the wise, economically and ecologically motivated intervention of the hunting factor. Hunting is therefore a conscious activity, through which a renewable natural resource is sustainably exploited (Cotta and Bodea, 1969; Şelaru, 2020).

In terms of the economic value of hunting, there were a total of 6.7 million hunters in Europe in 2016, providing an estimated economic output of €16 billion. The hunting sector in Europe provided 102,581 jobs, with hunting considered to contribute to rural development (Ebner, 2016). It is perceived in this way by hunting specialists, who constantly monitor the evolution of game populations in terms of quantity and quality and who establish, by methods and means with scientific pretensions, hunting quotas, differentiated for many sedentary game species by sex ratio, age class and quality category.

The first authentic hunting society was registered in Romania, in Bucharest, in 1870 (Şelaru, 2003), and in 1883 two societies were established: The Hunters' Union of Braşov and the Society for the Protection of Hunting in Bucovina. From the study of bibliographical sources on hunting heritage and its management in Romania, we can see the precariousness of the information.

As far as the consequences of recreational hunting for biodiversity conservation are concerned, large-scale recreational hunting is proposed as a means of conserving nature and sustaining livelihoods.

However, recreational hunting, especially trophy hunting, has been increasingly opposed on the basis of ethical concerns and arguments that it may threaten species of game interest and may not contribute significantly to local livelihoods. While there is extensive research on species ecology to debate sustainable hunting practices, there is relatively little research on the role of local institutions in determining socio-economic and conservation outcomes. There is a lack of evidence to answer pressing questions about where, how and how hunting contributes to biodiversity conservation and the sustainable and equitable use of its components. In terms of ecosystem services (Carucci et al., 2022; Conete, 2022) it is difficult to quantify the extent of hunting (Di Minin et al., 2021).

The prospects for game fauna (sedentary, migratory or erratic), edible or non-edible, for game culture or just for bringing their populations under control, are only likely and different from species to species. Of all the categories of fauna of hunting interest listed, migratory species unfortunately have the bleakest prospects. Not only because of the losses recorded during migration, but also because of the degradation of specific habitats in the nesting (breeding) sites, but not only in these, under the influence of anthropogenic activities and climate change (Şelaru, 2020).

2. MATERIALS AND METHODS

The existence of wild animal life has always been, and still is, influenced by environmental conditions. The main factors that determine the favourable environmental conditions for hunting are: food (food source), vegetation, climate, shelter and quietness. Vegetation has undergone major

changes over time, which has also influenced the situation of wild animals. In Europe forests and wetlands have shrunk by hundreds of millions of hectares. Thus, many species have disappeared and others have changed their range (Ivanescu et al., 1987). Also, the quietness and safety of game animals is an important factor. Some hunted species become accustomed to the noise, while others leave the site to seek safer areas. Hunted animals seek food in conditions that exist in the wild, which conditions are also provided by direct or indirect human intervention. Anthropogenic factors have increased in importance over time, primarily through their diversification as human activities have increased, with direct or indirect, positive or negative impacts.

The research on fauna of hunting interest was carried out on the territory of the hunting Fund no. 4 Seaca, Olt county, managed by A.V.P. "GTS MUNTENIA" Pitești. Geographically, the territory of the game fund is located in the south of the Cotmeana Platform, part of the Getic Plateau. Figure 1 shows the location of the hunting fund.



Figure 1. Location of the Seaca Hunting Fund no. 4

From an administrative point of view, the Seaca hunting Fund No. 4 covers the territory of the following rural communes: Spineni (41%), Poboru (33%), Leleasca (17%), Făgetelu (7%) and Cungrea (2%), all in Olt county (Figure 1). The surface of the hunting ground is 8,661 ha. Its distribution by use categories, according to the Hunting Fund File no 4 Seaca, is represented graphically in Figure 2.

The Seaca Game Fund No. 4 is located in the geomorphological unit of the Cotmeana Piedmont, which is part of the East European Platform Province, the Getic Piedmont Land. In point of altitude, the hunting grounds are located between 359 m in the northern part of the territory and 230 m in the south-western part (Poboru rural commune). From a hydrographic point of view, the territory of the hunting ground no. 4 Seaca is located in the middle basin of the Olt River, the sub-basin of the Cungrea Mica River (left tributary of the Olt River) – 33% and in the basin of the Vedea River, the

sub-basin of the Plapcea River (right tributary of the Vedea River) – 67% (Hunting Fund File no 4 Seaca, 2021).

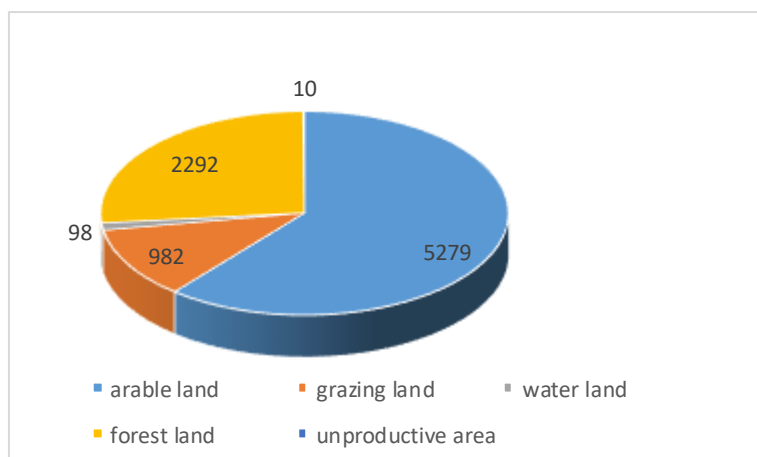


Figure 2. Graphical representation of the categories of use allocated to Seaca Hunting fund (Ha)

The territory under study is located in the sector of continental climate, hilly climate, subdistrict of the Getic Plateau, favourable for flora and fauna of the hilly area. Within the hunting ground the following can be found: arable land, forest, pastures (grazing land), orchards, water land, and less than 1% non-hunting productive land – roads, buildings, etc. (Figure 2).

Arable land occupies the largest area of the game fund (55%). The most common agricultural crops are maize, wheat, barley, oats, beet, potatoes, but also technical-purpose crops (rapeseed, sunflower and soy bean crops).

Grassland and commons within the hunting grounds occupy about 11% of the area. They belong to the rural communes in the territory or are owned by farms.

Grassland vegetation is represented by grass species (Gramineae), but also by Leguminosae species with much higher value as forage.

Farm pastures are made up of associations of grasses, cultivated clover and lucerne, artificially established by the owners of these lands. In natural meadows, the most common grass species are *Poa palustris*, *Poa pratensis*, *Festuca pseudovina*, *Festuca rubra*.

Grasslands have high productivity thanks to favourable climatic conditions and fairly abundant rainfall during the growing season.

The forest, that is the main living environment for the animals of the hunting grounds, occupies 26% of the territory. It belongs to the hilly oak and oak mixtures: *Quercus cerri*, *Quercus frainetto*, *Quercus petraea*, etc.

The forest massif of Seaca (with the Seaca – 1,355 ha, Gugu, Bisericii, etc.) located between the valleys of Cungrea Mică (a tributary of the Olt) in the west, and Plapcea (a tributary of the Vedea River) in the east, stretches 6 km from north to south and 6.3 km from west to east.

This territory has the most valuable grove of Hungarian oak (*Quercus frainetto*) in Romania and one of the cleanest in Europe. The species occupies 82% of the forest area and the trees have an average age of 75 years. Many trees are over 100 years old. The forest stands in the hunting forest

are composed of: beech (85%), hornbeam (5%), oak (4%), durmast / sessile oak (3%), acacia (2%) and other species (1%). The average age of the stands is 76 years, divided into different age groups. The silvicultural treatments applied to the stands are conservation felling, felling with long regeneration periods (shelterwood felling) and coppicing (generally in acacia).

The (natural) trophic supply of plants is mainly represented by stalks, leaves, bark, flowers, fruit (or seeds) of the forest species in the area: oak, Hungarian oak, durmast oak, Turkey oak, acacia, ash, elm, hornbeam, lime, uncultivated apple and pear trees, etc. The undergrowth is fairly well represented and consists of false indigo-bush, hawthorn, blackthorn, dog rose bushes, elderberry, and may provide food for deer species through the stalks of these species.

It can be concluded that the forest environment can represent an important source of food for game animals, which, combined with the supplementary food provided by man, can fully meet the needs of game species.

The relationship between wildlife and vegetation can be viewed from both directions. Thus, wild boar cause significant damage to meadows and agricultural crops through rutting, but the same wild boar can also play a useful role, especially in woodland, by encouraging the establishment of seedlings.

The **orchards** within the game fund occupy 7% of the area. Most of the orchards belong to farms, are fenced and not accessible to game.

Protected areas within the Seaca Hunting Fund No. 4. The Seaca Hunting Fund No. 4, with a total area of 8,661 ha, in accordance with the *Natura 2000 European Ecological Network* and the provisions of Art. 28 para. (2) of the O.U.G. no. 57/2007, overlaps with the Natura 2000 site – *ROSCI0255 Seaca-Optășani Forest* and the nature reserves established by Law 5/2000: 2.664 – *Seaca-Optășani Forest* and 2.669 – *Reserve of Hungarian oak groves*. Hunting, in the protected natural areas where it is allowed, is carried out in compliance with the conditions specified in the management plans of the respective natural areas, approved in accordance with the law.

Our research aims to assess the number of animals in this hunting ground in the period 2011- 2021. The analysis of the trend of the animal population size serves to evaluate the annual number of animals that can be hunted and to calculate the complementary food requirements for winter and also helps to maintain the sex ration. The aim of the evaluation was to gain numerical and structural knowledge of the sedentary game populations. The time chosen was the beginning of spring each year, after the vicissitudes of winter and the hunting season have been overcome by most species, when what is being assessed can be considered as surviving breeding stock for the future. The management of wildlife of hunting interest aims to conserve species of hunting interest, to establish as accurately as possible the numbers of the main species, to calculate the vigour of the game, the quality of the trophies and the age and sex structure, to avoid the adverse effects of factors such as pesticide pollution, habitat fragmentation, chemisation, mechanisation, etc, to capitalize the hunting potential of the hunting grounds as fully as possible, to establish trends and populations, to organize activities and implement measures to protect and promote wildlife, and to achieve agro-silvo-cynegetic balances. The number of animals is crucial for achieving optimal density, preventing damage to forest and agricultural crops (Șelaru, 2021). The research methods used were essentially methods of collecting information from bibliographic sources, as well as methods of collecting information from direct field investigations (Figure 3, Figure 4, Figure 5).



Figure 3. Field activities for roe deer feed management



Figure 4. Direct observations of roe deer in hyemal aspect

The classical methods for assessing the actual game population are: the direct observations method, the snow track reading method, the sample area method. As the existence and prosperity of game animals are primarily dependent on their living environment, the hunter's task is to contribute, to the best of their ability, to maintaining and possibly improving the environment. Given the new conditions in which game animals live, their conservation is more difficult than in the past and must be based on the biology, ethology and ecology of the species.

The arrangements for the maintenance and observation of the game are of great importance for a better management of the hunting fund.

In the Hunting Fund No. 4 Seaca, there are as many as 100 deer feeders (Hunting Fund File no 4 Seaca, 2021). For deer, manger-type feeders are recommended (Figure 3, Figure 6), for wild boar, food is administered directly on the ground where they frequent the area. Specialists advocate smaller and more frequent feeders to avoid large concentrations of game.

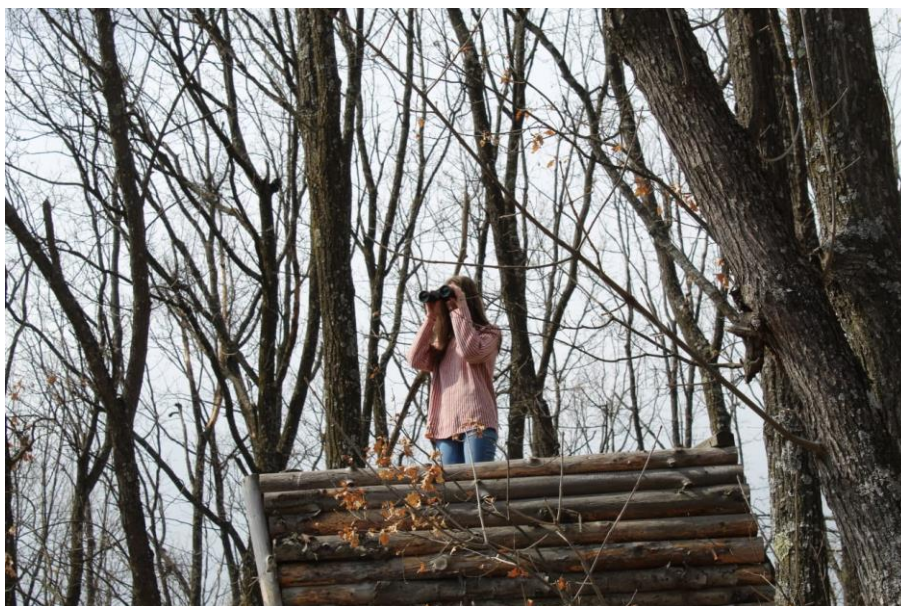


Figure 5. Observations on the European fallow deer



Figure 6. Feeding device for deer filled with complementary food in the winter season

Feeding devices should be placed in the wintering areas of the game. As far as possible, they should be located near water courses, accessible to both game animal and specialist staff.

Salt supplying devices and places are required in both winter and summer. They are placed next to the feeding devices, at 15-20m, and sometimes salt is placed in the feeders themselves. The hunting

ground where the surveys were conducted has higher than optimal actual herds, especially of fallow deer and roe deer, and so a total of 152 salt licks were set up (Hunting Fund File no 4, 2021). Bathing and watering ponds exist naturally and are maintained over the years. They are indispensable for wild boar, and where they are lacking they must be enforced in order to keep game in the area. According to the instructions, one watering hole (pond) is required for every ten wild boars.

Other facilities within the hunting fund, according to the hunting fund file: 2 hunting lodges and 1 hunting hut, 2 food depots, 10 observatories, 10 watering places, 25 bathing places and 3 km of hunting trails.

3. RESULTS AND DISCUSSIONS

During the personal observations in the field, as well as the observations conducted together with the field staff of A.V.P. "GTS MUNTENIA" in Pitești, in the Seaca Hunting Fund no. 4, we identified 9 representative species of game interest: 7 mammal species (belonging to 3 orders, 5 families) and 2 bird species (belonging to one order, one family – *Phasianidae*).

The main species of game interest are the common red deer - *Cervus elaphus* Linnaeus, 1758, the European fallow deer - *Dama dama* (Linnaeus, 1758), the wild boar - *Sus scrofa* Linnaeus, 1758, the roe deer - *Capreolus capreolus* (Linnaeus, 1758), the European hare - *Lepus europaeus* Pallas, 1778, the common pheasant - *Phasianus colchicus* Linnaeus, 1758 and the gray partridge - *Perdix perdix* (Linnaeus, 1758). The carnivorous species of no hunting interest are the red fox - *Vulpes vulpes* (Linnaeus, 1758), the Eurasian badger - *Meles meles* (Linnaeus, 1758), the golden jackal - *Canis aureus* Linnaeus, 1758, the Western polecat - *Mustela putorius* Linnaeus, 1758, the weasel - *Mustela nivalis* Linnaeus, 1766, etc.

Other species of secondary hunting interest are represented by migratory and sedentary species: the quail - *Coturnix coturnix* (Linnaeus, 1758), the common wood-pigeon - *Columba palumbus* Linnaeus, 1758, the Eurasian collared dove - *Streptopelia decaocto* (Frivaldszky, 1838), the European starling - *Sturnus vulgaris* Linnaeus, 1758, *Turdus sp.* and others.

Due to the geographical location, in the Seaca Hunting Fund No. 4, the main game species to be found are the wild boar, the roe deer, the hare and the pheasant. There are also some fallow and red deer, artificially introduced years ago, or as a result of migration (rarely). The presence of some specimens of red deer in the forests of the Seaca Hunting Fund no. 4 is something desired and pursued by the management, being a diversification of the existing species, without however establishing an optimal population for this species.

The dynamics of the real herds of sedentary hunting species over 10 years, respectively in the period 2011-2021, according to the Hunting Fund File, is presented in Table 1.

Thus, from Table 1 it can be seen that, during the research period, the common deer and roe deer herds were reduced in favour of the European fallow deer, the wild boar flocks were reduced, in spite of the care taken by the manager to supplement their food requirements, and the jackal appeared and multiplied in the area, the foxes multiplied, and the rabbit and pheasant flocks were reduced. The presence of large numbers of the fallow deer is a strong competitor for food and an important limiting factor for the red deer.

The first fallow deers (Figure 7) were brought to the Seaca-Optășani forest from Suceava, in 1962. In 1964 these animals were let to roam freely.

Table 1. The evolution of the hunting flocks

No.	Species	Evaluation of hunting flocks										
		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
1	Red Deer	25	19	18	18	18	16	16	16	15	15	15
2	Fallow deer	250	265	305	315	330	350	420	515	490	475	505
3	Roe deer	264	250	245	250	235	260	270	235	220	215	215
4	Wild boar	142	135	95	85	90	90	95	100	80	65	35
5	European Hare	970	810	820	800	810	800	800	690	680	670	660
6	Common Pheasant	540	550	510	500	510	500	500	500	490	475	480
7	Gray Partridge	500	450	430	400	400	400	400	400	400	400	400
8	Red fox	20	30	40	40	45	50	50	50	50	50	50
9	Golden jackal	0	0	0	5	5	15	17	19	22	22	25

*Figure 7. Red deer crossing the Seaca forest road in the winter season*

Comparing the actual (real) and optimal herds in 2021 the following can be seen: in red deer the actual herd represent less than half of the optimum (44%); in fallow deer the actual population is much higher than the optimum (about 337%); in wild boar the actual population has decreased significantly to 44% of the optimum; in European hare, the species with the largest numbers in the area of the studied hunting fund, the actual population size is below the optimal level approved for this fund (66%); in roe deer the actual population size is slightly above the optimal one - 102%; in pheasant the actual population size is close to the optimal one - 96% (Table 1, Figure 8).

Special attention was paid to the spring effective (real numbers) and the annual extraction hunting quotas for the 9 species during the survey period. The species analyzed are important from the points of view of hunting, ecology, economy and aesthetics. We will present the situation in detail only for species with obvious variations.

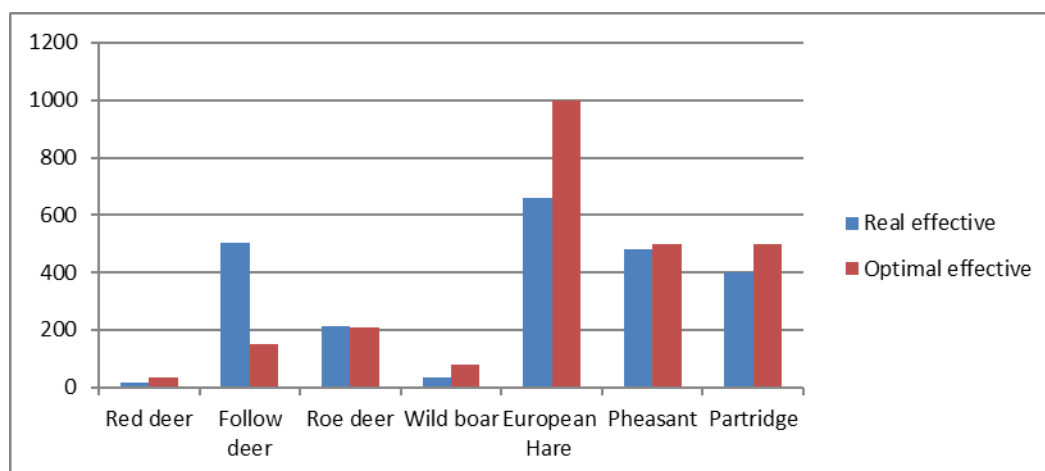


Figure 8. The dynamics of the real effectives compared to the optimal effectives (2021)

In the graphs below (figures 9, 10, 11, 12, 13) the spring effective, the extraction quotas per hunting season, and the number of specimens harvested during the research period are compared.

For the **fallow deer** it can be seen that the actual effective progressively increased from 2011 to 2018. The permanent increase in the population, although the entire extract quota was harvested, leads to the conclusion that the hunting (extraction) quota has been greatly reduced, given that the fallow deer is acclimatized in the area.

Thus, its reproduction was permanently pursued, even to the detriment of the other species of deer, as it is a major competitor for food and their feeding and sheltering grounds (Figure 9). In recent years, an attempt has been made to maintain the herd by setting hunting quotas close to the reproduction rate.

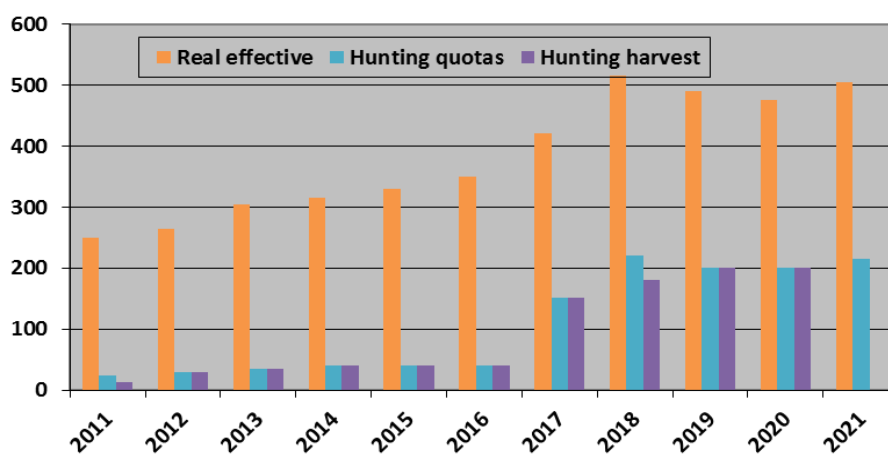


Figure 9. Numbers in spring - effective spring (by years), hunting quotas approved per hunting season for *Dama dama*

For the **roe deer**, comparing with the fallow deer, where the population doubled between 2011 and 2018, the actual population is slightly above the optimum (Figure 8). Hunting quotas are lower for females than for males, and also not all the authorized animals are harvested each year. It can be seen that in 2014 in the spring evaluations there was a high number of animals, and in the summer

of the same year there was a decrease in the roe deer herd due to the disease called *bluetongue*, so in the following spring, that of 2015, the evaluated population was lower. In the following years there was a slight increase in the herd, with a peak in 2017, but considering the excessive reproduction of fallow deer specimens in the last two years, the real roe deer herds decreased significantly (Figure 10).

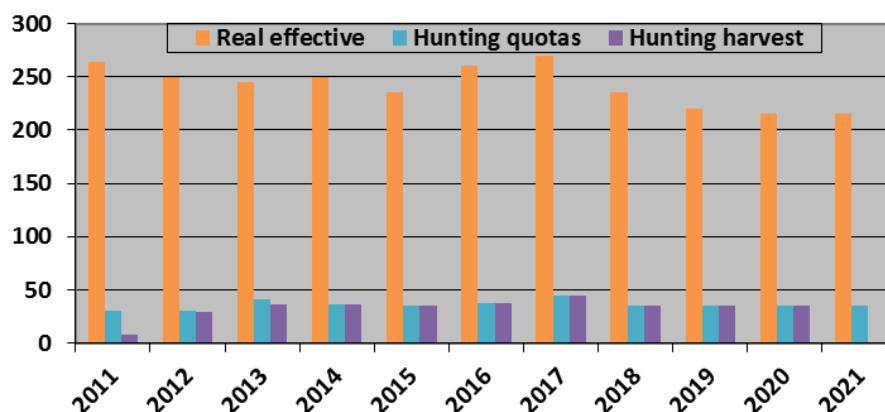


Figure 10. Numbers in spring - effective spring (by years), hunting quotas approved per hunting season for *Capreolus capreolus*

In the **wild boar**, the real herd decreased significantly in the spring of 2013, when the fruiting of the Hungarian oak, the main forest species in the area, was non-existent, which led to the migration of many boar specimens to the common oak and sessile oak forests in the north of the county.

In the following period, the manager took the needed measures to increase supplementary feeding, so that the wild boar herd increased from 2015 to exceed the optimal herd in 2018. In the last two years there has been a decrease in wild boar herd as a result of the large number of specimens harvested (Figure 11).

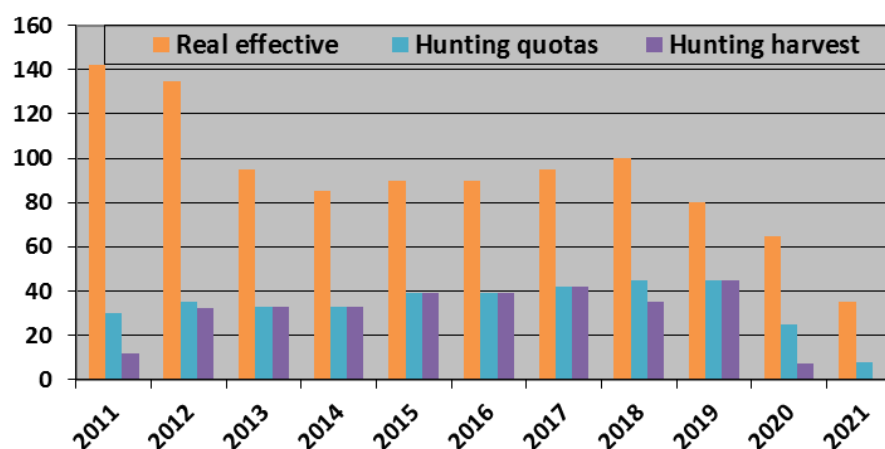


Figure 11. Numbers in spring – real effective (by years), hunting quotas approved per hunting season for *Sus scrofa*

The **European hare** is the species with the largest population (970 individuals) in the area of the studied fund (Figure 12), yet it is below the optimum level approved for this area (1,000 individuals). This situation is explained by anthropogenic factors (intensive agriculture, use of pesticides, poaching, etc.) and natural factors (the occurrence of jackals in the area). Intensive agriculture negatively influences the hare population through land consolidation, monoculture, use of chemicals, mechanization and use of modern technology.

This effect is particularly felt in spring at the first gestation, when the hare are at their most prolific period and females prefer arable areas, which are then processed for spring sowing, the young being unable to avoid machinery that is far too fast and with far too large working widths. We also mention the presence of jackals in the study area, which endangers the *Lepus europeaus* population. Measures need to be taken to reduce and control the jackal populations.

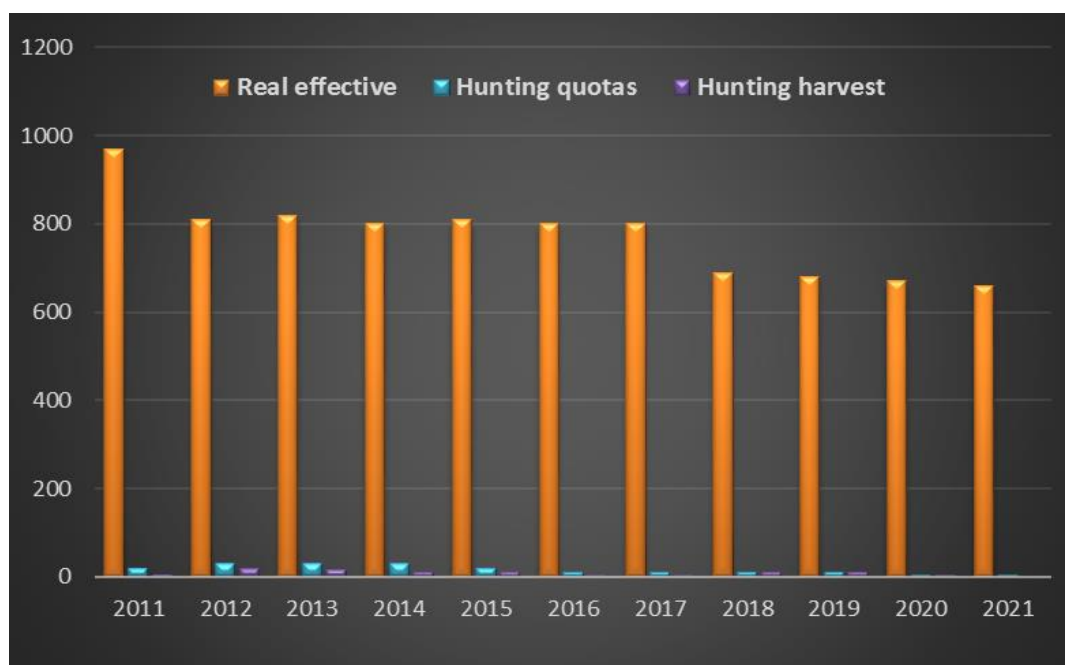


Figure 12. Numbers in spring – real effective (by years), hunting quotas approved per hunting season for *Lepus europeaus*

The **grey partridge** is slightly decreasing when compared to the number of specimens found all over the area of the fund in 2011 (500 specimens) and considering that it has not been harvested by hunting activities since 2015. This is a very hard-pressed species, having the most numerous natural enemies that are otherwise found within the range of the studied hunting grounds, from birds of prey (goshawk, eagle, crow, raven and magpie) to martens, polecats, foxes and jackals. The evolutionary trend of the European population is also declining. Among the most important factors endangering this species is the climatic factor, with freezing winters with snow cover making food inaccessible (Figure 13); other threats to the species: loss of habitat and degradation of the habitat occupied, mechanization and chemicalization of agriculture (pesticide poisoning), poaching, burning of stubble fields, cultivation under plastic sheeting, liquidation of field borders and hedges,

expansion of monocultures and the growth of industrial plants to the detriment of cereals and legumes, as well as the fact that green fodder harvesting overlaps with bird nesting season, expansion of human settlements, climate changes, abandonment of dogs and cats in the wild, etc. Thus, the gray partridge can be considered a barometer species for the future of biodiversity in the area occupied. Conservation measures for the species include maintaining hedges and field borders, encouraging organic farming, adjusting the agricultural calendar to the biology of the species, avoiding urban expansion, controlling dog, cat and jackal populations, controlling poaching and temporarily limiting hunting, environmentally friendly farming technologies in the future and others.

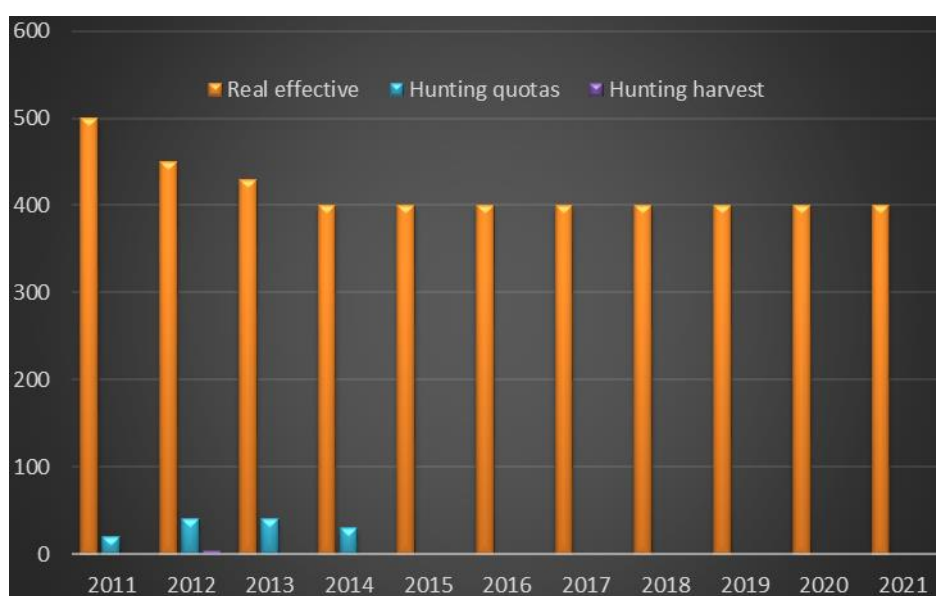


Figure 13. Numbers in spring – real effective (by years), hunting quotas approved per hunting season for Perdix perdix

The presence of individuals of a species in the habitat of the hunting ground has a diurnal, a seasonal and an annual dynamics. It is influenced by the range of activity and by certain characteristics of the habitat, the most important of which are trophicity (food), shelter, competition, etc. The wild boar may have its feeding grounds in one hunting ground and its shelter grounds in another hunting ground, if it does not have shelter and quiet conditions in the first hunting ground. Treatment of crops with pest control substances can cause significant losses to game flocks (hare, partridge, pheasant, etc.). The pheasant population is normal due to the prolific potential of the species. Also, the harvesting of green fodder overlaps with the nesting periods of the bird species or with the rearing period of young hares and young roe deers.

The grasslands have seen a continuous process of degradation. Communal pastures, due to their uneven territorial spread, have been subject to a continuous process of degradation, those lying close to villages through overcrowding (by being overloaded with animals,), and those further away through under-use, leading to their present state, which is unsuitable for the new requirements of animal husbandry.

Intensive farming on large areas negatively influences the species populations through land consolidation, monoculture, use of chemicals, mechanization and modern technology, etc.

In order to increase the herds of hunting interest, it is necessary to ensure quiet and peacefulness in the area, to regulate the free movement of the local population in the game reserve and, above all, to stop abusive grazing in the forest reserve. It is also necessary to combat and prevent poaching, a phenomenon that has become increasingly common recently, and to resolve conflicts with farmers over the destruction of agricultural crops.

Hunting in the Seaca fund must respect the laws and administrative regulations governing hunting, the hunters must protect the wild animals, and when they hunt them, they must do so rationally, with measure, so that the breeding stock is not reduced.

Also, one can notice that the level of the populations and extraction quotas are declining as the habitats of game species degrade at an alarming rate.

4. CONCLUSIONS

The low hills region of Olt County has a rich fauna, represented by a relatively large number of bird and mammal species, all of which can be observed in the Seaca Hunting Fund No. 4 in Olt County. The forest, due to its size and structural characteristics, offers good conditions for game to develop: food resources (of vegetable and animal origin), peace and quiet, resting and shelter places (roosts, nests, burrows, dens), mating places, the possibility of growth chickens in conditions of increased safety.

In conclusion, from the analysis of the data and graphs concerning the dynamics of herds, quotas and harvests of the game animal populations studied, some important observations can be deduced for the management of the hunting grounds. We note that among the species of game interest studied, only in the case of fallow deer, roe deer and red fox there is an increase in the numbers (herds), quotas and, implicitly, harvests in the period 2011-2021, so as to constantly aim to preserve a dynamic but stable balance in the natural surroundings between the numbers of game species and the environment, between carnivorous and herbivorous game species, and between the various age and sex categories within the same species.

It was also observed that any exaggeration, in the sense of renouncing the extraction of a part of the harvest quota (in fallow deer and roe deer) in order to cause a subsequent increase in the natural increase, respectively, an increase in the harvest quota in subsequent years, or conversely, to force the harvest (extraction) quota (in wild boar) by decreasing the breeding stock, may lead to unsatisfactory hunting quotas in subsequent years, in addition to undesirable disturbance of the balance in nature and may cause damage to farmers and foresters.

It is therefore important, under certain conditions, to maintain a natural balance or an artificial one (artificial selection), stabilized by man over time, between predatory and herbivorous game species, and between game species in general and their living environment. In the Seaca game fund, the herds of hunting fauna during the research period was relatively high and balanced, in accordance with the diversity of the habitats and the large number of arrangements for the maintenance and observation of game. The data confirm the quality of the hunting fund in providing favourable conditions for the game species. However, too large an increase in their numbers (herds) is not desirable, as damage to agricultural crops may occur.

Further protection and managing are needed of the territory where the game is taken care and hunted, as habitats are subject to continuous changes, affecting both the trophic capacity and the shelter needed by the game.

Hunting in the Seaca fund must comply with the laws and administrative regulations governing hunting, and proper hunting aims at a high and healthy game population. Hunting in the protected natural areas (which overlap with the hunting fund) where it is allowed is carried out in compliance with the conditions stipulated in the management plans of the respective natural areas.

It is necessary for the hunters in the area under study to maintain an open, honest and constructive dialogue with the other actors in the field, in particular those in the fields of biodiversity conservation, agriculture and forestry, and with the local community, in order to be able to jointly take the most appropriate measures for wildlife conservation, without damaging protected areas, agricultural and forestry production, etc. Measures are needed to protect game by harmonizing the economic interests with the ecological requirements of the species in the area under investigation, as well as measures to improve the wildlife-vegetation relationship.

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