

RESEARCH STUDY OF MAMMAL SPECIES OF HUNTING INTEREST IN FOUR HUNTING FUNDS IN TELEORMAN AND PRAHOVA COUNTIES

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Abstract

The need to ensure biodiversity conservation is seen as a measure to adapt to climate change and at the same time to protect vulnerable species by preserving and restoring ecosystems. For this purpose, in this article, was study the vulnerability of three species of mammals of hunting interest (deer, rabbit and wild boar) and their adaptation to the effects of climate change in two hunting funds in Teleorman County (hunting fund 1 Flămânda and hunting fund 62 Islaz) respectively Prahova county (hunting fund 43 Lapoș and hunting fund 11 Gherghița).

Key words: biodiversity conservation, mammal species.

INTRODUCTION

Natural habitats represented by forests and farmland management opportunities provide benefits and variety, offering hunters seeking opportunities to pursue both large game such as deer, wild boar, and small game such as pheasant and rabbit. In addition, these landscapes offer wildlife enthusiasts and lovers the chance to observe and photograph animals in their natural habitat.

While agriculture can alter wildlife habitats, agroecosystems (agricultural ecosystems) can also contribute to biodiversity conservation by providing recreational activities such as hunting and the aesthetic pleasure of observing wildlife in agricultural environments. Thus, agroecosystems serve as providers of various biodiversity and wildlife services and benefits to society, providing individuals with both non-use and use values by providing these goods and services.

The existence of diversified and abundant natural resources in Romania has led to an increase in cases of damage caused by wild animals both on private and public property. Consequently, the implementation of a consistent policy to prevent, combat and compensate losses has become imperative (Ionescu-Lupeanu, 2023).

The sustainable use of wildlife, whether for our direct (productive) or indirect (non-productive) purposes, is an undeniable aspect of societies. However, there are policies that advocate the end of productive exploitation. Wildlife, considered renewable, retains this quality only when the ecosystems remain unaltered and undegraded. Biodiversity conservation requires stopping practices that harm wildlife and biodiversity, regardless of the method of their exploitation (Knoche & Lupi, 2007). The trend in this sector is similar to other sectors involving the use of natural resources: demand is increasing, but natural resources remain in decline due to various pressures and threats from various human activities.

Understanding the influence of climate change on the quality and connectivity of natural habitats is essential for the effective conservation of a wild species and the management of the country's population (Zhenhua et al., 2024).

In Teleorman County, environmental disturbances have negative repercussions on wildlife, leading to disturbances among game species and diminishing their natural food sources, including supplementary feeding in colder seasons.

Meanwhile, in Prahova County, there has been a slight increase in poaching incidents over the last five seasons. Given the potential of the

region for natural resources and rural development, it is essential to impose strict measures on future poaching, especially as regards poaching through trapping. In general, tourism has minimal impact on the area, including the influence on hunting activities. In this article, the vulnerability of three species of mammals of hunting interest (deer, rabbit and wild boar) and their adaptation to the effects of climate change were studied in two hunting grounds in Teleorman county (hunting grounds 1 Flămânda and hunting grounds 62 Islaz) and Prahova county (hunting fund 43 Lapoș and hunting fund 11 Gherghița).

MATERIALS AND METHODS

Analysis and comparison of optimal and evaluated populations of mammal species of hunting interest in four hunting grounds in Teleorman County, respectively Prahova County, during 15 May 2022 and 14 May 2023. As species of hunting mammals representative for Teleorman and Prahova counties, was carried out a comparative study of wild boar, deer and rabbit species in two hunting funds (FC) in Teleorman County (hunting fund 1 Flămânda and hunting fund 62 Islaz) respectively in Prahova county (hunting fund 43 Lapoș and hunting fund 11 Gherghița).

The primary indigenous wildlife species thriving in the hunting areas FC 1 Flămânda and FC 62 Islaz, listed in order of prevalence, include:

Rabbit: Serving as the primary game species under management, rabbits flourish across the entire hunting grounds except for pastures and areas near water bodies like swamps.

Deer: Ranking as the second most significant game species in terms of management, deer inhabit approximately 20% of the hunting grounds, enjoying favorable living conditions.

Wild boar: Occasional sightings of wild boars occur, particularly during autumn seasons, influenced by the types of agricultural crops cultivated in the vicinity.

Hunting fauna presentation on FC 43 Lapoș and FC 11 Gherghița.

The relationship between fauna and vegetation must be considered bidirectionally. Forests provide optimal habitats, and the forested area significantly contributes to the credibility of a

hunting ground. Cervids, such as deer, with higher year-round food requirements, can cause considerable damage, particularly in areas with increasing population density, if food sources are not adequately managed. To address this, the cultivation of crops like maize, beet, or barley is recommended, especially where undergrowth is well established, to enhance food availability.

Supplementary feeding is administered as follows:

Deer: Hay or alfalfa feeders are provided from November onwards.

Wild boar: Concentrated feed is placed at feeding points between November and February.

Salt is administered throughout the year, with 10% in the first quarter, 45% in the second quarter, 40% in the third quarter, and 15% in the fourth quarter.

In these two hunting areas, studies have focused on mammalian species of hunting interest, including the European hare (*Lepus europaeus*), wild boar (*Sus scrofa*), and various deer species (*Capreolus capreolus*) (Figures 1, 2, 3).



Figure 1. Rabbit species (*Lepus europaeus*)
<https://ro.wikipedia.org>

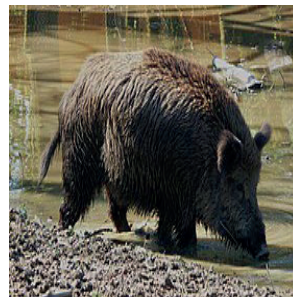


Figure 2. Wild boar species (*Sus scrofa*)
<https://ro.wikipedia.org>



Figure 3. Deer species (*Capreolus capreolus*)
<https://ro.wikipedia.org>

For each species, we recognized the importance of determining how to establish optimal herds aligned with creditworthiness categories. The creditworthiness or biogenic capacity of a hunting reserve is defined by various factors, including ecological, geomorphological, edaphic, climatic, and biotic elements (Daneti, 1968) which influences for positive or negative the lives of animals living on that land (Almasan et al., 1966) (Tables 1, 2, 3).

Table 1. Optimal herds corresponding to the creditworthiness categories, for rabbits (Almasan et al., 1965; Order 393/2002)

Name	Creditworthiness category			
	I	II	III	IV
Points awarded by creditworthiness category	91-112	61-90	33-60	8-32
Adequate optimal herds; pcs/100 ha productive land	25-15	10-14.9	5-9.9	1-4.9

Table 2. Optimal herds corresponding to creditworthiness categories, for deer (Almasan et al., 1965; Order 393/2002)

Name	Creditworthiness category			
	I	II	III	IV
Points awarded by creditworthiness category	111-140	76-110	42-75	6-41
Adequate optimal herds; pcs/100 ha productive land	9-11	7-8.9	5-6.9	0.5-4.9

Table 3. Optimal herds corresponding to creditworthiness categories, for wild boar (Almasan et al., 1965; Order 393/2002)

Name	Creditworthiness category			
	I	II	III	IV
Points awarded by creditworthiness category	81-100	55-80	30-54	5-29
Adequate optimal herds; pcs/100 ha productive land	0.7-0.8	0.5-0.6	0.3-0.4	0.05-0.2

Knowing it helps to establish the productivity of hunting funds, to take the most appropriate management measures, to achieve optimal productivity in the shortest time. In order to find the main causes or factors positively or negatively influencing the existence of game species, it is imperative to investigate the fluctuation of actual game populations and harvests. Such data must express as accurately as possible the situation on the ground, i.e. be based on highly accurate game assessment or inventory methods. The field assessment was carried out according to the provisions of the Order of the Ministry of Environment, Waters and Forests nr. 2847/2022 on the approval of the Instructions on the assessment of the numbers of certain species of hunting fauna admitted to hunting and for regulating the way of establishing their harvest quotas.

RESULTS AND DISCUSSIONS

Deer (*Capreolus capreolus* L.)

The evaluation of the deer herds was done through direct observations, in two stages which, corroborated, in order to provide an image as close as possible to the reality on the ground, both in terms of herd size and its structure by age classes, sexes and health status.

The direct, visual evaluation during the mating period (running) was organized in July and August (first decade). During this period, very easy observations were made, which provide essential data on deer herds. It was easy to observe the age categories in males, an assessment could be made on the annual increase in young exemplars under one year old, respectively it was possible to easily establish the sex: ration ratio of the deer population.

In each of the four hunting grounds, there were identified the places suitable for running where, as the case may be, one or more observation points were installed, from where the rafters in that area could be observed and heard well. The observations were held for 2-3 consecutive days, at all established points, simultaneously, early in the morning (before light) and in the afternoon, until dark. The second stage of evaluation of deer herds was based on visual observations made on flocks during the winter period (January-February).

Wild boar (*Sus scrofa* L.)

The evaluation of wild boar herds was carried out in January - February by visual observations at feeding points and by reading traces left on the substrate (earth, snow). The visual assessment procedure consisted of direct observations. The observations were made simultaneously, on the same day, at all feeding points within each hunting fund and were made at least two times during February.

Hare (*Lepus europaeus*)

The herd size assessment in hares was carried out on the basis of direct visual observations on sample areas or sample strips. The observations were made in late winter - early spring (February - March), recommended in January when the specimens are relatively grouped for mating, preferably on sunny, windless days, in the evening and morning hours, when rabbits are more active. The evaluation of the herds was carried out both in cultivated agricultural land and in the forests of the plain area.

The calculation of the herds by categories of land was made using the formula:

$$E.f.c. = (S.c.: S.p.) \times n (1)$$

E.f.c = the population calculated on a given category of land, in exemplars;

S.c. = the total area of the land category in the hunting fund, in ha;

S.p. = area of sample area travelled from the same category of terrain, in ha;

n = the number of specimens found on the sample area travelled, in the same category of terrain.

When centralizing the data, the results obtained by categories of land were totaled, excluding from the calculation the non-productive areas for rabbits of the hunting fund, finally establishing the total herd on its entire productive area.

Using the methods for assessing mammalian species of hunting interest, from the analysis of the above summary data, it follows that:

- for the deer species, the largest evaluated herds are in the hunting fund FC 43 Lapoș from Prahova county (218 pcs) as Table 4, which has Creditworthiness category I, which means that the area is populated, probably because the food was enough and there are not anthropogenic activities in the area;

- from the point of view of animal husbandry, the area is not so active, no negatively activity influencing the silence of the hunt; for the wild boar species, the largest evaluated herds are in the hunting fund FC 43 Lapoș from Prahova county (69 pcs) as Table 5, which has Creditworthiness category II, which means that the area had no significant negative influences of the anthropogenic activities in the area (e.g. chemical fertilizer from agriculture);

- the rabbit species, the largest assessed herds are in the hunting fund FC 1 Flămânda from Teleorman county (775 pcs) as it is observed in Table 6, which has Creditworthiness category I, meaning that that the area is overpopulated, probably because the enough fauna and the non- existence of the human activities;

- in addition to the agricultural works that are carried out on large areas, unevenly and over a long period of time, the vulnerability of the three studied species of mammals of hunting interest is due to poaching with greyhounds or dogs, with a noose, with a beacon or with hunting weapons and the burning of stubble after the harvesting of grasslands or the chaotic grazing in areas cultivated with perennials;

- the lands within the FC 1 Flămânda and FC 62 Islaz hunting funds are public property (forest, water surface, pasture, and part of the agricultural land) and private property of the citizens of the communes within the radius of which the hunting fund is surrounded;

- as a form of agricultural land exploitation in the past, the associative-cooperative form prevailed as well as that of organizing the exploitation of these lands in large agricultural farms;

- the territory of the FC 11 Gherghița hunting fund is quiet from the point of view of industrial activity. Consequently, the pollution phenomenon does not affect the way the studied area and, implicitly, the existing hunting species;

- the phenomenon of poaching has seen a reduced magnitude in recent seasons, no cases of poaching with weapons have been discovered. In 2022, a case of poaching with greyhounds was discovered;

- tourism has no significant influence on the area in general and game in particular;

- the territory of the hunting fund 43 Lapoș is a quiet one from the point of view of industrial

activity. The pollution phenomenon does not, therefore, affect in any way the studied area and, implicitly, the existing hunting species;

- from the point of view of animal husbandry, the area is active, a significant number of domestic animals being grazed annually. In total, about 2000 sheep, goats and cows, belonging to 12 sheepfolds, graze within the hunting fund, the influence being felt negatively, especially under the aspect of the silence of the hunt;
- reanalyzing the criteria for ranking of hunting funds;
- elaboration of a hunting management plan at national level;

- active involvement of the administrator of the national hunting fund in the evaluation of the populations of hunting interest (Gheta et al., 2022);

- limitation of the extraction quota;
- the popularization of the impact that this drastic decrease, of the wild boar herd, has on the environment (Cocor et al., 2022).

Of all the three species of mammals of hunting interest evaluated, it is observed that the rabbit species with creditworthiness category I has large herds in all the hunting funds evaluated, which means that human activities from the have not influenced on this species.

Table 4. Centralizer of evaluated deer species and harvest quotas

Crt . no	Name Hunting Fund	Hunting Fund Manager	Optimal Effectives (pcs)	Effectives evaluated (pcs)		Harvest quotas for hunting season 2022/2023 (pcs)		Proposed harvest quotas for hunting season 2023/2024 (pcs)	
				2022	2023	Approved	Accomplished	According to the formula	By Manager
1	FC 1 Flămânda	AJVPS TELEORMAN	60	57	57	4	4	4	3
2	FC 62 Islaz	AJVPS TELEORMAN	80	73	74	5	5	5	5
3	FC 11 Gherghița	AVPS CODRII VLASIEI	74	180	177	55	55	69	65
4	FC 43 Lapoș	AVPS MUFLONUL	80	223	218	35	20	69	35

Table 5. Centralizer of evaluated wild boar species and harvest quotas

Crt . no	Name Hunting Fund	Hunting Fund Manager	Optimal Effectives (pcs)	Effectives evaluated (pcs)		Harvest quotas for hunting season 2022/2023 (pcs)		Proposed harvest quotas for hunting season 2023/2024 (pcs)	
				2022	2023	Approved	Accomplished	According to the formula	By Manager
1	FC 1 Flămânda	AJVPS TELEORMAN	5	2	2	2	2	0	2
2	FC 62 Islaz	AJVPS TELEORMAN	15	6	6	6	6	0	6
3	FC 11 Gherghița	AVPS CODRII VLASIEI	25	26	40	11	10	20	20
4	FC 43 Lapoș	AVPS MUFLONUL	20	62	69	40	32	30	45

Table 6. Centralizer of rabbit species evaluated and harvest quotas

Crt . No.	Name Hunting Fund	Hunting Fund Manager	Optimal Effectives (pcs)	Effectives evaluated (pcs)		Harvest quotas for hunting season 2022/2023 (pcs)		Proposed harvest quotas for hunting season 2023/2024 (pcs)	
				2022	2023	Approved	Accomplished	According to the formula	By Manager
1	FC 1 Flămânda	AJVPS TELEORMAN	850	775	775	30	30	58,125	35
2	FC 62 Islaz	AJVPS TELEORMAN	750	685	685	30	30	51,375	35
3	FC 11 Gherghița	AVPS CODRII VLASIEI	500	548	546	40	40	175	60
4	FC 43 Lapoș	AVPS MUFLONUL	100	134	145	15	13	40	16

CONCLUSIONS

For each wild species, it is imperative to effectively identify optimums for all creditworthiness categories. The quality of a hunting ground, or its biogenic capacity, encompasses ecological, geomorphological, edaphic, climatic and biotic factors that influence the well-being and life cycles of resident animals. Understanding these factors is crucial to stabilizing gameland productivity, implementing appropriate management strategies, and effectively maximizing productivity. In order to identify the primary causes or factors that have a positive or negative impact on game species, a thorough investigation of herd fluctuations and actual game harvests is essential. This research must be based on precise methods of game assessment or inventory, aligned with the criteria for classifying hunting grounds in Romania for species such as: pheasant, rabbit, deer, wild boar, etc.

From these analyses, we considered it necessary to draw up sustainable game management action measures for these mammal species of hunting interest on the four hunting funds in Teleorman and Prahova counties, in the context of climate change:

- revision of existing populations through "refreshing the blood" actions;
- increasing the nutritional potential of hunting resources. this will be done by: creating the network of hunting units, buildings and installations, creating natural conditions for game feeding, complementary game feeding, combating game pests.

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