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STUDY REGARDING CERVIDAE EVOLUTION IN CALARASI COUNTY

Marius MAFTEI, Iulian VLAD, Razvan POPA, Lucica NISTOR, Daniela IANITCHI, Andra SULER, Nicoleta DEFTA

University of Agronomical Sciences and Veterinary Medicine Bucharest,
Marasti 59, Bucharest, Romania

Corresponding author email: mariusmaftei@yahoo.com

Abstract

This is another just part for an ample study regarding evolution of species from Cervidae family in Romania. The programme is developed in collaboration with Romanian Hunter's Federation. The main purpose of this study is to reveal the reality, to find causes and to elaborate long term strategies in direction of biodiversity conservation, especially for wild game. In the last years the Romanian hunters indicate that the number of roe deer population decreasing, because of intensive agriculture and also because of high number of predators (bear, wolf and lynx population). We analyze the official data from national evaluation of sedentary game in Calarasi County. Hunting territories in this area are managed by National Forest Authority, county associations of hunters and other associations for conservation of biodiversity and management of hunting territories. We analyse cervidae real livestock between by counties, by sexes, and in comparison with optimal livestock (maximal number of individuals who can leave in a hunting area, without causing damage to the agricultural fields or in the forest). Considering the new agricultural technics and technologies it is relatively normal to find a numerical depreciation of wild game. But for cervidae populations, in analysed period in Calarasi County, we find a good and representative population. The differences between what can be saw in hunting territories and what is reported was analyzed. We can say that the evaluation, the official evaluation, is not perfect and we must work together to know exactly the livestocks and to develop a long term strategy for conservation of biodiversity.

Key words*: cervidae, evaluation, game, Calarasi.*

INTRODUCTION

All over the world, scientific organizations, hunter's associations and organizations involved in environmental protection collaborate in the direction of conservation of the environment and biodiversity, implicitly in the protection of wildlife. The subjects of these researches are mainly the members of cervidae species. A lot of researches have as principal subject the red deer, especially in North America and in North – Western European countries. The themes aim are deep, detailed topics, mainly focused on the influences of the special and general environment on behavior, growth rate, etc., as well as pathological aspects. So, in Scotland, Albon et al. (1983) studies the influence of climatic variation on the birth weights of Red deer. In Slovakia, Trdan et al. (2003) shows that, at the forest border, because of red deer grazing, the herbal production is damaged with 50%. In this case, probably they have a big density or it is a temporary agglomeration. In 2000, Slate et al., analyzing a red deer population in the Islands of Rum (Scotland), demonstrate that inbreeding depression influences lifetime breeding success in wild population of red deer.

It is a certitude that in the hunting areas the number of game species has decreasing. This situation was detected by hunters, no matter the hunting territories that they used for hunting.

In Europe, a big project was "Big carnivores in Carpathians" (1995-2003) developed by WWF in Romania. The aim of this project was to analyze the wild livestock of brown bears, wolves, lynx and wild cat and to determinate the status of this species. The conclusions were that all this four species of predators are endangered and must be protected. It is interesting that in the middle of '90's, some Romanian researchers show that the Romanian brown bear was the biggest livestock from Europe (Cotta et al., 2008). More than that, the brown bear real number was almost three times bigger than the optimal number (optimal population – maximum number of individuals who can live in an area without depreciating

forest and agricultural crops. Protection of these predators led to decreasing of prey species, especially of that species that cohabitate in the same area with the brown bear and wolf. We refer here especially to red deer and roe deer. In almost the same time, from South, a new predator arrives in Romania: the jackal (*Canis aureus*). In the past, some individual of *Canis aureus* was observed in South-East of Romania, more exactly in Dobrogea area, and especially in Danube Delta. But this time, jackals were hunted in Alba County, at more than 400 km from the South border. In comparison with foxes, jackals prefer small game and roe deer and red deer kids. In the absence of a predator, the number of jackals has increased numerically and has expanded vertiginously. It is a fox competitor and, due to superior physiological and morphological characteristics, he became the predominant predator of the roe deer and even red deer, preferring the youth, but not getting back in front of the mature specimens, especially in the case of roe deer. In this situation, when in the field the red deer has became a rarity, and the roe deer it is obvious at a lower level, it is a must to know the real livestock and the real evolution of species, in order to developing medium and long-term strategies for the conservation of cervidae species. We can not leave aside the economic aspects, the deer representing the second species of hunting interest in Romania, after the rabbit (Comșia, 1961), by the species characteristics and hunting fees practiced.

Regarding the fallow deer, it is not a autochthonous species. In Romania the fallow deer was imported, for the first time, in centuries I-II, by Romans, being bred in fence area. After barbarians invasion, the fallow deer escape from this fence areas and became wild. In 1830 fallow deer were colonized in a forest with an area of 4,000 ha, situated along Crisul Negru, (today's territory of Hungary), on the border with Romania. Due to the existence of the wolves, entire stock grew hard. Because of this, in 1900 the forest and a part of the agricultural land have closed. Due to the favorable conditions the fallow deer stock has grown so much that it has created important forest damage. So, after about 15 years (roughly in 1915) the fence area has disbanded and it is supposed that some fallow deer has moved to the forest of Socodor, located at 9-12 km (Cazacu, 1983). In 1918 the fallow deer in Romania numbered 500 individuals grouped in nine cores. The only individuals who lived in freedom were at Savarsin and Socodor, Arad County (Geacu, 2009).

In 2007, according to the "Report on Romania's state of forests in 2007" the fallow deer livestock from freedom was evaluated at 5,700 specimens. Unfortunately, the economical value and the interest for hunting this species is low. More than that, due to physiological, ethological and morphological characteristics, the fallow deer is a food competitor for roe deer and red deer.

MATERIALS AND METHODS

Analyzed material was represented by Cervidae population from Calarasi County: Red deer, roe deer and fallow deer. It was analyzed the official data from national evaluation of sedentary game in Calarasi County area, more exactly for roe deer, fallow deer and red deer and it was calculated statistics, in order to have a better view of situation. The hunting territories in this county are managed by National Forest Authority, county associations of hunters and other associations for conservation of biodiversity and management of hunting territories.

It was analyzed the livestock of Cervidae between 2014 and 2018 by sexes, and in comparison with optimal livestock, in accordance with the rating keys for hunting territories.

We also use some statistics like average, standard deviation, error of average, and variability coefficient in order to have a better overview of the population evolution. In other way, our study is based on the official raports of hunting areas administrators, centralized at ministerial level, due to the fact that the evaluation of cervidae species, on such a big area, involve a huge number of observers and a lot of time (in according with the methodological norms for national game evaluation.

More than that, a correct evaluation must be done in the same time for all 42 hunting areas from Calarasi County (over 500000 ha).

RESULTS AND DISCUSSIONS

Analyzing the data from Table 1 and Figure 1, we can easily observe that the livestock is relatively stable until 2012, when the fallow deer population increasing from 84 to 136 individuals.

Table 1. Real livestock of cervidae in Calarasi County

Year	Roe deer (heads)	Red deer (heads)	Fallow deer (heads)
2014	4859	671	28
2015	4977	765	32
2016	4949	843	32
2017	5100	848	34
2018	5065	908	34

As we expected, the roe deer is dominating, from numerical point of view, the other two species, being the most important species of big game in south east, after the wild boar. We must say that the fallow deer is presented only in one hunting area administrated by A.V.P.S. Bucuresti – hunting area no. 20 – Frumusani.

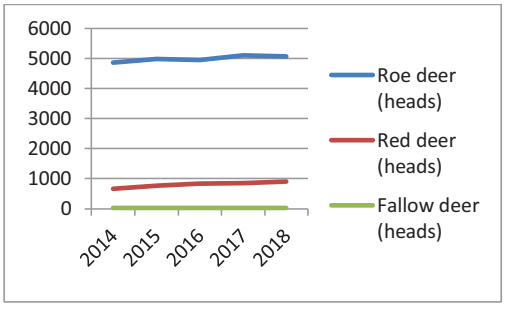

Figure 1. Cervidae evolution

For red deer, the individuals are mainly located on the hunting areas administrated by AVPS Natural Hunting. Analyzing by species we find, in red deer population (Figure 2), an increasing number of males starting from 2014 till 2018, at 23.23% in 2015, 0.96% in 2016, only 0.32% in 2017, and 5.68% in 2018. Females have a different evolution.

In females case, annual increasing was 8.39% in 2015, 16.59% in 2016, only 0.76% in 2017, and 7.91 in 2018. For the entire period, analyzed in this case, the differences between sexes, regarding the population evolution are not significant: 31.89% in males and 37.41% in females.

The natural increasing rate for red deer is normally 15%.

This situation, revealed above, it seems to be real, in comparation with other data who reveal an artificial way of increasing the real size of red deer population in other counties (Maftei et al., 2017).

More than that, an average yearly increasing that represents over 50% from natural increasing rate of species it's a healthy fact (it is considered that a normal hunting rate must be till 50% from increasing natural rate).

The statistics calculated for red deer is presented in Table 2

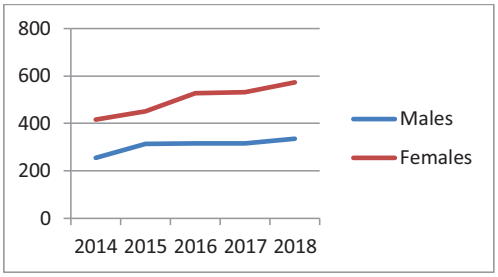

Figure 2. Red deer evolution

Table 2. Calculated statistics for red deer

Year	Optim	Males	Females	Total
2014	60	254	417	671
2015	60	313	452	765
2016	60	316	527	843
2017	60	317	531	848
2018	60	335	573	908
X	**51.43**	**307.00**	**500.00**	**807.00**
STDEV	**22.68**	**30.86**	**63.66**	**91.43**
Sx	**7.56**	**15.43**	**31.83**	**45.72**
CV%	**44.10**	**10.05**	**12.73**	**11.33**

In Figure 3 it is represented graphically the evolution of fallow deer in Calarasi County.

As we already say, the fallow deer in Calarasi County was reported only on Frumusani hunting area.

From this point of view, this species have a limited importance at county level.

Even if the importance of species is insignificant, at county level, we calculated statistics for this species. The data are presented in Table 3.

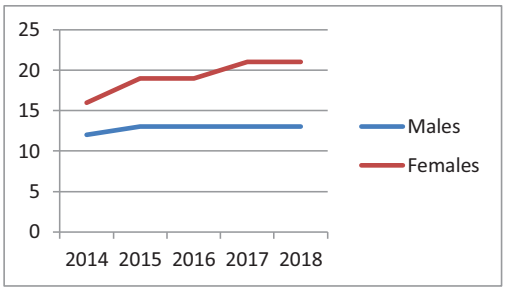

Figure 3. Fallow deer evolution

Table 3. Calculated statistics for fallow deer

Year	Optim	Males	Females	Total
2014	16	12	16	28
2015	16	13	19	32
2016	16	13	19	32
2017	16	13	21	34
2018	16	13	21	34
X	**16.00**	**12.80**	**19.20**	**32.00**
STDEV	**0.00**	**0.45**	**2.05**	**2.45**
Sx	**0.00**	**0.45**	**2.05**	**2.45**
CV%	**0.00**	**3.49**	**10.67**	**7.65**

In the male case it is obvious a small numerical evolution, one head, for the entire analyzed period (8.33%). For females we record an increasing of 5 heads in analyzed period which means 31.25%. The smaller increase of males can be explained by the fact that the hunting demands have as principal subject the fallow deer males. We must not forget that also the hunters interest for this type of cervidae is low, and the hunting and economic value is also low. In comparison with the others two species of cervidae that was analyzed, the fallow deer is cheap, being lower than red deer and near the roe deer (Maftei et al, 2017), as we can observe in Figure 3.

In roe deer population we observe a constant trend, with low fluctuation. In male case we remark an evolution, from numerical point of view, between 2014 – 2015 of 42 heads, more exactly 2.18%. Between 2015 – 2016 it was recorded a small decreasing, -0.86%, more exactly 17 heads. Between 2016 – 2017 the increasing of roe deer population was only 0.77, and between 2017 – 2018 the increasing of population was insignificant (0.05%). On the entire analyzed period the roe deer evolution was only 2.12%.

Graphic representation of roe deer evolution is presented in Figure 4 and statistics in Table 4.

The roe deer females record an increasing between 2014 – 2015 (2.59%) and an insignificant decreasing from 2015 to 2016 (0.47%). The situation became better in 2017 when the entire livestock of roe deer increase with 4.54%. In 2018 we record, again, a small decreasing, but insignificant, at only 1.15%. It is obvious that this entire situation, with small increasing and decreasing, is due to the fact that the real effective represents 292.27% from optimal effective. In this condition we talk about a reproductive natural inhibition of species. The sex ratio, in analyzed period was 1:5, except last two years, 2017 and 2018, when have a small tendency to became 1:6 (1:5.8, respectively 1:5.7.

Attention! Maintaining a sex ratio, in roe deer population, 1 female for 1.1 or maximum 1.5 males it is a good measure to maintain a good and strong population.

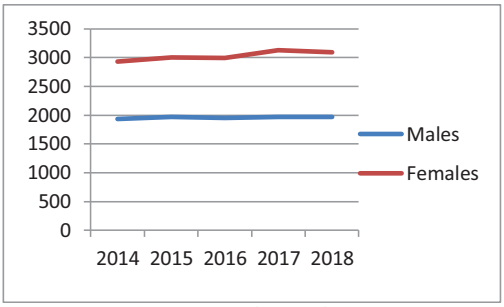

Figure 4. Roe deer evolution

Table 4. Calculated statistics for roe deer

Year	Optim	Males	Females	Total
2014	1733	1930	2929	4859
2015	1733	1972	3005	4977
2016	1733	1955	2994	4949
2017	1733	1970	3130	5100
2018	1733	1971	3094	5065
X	**1733.00**	**1959.60**	**3030.40**	**4990.00**
STDEV	**0.00**	**17.95**	**80.96**	**95.83**
Sx	**0.00**	**8.98**	**40.48**	**47.92**
CV%	**0.00**	**0.92**	**2.67**	**1.92**

CONCLUSIONS

The evaluation of game population it's seems to be ok in this county, in comparation with other counties from the south part of Romania. Unfortunately, some species, like fallow deer, are present only in a small part of the counties' hunting field. It is a must to have a support

from state authorities in order to populate some hunting areas with this species. This action is not necessarily only from hunting point of view. It is a necessity for conservation of the wild games species. Exaggerate extraction of roe deer males, and an unbalanced sex ratio can lead to decreasing of population from numerical and qualitative point of view.

We strongly recommend:

- Compulsory, for hunting areas administrators, to maintain a population with an ascendant trend till to the optimal population;
- Implication of hunters in surveillance of obligatory action of administrators (evaluation, feeding, etc.);
- Active implication of national hunting area administration in game evaluation;
- Compulsory, for hunting areas administrators, to maintain the sex ratio and all technical parameters in order to conserve and preserve biodiversity;
- Realization of some areas reports regarding principal factors that influenced the diagnosis keys;
- It is a MUST to update the diagnosis keys for hunting areas;
- Respect the term:"selection hunting";
- Diversification of fence hunting areas activity in direction of repopulation in free hunting areas.

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