Quantitative Evolution of the Wild Animals Populations for Hunting from 16-Sarlota

Dorel Dronca[1], Ioan Pet[1], Lavinia Ștef[1], Gabi Dumitrescu[1], Liliana Ciochină Petculescu [1], Pătruică Silvia[1], Mihaela Ivancia[2], Adela Marcu[1], Marioara Nicula[1], Ion Carabă[1], Sorin Voia[1], Silvia Erina[1], Mirela Ahmadi[1]

[1] Banats' University of Agricultural Sciences and Veterinary Medicine "King Michael the I[st] of Romania" from Timisoara", Calea Aradului nr.119, Timisoara – 300645, Romania
[2] "Ion Ionescu de la Brad" University of Agricultural Sciences and Veterinary Medicine of Iași, 3, Mihail Sadoveanu Alley, Iaşi, Romania

Abstract
The integration of Romania into the European Union requires special attention to the hunting populations. The observed size of an animal population, as opposed to the genetic size, is given by the number of individuals in all categories, as well as by the total number of males and females participating in the production of the descendant generation. The purpose of the present paper was to study the evolution of the observed sizes of the hunting population for 13 species of animals in the period 2016-2020, on hunting area 16-Sarlota, from Timis County, with a total area of 6.149 ha. The present study highlighted that on this hunting area, Cervidae family – which includes ruminants with deciduous horns, is represented by 3 species, namely Red Deer (*Cervus elaphus L*), Fallow Deer (*Dama dama L*), and Roe Deer (*Capreolus carpeolus L*). Our paper concludes that the decrease of the populations of Red Deer (*Cervus elaphus L*) species, Fallow Deer (*Dama dama L*) species, Roe Deer (*Capreolus capreolus L*) species, Wild hog *(Sus scrofa L.*) species, The European hare (*Lepus europaeus P)* species, and Common Pheasant (*Phasianus colchicus L.*) species, in the studied period of 2018-2019, is due to the increase of the observed size with 200% on this hunting area of Jackal *(Caniș aureus L.)* species, and also due to the significant presence of the Red Fox (*Vulpes vulpes L*) species. We recommend the permanent monitoring and limitation of populations from the Canidae family, especially of the Jackal *(Caniș aureus L.)* species. For the other identified species, the population of evolutionary numbers showed that there is a good correlation between the number of individuals and their biogenic capacity. The present study recommends the revival of the existing population on this hunting area, through "blood refreshing" actions.

Key words: observed size, hunting population, hunting area, game animals, cynegetic

1. Introduction

The observed size of an animal population, as opposed to the genetic size, is given by the number of individuals in all categories as well as by the total number of males and females participating in the production of the descendant generation.

The EU integration of the Romania is imposing a special attention to the populations of wild animals for hunting. The hunt was always a spring of rich in our country, not only by the large number of animals but also by the variety of species. The hunt represents the oldest occupation, before all others humans were hunter and gatherer. As old as man, the hunt evolved with the humans and with the development of the society. In this domain, man made the first observations, research and discoveries, also the first inventions. After extended study of the Paleolithic hunters, it was

* Corresponding author: Mirela Ahmadi, 0724 530 006, mirelaahmadi@gmail.com, ddronca@animalsci-tm.ro.

proven that there were domesticated animals [1]. The discovery of the spear, bow with arrows, perfecting the tools and hunting methods were the first and most important inventions of the primitive era, which lead to an increase of the success of the hunt [2].

Romania is one of the few countries in EU, that still have pools for aquatic hunting, large forest for roe deer, bears and other big game. The duty of hunters is to know the environmental requirement of the game and to contribute to its preservation.

The hunting terrain with the constructions makes up the hunting patrimony [7].

Starting from the year 1948, all over our country, the hunting terrain becomes state propriety. From that date, since there was no private propriety, large hunting terrain could be established. The management measures applied to a hunting terrain depends of the species that populate it. Presently, in Romania, after the institute of the Law 103/1996, the number of the hunting domains is 2.227 [2]. Main developmental conditions for a hunting domain and existence are: food, shelter and quiet.

There is considered that the hunt density is optimal when a sufficient number of individuals exist according to biogenic capacity [6]. Exceeding the optimal density can cause damage to other economical arias and also can affect the specie in cause, through lack of food, shelter and rapid expansion of diseases and other detrimental factors [3].

The purpose of the present paper was to study the evolution of the observed sizes of the hunting population for 13 species of animals in the period 2016-2020, on 16-Sarlota, from Timis County with a total area of 6.149 ha

2. Materials and methods

The hunting area studied – 16-Sarlota, is a total area of 6149 ha, and is delimited to the north by by the county road from Mașloc-Remetea Mică-Charlotenburg, then the communal road to Buzad; to the east by the dirt road between Păzit hill, Fântâna Seacă hill, Cobolaș hill – at the forest boundary to Valea Băcin; by south of Valea Băcinului from Bencecul de Jos to the dirt road that descends from the Cobolaș hill near the Braconierilor brook; and to the west by the dirt road from Bencecul de Jos to Fibiș, then the Fibiș-Mașloc county road. Until 1948, the forests belonging to this hunting area, as well as the agricultural lands in the Honoş and Şumanda basins, which were owned by the family of Count Webcheim Siegfrid, and those in the Cavaş basin, to Count Karolz Gzula. Until 1990, the 16-Sarlota Hunting Area was a Household Special Hunting area, and at the moment it is managed by the ROMSILVA National Forests Authority, through the Timis Forestry Directorate, respectively the Timișoara Forest District.

In table 1 is presented the total surface of the hunting area studied, divided in categories.

Table 1. The surface of the hunting area 16-Sarlota divided into categories

	The cynegetic productive surface for:						
	Aquatic animals land	Other hunt species					
UM	Water length	Forest	Agricultural land	Grazing field	Total	Unproductive land	Total
Ha	60	1998	2764	1301	6063	26	6149
%	0.97	32,49	44.96	21.16	98.61	0.42	100

From table 1 it can be seen that, from the total surface of the land studied (6,149 ha) the terrain occupied by the Aquatic animals represents 60 ha (0.97%) while other species have 6,063 ha (98.61%) from which agricultural land 2,764 ha (44.96%), grazing field 1,301 (21.16%) and forest land 1,998 ha (32.49%). The cynegetic non-productive surface is 0.42% respective 26 ha.

The study presented in this paper is aiming to evaluate the number of animals from this hunting area in the period 2015-2020, because without this information a rational hunt of the animals would not be possible. Knowing the effective of animals serves for evaluate the annual number of animals that can be hunted and for calculate the complementary food requirements for the winter,

and it also helps maintaining the sex ration [4]. The number of animals is crucial for achieving an optimal density and prevent de degradation of the trophies and the damages in forest an agricultural cultures. This is why this action to be made with responsibility by the persons that know well the terrain and the biology of the hunted animals [5].

3. Results and discussion

In table 2, we presented the evolution of the spring effectives by species and number of individuals during the hole studied period.

Table 2. The evolution of the spring effectives from the 16-Sarlota hunting terrain, in the period 2016-2020

Specie	2016	2017	2018	2019	2020
Red Deer (*Cervus elaphus L*)	104	110	119	109	113
Fallow Deer (*Dama dama L*)	219	221	231	205	215
Roe Deer (*Capreolus capreolus L*)	110	108	111	95	94
Wild hog (*Sus scrofa L)*	100	110	110	80	100
European hare (*Lepus europaeus P.*)	364	393	389	390	390
Weasel *(Mustela nivalis*)	10	10	10	10	10
Common Pheasant (*Phasianus colchicus L*)	771	779	768	758	820
Grey Partridge (*Pedrix pedrix L*)	12	12	20	20	20
Tree marten (*Martes martes*)	10	10	10	10	10
Red Fox (*Vulpes vulpes L*)	25	25	25	25	25
Jackal (*Canis aureus L*)	5	5	10	15	15
Polecat (*Mistela putorius L*)	7	7	7	7	7
Badger(*Meles meles L.*)	3	3	3	3	3

From table 2 data, we can observe that in this hunting area, the Cervidae family – which includes ruminants with deciduous horns, is represented by 3 species, respectively Roe deer (*Capreolus capreolus* L.), Red deer (*Cervus elaphus* L.) and Fallow deer (*Dama dama* L.).

Red Deer (*Cervus elaphus* L) species, registers at the beginning of the study (2016) a herd of 104 individuals, which in 2017 increases to 110 individuals – so an increase of 6 specimens – which in relative values represents 5.77%. The trend of the herd growth is also manifested in 2018, this being 9 individuals, ie 8.18%. At the level of 2019, the herd number registers a decrease, with 10 individuals (8.4%), and in the last year of study, respectively 2020, the number registers a slight increase of 4 individuals (3.6%). During the entire studied period, respectively 2016-2020, the increase of the Red Deer herd (*Cervus elaphus* L.) was of 9 individuals, which in relative values represents 8.65%.

Fallow Deer (*Dama dama* L) species, starts in this study (2016), with a number of 219 individuals, and registers a dynamic similar to Red Deer (Cervus elaphus L) species, ie in 2017 it grows to 221 individuals, so an increase with 3 copies, which in relative values represents 1.35%. The trend of animals growth is also manifested in 2018, this being 10 individuals, ie 4.52%. At the level of 2019, this species as well as Red Deer (Cervus elaphus L) species, registers a decrease, with 26 individuals (11.25%), and in the last year of study, respectively 2020, the herd registers again a slight increase of 10 individuals (4.87%).

Fallow Deer (*Dama dama* L) species, starts in this study (2016), with a number of 219 individuals, and registers a dynamic similar to Red Deer (*Cervus elaphus* L) species – ie in 2017 it grows to 221 individuals, so an increase with 3 individuals, which in relative values represents 1.35%. The trend of animals growth is also manifested in 2018, this being 10 individuals, ie 4.52%. At the level of 2019, this species as well as Red Deer (*Cervus elaphus* L) species, registers a decrease, with 26 individuals (11.25%), and in the last year of study, respectively 2020, the herd registers again a slight increase of 10 individuals (4.87%).

Throughout the period studied, the Fallow Deer (*Dama dama* L) species, registered a slight decrease in the herd with 4 individuals, which represents in relative values 1.83%.

Roe Deer (*Capreolus capreolus* L) species, another member of the Cervidae family, recorded in 2016 a number of 110 individuals, a number that decreased slightly in the following year (2017) to 108 individuals (1.81%). In 2018, the number returns to a value of 111 individuals, so a

slight increase of 3 individuals, which represents in relative values an increase of 2.7%. It is very interesting that Roe Deer (*Capreolus capreolus* L) species, in 2019, registers a significant decrease in herd by 16 individuals, which represents in relative values 14.41%. The decreasing trend remains at the level of the last year of study (2020), with a relative value of 1.05%. During the entire period studied for 5 years (2016-2020), Roe Deer (*Capreolus capreolus* L) species, registered a decreases of the herd by 6 individuals, respectively 5.45%. It is noteworthy that in all 3 species, respectively Roe deer (*Capreolus capreolus L.*), Red deer (*Cervus elaphus L.*) and Fallow deer (*Dama dama L.*), recorded a decrease in numbers in 2019. We consider that these decreases in herd are correlated with the significant increase in the period 2018-2019, of the Jackal (*Canis aureus* L.) species, on this cynegetic hunting area.

Wild hog (*Sus scrofa* L.) species, registers at the beginning of the studied period, respectively in 2016, a number of 100 individuals, which increases in 2017 to 110 individuals (10%). In 2018, the herd of this species – Wild hog is constantly maintained at the value of 110 individuals. In 2019, the species registers a significant decrease by 30 individuals, which in relative values represents 27.27%. In the last year of study, respectively 2020, was observed an increase of 25%, the number reaching the value recorded at the beginning of the study (2016), of 100 individuals. It is noteworthy that in this species – Wild hog (*Sus scrofa* L.), there is a significant decrease in observed population, in 2019 The European hare (*Lepus europaeus* P.) species, records the next evolution of the herd, 364 individuals in 2016, effectively increasing to 393 individuals in 2017 (7.96%). The number decreases in the following year (2018), to 389 individuals, which represents in relative values 1.02%. In 2019, and 2020 the number of European hare (*Lepus europaeus* P.) species, maintains its observed population at 390 individuals. Common Pheasant (*Phasianus colchicus* L.) species, starts in 2016 with a population of 771 individuals, a population that registers a slight increase to 779 individuals in 2017 (1.03%), but subsequently registers a downward evolution throughout 2018-2019. Thus, in 2018, the number decreases to 768 individuals, which in relative values represents 1.41%, and in 2019 the observed size decreases again, reaching 758 individuals (1.30%) – registered in fact the lowest value recorded during study.

We also notice in this species a decrease of observed population in the period 2018-2019. In the last year of study (2020), the Common Pheasant (*Phasianus colchicus* L.) species, registers an increase of the population with 62 individuals, which represents in relative values 8.17%.

Gray Partridge (*Pedrix pedrix* L.) species, recorded at the beginning of the study (2016), a herd of 12 individuals – that remains constant in 2017. In 2018 Gray Partridge (*Pedrix pedrix* L.) species, records an increase significant observed size with 8 individuals, respectively from 12 to 20 individuals, which represents in relative values 66.66%. In the following study periods, 2019 and 2020, the observed population was maintained at a constant value of 20 individuals.

The Canidae family, which includes carnivores with elongated snouts and slender limbs, is represented on this hunting area by two species, namely Red Fox (*Vulpes vulpes L.*) and Jackal (*Canis aureus L.*).

If the species Red Fox (*Vulpes vulpes L.*) registered a constant number of individuals over the entire studied period 2016-2020, respectively 25 individuals, the Jackal species (*Canis aureus L.*), remains constant in the period 2016- 2017 to a number of 5 individuals, but in 2018 the number doubles, so increased with 100%. In 2019, the Jackal species (*Canis aureus* L.), registers again a significant increase of 50%, respectively from 10 individuals to 15 individuals, which remains constant at the level of the last year of study, respectively 2020.

Notable on this hunting area, is the increase of 200% of Jackal (*Canis aureus L.*) species during studied period. We also consider that it is noteworthy that the significant increase of observed size for the Jackal species (*Canis aureus* L.) took place in the period 2018-2019, a period in which other species recorded significant decreases in the number of individuals.

We mention that, out of the 13 species followed on this hunting cynegetic background, 5 species maintained their constant numbers throughout the 5-year study, namely the species Weasel (*Mustela nivalis*) – with a number of 10 individuals, the species Red Fox (*Vulpes vulpes L.*) – with 25 individuals, species Tree marten (*Martes martes*)

– with 10 individuals, species Polecat species (*Mistela putorius L.*), with 7 individuals and species Badger species (*Meles meles L.*), with a constant number of 3 individuals.

4. Conclusions

Following the study on the hunting herds' dynamics for 13 species, in the period 2016-2020, on the 16-Sarlota hunting area, in Timis County, under the management of Forestry Directorate Timis, Timisoara Forest District, we concluded:

✓Referring to this hunting cynegetic area, the Cervidae family – which includes deciduous ruminants, is represented by 3 species: Roe Deer (*Capreolus capreolus L.*), Red Deer (*Cervus elaphus L.*) and Fallow Deer (*Dama dama L.*).

✓We consider that the decrease of the herds of Red Deer (*Cervus elaphus* L), Fallow Deer (*Dama dama* L), Roe Deer (*Capreolus capreolus* L), Wild hog (*Sus scrofa* L.), The European hare (*Lepus europaeus* P) and Common Pheasant (*Phasianus colchicus* L.), in the study period 2018-2019, is due to the observed increase in population with 200% on this cynegetic hunting area of Jackal (*Caniș aureus* L.), as well as the significant presence of Red Fox (*Vulpes vulpes* L). We recommend the permanent monitoring and limitation of the herds of the Canidae family, especially of the Jackal (*Caniș aureus* L.).

✓From all the 13 species evaluated on this hunting cynegetic background, 5 species remained constant throughout the 5-year study, namely the Weasel (*Mustela nivalis*) – with a number of 10 individuals, the Red Fox (*Vulpes vulpes L.*) – with 25 individuals, Tree marten (*Martes martes*) – with 10 individuals, Polecat species (*Mistela putorius L.*) – with 7 individuals and Badger (*Meles meles L.*) – with a constant number of 3 individuals.

✓The climatic characteristics at the level of the hunting area are not likely to lead to increased mortality in the hunting herds. Relatively high temperatures during spring associated with non-excessive rainfall do not lead to high mortality among juveniles.

✓The structure and composition of the vegetation provide very good nutritional conditions for the development of hunting herds. Livestock is an annoying factor for hunting animals, due to the ubiquity of herds on the same areas, which makes the hunting animals gradually retreat to quieter areas, because the herds are accompanied by dogs, often without yoke.

✓The existing biotope characteristics on the surface of the hunting area are likely to provide the trophic and shelter necessary for the existing hunting species and herds. Also, the geomorphological conditions allow in this hunting area the installation of food lands, and the administration of complementary food.

All of these observations led us to the conclusion that on a hunting area there is a good relation between the individuals' number and the biogenic of the hunting area for all 13 identified species.

We strongly recommend the implementation of real and consistent management measures that will increase the productive hunting potential on the specific hunting ground. The most relevant and actual problems are related to the intensification of agricultural activities, and also the usage of pesticides on a large scale, but nor only.

We also recommend specific actions to restoring the biogenic potential of the hunting area by reintroducing some vanishing wild animal species for hunting interest or by introducing new hunting species that can harness the free ecological niches.

References

1. Dronca D., Ameliorarea genetică a populaţiilor de animale. Editura Mirton, 2007.
2. Cotta V., Badea M., Micu, I., Vânatul şi vânătoarea în România, Ed.Ceres, 2008.
3. Bud I., Economia vânatului, Editura Tipo Agronomia Cluj-Napoca 1998.
4. Dronca D, Nicolae Păcală, Ioan Bencsik, Gabi Dumitrescu, Adela Marcu, Ioan Tapalaga, Ada Cean, Razvan Popa, Ada Cean, Adrian Oprea - Study regarding the quantitative evolution of the game animals populations from 66 Tolvadia, Forest Domain - Lunca timisului, in 2008-2012 period. SPASB, Timişoara, 2013, 46 (1), 106-108, ISSN 1221-5287
5. Dronca, D., Nicolae Pacala, Lavinia Stef, Ioan Pet, Ioan Bencsik, Gabi Dumitrescu, Adela Marcu, Marioara Nicula, Liliana Ciochina-Petculescu, Ion Craraba, Sandro Pogialli, Mirela Ahmadi – Study on Wild Animals Dynamics on 20 Bara Hunting Area from Timis County during 2014-2018, SPASB, Timişoara, 2019, 52(1), 52-55
6. Georgescu, M. şi Georgescu, G.C., - Enciclopedia zoocinegetică. Editura Albatros, Bucureşti, 1996
7. Şelaru, N., - Manual pentru examenul de vânător. Editura Cynegis, București, 2001.