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Article in *Biotechnology & Biotechnological Equipment* · April 2014

DOI: 10.1080/13102818.2010.10817924

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# DYNAMIC OF DISTRIBUTION AND NUMBER OF GRAY WOLF (*CANIS LUPUS* L.) DURING TEN YEAR PERIOD IN BULGARIA

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## ABSTRACT

*After 2000 year was started to collect statistical data about number of wolfs (Canis lupus L.) in Bulgaria. The number during ten years period was above 2000 ind. (with maximum 2479 ind. during 2008). In our opinion these data are not correctly. According to our estimates, based on suitable areas (forest area) in country, home range size of the pack (about 18.4 ha) established with radio-telemetry in Europe, in the country inhabit average 918 wolfs before opening of the hunting season and about 498 ind. after that. For one period of ten years 92.9-95.2 % of wolfs were shooting from October to March. From April to September were shooting from 4.8 - 7.1 % of wolfs. We propose one part of this six month period to be protected (for example April-June, when flocks don't carry out in the summer pastures). This protected period (without shooting) will be beneficial for species, without conflicts with local economics and society.*

**Keywords:** Gray wolf, *Canis lupus*, number, shooting, conservation, Bulgaria

## Introduction

During the Ottoman slavery a legal right of hunting had only turks and they hadn't interested much more in the hunt of wolfs, therefore its is meted everywhere in the country. The Bulgarian people are not having right to use weapon, that the only salvation from predators have been poisons, traps and taken of small animals. These methods were practice during 20th century too. After Liberation of Bulgaria, before creation of the Hunt-shooting organization in 1898, started to organized fight against predators too. The first facts about shooting of wolfs are published in "Darzhaven vestnik" 1889-1899 and magazine "Lovetz", that were reported for shouted 533 individuals. In the first two years due to less hunters and lack of payment for killed harmful game, the number of the killed wolfs is low, but from 1891 is starting to pay for hunting wolfs and he increased double, as reached 1016 in 1891. After that shooting constantly increase and he reach 1649 individuals in 1896. In the period of 1889-1900 are killed 14891 wolfs, average 1241 per year.

## Materials and Methods

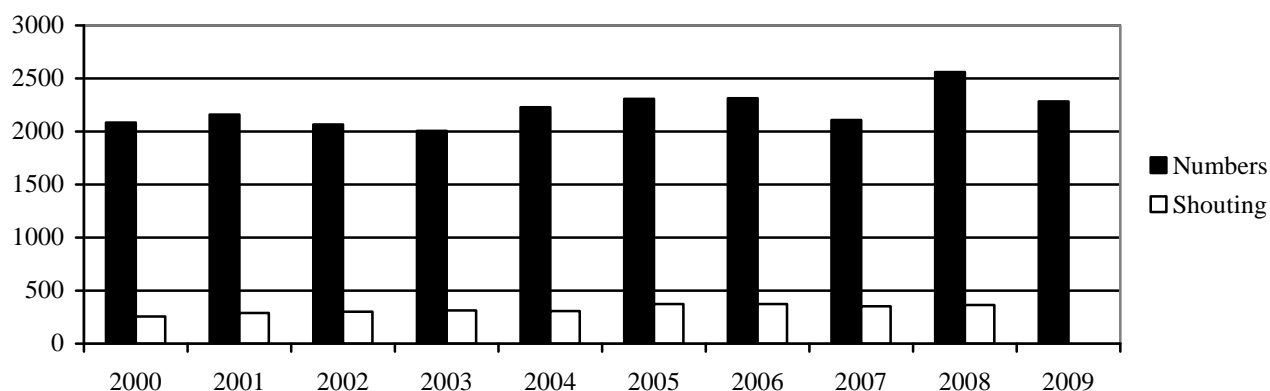
From 2000 the governmental administration collected information about the number of the wolf in the country. For the period of 2000-2008 part of the evidence about shouting are collected personally from authors in Rhodopes and complemented from newspaper "Nasluka" 1999-2009. All this material was analyzed in detail, which gives us idea about dynamic of the number and struggle with wolf in the country for 10 years.

## Results and Discussion

In present the distribution and the number of the wolf in our country is all over the country. The fact, that he returns in small plain forests of Pleven region shows, that it founds enough food for its exist. Therefore damages, caused from his are increasing constantly. But it doesn't mean that the control on his number is impossible. As we mentioned it must come the period of drop in the number, because it's expected covering unsuitable areas and this make easier it's shouting. According facts from taxation the number of the wolf in the country is between 2005 numbers – 2003 and

2479-2008 (**Fig. 1**). At first sight is clear, that these facts are rather unclear, especially if penetrate in their precision, which is by one and aware amazement for specialist about methods, which are using for determine on the number. For correct can be accept the facts about shouting, because is paid payment, but these from taxation are absurdity. It can't

be in constantly increasing of the number, the number of the shouting specimens to be almost the same and increase from 12.6% in 2000 to 16,8% in 2007, from determined on evidence of National agency of forests number.



**Fig. 1.** Dynamic about the number and shouting of the wolf for the period 2000-2009 in Bulgaria

These differences arise much more questions, but the main is how much in fact are wolfs in the country? Is it possible to determine their approximately number? It is possible, but we have needed contemporary technique – radio tracking and DNA analyses. According to carried out radiotelemetric researchers in Bialowiezha Primeval Forest (Poland), the part of family in spring and summer (March-September) covers 14100-16800 ha, and in autumn and winter (October-February) is 9900-27100 ha. In Poland the wolf is protected and the density is 2.0-2.6 inds/10000 ha. The number of the wolfs in pack is 4-5 animals, and in Byelorussian territory, where is hunted on the wolfs, their number is 0.9-1.5 specimens on 10000 ha, and the number of the pack is 2.7-3.2 wolfs (6). In Italy the family area covers 19700 ha.

On based of appreciated from us fits area, in which are included all coniferous, fagus and oak forests in the country, wolf can inhabits 2 917 752 ha or 92.8% from the forest area. Moreover according the number of the wolfs in different Regional Directions of Forests in 2008 come off, that the density on 1000 ha forest area is hesitated from 0.4 in Lovech to 1.4 specimens in Sofia. This density is possible for

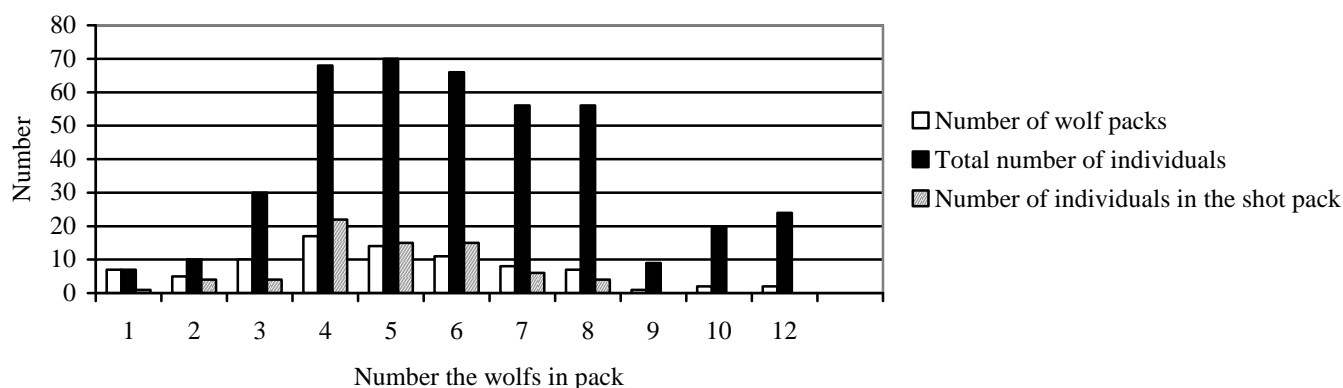
lower value, but impossible for upper, because according to Apollonio & Mattioli (1) in different countries in Europe is vary 0.001-0.2/1000 ha. If we separate this area on determined, by radiotelemetry inhabitant surface from one pack, which is average 16 975 ha for Poland and for Italy 19 700 ha, average this area is 18338 ha. According our evidences, before discovery of the hunting season for big game on October, one pack is included average 4.7 specimens, and after its finish in January from 2.7 (**Fig. 2**). And than, if we separate fit to life from wolfs area in the country (2917752 ha) on average area, covered from one pack (18338 ha), come out, that in the forests of Bulgaria can live about 159 wolf packs. That is to say, according these calculations in our country there is from 747 number of wolfs, lived in packs from 2 to 12 specimens and 56 single wolfs, before discovery of the hunting season or total 803 numbers. In spring remain 429 specimens, which with single specimens – 22 count 492. Or according to our information are shouted average 354 animals. These values are close to average shouting for the last 9 years – 328 wolfs, like must take into consideration, that not all killed wolfs are founded.

In spring start reproduction season and according to facts

for 100 years (1889-1989) the average number of taken small specimens is  $6.2 \pm 0.5$  (4). If we suggest, that 80% or 127, (1) from estimated higher up number of packs (with more than two specimens) are reproduction, then the number of small simple specimens. But here, must take into consider natural death of adults specimens, which according to Mech & Boitani (5) is about 10%, and that, in summer are shouted average from 4,8% to 7,1% from adults, part of which are female, nursing small specimens, who after the hunting

specimens in 80% participation must be 787. But from these specimens survive average 55% (3) or until autumn there will be 433 numbers. Then in the beginning of hunting season can be have about 918 wolfs, plus about 56 mother die. In this way after the first of April survive about 520 specimens (**Fig. 2**).

For determine spread and the number of the wolf are used following parameters (see **Table 1**).



**Fig. 2.** The number of wolfs in meted packs at 2008-2008

**TABLE 1**

Fit area for inhabit of the wolfs in the country (2 917 752 ha).

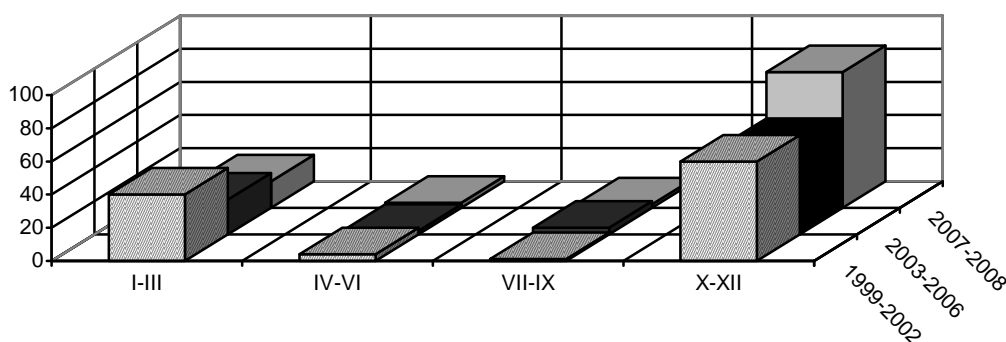
Parameters	Number
Average number of wolfs in one pack before discovery of the hunting season	4,7
Average number of the shouting in one pack wolfs at the end of March	2,0
Average number of wolfs in one pack at the end of March	2,7
Average living space of one pack	18 338 ha
Number of packs on area of 2917752 ha	159
Number of little specimens in 80% (127) participate in reproduction average 6,2 little specimens and survival 55%	433
Number of wolfs before discovery of hunting season in October $2,7 \times 159 = 429 + 56$ singles and 433 young's - total	918
Number of wolfs after 1th April after shouting of average 328 specimens and 10% mortality of adults – $92 + 22$ single and total 420	520

In your monographic about wolf Mech & Boitani (5) indicate, that in Bulgaria are living from 800 to 1000 specimens, which agree with point number. And based on these analyses, it can be content, that in the country live from 800 to 1000 wolves and on base of this number, to start monitoring on population of wolf in the country.

We have discuss the question about when are hunting wolves. One year ago with big noisy, but with minimal success were organized packs. This indicate analyze of Penchev (7), which gives the following facts: 80% of wolves are shouting in hunting of wild

boards, 5% on battues, 5% on carrion, 5% from shepherds and 5% accidentally.

These facts are corroborated from us too (**Fig. 3**), for the period of 10 years, in which period from 60% to 82% from wolves are shouting from October to the end of November. From April to September are shooting from 4.8% to 7.1% from wolves. So that, if one part of this six mouths period of time is announced for protected, for example April-June, when the herds are not carry out in summer sheep-folds, then this will not harm to anybody and it will be to advantage of save of kind.



**Fig. 3.** Shouting of wolves during different seasons in 1999- 2008

## Conclusions

According the present analyze, can to be concluded that the wolf population in Bulgaria has relatively constant number. The wolves were shooting most intensively during hunting season, therefore one restricted lows in spring, when wolves care for pups, would not have big impact on wolf increasing.

## Acknowledgment

The present study was supported by BG051PO001-3.3.04/41 (European Social Fund through the Ministry of Education, Youth and Science of Bulgaria).

The authors are very thankful to Nikoleta Stoyanova (Institute of Zoology, BAS) for tehcnical assistanse.

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