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Determining the Participatio of Young Hares in the Population of Vojvodina for the Period from 1967. to 2012. with Proposed Measures

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Abstract

During 46 years the laboratory for Hunting from the hunting Association of Vojvodina continuously, every year hunting organizations sent eye lens to determine in hunting area, the participation of youngs in the micropopulation, and based on that real growth. These two parameters, along with spring numerical strength and harvest from last year are enough to them that the Professional service Association give recommendation how and how many hares they have to hunt in current year. Initially (1967) about 20% of hunting areas were sending patterns, and after 10 years (1977) it amounted over 30%, at the year of 1987. over 45%, 1997. over 60% and 2011. about 70%, with maximum recorded in 2009. with nearly 75%.

In the period of 46 years it was examined 371.612 eyes of hunted hares, that approximately was 8.079 eye lenses from total 9.015 examples, so that the annual average of the samples was 196, or about 50% of all established hunting areas. The small number of hunting areas that didn't send the samples didn't hunt the hare either.

Research has shown that for such a long period, the average percentage of youngs was 58,08% (with a minimum of 38,0% recorded 2010., and a maximum of 70,3% recorded in 1994.), that is, the average part of youngs in the population of Vojvodina was 58,1%, and that the average ratio of the real growth was 1,67 youngs per hare (with a minimum of 1,13 recorded 2010., and a maximum of 2,33 recorded in 1994.).

To make recommendations by professional hunting services Hunting Association of Vojvodina, for each specific pattern of hares eyes, it is necessary to submit the data on the number of hares in the hunting area, the last year harvest, what was the weather conditions during the hunt, and the length of hunting- the number of hours, number of participants and the amount of coughed hare. After considering all the parameters and laboratory processing of samples, professional service sends a recommendation for each area: to be hunted according to the plan, we need to stop hunting or to reduce hunting quotas.

These parameters are important for realistic planning and balancing the hare population in hunting grounds. Determining the actual annual harvested quota of hares is of importance for modern planning and rational management of the hare hunting, but also with other types of small game, and thus the preservation of hare populations in our hunting grounds. Because of this, the hunting grounds of Vojvodina are today the riches hunting areas with rabbit in this part of Europe.

Keywords: youngs participation, hare, real growth.

Introduction

Age of a hare (Lepus europaeus Pallas, 1778) can be determined in several ways. One of the way, in addition to scientific contributions, entered in "routine" practical application is determination of the young hares participation in particular micropopulation (hunting grounds - hunting society), and real growth is obtained based on this indicator.

Also, based on that indicator, the expert service of Hunting Association of Vojvodina sends to hunting organizations professional recommendations on the continuation of hunting, the reduction of hunting quotas for a specific year, or a total suspension of hunting.

Now, with decades of experience, since 1967. till today, in Vojvodina the participation of youth in the population, and then real growth, is determined by laboratory analysis, on the basis of the examined lens of the eye of hares, caught in the first hunts (October-November). This method has been applied since in 1967. up to 1987. (Agriculture in Novi Sad), and since 1987. till today in the laboratory for Hunting in the Hunting Association of Vojvodina. By laboratory analysis and procedure of the lens of the eye of caught hares, (a sample of at least 30 eye lens - lens cristallina), is determined the participation of young people in particular micropopulation, and on that basis the real growth is determined. After that, with data obtained from each year in this way, from the hunting area from which samples were obtained, professional service of the association with obtained data on the number of hares in the spring and finished shooting in the previous year, sends professional recommendation. This recommendation consists of the following: if a growth is small, and when the participation of young in the population is below 50%, then any further hunting should be suspended, if this percentage is above 50%, and if a good spring fund is on disposal, they can be hunted according to the plan.

Although this method is applied in other countries (Hungary, Czech Republic and others.), the highest application it has in the hunting grounds of Vojvodina, and according to the current density, it certainly has justified the confidence in professional and scientific workers as well as hunters on the fields (hunting grounds).
There are several methods for determination the age of hares, such as: age determination based on ossified lump located on the lower end part of the elbow bone (Styloides ulnea), then based on the lacrimal bone and on the basis of ear splitting, but those methods related to the first are quite unreliable.

Age determination of hares

The study of the ideal annual growth of the hares
Number of litters and number of fetuses in bunnies (ideal growth), first were studied in the Pearl Island by prof. Valentinčić (Valentinčić S., 1955). It was determined the ideal growth and number of litters in 1954. and in 1955. Based on these studies it was found that the average female hare has baby bunnies five times, which means that there are five litters.

The first litter occurs between 8 and 25 of March with the epicenter 18 to 20 of March. The main mating (breeding) of female hare runs from 25 of January till 11 of February, with the epicenter approximately on 5 of February. In the second year of study having baby bunnies is started massively from 1 to 20 of March with the epicenter from 10 to 15 of March. The main mating (breeding) of female hare began about 17 of January and lasted until 5 of February with the epicenter from 27 of January to 1 of February.

For the first litter the average of offspring per female for those two years has been determined at 1.23 cubs per female.

For the second litter for the first year of the study has determined that there were between 25 of April and 5 of May, which means that the second mating of female hares were between 15 and 25 of March. The average number of offspring in the second litter, studied for two years, was 2.9 offsprings per female per year (bunnies).

Third litter for the first year of the study was between 5 and 23 of June, with the epicenter about 15 of June and the third mating (breeding) of female hares were between 23 of April and 15 of May (with the epicenter around 5 of May). For the second year of study the third litter was at the end of May, and the third mating (breeding) of female hares was about 20 of April. The average number of the youth in the third litter for two years was 2.75 offspring per female hare.

The fourth litter was from the end of July to 10 of August, with the epicenter about 5 of August, and the fourth mating (breeding) of female hares was between 20 and 30 of June, with the epicenter about 23 of June. The average number of offspring per female hare in the fourth litter is 1.20 bunnies.

The fifth litter was between 5 and 20 of September (with the epicenter around 12 of September), and mating (breeding) of female hares between 25 of July and 10 of August, with the epicenter about 1 of August.

Based on the study of Valentinčić (Valentinčić S., 1955) was found that most bunnies were born in the first litter from 10 to 20 of March, in the second from 25 to 30 of April, in the third from 1 to 15 of June, in the fourth from 1 to 15 of August and in the fifth litter from 12 to 25 of September.

All this suggests that the mentioned days, or whelping time, are the most decisive for the survival of the whelped hares (meteorological factors, field work, peace in hunting ground, feathered and furry predators, dogs and cats, etc.).

When talking of five litters, it doesn't mean that every female hare give birth five times. Hence, the entire hare fund is considered, not some female hares.

Based on these studies, the ideal growth in the first year of the study it is determined up to 10 offspring per female hare, and in the second year, slightly lower ideal growth is determined, which amounted up to 8 bunnies per female hares.

Based on the above it was found that the ideal growth in the second and third litter (average of 2.90 and 2.75 as for the two litters totaling 5.65 bunnies per female hare), which is the most important for the preservation and prognosis of real annual growth, and those two litters are the carriers of the whole growth. The percentage of these two litters compared to the first year of study was over 56% and over 70% compared to the second year of study.

The second and third litter actually carries population and if these two litters survive, a good hunting season may be expected, under the condition that we have a solid game fund in spring. It also means that for the two litters of crucial importance are conditions for the survival of bunnies in these days in the last decade of April and the first half of June, and how many predators are in the hunting ground.

It is also interesting that no young female hare was found who was whelped in the same year so she could be pregnant in the first year of her life.

With the three-year research of Jovanovic and Aleksic (Jovanovic, V. and Aleksic D., 1976, p. 283) of ideal annual hare growth, it was observed that hare mating does not begin before 10 of January. They found that the terms of some litters were: the first, from 23 of February to 15 of March; the second, from 9 of April to 29 of April, the third 22 of May to 11 of June, the fourth, from 3 of July to 23 of July and the fifth litter from15 of August to 4 of September.
Analyzing the data for three years together (1974-1976) the following facts have been determined:

- That in the first litter was pregnant 57% of hunted female hare and that 0.6 fetuses was the average per female;
- In the second litter 88% of the hunted females were pregnant with an average of 2.5 fetuses in the wombs;

- In the third litter 92% of the hunted females were pregnant with an average of 3.9 fetuses;
- In the fourth litter all hunted females were gravid with an average of 3.4 fetuses and
- In the fifth litter 46% of the hunted females were pregnant with an average of 1.2 fetuses.

Considering all three years, it can be concluded that from the total number of hunted females, pregnant was 79% (research of Valentinčić for two years, the average was 68%), and the average number of fetuses per litter was 2.4 (Valentinčić research for two years, the average was 1.5). The largest number of fetuses for three years was determined in the third and fourth litters (3.9 and 3.4), while with researches of Valentinčić the largest number of fetuses was determined in the second (3.3) and the third (2.5) litter.

With researches of Valek (Valek J. 1976) from 1968. until 1974. for Czech conditions of the hunting grounds was found that the first gravid females appear in February (63.5% were pregnant). In March, the number dropped to 60%, in April, May and June was from 74 to 77% and 65.5% in July and in August only 53%. In September solitary pregnancies are determined.

In February, in the uterus of pregnant females an average of 1.3 fertile eggs was found, in March an average of 2.3, in April an average of 3.1, in may 3.6, in June an average of 3.2, in July, 3.3 and in August 2.7.

Out of 159 pregnant females, 29.6% had three fertile ovum, 22% - four, 21.4% - two ovum, 18.2% - one, 8.2% - five and 0.6% - seven ovum.

Depending on the number of pregnant females and the mean number of fertile ovum in the breeding months, Valek, 1976, determined form of litter per months. From the overall number of offspring born in March was 6.3%, in April, 10.4%, in May 18.0%, in June 20.0%, in July 18.2%, in August 16.3% and in September 10.8% of bunnies.

By the examinations of Novak (Novak, E., 1960) on the effects of temperature and sediment on the in the hare population density, it was found that, the March "bunnies" are irrelevant to the overall production.

Jaksic (B. Jaksic, 1956) states that the offspring of the second and the third litters are numerous and, in terms of the number of offspring in some litters, stronger in the years following unfavorable years for hares. He also states that no litter in number reached the average of four individuals.

Romic (Romic S., 1965) when investigating fertility of the female hares, classified them into three groups: young females to 3.70 kg, mean old females from 3.70 to 4.70 kg and old females over 4.70 kg. The average number of fetuses in the female hare's womb was: 1.54 in mean old females 2.56 and 2.20 in the elderly.

Donchev and Trpkov (Donchev I and Trpkov B., 1971) found that the development of the embryo begins in some female hares in January, and that female hares give birth til August.

Material and method

Determination of the real annual growth of hare

To determine the age of hares there are several methods. Some of them are very simple and do not require special expertise or technical analysis foe the application, while others are much more complicated, so for their use, in addition to trained technicians, and a well-equipped laboratory is necessary. Of course, the accuracy of determining the age of hares is far greater, and the data obtained by this second group of methods are more reliable.

In determining the age of hares, known methods are based on the color of the coat of the forehead, ease of splitting ears, body weight, degree of ossification of the lacrimal bone and the like. Conclusions on age, based upon them, should be used with a lot of reserves.

By changing the understanding of the role and significance of a hare, as a member of modern biodiversity and by development of game management, as the industry branch, leads to the development of new methods.

According to Selmic, in 1981., in 1931. Mr. Stroh introduced a new method of determining the age of hares based on the fact that the epiphysis lump on ulna of hare's forelegs is lost in time of complete ossification of these bones, ie. at age of 9-12 months. This disappearance of the epiphyseal lump has become the subject of many scientific researches and discussion (W. Rieck, in 1963. Szederjeii MIA, L. Studinka, 1959).

An advantage of this method is the ease of implementation and use in the open countryside, and the biggest disadvantage is the unreliability of the results obtained during their application on the study population, according to Šelmić, in 1981. according to Bujalski and as. 1965 Waldhovd, in 1966.

Semozorovova (Semozorova I, 1975), in order to determine the age of a hare, the degree of epiphyseal of these fortified bone was determined by x-ray machine, which gave slightly more accurate results, but the research was more expensive.

Quite a different approach - of age determination of hares

According Šelmić (1981), Lord (1959) introduces the application and explains a new method for determining the age of hares. This author did an experiment on Floridian hare (Sylvilagus floridanus JA Allen, 1890), and a method of determining their age is based on the phenomenon that was first observed by English ophthalmologist Smith (1883). According to research of Selmic (1981), Lord quoting Lemsiga 1952 than he Kraus O. 1934 than he Clappa 1913 than he WJ Collins 1905, than he ET Collins in 1894, and then he Smith in 1883., studying disease of a crystalline body and eyeballs. Smith noted that the growth of the eye lens is not stopped as the growth of other organs of the body, but that it continually grows the entire period of life (Jovanovic, V., et al. 1971). Precisely on this fact, Lord has based his hypothesis, that it is possible to determine the age of the hare on the weight of dry eye lenses, which proved by Floridian experiment on 92 hares of known age. The method has proved to be powerful, not only in the separation of the young hares in one year old and older, but it has made possible to accurately determine the age within these classes, birth month in youth and year of birth in old hares. Lord is in this work, also examined the

dependence of wet lens weight, lens volume and the percentage of dry matter of the lens compared to the age of the hare.

In the European literature of determination of the hares age, this method is mentioned as Rieck because of that, as this writer applied it first in the European hare - Lepus europaeus Pallas, 1778 (W. Rieck, 1962), as he stated in his works, he was inspired by the work of Lord. Since at that time hunting of hares in Germany was from mid-October to mid-January, the use of Stroh method for determining the age of hunted hares gave not objective results. Due to the aforementioned lack Rick concurrently was investigating the application of both methods and found that from 4 of November 8% of young hares don't have Stroh mark. The most comprehensive comparative study of these two methods, according to Šelmić (1981) worked Krystyna Cabon - Raczynski and Jan Raczynski in 1972., on a sample of 2,277 hares. These authors have reported the presence or absence of epiphyseal growths by palpation, and at the same time, they determined the weight of dried eye lenses. They found that the limit value of weight of dried eye lenses between youth to one (1) year and over one year old is 275 mg.

These authors also found that no hare, which had epiphyseal lump, did not have heavier dry lens of the eye than the established limit values between young and old. Based on their results, it can be concluded that the use of Stroh method is limited to individual cases of age determination, when it comes to studies that used capture-recapture method, as Andersen and J. Jensen B. applied in their researches (1972). But since Stroh method gives the results up to 20% less than the actual situation, this is not reliable in population dynamic studies, in which the method of dry eye lens weight is superior, and with its results disqualifies Stroh method. However, despite the obvious deficiencies of Stroh methods, there are authors who consistently used it today.

Based on the weight of eye lenses. - Several other researchers have used the method of estimating the weight of the dried eye lens to determine the of the age of, not only hares, but other species of game. Some of them have examined the influence of different fixation treatment and drying of eye lens on the accuracy of the results. So Šelmić (1981) found that by freezing of eye lenses their weight was drastically reduced and imprecision was increased. Šelmić (1981) recommend, for the best results, that the drying carried out at a temperature of 60 ° C and Cerne (1979) at 110 ° C.

In the former Yugoslavia, determination of the age of hares based on the dried eye lenses first started prof. Bogdan Jaksic, by following parallel body weight as well as the state of ossification of the aforementioned lump on elbow bone in examined hares. The study was conducted on material taken from 300 hares. Based on these researches, Jaksic came to the following conclusions: weight of old hares was usually between 3,600 and 3,900 g, and the weight of their eye lenses between 250 and 490 mg. He noticed an extremely low incidence of animals with a body weight of 2,800 to 3,300 g and 3,800 g. By comparing methods of age determination, with the respect to the presence or absence of a lump in the and part of the elbow bone and the weight of eye lens, samples were found in where there were no lumps (according to that method old hares should have been considered), and the weight of eye lenses showed that they were young rabbits, and vice versa. Presented research was accepted with caution, because it was a small sample (300), and

the year in which the survey was conducted (1961-62) was quite unfavorable, because hare weighing from 2,800 to 3,800 g were very rare, as it could be anticipated that the hares from the May-June's litter died due to unfavorable climate and other factors.

In the laboratory of the hunting of Agriculture University of Novi Sad, this method of determination of the age of hares was used in 1967. (led by prof. Vojislav Jovanovic). The procedure of fixation and processing of materials is done in the way that to the hunted hare carefully is removed the eyeball that is put in 5-10% solution of formalin (formaldehyde) and holds there for 3-4 days. After that time, the lens is removed and dried for 72 hours at a temperature of 55-60 ° C in a thermostat, and as completely dry, measure on the Meltzer scale with an accuracy of 5 mg. Uniformity ways of stuffing, drying and measuring of the lens from the start of adoption of this method by the laboratory ensures that opens the possibility of comparing results from different years. Thus obtained data have been used to investigate the effect of various meteorological factors on hares growth (Jovanovic, V. et al., 1971) and determining the real hunting quotas of hares, as the measures of active protection of hares population in Vojvodina (Šelmić V., 1981).

Based on weight in the dry state, the division of the population is done into six age classes: I age class up to 100 mg - hares up to 3 month old; II age class from 100 to 200 mg – hares old from 3 to 6 months, III age class from 200 to 280 mg - hares old from 6 to12 months; IV age class from 280 to 310 mg - hares old between 1 - 2 years; V age class from 310 to 370 mg - hares old between 3 - 4 year, and VI age class over 370 mg - hares old over 4 years.
The limiting values between age classes were determined based on research of Šelmić (1981). This research in Vojvodina have been continuously working for 46 years (1967-2012), and until now, 371 612 eyes of hunted hares have been processed and measured out of 9,015 samples.

Innovations in laboratory processing of materials
Laboratory techniques of eyes processing of hunted hares from the first few hunts are consisted in the fact that, upon the receipt of the samples, eye lenses are placed in 5-10% formalin solution to fixate. The eyes are kept for at least three (3) days in solution, after which the lenses are extracted from the eyeball and placed in the thermostat at 37 °C to dry for a period of 3-4 days. After that, the precise Meltzer analytical scale measures dried eye lenses. This technique has been applied till 1989. when, at the suggestion of Prof. Dr. Nestor Šijački from the Faculty of Agriculture in Novi Sad (in the lab for hunting)a correction was made. The correction of the method consisted in the fact that after obtaining samples from the field, from the first hunts, vitreous of the eye were immediately separated (lens cristallina) from the outer part of the eye and placed in 10% formalin solution in which it was for 48 hours. After that, by separating of the vitreous part of the fluid, they are placed in a thermostat at 37 ° C until reaching a constant weight (for 2 to 3 days). Such dried eye lenses were measured on the precise Meltzer analytical scale in mg. After measurement of all samples from a hunting ground, data are classified according to the weights by age, as already mentioned in the previous section. Due to the changed mode during the laboratory processing of samples, time is reduced (fewer days for the processing of samples), and the entire process is simplified.

A practical method

As noted, these researches have been conducted in Vojvodina for 46 years and so far, this method has given excellent results and thanks to it, only realistic was hunted. Realistic means that not interfered with breeding stock and it was hunted just as much as our nature "allowed", so that in a large number of hunting grounds hares were preserved. Nevertheless, it is the most important that almost all hunting grounds in Vojvodina have adopted this method as "their" and from the first hunts they sent (those that hunt a hare) one by one lens of the eye of each hunted hare, which is kept in the laboratory, and then follow the treatment of the sample as described above under "shorted" process. Tests are performed for the first hunts, that means in the fall, when the most of young hares are grown up.

Based on the determined participation of young hares in the population (up to one year old) at the beginning of the hunt and the criteria for assessing the real growth (Šelmić V., 1981), as well as data obtained from hunting societies - section on the spring number of individuals, and hunting performed in previous year, professional service is able to, for each processed sample obtained from the field, give a recommendation on hunting opportunities according to plan on to the end of the hunting season, or should it be reduced hunting quotas for that year. The proposal for reducing hunting quota refers to the greatest extent to those hunting organization in which in that year was found that the participation of youth in the population is less than 50%, and therefore the real growth is small and in hunting ground have a low density (for example under 10 individuals per 100 ha).

Based on the above set of criteria and based on the spring number of hares, the condition of each specific population and micropopulation of hares is determined and on that basis, recommendations are given to the hunting clubs - sections on possible revisions of hunting plans.

Table 1. The criteria for determining the participation of youngs in the population and the real gain in relation to the numerical strength of hare in the spring

Evaluation of growth	Participation of young hares in the population	Periodic real growth compared to the numerical strength in the spring
Very low	till 40%	till 20%
Low	from 41% - 50%	21% - 40%
Good	from 51% - 57%	41% - 62%
Very good	from 58% - 63%	63% - 90%
Excellent	over 64%	over 90%

It happens that the hunting grounds which have high density populations of hares in the spring (as the hunting clubs in Vojvodina, where in the spring the average number in hunting ground is over 50 individuals per 100 ha, for example, a hunting ground is good if its density is between 25 and 30 individuals per 100 ha) may have a small real growth, but can hunt as planned because their numerical strength in the spring and in the fall is beyond the capacity of hunting ground.

In the hunting grounds where there is small number of hares in the spring, it is possible that the real growth is twice higher than in the previous example, so in those hunting grounds a minimum hunt is recommended (is only rational hunt) as long as the planned capacity of hunting ground is achieved.

The increase in the population of hares during a year depends on a number environmental factors, modern machinery, and pesticide use in hunting, increased numbers of predators and similar, so these researches so far are valuable because they "kept" hares in Vojvodina.

Results and discussion

The coefficient of periodic real growth

The coefficient of real growth till the hunting season, calculated on the basis of the participation of young hares in the population at the beginning of the hunt, is balanced for the entire test period, except in 1993 (2.26) 1994 (2.33), when the highest participation of young in the population was recorded, and thereby the highest real growth for 46 years, since this method have been applied in practice (Figure 1). Numerical strength of mega-population of hares in Vojvodina (Figure 1) for the observed period from 1967. to 2012. is balanced, except in 1971. when the minimum strength was recorded (Vapa et al., 2007). Because of this fact in the hunting grounds in Vojvodina during two years, a total ban on hunting was introduced (in 1971.and 1972), except for experimental purposes (Vapa Lj., et al., 2007). The maximum strength was in 1995.

The hunting for the same period ranged between 35 and 45,000 in the most years, with the average for the entire period of 42,635 hares. The largest annual harvest was recorded in 1985 (63.591), 1986 (61.667) and 1994 (65.848) and the annual percentage usage of 13.2 (1991), when in the whole Vojvodina, because of the war in the neighboring, a partial ban on hunting was introduced. The same percentage was recorded in 1996. and 1999 (10.1), and in 2012 - (Only 8.95%), when the most of the hunting grounds stopped hares hunting, because the year was disastrous drought, with an increased number of predators, particularly foxes (oral vaccination was done). The highest percentage of the use was recorded in 1983 (21.8) 1984 (21.2) 1985 (23.3) and 1986 (22.7), with the average for the entire period of 16.44.

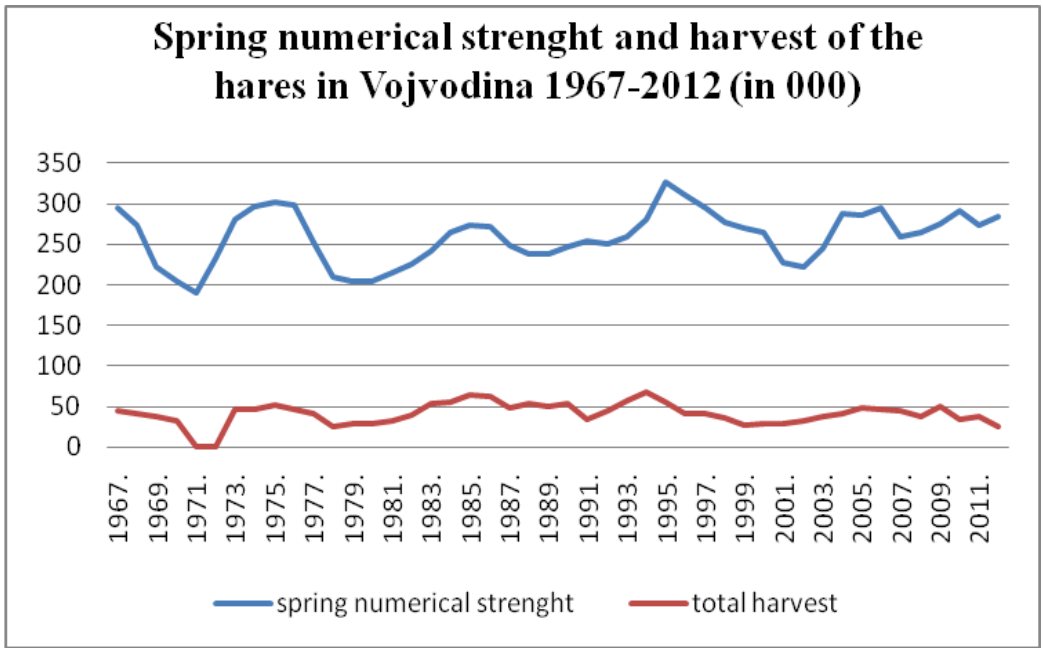

FIGURE 1.

The participation of young hares in the population (Figure 2) at the start of the hunting season, during which samples are processed (one eye lens was removed from the hunted hares from the first hunts), and determined real growth have a balanced flow. The minimum participation of young hares was recorded in 2010 years (38.0%), and 2012, (43.5%), with the average for the completely observed period of 58%.

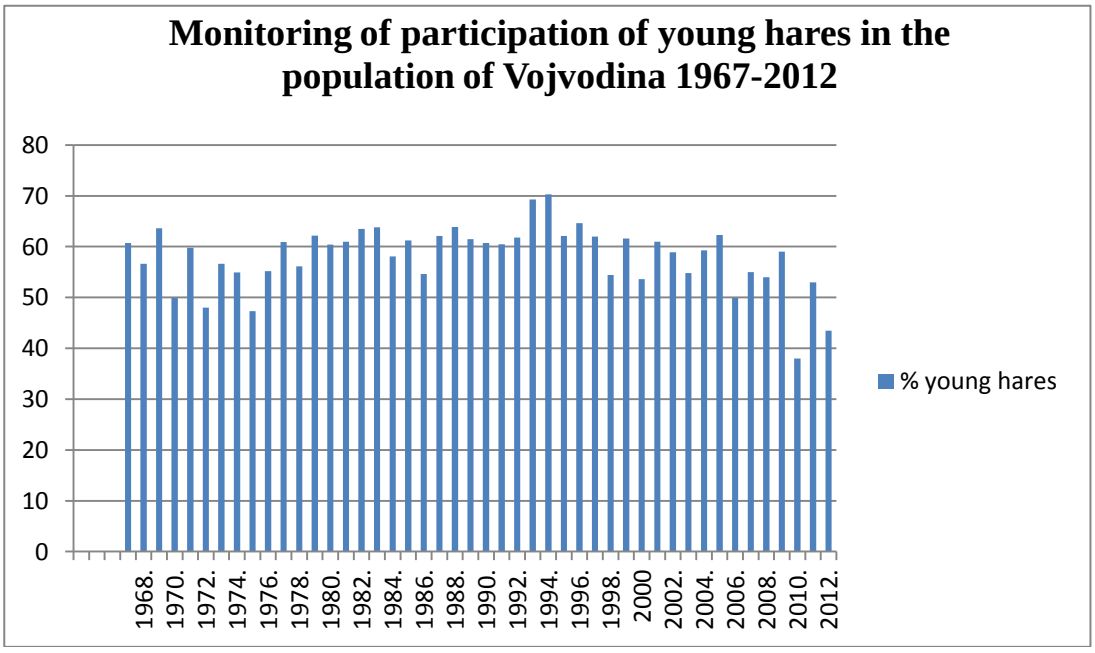

FIGURE 2.

The coefficient of real growth (Figure 3) was minimal in 1972 (1.25), when a hare was not hunted throughout Vojvodina, but only experimentally, and in 1975 (1.33) and the lowest value repeated in 2010. of 1.13 and in 2012 was 1.24. The maximum ratio of the real growth was recorded in 1993 (2.28) and 1994 (2.33), with the average for the whole observed period of 1.67.

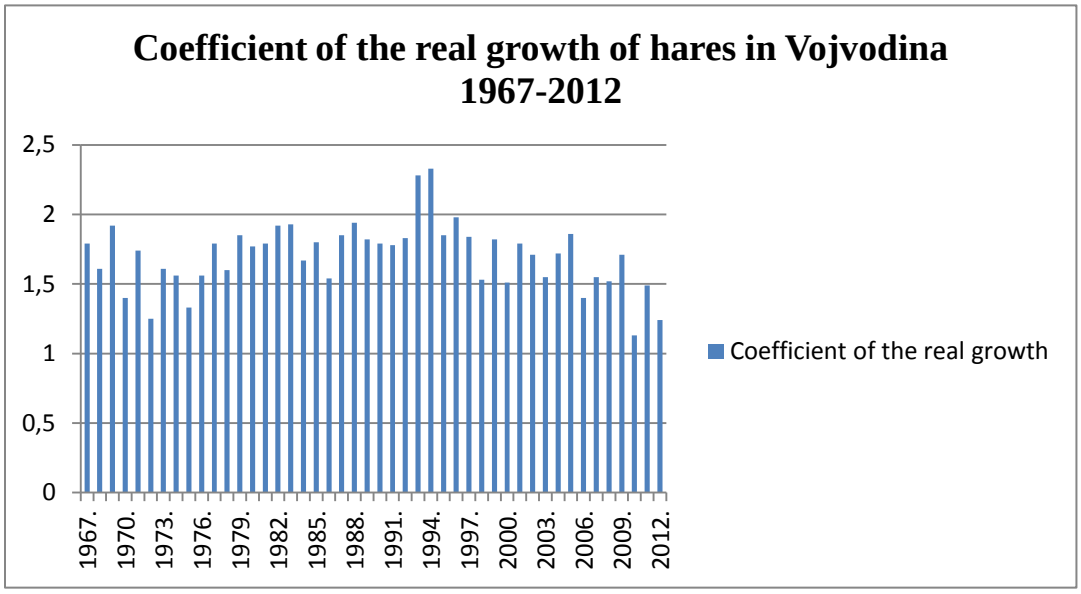

FIGURE 3.

Conclusion

Determination of youth participation in the hare population in Vojvodina, and based on this parameter real annual growth hare is an invaluable contribution to balancing quality hare populations, using data of the spring numerical strength or loss (winter) to rational planning and management of hunting with a population of hares. These studies are aimed at preserving the population primarily in the hare hunting grounds, and all other countries in which this method is applied.

Determination of real annual hunting quota of hares, based on these studies, it may be accurate enough to determine the participation of young rabbits in the population, and based on this parameter, the real annual growth. For quality balancing of micropopulation for which determines the participation of youngs and the real growth is necessary to know the ecological population density in the spring, and just before the hunt. Since the numerical number is not determined in autumn, to calculate the hunting quota, in Vojvodina based on numerical strentht in spring and obtained real gain for each year comes to autumn conditions. Obtained from such a situation, we are able to get to the computation of winter losses realized by subtracting the hunting of the year and subtracting the strength of the spring obtained by counting the hunting ground in the next year. Losses of 30% of the numerical strenght of spring are used in preparing planning documents (Valentinčić, 1956, Šelmić, 1981). Ristić and research Matejević, (Ristic,

Matejević, 2010), winter losses and losses in the period of reproduction are 32%, and the authors suggest them as planning documents for realistic planning of hare population.

Method for determining the participation of young hares in the population in Vojvodina, and then received real periodic gain was fully accepted by hunting organizations and hunting grounds which sends eye lenses of the first hunts, and then, after laboratory processing waiting for recommendations on suspension or continuation of hunting. Due to this fact, it can be concluded that more than 70% of hunting grounds have stable populations of hares, and thus secured the permanence of management with hare. This is very difficult in the management of small game, especially in the open hunting grounds.

In the preparation of planning documents (management plan), in preparing the dynamic of hares population, it is recommended to use the average real gain coefficient of 1.65 till 1.70 that was obtained on the basis of decades average of stable population. Using a larger coefficient than it is predicted, it can in a short time reduce the number of hares in hunting area, that is to unrealistic harvesting.

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