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REINTRODUCTION OF RED DEER IN NATIONAL PARK „FRUŠKA GORA" (2009 - 2012)*

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SUMMARY: In this paper work will be shown results of reintroduction of red deer in hunting area of National Park "Fruska Gora", that was supported by Ministry of Agriculture, Forestry and Water Management and Public Enterprise "Fruska Gora" National Park. The aim of this research is to provide reintroduction in ex habitat hunting area in Fruska Gora. Deer game is situated in fenced rearing "Ravne" that was build to provide quarantine surface 108,30 ha, where red deer were inhabited on 13th of February 2009. It was inhabited 36 throats (6 ♂ and 30 ♀) originating from hunting area "Kaposvar" (Hungary). All 30 hinds were fraught, ages 3 to 5, and 6 deer - 3 deer with third antler and 3 with fourth antler. In 2012 were counted 141 throats. For 4 years in gater was calve 109 calves. They made lot of damage to trees, the beech, ash and elm, what cause drying of numerous trees because of peeled the bark.
Key words: reintroduction, repro center, red deer game, Fruska Gora

Introduction

The National Park covers an area of 25,393 ha, including forest areas (over 90% of the area), and meadow habitats are present in 5,000ha. As Fruska Gora legally protected as a national park - the natural asset of great importance the Republic of Serbia, protection is provided to the whole area. Spatial plan of special purpose Fruska Gora till in 2022. year in the National Park is designated three-stage regime of protection: protection regime and the level I of 934 ha (3.7%), grade II protection regime 17,020 ha (67%) and third-degree protection regime 7,439 ha (29.3%). Also, according to the Classification of the IUCN („International Union for Conservation of Nature") this National Park is one of the natural resources of great importance, as Protected Landscape or Seascape. The main feature of this area is the existence of a number of endangered, rare and protected plant and animal species. Pastures and fertile fields, vineyards and orchards, adorned slopes and lower Fruska Gora, while plots located at altitudes above 300 meters, is covered with dense deciduous forests. As a national park is one of the "Important Bird Area" („IBA") receives membership in international organization in 1996.: Federation of Nature and National Parks of Europe(„FNNPE"). The Government Autonomous Province of Vojvodina was made the Spatial Plan of special-purpose National Park Fruska Gora and tourism region of Fruska Gora [1].

There are many possibilities for the use of NP Fruska Gora, such as educational programs (Eco-camps, the School in nature); Production Programs (Program for production of high quality food and herbs); Village revitalization program (development of horticulture, viticulture and animal husbandry, collection of secondary forest products, conservation and improvement of fishing water of the ichthyofauna of the National Park); and Attractive destination for eco-tourism.

Although region Vojvodina was considered as a traditional hunting and tourist area with the reputation of long decades on the international tourism scene, this is not the case today. Because of the social, economic and political crisis in the country there was a need to re-create the hunting tourism resources. Reduction the fund of wild animals cultivated species, the decrease in tourist turnover, prohibited exports of meat of wildlife game meat from our country to the European Union countries, as well as increased competition in neighboring countries, all this influence the need to make policy loans in the tourism market with profitable and sustainable development of hunting tourism in Vojvodina. In the past, Vojvodina counted among the richest hunting regions in Europe. From this area is a trophy deer (248.55 CIC points), which has been in 1971. even 17 years ago was a world champion [7].

Material and Method

Reintroduction of the red deer

Reintroduction is a breeding conservation measure through the introduction of artificial preserved certain parts of the population (in this case, deer) on the premises from which it is eliminated (in hunting grounds National Park "Fruska Gora"). Reintroduction of large mammals became an important silvicultural measure in hunting forest [2],

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which is always a long, complex and very expensive process. Eco-coenological features of the massive Fruska Gora features an abundance of flora and fauna which include also European red deer (Cervus elaphus L.) [3]. Before that started with the realization of the idea of reintroduction of red deer in hunting ground National Park Fruska Gora, is planned to be done feasibility study, and on the basis of it, made the project of reintroduction with the other supporting documents. Feasibility Study is the basic document to manage the project, Reintroduction of red deer in National Park Fruska Gora. The project is based on the assessment of the existing status and potential for the current investment. Also, the implementation of the project defined the objectives and strategies to achieve them, with reflecting the financial, public and social aspects of the observed period. The project envisages the implementation of reintroduction of deer in three phases: 1) Construction of reception center, 2) Acquisition and socialization of individuals, and 3) Monitoring of the population (the duration of phase with the reintroduction 7 - 8 years).

The main goal of reintroduction of the red deer is the formation of viable populations of this species, its maintenance within the capacity of the environment and then the valorization a natural resource. However, considering that, this is about biological and ecological characteristics of individual species, in most cases, if it isn't fulfill just one of the conditions of reintroduction, this settlement will fail. In Europe, the analysis on 130 wildlife reintroduction projects for the last 30 years, showed in most cases, that they are not fully implemented, and therefore failed. Most frequently were in the implementation of reintroduction, that people hoped to have „lucky" that project alive. In order to avoid this it is necessary to prepare a feasibility study, which can provide all the details, as the implementation of the project would relying on luck, but on knowledge. Similar analyzes were carried out in Italy [6] with 45 projects of re-introduction of red deer for the period 1950-1998. [4], who found that the mistakes of the past over and over again.

In addition, the valorization of red deer as a natural resource in terms of social-economic aspects has special significance in the enrichment of tourist and educational offerings (organization of "huntwatching" and a variety of educational programs for visitors). Natural conditions that allow survival of deer on Fruska Gora, they could at the same time make this location significant reprocenters, because its isolation prevents the spread of American liver fluke, which are infected almost all other populations in in the surrounding lowland hunting grounds.

The location of reception center for acceptance of red deer

When choosing a location for the Reception Centre (a place where the deer will adapt and keep for a short time after the shipment) are taken into account, besides the above mentioned, other factors related to food, peace and shelter in the winter [6]. Taking into account all of the Reception Centres chosen locality „Ravne" in the management unit „Ravne" („No. 3,808"). The total area is 108.80 ha, out of which 10.31 ha of meadows waste, and the other area is forested. This area is characterized by the most represented community: coppice forest oak and linden; elm and linden; oak and linden; and a smaller part of the high forest of beech and linden; beech and oak; Turkey oak and sessile. Minimum altitude is 260 m and the highest 400 m.

The chosen location is situated in the center of Fruska Gora with the existing individual objects that can serve for the purposes reception center, but were in very poor condition. Access roads are in good condition and they have ramps that prevent free access to the locality. The surface on which the the Reception Centre is planned according „Capability evaluation Instructions for hunting" is classified in part I and part II of Solvency for deer habitats, which means that are all conditions for its proper growth and development.

Locality „Ravne" was selected for the re-colonization-reintroduction of red deer on Fruska Gora, because it was even earlier the summer residence of the wildlife as was the hunting ground. The western parts of Fruska Gora, in which is also locality Ravne, represent the optimal environment in the National Park for breeding of red deer. For these reasons, it is specified that the locality Ravne first build the Reception Centre, and then some animals released into the open part of the hunting grounds in its immediate vicinity in the form of cyclic loops.

Natural feeding conditions in the hunting ground where red deer anticipated after the introduction, and then release to the open part, because the diversity of the vegetation, are very favorable. This advantage consists of locality conditions where they can develop lush vegetation, where most of the hunting ground is forest with undergrowth of herbaceous vegetation. From shrub species there are: fiddle, buckthorn, hawthorn, hazel and others. In quarantine and then the open part thereof, are provided natural water and also peace. Since this is a coppice forest, with plenty of bushy vegetation present, this wildlife is available a lot of hiding places throughout the year. These are the resting places where deer can get away and ensure peace during rumination, the growth of antlers and playing an important factor for undisturbed breeding of quality and healthy deer population in the hunting area. Taking all into account, it can be concluded that the conditions for breeding of red deer are favorable, because of three basic factors: food, shelter and peace. Such suitability of conditions determined primarily good grazing in the meadows and pastures (10.31 hectares) occupying about 9.48% of the total area of ??the fenced area (108.80 ha). These meadows and pastures are covered with plants that are appropriate in the feeding of red deer. Shrub vegetation is present sufficiently enabling adequate consumption to this wildlife species. Fenced part offering sufficient water for drinking and rolling of the wildlife. Climatic conditions allow successful breeding of wildlife. Unfavorable is only that in the winter snow cover sometimes exceed 30 cm in height, but in that time, intensive feeding, pre-prepared foods, wild game can successfully overcome this period.

Transportation of wildlife and the health control

The basic project of reintroduction is planned to build a fence to quarantine device of red deer when brought from Hungary to temporarily adapt to the new conditions in the wildlife habitat – hunting ground. Transported deer

housed in a small enclosure that has a dual role: to adapt and stay in quarantine (for health contro by veterinary inspection). This shelter is in the center of the hunting area, from where the deer release in the hunting area, and this will be provided to the construction of feeding stations. Quarantine is built of wooden poles and steel wire, and associated with a fixed path and roads, to deer could bring there. Beside transport of wildlife, existing road allow normal access to professional staff and effective veterinary control of wildlife. The total productive area for hunting deer in the hunting ground is 4,000 ha. Economic capacity for hunting deer population in the hunting ground „National Park Fruska Gora" was determined in 140 animals, and biological capacity is set at 120 animals.

Taxonomic aspects of reintroduction

After completion of the construction and equipping shelters for reintroduction of the red deer in the area National Park Fruska Gora, is planned and was purchased deer from the farms for breeding of quality animals that are primarily used for further reproduction in Hungary (breeding center "Kaposvar"). On this farm are grown deer - Central European red deer (Cervus elaphus hippelaphus Erxleben, 1777), or the same one subspecies that once inhabited this region, which guarantees there will not be genetic pollution of" population''.

Results and Discussion

According to the plan were purchased 36 young animals in the sex ratio 1:5 or 6 throats red deer (born in 2006.) and 30 hinds (born in 2005.). In hunting ground National Park Fruska Gora reintroduced - was entered into, reproduction center "- quarantined area of 108.30 hectares, in Februar 2009. The 30 hinds (all of whom were pregnant), whose age was 3 to 5 years, and 6 deer (3 deer antler the third and fourth with two deer antler). After accepting at the reception, all individuals were marked with stamps in order to monitor animals after their release into the open part of the hunting area, in the whole area National Park Fruska Gora and beyond. In order to manage with red deer on contemporary principles, it is necessary to be in the population between 90 and 100 individuals. Further reproduction of red deer was going over the following: In late May and early June 2009., the 22 calves were born. On the counting at the 15. decembre 2009. were counted in a fenced part 57 throats. Damage to vegetation has not been found.

In late May and early june 2010., the 24 calves were born. Roaring began on 10. september 2010., there were three roaring red deer who seized each his own territory. On the counting on 20. decembre 2010. counted 81 individual. Deer are began to peel the bark of trees, and to make damage to vegetation in quarantine.

In late May and early June 2011., the 28 calves were born. In June 2011. died 3 hinds, whose carcasses were examined veterinarians of the Veterinary Institute Novi Sad, and concluded that died from overeating. Roaring began on 20. september 2011., when it was 5 roaring deer, and for the first time with the appearance of fierce fighting. Counting was carried out on 20. december 2011., when there were 106 individuals, and the incidence of major damage to trees.

In late may and early june 2012., the 35 calves were born. In total, in the 2012. counted 141 individual, with a lot of damage to trees, the beech, ash and elm, and the the appearance of of a large number of trees drying the peeled bark. So that, in the 4 years from 31 hinds were obtained a total of 109 calves with a note that the calves were born in the 2009. gave progeny for 2011., and one that have born in 2010., also gave progeny in 2012., and calves from the 2011. shall deliver progeny in may 2013.

End of 2012. into the hunting ground was discharged 27 throats, and in the beginning of 2013. another 7, so that into the open part of the hunting ground discharged 34 throats (10 male and female calves, 5 two-year deer, 3 three-year, 1 deer of 6 years and 15 deer of different ages). In the fenced area was left 107 throats of different sex and age structure.

Defining the minimum number of animals required for settlement

The size of the population was 36 animals in breeding stock, of which 30 pregnant hinds were brought from Hungary, who, at the 2009. calved in a shelter, and 6 deer that are capable for sexual reproduction for the following hinds, which is exactly happened in this year, because a few the most dominant males participated in mating. The increment of 0.80 calves per hinds older than 2 years provides a sufficient number of animals that is certainly essential to successful reintroduction. Natural renewal of herds will not be affected, because the deer will have enough food. If would observe the damage caused by the anticipated population density, it aimed at resolving with a timely release of the game in the open part of the hunting grounds, and reduce the capacity of the deer in fenced hunting grounds - the shelter. The practice in similar fenced areas, with intensive feeding throughout the year showed that the population density of 30 to 35 cows on 100 ha with securing 10 acres of open space per head for grazing, can be successfully maintained and reproduced. The fenced hunting grounds "Ravne" has more than 10 acres of meadows and pastures.

Forecast population growth and maintenance

According to the proposed population dynamics drawn for deer that was taken in hunting ground for the safety and success of reintroduction projects, it is proposed that the first three years of parent breeding stock (a high quality

and expensive paid), keep in a shelter, and released progeny in open part in the each year. In this case, that means 24 animals per year, with two or three of the oldest hind which led the offspring and two older deer.

Defining the the possible migration routes

After discharge into the open part of the hunting ground, red deer will be fed in feeding stations, that will be deployed in the so-called cyclic circuits with the maximum moving away 6. to 7. km in diameter from reception centers, and surface area of 3.500 to 4.000 ha as planned productive hunting area.

Conclusion

Unfortunately, the population of red deer hunting ground in National Park Fruska Gora is not fully done to the IUCN guidelines for reproduction [5]. This is due to the fact, that first was made elaboration of reintroduction, and then the feasibility study, and should proceed in reverse order. Also, it made the mistake in the purchasing of an insufficient number of red deer (it need 90 to 100 animals, and purchased 36 animals). It was selected unfavorable structure of the initial stock of 1:6 in favor of of female animals, and the unfavorable age structure of males and females (3 and 4 years). Most likely because of transportation and experienced stress, some hinds lost calves prematurely or were calved the dead calves, as a result of a late shipment of individuals in advanced stages of gravidity in hunting ground in february and march 2009. It is therefore crucial, that from existing population of red deer should form strong and stable population, that with breeding measures (food, water, and salt), will „bind“ with the planned area on the locality „Ravne“ and its direct surroundings, so making minimal damage to agriculture and forestry. Because of that, we believe that in the future should be engage competent people in National Park Fruska Gora in order to avoid mistakes and to reach the desired goal, which is to restore of red deer in open hunting ground and the formation of a stable population, which will be within the limits of economic and biological capacity of hunting ground. With the recapturing of red deer in this hunting ground will be establish the ecological balance, and all of that will aimed the creation of ecological units, because the deer as an indigenous species had, and still has its place in hunting ground.

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