RESEARCH ON THE FAUNA FROM OLT COUNTY

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Abstract. *Olt County comprises 57 game funds with a surface of 492.073 ha. Eight game species from the ones present in this area (fallow deer, mouflon, eurasian-coot, common-quail, eurasian-jay, hooded crow , bream, picke-perch) were chosen and ranked according to 19 criteria (harvesting period, the quantity gathered by a worker in eight hours, harvesting cost, harvesting knowledge, knowledge for harvesting the species, tools needed for harvesting, complexity of harvesting process, harvesting process development, knowledge for recognition, distribution range, biotic threats, abiotic threats, perishability, market potential, market demand, "celebrity" of the product on the market, the price of raw product, the price of the derived product, portfolio of derived products, the transport from the harvesting point up to the storage center). Grades 1 to 8 were assigned to each species studied by specialists in the field and using a hierarchical analytical process (AHP) based on Desktop Choice Expert software. As such, the species with an important game interest in this area are the fallow deer and mouflon due to the fact that they have a large portfolio of derived products, a large distribution range and a high demand on the market. On the other side, the least important species are the eurasian-jay and eurasian-coot as they are low in biotic threats, abiotic threats, perishability, market potential, market demand, "celebrity" of the product on the market, the price of raw product, the price of the derived product and the portfolio of derived products. Overall, the harvesting potential and commercialization of game species, as well as their diversity and portfolio of derived products is high in this County. This is due to the forest and sapling area, which is the favorable environment for the reproduction and development of the species, as well as a large crop area from which the hunting can obtain its food and a good management of the fauna through the protection of the fauna and the complementary food that has a contribution essential. Thus, the sale of both trophies and hunting meat is an important source of income for the management of hunting funds.*

Keywords: *Olt County, fauna, harvesting, fallow deer, common-quail*

INTRODUCTION

The simple knowledge of recognizing wild animals cannot ensure the survival of wild fauna today if it is not supported by multiple protection preoccupations and consistencies especially under less controlled hunting situations. The judicious management of game funds can improve a series of elements belonging to the natural environment, influencing as such the game's collective, distribution and reproduction. This can lead to more advantageous conditions for a superior capitalization correlated with socio-economic interests (COTTA, et al., 2001).

The costs for biodiversity loss and degradation are still hard to establish, while worldwide studies realized up to the present date indicate that they are increasing. Due to this reasons, the exploitation of wild fauna under different forms, including hunting, has and still continues to be the subject of numerous studies and debates whose results were implemented under a form or other in national laws (CRĂCIUNESCU, et al., 2014).

It is important to note that hunting collectives are increasing, even though they are being hunted; this situation occurs as there are protected by humans. Hunting is a conscious human intervention, defending certain species and reducing the number of others that become harmful. Laws and regulations are created with this purpose, namely to stop human wrecking and to oblige him to protect its environment (COTTA, et al., 1969).

This has led to the present concept of fauna as "a natural national and international renewable game interest resource", while "hunting is done today in order to ensure an ecologic equilibrium, to improve the quality of fauna populations, for scientific purposes as well as educational ones or for recreational-sport activities" (LAW NUMBER 407/ 2006, with its subsequent changes and addendums, art. 2 and 3).

The management of game funds limits the number of hunted species and intends to maintain habitats and biodiversity (MOLNÁR, 2011)

The present article intends to emphasize the most important game species that can be found in Olt County, as well as to evaluate them through an analytical hierarchical process (AHP), while the results were obtained through the Expert Choice Desktop Software (CIONTU, et al., 2018).

MATERIALS AND METHODS

The study was realized in Olt County, located in the south part of Romania, on the inferior course of the river that has given it its name and that belongs to the Danube riverine counties. Through Corabia Danube harbor, it has exit to the Black Sea. The total surface reaches 5.498 km², namely 2,3% of the country's territory and placing the county on the 22nd place in Romania. From the population's point of view, the county occupies the 18 place, with 489.274 inhabitants (2002), and a density of 89 inhabitants/km². The climate is temperate-continental, more humid in the North part and more arid in the South part. The coldest point is located at Caracal due to cold currents from East Romanian Plain that have their terminus point in this area, while the hottest point is at Corabia. The relief is centered on Olt's inferior valley and its terraces, being formed of plains and hills that are not too tall. The hill area can be found from the county's North limit, up to Slatina. These hills belong to the Getic Plateau, occupying a third of the county's surface. A part of Romania's Plain is located from South of Slatina up to the Danube, having the following subunits: Romanaților Plain, Boianului Plain and Burnazului Plain. The relief's altitude lowers in a smooth slope from Vitomirești towards the Danube, offering a sunnier South exposition (RO.WIKIPEDIA.ORG).

The total surface of the public state forest fund managed by Olt Forest District through its six forest districts is of 31.186 ha. The forests situated in the first functional group (forests with special protection functions) occupy 20680 ha (71%), while forests from the second functional group (production and protection forests) amount to 8568 ha (29%). (WWW.ROSILVA.RO)

Olt Forest District manages five game funds in a total surface of 38.100 ha. The main game species that create the game tableau of these game funds are: *Dama dama* (follow deer), *Capreolus capreolus* (roe deer), *Sus scrofa* (wild boar), *Canis aureus* (jackal), *Vulpes vulpes* (fox), *Lepus europaeus* (hare), *Phasianus colchicus* (pheasant), *Anas platyrhynchos* (mallard), *Anser fabalis rossicus* (bean goose), *Fulica atra* (eurasian-coot), *Perdix perdix* (grey-partridge), *Coturnix coturnix* (comon-quail) etc.

Besides the five game funds managed by Olt Forest District, the county has another 57 game funds covering 492.073 ha., managed by AJVPS Olt and other private entities.

Amongst the species present in Olt County, eight were selected for this study (follow deer, mouflon, eurasian-coot, comon-quail, eurasian-jay, hooded crow, bream, and pike-perch) and added through an analytic hierarchy process (AHP). The analyses were then used with the Expert Choice Desktop software. AHP is one of the most used worldwide decisional support models for solving complex decision-making problems in numerous domains, including biologic sciences (ARAS, et al., 2004; WANG, et al., 2004; PARK, et al., 2013). The analytical hierarchy process uses pair comparisons of selected criteria in order to evaluate their

importance (HUANG, et al., 2011). In this manner, the complex problem (namely the purpose of this research) is structured hierarchically, with the objective at the top of the hierarchy, while the criteria (and sub-criteria) are at the hierarchy levels and their alternatives (namely the eight non-wood forest products) at the bottom (SAN CRISTÓBAL, 2011).

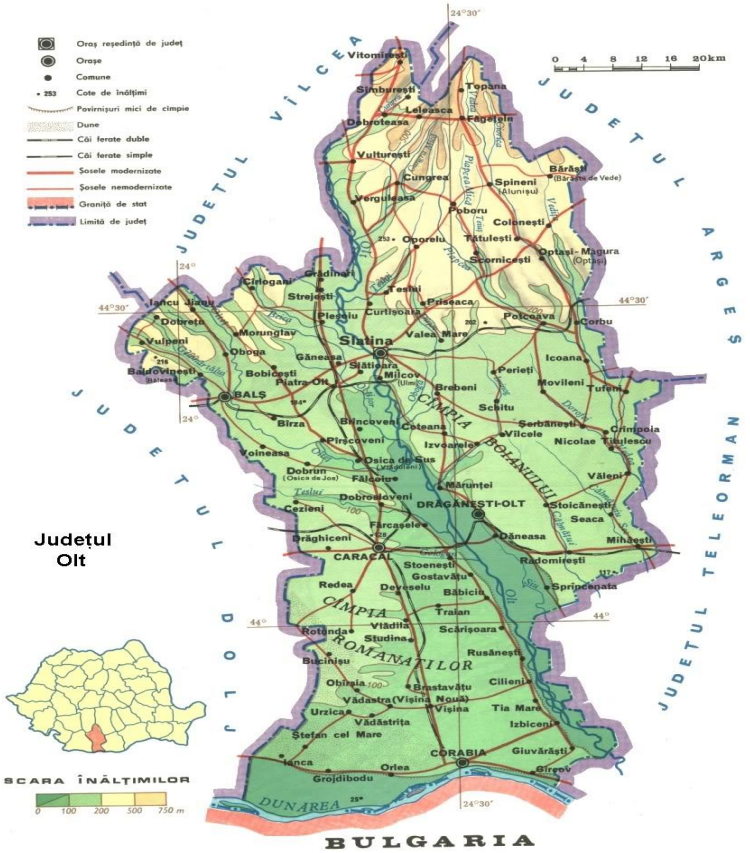

Figure 1. Location of Olt County (www.pe-harta.ro)

RESULTS AND DISCUSSIONS

The concept of non-wood forest products (NWFPs) was introduced four decades ago in the tropical silviculture for considering the entire production generated by the forest sector (ENESCU, 2017).

The present paper has used an analytical hierarchy process (AHP) in order to evaluate the performance of the selected alternatives by pair comparisons, while the results were obtained with the help of the Expert Choice Desktop software (DINCĂ, et al, 2018).

The NWFPs selected for evaluating their performance were the following: follow deer (*Dama dama* L), mouflon (*Ovis aries musimon* - Pallas), eurasian-coot (*Fulica atra* L), comon-quail (*Coturnix coturnix* L), eurasian-jay (*Garrulus glandarius* L), hooded crow (*Corvus cornix* L), bream (*Abramis brama*) and pike-perch (*Sander lucioperca*).

The following table presents the alternative AHP classification based on the 19 criteria taken into account:

Table 1

AHP alternative ranking

Criteria		Animal species							
		Fallow deer	Muflon	Eurasian-coot	Comon-quail	Eurasian-jay	Hooded crow	Bream	Pike-perch
		1	2	3	4	5	6	7	8
1	Harvesting period	4	1	3	2	7	8	5	6
2	Harvested quantity by one worker in 8 hours	1	2	4	6	3	7	8	5
3	Harvesting cost	8	7	1	6	2	3	4	5
4	Knowledge for harvesting	7	5	2	8	3	4	1	6
5	Tools needed for harvesting	8	7	2	6	3	4	1	5
6	Complexity of harvesting process	6	7	2	8	3	4	1	5
7	Development of the process of harvesting	8	5	1	7	4	3	2	6
8	Knowledge for recognition	6	5	7	8	2	3	1	4
9	Distribution range	2	1	6	5	7	8	3	4
10	Biotic threats	6	7	4	8	2	1	5	3
11	Abiotic threats	6	7	3	8	2	1	5	4
12	Perishability	7	6	3	8	2	1	5	4
13	Market potential	6	5	3	8	2	1	4	7
14	Market demand	8	7	3	6	2	1	4	5
15	Celebrity" of the product on the market	8	5	3	7	2	1	4	6
16	The price of raw product	8	7	2	5	3	1	4	6
17	The price of the derived product	8	7	2	5	3	1	4	6
18	Portfolio of derived products	8	6	2	7	3	1	4	5
19	Transport from the harvesting point to the storage center	8	7	3	6	1	2	4	5

Based on the AHP results, the most important game species from Olt County are follow-deer and mouflon, while the least important ones are jaybird and coot (Figure 2).

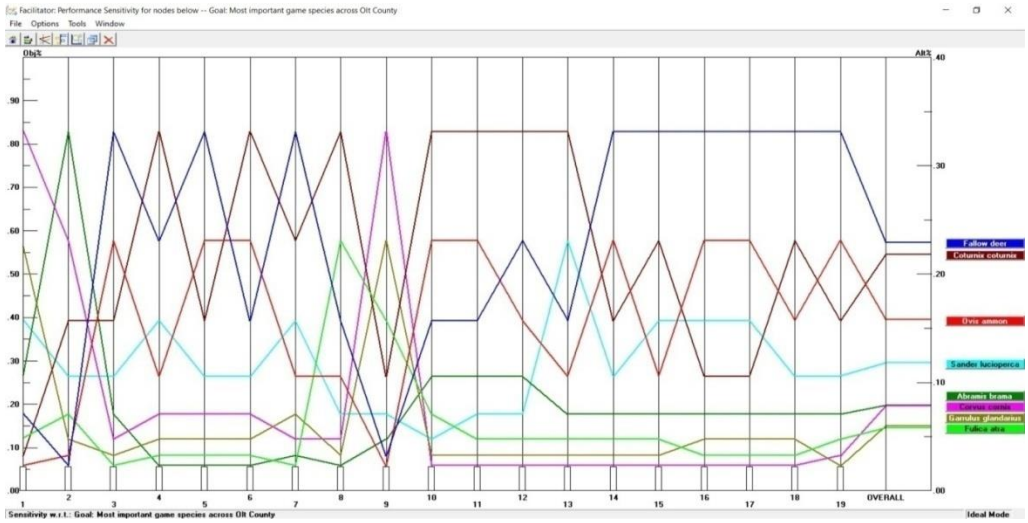

Figure 2. Ranking of the selected NWFPs

According to the results of this study, follow-deer and mouflon have a larger portfolio of derived products, a larger distribution range and a higher market request, even though they have higher harvesting costs, a longer transportation from the harvesting place to the storage center and more derived products. Compared with the buck, who occupies the second place in Argeș (CIONTU, et al., 2018), their harvesting period is not that long. In a neighboring county (Dolj), the most appreciated NWFP category was the hare (CÂNTAR, et al., 2018), while the mouflon was on the fourth place (CÂNTAR, et al., 2019).

The least important game species were eurasian-jay and eurasian-coot. These birds are not of interest for hunters, having a reduced score for all criteria with the exception of distribution area, as they are present in the entire county.

Follow deer is the most advantageous game species from Olt County (1.709 samples in the national harvest quota for 2019/2020 and 244 samples in the quota from Olt County (ORDER 673/13.05.2019, appendix 1).

The wild boar is the most promising game species from our country (65.560 samples in the national harvest quota for 2019/2020 and 844 samples in the quota from Olt County) (table 2), being the most appreciated game in Bihor County (TIMIȘ-GÂNSAC et al., 2018a). In regard with the small hair game, rabbit occupy the first place (102.406 samples in the national harvest quota for 2019/2020 and 3.247 samples in the quota from Olt County), as can be seen in Table 2 (ORDER 673/13.05.2019, appendix 2).

Pheasant is the most important small game with feathers from our country (122.360 samples in the national harvest quota for 2019/2020 and 4.769 samples in the quota from Olt County), as can be seen in table 2 (ORDER 673/13.05.2019, appendix 2). The species occupies the third place amongst the most appreciated game species from Calarasi County (CIONTU, et al., 2018) and the second place in Bihor (TIMIȘ-GÂNSAC, et al., 2018b).

The small game species with feathers from Olt County that are less advantageous are eurasian-jay (with 21.209 samples in the national harvest quota for 2019/2020 and 57 samples in the quota from Olt County) and eurasian-coot (with 15.604 samples in the national harvest quota for 2019/2020 and 1.256 samples in the quota from Olt County), Table 2 (ORDER 673/13.05.2019, appendix 2).

Table 2

Harvesting quotes for mammals and birds from Olt County during the 2019-2020 season

Species	Follow deer	Wild boar	Roe deer	Hare	Pheasant	Gray-partridge	Common-quail	Eurasian-coot	Hooded crow	Eurasian-jay	Fox	Jackal
Harvest quota	244	844	473	3.247	4.769	1.490	11.830	1.256	1.762	57	1.844	808

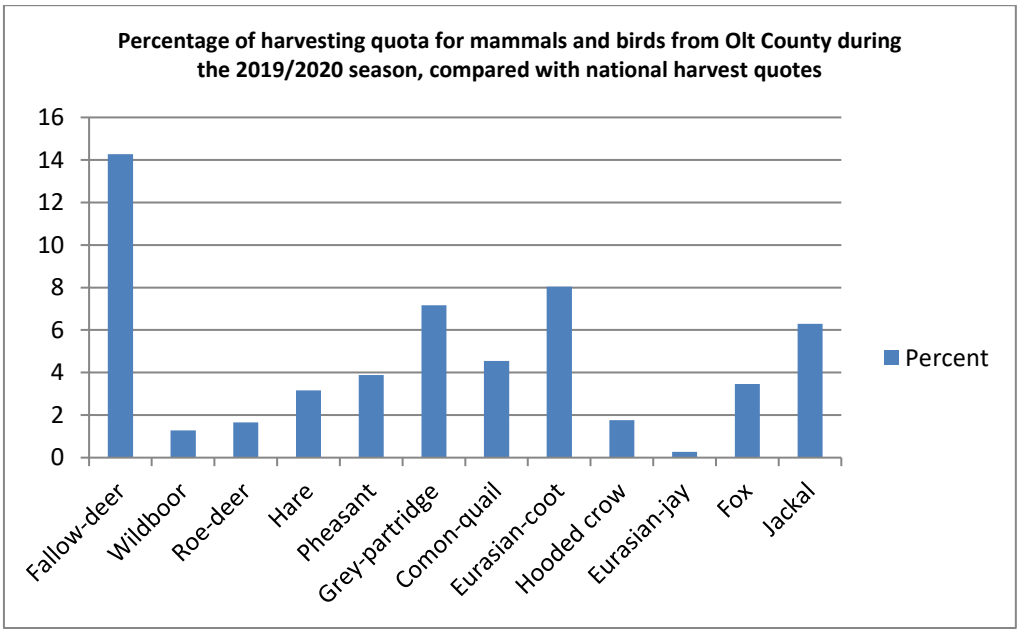

Figure 3. Percentage of harvesting quota for mammals and birds from Olt County during the 2019/2020 season, compared with national harvest quotes

CONCLUSIONS

By analyzing eight species with an analytical hierarchy process, the most important game species that can be hunted in 57 game funds with a surface of 492.073 ha are follow-deer and mouflon, while the least important ones are eurasian-jay and eurasian-coot. If follow deer and mouflon are hunted because of their large portfolio of derived products, a large distribution array and a high market request, eurasian-jay and eurasian-coot are not sought by hunters as they have a low score at almost all criteria, with the exception of distribution area as they are present all over Olt County.

The results of this study represent an important contribution in evaluating the potential of NWFPs, especially for their harvesting, marketing and other connected activities.

The analytical hierarchy process – Expert Choice Desktop combination proved to be an easy to use instrument if solving a complex decision problem. Future studies are recommended for obtaining more representative results, and focused on additional criteria that involve specialists and other interested factors from diverse domains.

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