

THE MOST IMPORTANT ANIMAL SPECIES FROM BIHOR COUNTY

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Abstract

The present study was realized in Bihor County, renowned for its quantity and quality of non-wood products harvested and harnessed from the most ancient times. As such, the purpose of this study was to emphasize the most important animal species from Bihor. The analytical hierarchical process was used for systematically evaluating both quantitative and qualitative criteria, as well as for evaluating the performances of the alternatives selected by the means of comparing pairs. The most appreciated game species from this county were the boar and buck, while the species with the lowest points were the beaver and godwit.

Key words: game species, AHP, non-wood forest products, Bihor

INTRODUCTION

Non-wood forest products are constituents of the forest system that exist in nature, being plants or part of plants that have a sufficient economical or consumption value that recommends them for harvesting and extraction from the forest. They can be classified in edible products (edible plants and animals, honey, oils, fish) and non-edible products (including herbs, ornaments plants, oils for cosmetic usage, etc.). Non-wood forest products represent an important income source for poor people from many developing countries (Adepoju, et. al, 2007).

Non-wood forest products is a term used for describing over 200 species of forest resources, other than wood, harvested in commercial, personal or traditional purposes (Sinclair, 2002).

In present times, non-wood forest products are defined as being all the biological materials (other than industrial round wood and derived timber, wood splint, wood panels and cellulose) that can be extracted from natural ecosystems, managed plantations etc. and can be used in households, or can be commercialized. As such, non-wood forest products include the plants used for food, fodder, fuel, medicines, fibers, biochemical etc., as well as animals, birds, reptiles, fish, insects etc., used for food, fur, feathers and so on. Using ecosystems for recreation, natural reservations, managing hydrographic basins etc., is considered as forest services (Wickens, 2003.).

In Romania, non-wood products are mainly represented by forest fruits, mushrooms, game and medicinal plants, amounting to approximately 350 species of interest (Enescu, 2017).

In accordance with the Ministry's Order project concerning the instructions for harvesting and purchasing non-wood forest products specific to the national forest fund (MEWF, 2016a), the list of non-wood products with harvesting and commercialization purpose contains a number of 120 mushroom species and 171 herbaceous, shrubs and tree species. A special category of non-wood products is represented by game species (Enescu, 2017b).

The purpose of this research was to emphasize the importance of animal species from Bihor County.

MATERIAL AND METHOD

The study was realized in Bihor County, located in the North-West part of Romania, alongside Crișul Repede and Crișul Negru rivers, narrowed on the East by Apuseni Mountains and on the West by Tisa Plain.

The forest fund's surface from Bihor County is of 209,3 thousand hectares, from which 205,8 thousand hectares are occupied by forests.

Romsilva National Forest Administration manages through Bihor Forest District 115,26 thousand hectares, from which 61,17 thousand hectares are owned by the Romanian state and 54,09 thousand hectares are the public property of UTT, associations, composers, parochial forests and physical or juridical entities.

The Bihor County's forest fund represents 27,7%, from which 171,9 thousand hectares (85,6%) are occupied by broad-leaved forests and 33,9 thousand hectares (14,4%) are occupied by Norway spruce forests (INS, 2016).

The moderate-continental climate is under the influence of the occidental air mass, which is more humid and colder. The average annual temperature varies between 6° C and 10,5° C, while precipitations grow from West to East, ranging between 500 and 1200 mm.

The game species present in the game funds managed by Bihor Forest District are: red deer (*Cervus elaphus L.*), fallow deer (*Dama dama L.*), roe deer (*Capreolus capreolus L.*), chamois (*Rupicapra rupicapra L.*), wild boar (*Sus scrofa L.*), brown hare (*Lepus europaeus L.*), pheasant (*Phasianus colchicus L.*), capercaillie (*Tetrao urogalus L.*), partridge (*Perdix perdix L.*), quail (*Coturnix coturnix L.*), common snipe (*Gallinago gallinago L.*), and fieldfare (*Turdus pilaris L.*).

The present paper has used the Analytical Hierarchical Process (AHP), a method established by Professor Thomas L. Saaty. On short, the

method is used for obtaining the scale of reports from pair comparisons and is used worldwide for decision makings in a variety of situations: from international management to solving industrial, private affairs, health and education problems (Saaty, 2008).

The Analytical Hierarchical Process (AHP) is a measurement theory through pair comparisons and is based on the judgment of experts in order to obtain priority scales. These scales are the ones that measure intangibles in relative terms (Saty, 2008).

The hierarchy analysis was used for determining the most important game species by taking into account 19 selected criteria. 1: Harvesting period (1: the shorted period of harvesting ... 8: the longest period of harvesting); 2: Portfolio of derived products (1: the shortest number of derived products ... 8: the largest number of derived products); 4: Harvesting cost (1: the smallest cost ... 8: the highest cost); 5: Knowledge for recognition (1: the easiest product to recognize 8: the hardest product to recognize); 6: Knowledge for harvesting (1: fewer necessary knowledge ... 8: the majority of knowledge necessary); 7: Tools needed for harvesting (1: the lowest number ... 8: the largest number); 8: Complexity of harvesting process (1: the lowest ... 8: the highest); 9: Distribution range (1: the lowest ... 8: the highest); 10: Market potential (1: low ... 8: high); 11: The price of raw product (1: the smallest ... 8: the highest); 12: The price of the derived product (1: the lowest ... 8: the highest); 13: Transport from the harvesting point to the storage center (1: the easiest ... 8: the hardest); 14: Perishability (1: the lowest ... 8: the highest); 15: "Celebrity" of the product on market (1: the most unknown ... 8: the most popular); 16: Market demand (1: the lowest ... 8: the highest); 17: Biotic threats (1: the least threats ... 8: the most threats); 18: Abiotic threats (1: the fewest threats ... 8: the most threats); 19: Development of harvesting process (1: undeveloped ... 8: extremely developed).

RESULTS AND DISCUSSION

The AHP alternative ranking, based on experts opinion, is presented in Table number 1.

Table 1

AHP alternative ranking

Criterion		Animal species							
		<i>Sus scrofa</i>	<i>Capreolus capreolus</i>	<i>Vulpes vulpes</i>	<i>Lepus europaeus</i>	<i>Phasianus colchicus</i>	<i>Perdix perdix</i>	<i>Scolopax rusticola</i>	<i>Meles meles</i>
		1	2	3	4	5	6	7	8
1	Harvesting period	6	4	8	5	2	1	3	7
2	Portfolio of derived products	8	7	1	6	5	4	2	3
3	Harvested quantity / worker / 8 hours	7	2	6	5	8	4	3	1
4	Harvesting cost	7	8	3	5	6	2	1	4
5	Knowledge for recognition	8	6	1	2	5	4	7	3
6	Knowledge for harvesting	8	7	1	2	3	4	6	5
7	Tools needed for harvesting	7	8	1	4	3	6	2	5
8	Complexity of harvesting process	7	8	1	2	3	5	6	4
9	Distribution range	8	6	7	5	4	2	1	3
10	Market potential	8	7	2	5	6	4	3	1
11	The price of raw product	7	8	1	6	5	4	3	2
12	The price of the derived product	7	8	4	5	6	1	2	3
13	Transport (harvesting - storage center)	8	7	6	5	3	2	1	4
14	Perishability	7	8	6	5	1	2	3	4
15	“Celebrity” of the product on market	7	6	2	4	8	5	3	1
16	Market demand	6	7	1	5	8	3	4	2
17	Biotic threats	3	7	4	8	6	2	5	1
18	Abiotic threats	3	5	1	4	7	8	6	2
19	Development of harvesting process	7	8	1	6	5	4	3	2

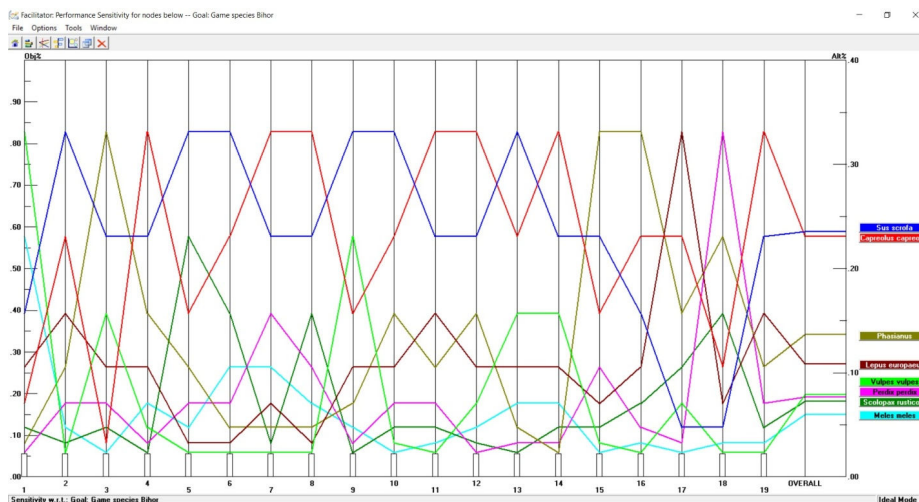


Fig. 2 Ranking of the selected game species

The boar was first when staggering the 8 non-wood forest products (animals, as well as mushrooms, forest fruits and products from trees) in Tulcea County (Dincă et al., 2018) and third in Maramures (Enescu et al., 2017), while the pheasant occupied the first place in Prahova (Enescu et al., 2018) and the second place in Bihor (Timiș-Gânsac Voichița et al., 2018) and Timiș (Enescu et al., 2018).

The red fox (*Vulpes vulpes*) is the most geographically widespread member of the Canidae family and occurs across the Northern Hemisphere in Europe, Asia, and North America. Red foxes are highly adaptable and easily colonize new habitats, in search of food, including urban environments (Deplazes et al. 2004). The red fox (*Vulpes vulpes*) is considered one of the main reservoir of *Trichinella* spp. in Europe (Szell, et al, 2008).

CONCLUSIONS

Bihor County is renowned for the quantity and quality of products harvested during the ages. This County hosts numerous species of game due to its territory, which includes both mountain areas, where red deer (*Cervus elaphus L.*), chamois (*Rupicapra rupicapra L.*), and capercaillie (*Tetrao urogalus L.*) can be hunted, as well as hill areas, from where roe deer (*Capreolus capreolus L.*), fallow deer (*Dama dama L.*), wild boar (*Sus scrofa L.*), common snipe (*Gallinago gallinago L.*) and fieldpore (*Turdus pirlis L.*) can be harvested and plain areas, with the following game species: brown hare (*Lepus europaeus L.*), pheasant (*Phasianus colchicus L.*), partridge (*Perdix perdix L.*), and quail (*Coturnix coturnix L.*).

By analyzing the 8 game species from the point of view of the method, period and process used for hunting, as well as the products obtained, the biotic or abiotic factors that can affect the species and the market's prices and request, the most appreciated species from this County are the boar and the buck.

REFERENCES

1. Adepoju, A., Salau, A. Sheu, 2007, Economic valuation of non-timber forest products (NTFP_s). Munich Personal RePEc Archive, pp: 1-17.
2. Dincă L., Enescu C.M., Timiș-Gânsac V., 2018, Game species from Tulcea county and their management. Scientific papers series Management, Economic Engineering in Agriculture and Rural Development, Vol. 18, Issue 3, pag 101-106.
3. Deplazes P, Hegglin D, Gloor S, Romig T. 2004, Wilderness in the city: Urbanisation of *Echino-coccus multilocularis*. Trends Parasitol 20:77–84
4. Enescu C. M., Dincă L., Vasile D., 2017, Importance of non-wood forest products for Maramureș County. Revista de Silvicultură și Cinegetică, nr.40, pag. 92-97.
5. Enescu C. M., 2017, Which are the most important non-wood forest products in the case of Ialomița county? AgroLife Scientific Journal , Volume 6, Number 1, pp. 98-103.
6. Enescu, C. M., 2017b, The most important non-wood forest products from Arges County. Current Trends in Natural Sciences, 4(8): 96-103
7. Enescu M. C., Dincă L., Crișan V., 2018, The most important non-wood forest products from Prahova County. Revista Pădurilor nr.1, pag. 45-51.
8. Enescu C.M., Dincă L., Cântar I., 2018, Which are the most common non-wood forest products in Timis County? Research Journal of Agricultural Science, Vol 50, No.1, p. 51-56.
9. National Institute of Statistics (INS), 2016, Suprafața fondului forestier pe categorii de terenuri și specii de păduri, macroregiuni, regiuni de dezvoltare și județe, <http://statistici.insse.ro>.
10. Saaty T. L., 2008, The Analytic Hierarchy and Analytic Network Measurement Processes: Applications to Decisions under Risk. European Journal of Pure and applied mathematics, Volume 1, Number 1, pp. 122-196.
11. Szell, Z., Marucci, G., Bajmóczy, E., Csépló, A., Pozio, E., Sréter, T., 2008. Spatial distribution of *Trichinella britovi*, *T. pseudospiralis* and *T. spiralis* in red foxes (*Vulpes vulpes*) in Hungary. Veterinary Parasitology, Volume 156, Issues 3–4, Pages 210-215.
12. Sinclair T., Darcy M., Hillye A., 2002, Property rights in the sustainable management of non-timber forest products. Forest Renewal BC, 122 p.
13. Timiș-Gânsac V., Enescu C.M., Dincă L., Oneț A., 2018, The management of non-wood forest products in Bihor County. Natural Resources and Sustainable Development, Vol. 8, No. 1, pag. 27-34.
14. Wickens, G.E., 2003, Management issues for development of non-timber forest products. Unasylva , Number 165 Forest products , pag.1-6.