Verification of the food supply to game under conditions of the floodplain forest ecosystem

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ABSTRACT: In order to determine the environment carrying capacity in terms of biomass production utilizable by game 360 representative sample plots (1 × 1 m) were laid out in the growing season on the basis of typological classification in forest stand of an area of 1,796.49 ha in the studied region of the Soutok Game Preserve, Židlochovice Forest Enterprise, Lanžhot Forest District. On meadows, pastures and others areas producing grass and herbs of a total area of 532.87 ha, other 57 sample plots were laid out and sample of biomass utilizable by game. Quantification of the biomass was carried out on the basis of the area cover of grass and woody undergrowth. In total, forest and non-forest land provides 14,659,851 kg grass and herb utilizable biomass. In forest stands production was found of 6,826,662 kg grass and herb biomass (on average 380 g/m^2) and on meadows and pastures 7,833,189 kg (on average 1,470 g/m^2). Moreover, production of 1,401,262 kg (on average 78 g/m^2). Laboratory analyses were carried out of naturally dried-up samples of biomass and these values available energy were ascertained: the energy of grass and herb biomass amounted to 5.7 MJ/kg, the utilizable energy of wooody origin amounted to 4.03 MJ/kg. In view of the standardized game population size up the available food supply sufficient, because the energy requirement was fully covered by their daily quantitative consumption of biomass.

Keywords: game management; carrying capacity; biomass production; energy need

Game is an inseparable part of forest ecosystems. The balance between producers and consumers in particular ecosystems has developed in the course of evolution during tens of thousands of years. At present, however, man markedly affects the amount of food supply in the forest environment by their management measures. Thus, to preserve a certain balance between the vegetation and herbivorous game, man has to control the game populations according to the actual conditions of food supply.

For the needs of responsible game management, experimental verification of food supply was carried out for red deer, fallow deer and roe deer under the conditions of a floodplain forest ecosystem aimed at the determination of reasonable winter stocks of game. The results were then compared with the present practice of game management in the studied area. The Soutok Game Preserve, Lanžhot Forest District, Židlochovice Forest Enterprise, was selected as an experimental area where the hunting rights are exercised by the organization concerned.

State of the problems

Homolka (1991, 1993, 1996) and Homolka and Heroldová (1992) dealt with the problems of food

composition, food niches of herbivorous hoofed game and their overlaying. Woody species account on annual average for 74% of the food volume in roe deer, for 39% in red deer, and for only 28% in mouflons. Dicotyledonous herbs and grasses ranked among other important components of food. The method of management, age and stand composition, slope orientation, altitude, season and underlying rock affect the diversity and quality of food sources (Katreniak 1992).

On the basis of anatomy and physiology of the game digestive tract Hofmann (1989) determined three basic food types of European ruminant ungulates: browsing animals (*Foliavora*), "food opportunists" (*Herbivora*) and grazing animals (*Graminivora*). The roe deer as a typical example of browsing animals takes in easily digestible food rich in nutrients and feeds on grass 11–12 times within 24 hours. A smaller amount of microorganisms in their paunch causes that the roe deer is not able to utilize plants rich in fibrous material and, therefore, it takes in energy-rich food, i.e. fruits, buds, leaves, flowers and annual shoots. The mouflon (grazing animal) is able to digest food rich in fibrous material. The process of digestion and the periods of rumination are longer. During 24 hours, there are 6 grazing periods. So called food opportunists are between the two extremes. These are red deer and fallow deer. This game is food-adaptable, being able to consume both easily and with difficulty digestible food. The red deer requires 5 to 7 grazing periods within 24 hours. The daily consumption of dry matter (DM) per 1 kg live weight amounts to (year-long average) 34 g (Lochman et al. 1964).

The examination of red deer paunches proves unambiguously that the proportion of grass amounts to 62–80% of the total food intake according to the environmental conditions (Hofmann 1978). The paunch capacity and the absorption area of its epithelium show annual cyclicity. The paunch capacity ranges between 13 and 25 litres (winter–summer) and the absorption area shows an 8 to 19-fold increase (Hofmann 1979). On the basis of the examinations carried out on European red deer and wapiti deer (Maloiy et al. 1970; Gates, Hudson 1978; Cohen et al. 1978; Mould, Robbins 1981), the energy need as determined for the basic metabolism amounts to 79–96 kcal per kg of the metabolic size (kgKG$^{0.75}$) of the red deer body. At critical temperatures from +15°C to –20°C the maintenance ration increases to 125–156 kcal/kgKG$^{0.75}$ at the calm behaviour. An increase in the energy requirements at locomotion ranges about 0.5 kcal/kgKG$^{0.75}$. They can increase to 3–4 kcal/kgKG$^{0.75}$ at 6 km per hour and

terrain slope 11°. At the average total movement of 6 hours per day, this increase in energy needs can be considered negligible.

The maintenance ration of fallow deer amounts to about 115 kcal/kgKG$^{0.75}$ in summer. In consequence of the formation of fat reserves the energy need of fallow deer increases up to 2.6 times in autumn. About 130 kcal/kgKG$^{0.75}$ (Bubeník 1984) can be considered as the basic energy need. As for roe deer, the basic energy need in summer months amounts to 107–153 kcal/kgKG$^{0.75}$ (Bubeník 1984).

MATERIAL AND METHODS

Characteristics of Soutok Game Preserve, Lanžhot Forest District

The Lanžhot Forest District is situated in the SE part of the Židlochovice Forest Enterprise, forest region 35 – Jihomoravské úvaly (Dyjskosvratecký and Dolnomoravský úval, lowlands). It is one of the largest complexes of floodplain forests in Central Europe. Its territory in the form of a triangle is created by the confluence of the Morava and Dyje Rivers. It includes the National Nature Reserves (NNR) Ranšpurk, Cahnov, Soutok, Sekulská Morava and the Protected Natural Formation (PNF) Krumpava. In 1971, the construction of a new fencing started to establish an enclosed game preserve intended for the management of a specific form of the so called floodplain red deer, fallow deer and wild boar.

The bedrock is formed by alluvial deposits of the Morava and Dyje Rivers, loess overlaying occurs sporadically. From the aspect of orographic conditions, the Dolnomoravský úval ranks among the intra-Carpathians basins. It is a depression with flat topography on Neogene and Quaternary rocks. The bedrock is formed by Holocene alluvia; aeolian sands create the soil-forming rock sporadically. On Holocene alluvia in the floodplain, extremely rich to very rich soils are developed, freshly moist to moist, sporadically wet. Alluvial soils are the main soil type. On Quaternary aeolian sands, there are soils with lower nutrient reserves and very unfavourable moisture conditions. The altitude of the Morava and Dyje Rivers confluence is 151 m, the river flow is channelled but also numerous cut-off meanders have remained. The Kyjovka stream runs roughly through the centre of the Forest District. The whole bottom land is interwoven by a system of drainage and flood canals, which makes it possible to control water in the floodplain forest.

The area belongs to the markedly continental climatic region, district A3 – warm and dry with

mild winter where the mean annual air temperature ranges between 9 and 10°C. The mean length of the growing season is 175 days and the period with the mean daily temperature higher than 5°C (including) begins on the 21st March. The annual mean total precipitation amounts to 524 mm, in the growing season to 323 mm, and the snow cover duration does not usually exceed 40 days.

From the aspect of the tree species composition, the highest proportion 47% is represented by oak followed by ash 29%, field maple 6%, poplar 5%, hornbeam 3%, Scots pine 1%, and other interspersed broadleaves. The black walnut with an admixture of linden is an important species while on water affected sites it is also the willow. The proportions of age classes considerably fluctuate. The 3rd and then the 13th and 11th age classes occupy the largest area. Generally, this refers to high forests with the predominance of oak and ash and sporadically also black poplar. Regeneration is carried out by large-area clear-felling, afforestation by planting or seeding. Field maple, hornbeam and elm are important self-seeding species and locally also horse chestnut and wildings.

The total area of the Soutok Game Preserve according to the decision of the Břeclav Municipal Authority (MÚ) is 4,232.47 ha (Ref. No. MUBR 4789/2004 OŽP-Sf). Out of the area, forests represent 80.20%, meadows 8.52%, grassland 3.82%, arable land 0.25%, water bodies 4.50%, and other lands 2.71%. Only

forest, meadow and grassland areas fenced in the game preserve and in total accounting to 92.54% of the game preserve were selected as a special-interest territory. Because in the game preserve there are situated fenced regeneration blocks, game enclosures, and the National Nature Reserves Ranšpurk and Cahnov, the total area of the forest land was reduced by 1,597.95 ha of the area inaccessible to game. Thus, the total special-interest area accessible to game amounts to 2,329.36 ha.

The forest types which occur in the studied region are shown in Table 1 in descending order according to the carrying capacity of edaphic categories. The data have been taken over from the forest management plan for the Židlochovice Forest Enterprise for the period 1. 1. 2000–31. 12. 2009, and from the data provided by Židlochovice FE and Lanžhot Forest District.

Table 1 shows that 98.36% of the studied forest area are occupied by areas of particular carrying capacity, 0.81% is of considerable carrying capacity, and 0.83% is of low carrying capacity.

Numerical stock of game

At the end of the last century, there were high stocks of game in the Soutok Game Preserve and, therefore, the stocks were reduced. At present, standardized game stocks are determined on the basis of Decree No. 491/2002 and the decision of

Table 1. Area proportions of forest types in the studied area according to the carrying capacity of edaphic categories

Forest type	Area (ha)	Area (%)	Carrying capacity (%)
1L1	489.42	27.24	
1L2	444.03	24.72	
1L4	189.44	10.55	
1L6	30.38	1.69	extreme carrying capacity 98.36
1L7	29.35	1.63	
1L8	21.04	1.17	
1L9	563.36	31.36	
1S1	2.65	0.15	
1S2	11.72	0.65	considerable carrying capacity 0.81
1S3	0.22	0.01	
1G1	1.05	0.06	
1G2	2.66	0.15	lower carrying capacity 0.83
1G4	11.17	0.62	
Total	1,796.49	100	100

Table 2. Calculation of conversion units of hoofed game on studied forest units according to the carrying capacity of edaphic categories (methodology of Forest Management Institute in Brandýs nad Labem, branch office in Brno)

Site class	Carrying capacity	Forest land (ha)	Hoofed game units (min.–max.)
I. a	of extreme carrying capacity	1,767.02	45.94–53.01
I.b	considerable carrying capacity	14.59	0.31–0.36
II.	medium carrying capacity	0.00	0.00
III.	of low carrying capacity	14.88	0.16–0.22
IV.	no carrying capacity	0.00	0.00
Forest area under study in total (1,796.49 ha)			46.41–53.59
Conversion to 1,000 ha forest land of the studied area			25.8–29.8

Břeclav MÚ (Ref. No. MUBR 4789/2004 OŽP-Sf) as follows: red deer 450, fallow deer 200, roe deer 150, and wild boar 100. Minimum game stock is as follows: red deer 300, fallow deer 140, roe deer 80, and wild boar 50. In 2006, however, the game preserve was affected by extensive floods, and during these floods deaths of game occurred (particularly of wild boar and roe deer). The fencing was destroyed and the game partially escaped to the open (particularly the red deer).

For these reasons, hunting was reduced so as to enable the standardized game stocks to be completed again in this game management year.

Using the methodology of Forest Management Institute (ÚHÚL) in Brandýs nad Labem, branch office in Brno, a comparative calculation of hoofed game units was carried out for forest lands according to the carrying capacity of edaphic categories, so called potential carrying capacity (Table 2).

Based on the calculation documented in Table 2, the maximum number of converted units of hoofed game for the forested part of the studied area is 54.

According to the decision of the Department of Environment of Břeclav MÚ, Ref. No. MUBR 4789/2004 OŽP-Sf, the standardized stocks of game in the game preserve are as follows: red deer 450, fallow deer 200, roe deer 150 and wild boar 100.

Determination of biomass utilizable by game

On the basis of typological classification, 360 representative sample plots (1 × 1 m) were laid out on the area of 1,796.49 ha forest stands during the growing season to determine the existing mean area production (g/m^2) of the biomass utilizable by game. In meadows, grasslands and other areas producing grass and herbs of the total area of 532.87 ha, other 57 sample plots were laid out.

The frequency of sample plots was selected depending on the total size of the assessed area of homogeneous grass, herb and woody vegetation, however, with at least two plots per stand. Biomass cut off closely above the ground was weighed in the field and differentiated to grass and woody components. In the course of sampling, the total cover of woody species and non-woody undergrowth was registered and particular species were determined. The total production of biomass utilizable by game was calculated for the areas of particular stands and it was also summed up for the total area studied.

Determination of the mean quantitative and qualitative need for food

The mean daily amount of food necessary for the particular species of game was derived from the papers by Bubeník (1954, 1984), Herzig et al. (1960) and Šikula and Zubrický (1964). The data were used to calculate the total consumption of food by red deer, fallow deer, and roe deer.

To calculate the utilizable energy of the mean consumption of food by game in a hunting district, the data were used from the feed catalogue of Research Institute of Animal Nutrition (VÚVZ) in Pohořelice (1995) and those of Bubeník (1984).

Check data were obtained by laboratory analyses of aggregate samples taken in the Soutok Game Preserve and processed by the Experimental Laboratory of Food Hygiene, State Veterinary Institute in Brno. The daily mean consumption of food was converted to utilizable energy in MJ. To assess the sufficient food amount from the aspect of quality, the need for energy was calculated on the basis of the metabolic

body size of the particular animals according to the methodology of ČAZV (1994).

RESULTS

Production of biomass utilizable by game

In forest stands, in meadows, grasslands and on other plots of the studied area, 417 samples were taken on an area of 2,329.36 ha in the growing season for the quantitative and qualitative evaluation of biomass available to game. The determined mean production of grass and herb biomass utilizable by game in the forest part of the studied area of 1,796.49 ha amounted to 380 g/m². The determined mean production of woody biomass, i.e. leaves, buds, shoots, and seedlings, amounted to 78 g/m².

In meadows and grasslands of an area of 532.87 ha, the mean production of grass and herb biomass was determined as amounting to 1,470 g/m².

In total, forest and non-forest areas provide about 14,659,851 kg utilizable grass and herb biomass available in the course of the growing season, which represents 6,293.51 kg/ha.

The mean production of woody biomass (leaves, buds, shoots and seedlings) was 780 kg/ha, which amounted to 1,401,262.20 kg after the conversion into 1,796.49 ha area of the forest part. Dominant woody species creating the woody component of the game food are as follows: field maple, hornbeam, lime, European elm, ash, hawthorn, willow, blackthorn, oak, poplar, and alder. On the basis of the investigations carried out, the total production of biomass utilizable by game on the area of 2,329.36 ha amounted to 16,061,113.20 kg, i.e. 6,895.08 kg/ha.

Quantitative needs for game food

The daily mean amount of food for the particular species of game is determined on the basis of the papers by Bubeník (1954, 1984), Herzig et al. (1960) and Šikula and Zubrický (1964). For the purpose of calculations, the mean daily consumption of food in the growing season was determined per one red deer as amounting to 11 kg grass and herbs (78%) and 3 kg woody biomass (22%). As to fallow deer, the summer mean daily consumption amounted to 6.5 kg grass and herbs (84%) and 1.25 kg biomass of woody origin (16%). In roe deer, the summer mean daily food consumption amounted to 2.5 kg grass and herbs (5.5%) and 2.0 kg biomass of woody origin (45%).

The calculation of the quantitative need for food of standardized stocks of game:

– Grass and herb food available in the growing season:

14,659,851 kg (100%)

Consumption:

Red deer: 11 kg/day × 175 days = 1,925 kg × 450 = 866,250 kg (5.90%)

Fallow deer: 6.5 kg/day × 175 days = 1,137.5 kg × 200 = 227,500 kg (1.55%)

Roe deer: 2.5 kg/day × 175 days = 437.5 kg × 150 = 65,625 kg (0.45%)

Total consumption 1,159,375 kg (7.90%)

The surplus of grass and herb food 13,500,476 kg (92.10%).

– Food of woody origin (leaves, shoots, seedlings) available in the growing season:

1,401,262 kg (100%)

Consumption:

Red deer: 3 kg/day × 175 days = 525 kg × 450 = 36,250 kg (16.86%)

Fallow deer: 1.25 kg/day × 175 days = 218.75 kg × 200 = 43,750 kg (3.12%)

Roe deer: 2 kg/day × 175 days = 350 kg × 150 = 52,500 kg (3.75%)

Total consumption 332,500 kg (23.73%)

The surplus of food of woody origin 1,068,762 kg (76.27%).

To determine standardized stocks of the particular game species in the areas accessible to game in the Soutok Game Preserve, the total basic consumption of grass and herb food amounts to 1,159,375 kg, and of food of woody origin to 332,500 kg.

Thus, the production of grass and herb biomass in the growing season exceeds the consumption of food by about 92.1% and that of woody component by about 76.27%.

Utilizable energy in biomass

For the purpose of calculations, mean values of utilizable energy were used as determined by laboratory analyses of biomass samples and completed by literature data. Mean values of the examined naturally dried samples of biomass of grass and herb origin showed 36.43% fibrous material, 94.48 g/100 g DM, 11.10% nitrogen substances, 2.42 g/kg phosphorus, 6.60 g/kg calcium, 125.92 mg/kg sodium, 10.05 g/100 g ash matter, 2.48 g/100 g fat.

The energy of biomass of grass and herb origin amounted to 5.7 MJ/kg on average. This energy amounts to 1.45 MJ/kg in a fresh sample with the content of DM 24%.

The value of the energy utilizable by game was obtained by multiplying this value by the percent

of digestibility, which amounts to 80% on average for grass and herbs (based on papers by Bubeník 1984).

The utilizable energy of fresh grass and herb biomass amounts to 1.16 MJ/kg on average.

Through the evaluation of fresh mixed samples of woody biomass (oak 47%, ash 29%, field maple 6%, poplar 5%, hornbeam 4%) the mean energy was calculated, viz. 7.9 MJ/kg at the DM content of 39.2%. The percentage of digestibility is 51%.

Thus, the utilizable energy of woody biomass amounts to 4.03 MJ/kg on average.

The calculation of utilizable energy in the daily quantitative consumption of food in the particular species of game:

Red deer

Utilizable energy contained in the daily quantitative dose of grass and herb biomass needed per one average red deer: 11 kg × 1.16 = 12.76 MJ.

Utilizable energy contained in the daily quantitative dose of woody food needed per one average red deer: 3 kg × 4.03 = 12.09 MJ.

Total utilizable energy contained in the daily food of one average red deer amounts to 24.85 MJ.

Fallow deer

Utilizable energy contained in the daily quantitative dose of grass and herb biomass, needed per one average fallow deer: 6.5 kg × 1.16 = 7.54 MJ.

Utilizable energy contained in the daily quantitative dose of woody food, needed per one average fallow deer: 1.25 kg × 4.03 = 5.04 MJ.

Total utilizable energy contained in the daily food of one average fallow deer amounts to 12.58 MJ.

Roe deer

Utilizable energy contained in the daily quantitative dose of grass and herb biomass, needed per one average roe deer: 2.5 kg × 1.16 = 2.9 MJ.

Utilizable energy contained in the daily quantitative dose of woody food, needed per one average roe deer: 2 kg × 4.03 = 8.06 MJ.

Total utilizable energy contained in the daily food of one average roe deer amounts to 10.96 MJ.

Energy needs of game

To assess the sufficient energy value of food for the particular species of game, the calculation of the need for energy in ruminants was based on determining the metabolic size of the body according to the methodology of ČAZV published in 1994.

The calculation of the basic need for energy in the average red deer animal of 100 kg live weight at standard physical activities:
$100^{0.75}$ = 31.62 = average metabolic size of the red deer body.

Energy need per unit of the metabolic size of the body = 0.367 MJ.

Total need of energy in red deer at standard physical activities = 31.62 × 0.367 MJ = 11.6 MJ/day.

The calculation of the basic need for energy in the average fallow deer animal of 50 kg live weight at standard physical activities:
$50^{0.75}$ = 18.80 = average metabolic size of the fallow deer body.

Energy need per unit of the metabolic size of the body = 0.544 MJ.

Total need of energy in fallow deer at standard physical activities = 18.80 × 0.544 MJ = 10.2 MJ per day.

The calculation of the basic need of energy in the average roe deer animal of 20 kg live weight at standard physical activities:
$20^{0.75}$ = 9.46 = average metabolic size of the roe deer body.

Energy need per unit of the metabolic size of the body = 0.544 MJ.

Total need of energy in roe deer at standard physical activities = 9.46 × 0.544 MJ = 5.15 MJ/day.

The calculations have proved that the energy need of all standardized species of hoofed game in the Soutok Game Preserve is fully covered by its daily quantitative consumption of herb, grass, and woody biomass even in the case of an increased expenditure of energy in consequence of lactation, antler formation, or the body development of young animals.

DISCUSSION

Stocks of game – The food supply for game which is produced under the conditions of the floodplain forest ecosystem covers the food demands of game stocks (determined on the basis of Decree No. 491/2002 published by the Department of Environment of Břeclav MÚ) without any detriment/damage to the forest management.

Although the area accessible to game amounts to only 55% of the total game preserve area (because of fenced regeneration blocks and the National Nature Reserves), the production of biomass covers, with a marked surplus, quantitative and qualitative needs of game in the growing season. The number of converted units of hoofed game, calculated according to the methodology of Forest Management Institute

resulting from the potential carrying capacity on the basis of edaphic categories, is roughly 10 times lower for the studied area than the game stocks determined on the basis of Decree No. 491/2002. We assume that this methodology is not suitable for determining game stocks in intensive game preserve management.

The quality of food supply – utilizable energy (MJ) determined in laboratory-evaluated mixed samples of biomass produced in the studied area corresponds to the data given for the respective plant species in the catalogue of foods of Research Institute of Animal Nutrition in Pohořelice (1995) and papers by Bubeník (1954, 1984).

Energy need of game – according to the ČAZV (1994) methodology the metabolic size of the body of an average red deer animal of 100 kg live weight amounts to 31.62 units.

According to Bubeník (1984), the need for energy in red deer per unit of the metabolic size of the body amounts to 87.5 kcal (0.367 MJ) in summer, which corresponds to the daily need of 11.6 MJ.

The weighted average of the amount of energy contained in the food supply determined by the evaluation of biomass samples is 1.775 MJ/kg, which corresponds to the daily supply of energy 24.85 MJ at the intake of 14 kg food. The daily supply of energy amounts to 214% of the basic energy need in red deer.

Likewise, we determined the surplus of energy in ingested food in fallow deer (123%) and roe deer (213%). The determined values are treated as utilizable because the need for energy is subjected to many effects (pregnancy, lactation, antler development, moulting, period of growth). According to Bubeník (1984), in this period the energy need increases roughly 2.3 times as compared to the need for basic metabolism. The determined amount of utilizable energy contained in ingested food covers even the increased energy need of female game in the period of lactation or male game in the course of antler development.

CONCLUSION

The results of the quantitative and qualitative research into food supply under the conditions of the floodplain forest ecosystem show the sufficient production of biomass utilizable by game in the monitored area. Therefore, there is no reason for the potential non-fulfilment of the standardized stocks of game determined on the basis of Decree No. 491/2002. In the course of the growing season, a marked surplus was found, of both grass and herb and woody components of biomass utilizable by game.

The mean summarized production of the biomass of grass and herb vegetation per 1 m^2 represents a volume which exceeds the quantitative need for food roughly 13 times. The production of biomass of woody origin exceeds the food needs of the standardized stocks of hoofed ruminant game roughly 4 times in the studied area. In the interest of support of the red deer floodplain ecotype and in order to restrict possible inbreeding, we recommend to extend its breeding basis through an increase in the target red deer populations to the total number of 600 animals.

The present total area accessible to game amounts to 2,329.36 ha with one converted unit of a hoofed game animal corresponding to 4 ha of the region. At increasing the management basis of the floodplain red deer by 150 animals, 3.2 ha game-accessible area would correspond to one converted unit of the hoofed game. This game stock is consistent with § 2, subparagraph 3 of Decree No. 491/2002 on the method of determining minimum and standardized stocks of game, which sets the standardized stock of the particular species of hoofed game not to be higher than 1 individual of hoofed game per 2 ha of the game preserve area.

With the red deer population level proposed by our team grass and herb biomass available to the game would be used at 9.9% compared to the present 7.9%, and the production of biomass of woody origin at 29.3% compared to the present 23.7%.

In spite of the sufficient supply of food during the growing season, we recommend the species-specific additional feeding of game by suitable energy foods from the beginning of October to the end of November. Thus, we will enable to create sufficient supplies of fat necessary for the period of winter privation of game.

It is of particular importance to ensure the winter repose of game in order to restrict energy expending in consequence of forced locomotion. The disturbance of game during this period is an important factor negatively affecting its energy balance.

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Ověření potravní nabídky zvěři v podmínkách ekosystému lužního lesa

ABSTRAKT: Za účelem zjištění úživnosti prostředí na základě zvěří využitelné produkce biomasy bylo na sledovaném území obory Soutok, LZ Židlochovice, LS Lanžhot, na základě typologické klasifikace vyčleněno ve vegetační době na ploše lesních porostů o rozloze 1 796,49 ha 360 reprezentativních zkusných ploch (1 × 1 m) pro zjištění stávající průměrné plošné produkce (g/m^2) zvěří využitelné biomasy. Na loukách, pastvinách a ostatních plochách s produkcí travin a bylin o výměře 532,87 ha bylo vytyčeno dalších 57 zkusných ploch. Z nich byly odebrány vzorky, využitelné jako potrava pro zvěř, a provedena jejich kvantifikace na základě plošné pokryvnosti travinného porostu a dřevinného podrostu. Celkem lesní a nelesní plochy poskytují 14 659 851 kg (tj. 6 293,51 kg/ha) využitelné travní a bylinné hmoty. V lesních porostech byla zjištěna produkce 6 826 662 kg (tj. 380 g/m^2) travní a bylinné biomasy. Na loukách a pastvinách produkce činila 7 833 189 kg (tj. 1 470 g/m^2). Produkce dřevinné biomasy byla 1 401 262 kg (tj. 78 g/m^2). Laboratorní analýzou vyschlých vzorků biomasy byly zjištěny následující hodnoty využitelné energie: trávy a byliny 5,7 MJ/kg, biomasa dřevinného původu 4,03 MJ/kg. Vzhledem k normovaným stavům zvěře je potravní nabídka dostačující, neboť energetická potřeba je plně pokryta denní kvantitativní spotřebou biomasy.

Klíčová slova: management zvěře; úživnost; produkce biomasy; energetická potřeba

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