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Real potentials of social forest functions of selected forest stands at Židlochovice Forest Enterprise

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ABSTRACT: Social functions of forests were evaluated at Židlochovice Forest Enterprise by applying the method of VYSKOT et al. (1996–2002). Real potentials of social forest functions were determined for all stand groups included in a forest management plan (FMP). The results of evaluation were processed in a database and projected in GIS. Tables and charts were used for the evaluation of results. We can claim on the basis of the results that the forest stands of the examined area are characterized by a very high potential to fulfil a bio-production social function. On the contrary, they have a low potential to fulfil social functions of ecological stabilization and edaphic soil conservation and hydric-hydrological function. The results of evaluation of the real potentials of social forest functions at Židlochovice Forest Enterprise are represented by the forest stands of management group No. 19 of forest management plan area Židlochovice.

Keywords: floodplain forests; social forest functions; real potential of social forest functions

Recently the problem of "non-wood producing" functions of forest has been accentuated not only by forest experts but also by the public at large. Documents of international significance (Rio de Janeiro 1992, Helsinki 1993), national departmental directives and corporate documents (LČR – Program 2000) promoted an increased interest in this field of forestry. It was also supported by the public demand for fulfilment of these functions. Therefore one of the most important goals of modern forestry is to evaluate and quantify the potentiality of forest stands according to their fulfilment of social forest functions and to employ the values of this potential to forest management appropriately.

The beginning of a great interest in the objective evaluation of forest usefulness falls to the period when the first proprietary relations to forests were created. Forest management was focused mainly on a bio-production function (wood-producing function) and its maximization in existing economic, political and natural conditions till the end of the last century.

We can trace some significant attempts to classify and evaluate other functions of forest within forest management, so called "non-wood producing" functions (mainly hydric-hydrological, edaphic soil-conservation, recreational and health ones) since the 1970s.

These functions were a subject of investigations for many scientists, e.g.: KANTOR (1984), KREČMER (1981), VALTÝNI (1981, 1986), POBĚDINSKY and KREČMER (1984), ŠÁLY (1978), MIDRIAK (1981), MÍCHAL (1973, 1974), MRÁČEK (1971), SAMEK and ŠINDELÁŘOVÁ (1979), TERPLAN (1974), etc.

The Department of Landscape Protection and Creation at the Faculty of Forestry and Wood Technology of Mendel University in Brno has paid a constant attention to this problem. It can be proved by many studies: KREŠL (1986), VYSKOT (1981, 1984a,b, 1988, 1996, 1997, 1998, 1999a,b, 2001, 2002), VOLNÝ (1980), etc.

The demand for objective knowledge (in closer sense "objective quantification") of forest functions aroused an interest of forest public mainly thanks to the introduction of functionally integrated forest management (FIFM).

When applying the principles of FIFM, a primary assumption is to use classification and a complex system of objective evaluation. The primary classification and projects of evaluation of social functions of forest were published by e.g. MIDRIAK et al. (1983), PAPÁNEK (1978), ZACHAR (1983), ZACHAR and TLAPÁK (1981), PLÍVA (1991, 2000). The functions of forest were evaluated according to responses of forest stands to society demands.

Contrary to this conception, there is an ecosystem approach of the Department of Landscape Protection and Creation of the Faculty of Forestry and Wood Technology at Mendel University in Brno. The most important work in this field was done by VYSKOT et al. (1996–2002). This work was presented within a national project of Ministry of the Environment. Its title is *Quantification and Quantitative Evaluation of Social Functions of Forests in the Czech Republic as a Basis for their Evaluation*. The author presented a complex change in understanding the social functions of forests in his studies. It is an ecosystem approach to forest and equality of all functions

that are provided by forest ecosystem. He suggested his own classification of social functions of forest that was based on natural effects of forest ecosystems. I. Vyskot also submitted a method of objective evaluation of forest functions within functional management groups. He defined the potential and the effect of social functions of forest and total real social potential of social functions of forest. The whole work finished up in a proposal for functional categorization of forests in the Czech Republic within the framework of FIFM.

The main aim of this paper is to present some results obtained during the evaluation of social functions of forests at Židlochovice Forest Enterprise by applying the above-mentioned method according to I. Vyskot. This will be presented by an example of forest stands typical of Židlochovice Forest Enterprise – forest management group No. 19.

MATERIALS AND METHODS

Židlochovice Forest Enterprise

Židlochovice Forest Enterprise is situated in the area of Southern Moravia demarcated by the town of Brno in the north and the state border with Austria in the south. It was established as an organizational unit in 1978 by unification of three former forest enterprises – Židlochovice, Břeclav and Moravský Krumlov. The cadastral area of the forest enterprise is approximately 23,500 hectares. Forest percentage of the administrative area is 14%, however local floodplain forest ecosystems account for approximately 1/3 of all floodplain forests in the Czech Republic. There are two FMPAs incorporated into the organizational structure of Židlochovice Forest Enterprise – FMPA Židlochovice and FMPA Moravský Krumlov. The validity of forest management plan for the whole area of Židlochovice Forest Enterprise is from January 1, 2000 to December 31, 2009. Almost the whole area of Židlochovice Forest Enterprise is included in Natural Forest Area (NFA) No. 35 – Jihomoravské úvaly (South Moravian Lowlands) (PLÍVA, ŽLÁBEK 1986). Natural conditions of NFA No. 35 define natural conditions of forest management of the region. The following forest vegetation zones (FVZ) are mostly represented in this area: 1. oak (91%) and 2. beech-oak (9%). The representation of the 3rd oak-beech FVZ is marginal. As for the ecological series, nutritive series (50%) and water-enriched series are most frequent (37%); humus-enriched series is less frequent (10%).

Three basic forest site types prevail in the area of Židlochovice Forest Enterprise. The group of forest site types (FST) 1L (elm floodplain forests) occurs on the alluvia of the Morava, Dyje and Svratka rivers. FST 1S (hornbeam-oak wood) prevails on sands and gravels in the western and south-western part of the area. The occurrence of FST 1H (loess hornbeam-oak wood) is typical of loess soils of uplands.

The main vegetation-forming tree species are: sessile oak (*Quercus petraea*) and pedunculate oak (*Quercus robur*), European ash (*Fraxinus excelsior*) and narrow-leaved ash (*Fraxinus angustifolia*) in floodplain forests, Scots pine (*Pinus sylvestris*) at poor sand sites. Black walnut (*Juglans nigra*), black locust (*Robinia pseudoacacia*) and various cultivars of poplars are other important tree species occurring at Židlochovice Forest Enterprise, however they are not autochthonous and they have a smaller vegetation-forming function.

Method and data processing

A methodical approach according to VYSKOT (1996–2002) was chosen mainly because maximum objectification of potential evaluation of social forest functions at Židlochovice Forests Enterprise was required.

Research was conducted according to the methodology published by VYSKOT et al. (1999a,b, 2001) in the following steps:

1. Data analysis of FMP at Židlochovice Forest Enterprise (Lesprojekt Brno 2000) and its modification for subsequent mass processing:
   – Reduction of data definition and omission of irrelevant data for the chosen method;
   – Synthesis of data lines concerning one vegetation group;
   – Separation of vegetation groups that are clear-cut areas at the present moment.
2. Creation of databases – forest stands and clear-cut areas were processed in different ways

   Forest stands:
   – Assignation of stand types (ST) to individual stand groups according to the present stand composition and site conditions within the functional management group (FMG);
   – Assignation of values for the real potential of particular social functions of forest to individual stand groups according to ST within the functional management group.

   Clear-cut areas:
   – Real potentials of forest functions (RPFF) were processed by the method of an average clear-cut area. This method determines RPFF of each complex group of social functions of forest as an arithmetic mean of the values of RPFF of all vegetation in all vegetation types within FMG.
3. Creation of GIS layers in TopoL program
   – Conversion of input data from mass computer processing to GIS TopoL data format;
   – Insertion of databases of stand groups and their stand types with determinist RPFF to the map raster of basic forest maps.
4. Evaluation of results:
   – Evaluation of functional management groups;
   – Evaluation of stand types;
   – Evaluation of the real potentials of social forest functions.

All results were processed by PC IBM standard. The following configuration was sufficient for complete

processing: processor Intel Pentium III on motherboard with integrated graphic card, capacity RAM 128 MB, hard disk with capacity 10 MB, CD recording device 48* IDE. The described PC had standard periphery, keyboard, mouse and 17´´ monitor. The described PC configuration was equipped with operation system Windows 2000. The package of programs Microsoft Office Professional 98 (mostly MS Word, MS Excel and MS Access) was used for basic data and document processing. The real potentials of social forest functions of standardized stand types (VYSKOT et al. 1999) were evaluated by the own program that was developed at the Department of Forest Engineering and Reclamation by Ing. Jiří Schneider. This program was implemented in MS Visual Basic where it runs as an enlarged macro of MS Excel. The cartographical data (all GIS layers) were processed by the standard forest software from TopoL package, version 5.502. A database module FoxPro was used for data transformation from MS Excel to GIS TopoL data format.

The digital layer of a forest detail det.blk from FMP (Lesprojekt Brno 2000) was used as a basic layer for the creation of real potentials of social forest functions. Auxiliary files *.zta were used for the representation of concrete layers of RPFF according to a database attribute: – layer of real potentials – RPfl.blk: bio-production function – bp.zta, ecological-stabilization function – es.zta, hydric-hydrological function – hv.zta, edaphic soil-conservation function – ep.zta, social-recreational function – sr.zta, sanitary-hygienic function – zh.zta, total RPFF – sum.zta, total RPFF – class tr.zta.

RESULTS

Data analysis and database formation

The data file, consisting of 7,423 lines (7,423 stand groups of forest stands) and 156 lines assigned as clear-cut areas, was included in the basic computer processing of RPFF at Židlochovice FMA.

So called standardized stand types (VYSKOT et al. 2001) and their RPFF were generated by the computer processing of the data file. A total of 3,118 stand groups (approximately 42% of input data file for Židlochovice FMA) were included in standardized stand types by automatic processing. The residual data file (non-standardized stand types) was substituted for standardized stand types within functional management groups by the own expert analysis and RPFF were assigned to them. The substitution of non-standardized stand types was carried out by successive approximation of stand types within functional management groups on the basis of ecological, mathematico-statistical and economic similarity to the standardized stand types (VYSKOT et al. 2001). The number of 2,078 stand groups (approximately 28%) was processed at Židlochovice FMA in this way.

The last 30% of non-classified and non-standardized stand types could not be substituted mostly because of specific natural conditions. New stand types and RPFF within real conditions of introduced FMG were proposed for this file according to the principles of solution for the above-mentioned National project of Ministry of

Table 1. New proposed stand groups and their RPFF for FMG No. 19 at Židlochovice FMA

FMG	ST	BP	ES	HH	EC	SR	SH	Tot RPFF	Class
19	C3	3	1	2	2	3	4	15	2
	C7e	3	0	2	2	2	3	12	2
	D1	4	1	2	3	2	2	14	2
	D9	4	2	2	3	3	3	16	2
	D9e	4	1	2	3	3	2	15	2
	M3Z5	3	2	2	3	3	3	16	2
	M5P9e	4	2	2	2	3	3	16	2
	M5P9x	4	4	2	2	3	3	19	3
	M5Z9x	4	4	2	2	3	3	19	3
	M7P9e	4	2	2	2	3	3	16	2
	M8P9x	4	3	2	2	2	3	16	2
	M9xZ5	3	3	2	2	3	4	17	3
	Z5Z9x	3	4	2	2	3	4	18	3

For Tables 1–7: FMG – functional management group, ST – stand type, BP – bioproduction function, ES – ecological-stabilization function, HW – hydric-hydrological function, EC – edaphic soil-conservation function, SR – social-recreational function, SH – sanitary-hygienic function, Tot RPFF – total real potential of social forest functions, Class – total real potential of social forest functions class

Table 2. Real potential of social forest function of an average clear-cut area for functional management group No. 19 at FMPA Židlochovice

FMG	BP	ES	HW	EC	SR	SH	Tot RPFF	Class
19	5	2	2	2	3	4	18	3

Table 3. An example of database of the RPFF of forest stands within FMG No. 19 at FMPA Židlochovice

Compartment	Subcompartment	Stand	Stand group	Area (ha)	Forest type	Forest management group	Stand type	RPFF of bioproduction function	RPFF of ecological-stabilization function	RPFF of hydric-hydrological function	RPFF of edaphic soil-conservation function	RPFF of social-recreational function	RPFF of sanitary-hygienic function	Total real potential of social forest functions	Total real potential of social forest functions class
103	D	a	6	0.08	1L1	19	D9	4	2	2	3	3	3	16	2
103	E	a	8a	0.15	1L2	19	M9xZ5	3	3	2	2	3	4	17	3
103	E	a	8b	0.23	1L2	19	M9xZ5	3	3	2	2	3	4	17	3
104	C	a	4	0.10	1L2	19	C7e	3	0	2	2	2	3	12	2
105	B	a	1	0.77	1L4	19	C3	3	1	2	2	3	4	15	2
105	B	a	8a	0.61	1L4	19	C5	6	2	2	2	3	4	19	3
105	B	a	8b	1.46	1L4	19	C5	6	2	2	2	3	4	19	3
105	B	a	8c/3b	1.42	1L4	19	D9e	4	1	2	3	3	2	15	2
105	C	a	1a	1.39	1L4	19	D9e	4	1	2	3	3	2	15	2
105	C	a	1b	0.20	1L4	19	C3	3	1	2	2	3	4	15	2
105	C	a	1c	1.82	1L4	19	D9e	4	1	2	3	3	2	15	2
105	C	a	2	0.04	1L4	19	D1	4	1	2	3	2	2	14	2
105	C	a	3	0.21	1L4	19	C5	6	2	2	2	3	4	19	3
105	C	a	4	1.48	1L4	19	D9e	4	1	2	3	3	2	15	2
105	C	a	5a	1.06	1L4	19	D1	4	1	2	3	2	2	14	2
105	C	a	5b	0.48	1L4	19	D9e	4	1	2	3	3	2	15	2
105	C	a	6	5.46	1L4	19	Z5Z7	5	4	2	2	3	4	20	3
105	C	a	7	0.20	1L4	19	M9xZ5	3	3	2	2	3	4	17	3
105	D	a	1	1.80	1L4	19	D9e	4	1	2	3	3	2	15	2
105	D	a	2	0.17	1L4	19	D1	4	1	2	3	2	2	14	2
105	D	a	3a	0.20	1L4	19	D1	4	1	2	3	2	2	14	2
105	D	a	3b	0.65	1L4	19	M9xZ5	3	3	2	2	3	4	17	3
105	D	a	3c	0.10	1L4	19	C5	6	2	2	2	3	4	19	3
105	D	a	4a	0.12	1L4	19	C3	3	1	2	2	3	4	15	2
105	D	a	4b	1.25	1L4	19	D9e	4	1	2	3	3	2	15	2
105	D	a	5a	3.88	1L4	19	M5P9x	4	4	2	2	3	3	19	3
105	D	a	5b	0.68	1L4	19	D5	5	2	2	2	3	4	18	3
105	D	a	9	5.00	1L4	19	C5	6	2	2	2	3	4	19	3
106	A	a	3a	0.92	1L4	19	D1	4	1	2	3	2	2	14	2
106	A	a	3b	0.78	1L4	19	C7e	3	0	2	2	2	3	12	2
106	A	a	8a	3.15	1L4	19	C5	6	2	2	2	3	4	19	3
106	A	a	8b	4.00	1L4	19	M5P7	5	4	2	2	3	4	20	3
106	B	a	1	0.61	1L4	19	C7	5	2	2	2	3	4	18	3
106	B	a	2a	1.01	1L4	19	C3	3	1	2	2	3	4	15	2
106	B	a	2b	0.32	1L4	19	C3	3	1	2	2	3	4	15	2
106	B	a	3	0.14	1L4	19	C5	6	2	2	2	3	4	19	3
106	B	a	8	1.27	1L4	19	D5	5	2	2	2	3	4	18	3

Environment of the Czech Republic. The values of RPFF for every social function were created by the analysis of the following criteria: bioproduction function – growing stock according to relative (absolute) yield class of tree species, ecological-stabilization function – species diversity, natural composition, hydric-hydrological function – horizontal precipitation, potential infiltration, interception, evapotranspiration, soil permeability, edaphic soil-conservation function – rain factor, characteristic soil type, factor of slope inclination, geologic-pedological factor, soil depth, humification, humus form, social-recreational function – air temperature, growing season, physiological optimum, number of summer days, number of rainy days, number of days with snow cover, number of sunshine days, relief energy, ground accessibility, soil depth, site bearing capacity, biodiversity of tree species, herb biodiversity, herb cover, sanitary-hygienic function – max. air temperature, number of frosty days, number of tropical days, quantity of solar radiation, filter effect of tree species, air pollution load, allergens. It is necessary to note that the amount of used criteria was limited by existing database folders. Stand groups in the number of 2,227 were processed in this way.

Table 1 gives an example of the new proposed stand types for FMG No. 19 at Židlochovice FMA.

Construction of stand types (VYSKOT et al. 1999b). Tree species proportion: C – monocultures, pure ST, proportion > 90%, D, M – mixed stands, D – dominant ST, proportion 71–90%, M – majority ST, proportion 51–70%, Z, P – heterogeneous stands, Z – basic ST, proportion 31–50%, P – admixed ST, proportion 11–30%.

Tree species codes (in simplified form): 1 – *Picea abies*, 1e – exotic spruce species, 2 – *Abies alba*, 2e – exotic fir species (incl. *Pseudotsuga* sp.), 3 – *Pinus sylvestris*, 3e – exotic pine species, 4 – *Larix decidua*, 5 – hardwood broad-leaved tree species (incl. *Quercus* sp., *Tilia* sp., *Ulmus* sp.), 6 – *Fagus sylvatica, Acer platanoides, A. pseudoplatanus*, 7 – *Fraxinus* sp., 7e – *Robinia pseudoacacia*, 8 – *Alnus* sp., 9 – softwood broad-leaved tree species (incl. *Populus* sp., *Salix* sp.), 9x – admixed tree species without stand-forming function (incl. *Carpinus betulus, Betula* sp., *Sorbus* sp. etc.).

Value classification of real potentials of forest functions in the CR (VYSKOT et al. 1999b): 0 – functionally unsuitable, 1 – very low, 2 – low, 3 – average, 4 – high, 5 – very high, 6 – extraordinary.

RPFF of the clear-cut areas for the FMPA Židlochovice processed by the method of an average clear-cut area was introduced through an example of functional management group No. 19 and described through Table 2.

Table 3 gives an example of data bases of RPFF for forest stands of functional management group No. 19 at FMPA Židlochovice.

Table 4. Evaluation of the functional management groups at the FMPA Židlochovice

FMG	Area (ha)	Area (%)
1	203.29	1.21
13	1.69	0.01
19	9,234.48	54.78
21	80.81	0.48
23b	2,886.36	17.12
25a	4,043.48	23.99
25b	42.65	0.25
29	345.7	2.05
45	17.47	0.10
Total	16,855.93	100.00

Only the area of standing forest growths is calculated in the presented areas

The evaluation of results

Functional management groups of FMPA Židlochovice

The area of FMPA Židlochovice is characterized by the prevailing occurrence of floodplain sites. It corresponds with the representation of functional management groups. Functional management group No. 19 takes up the largest area and covers nearly 55% of FMPA. Further important functional management groups in terms of their area are FMG 25a (24%) and FMG 23b (17%) (see Table 4).

Stand types of FMPA Židlochovice

The representation of determined stand types of FMPA Židlochovice is defined mostly by natural conditions. Areal representation of stand types is characterized by the highest proportion of "oak" stand types. Stand types with oak in pure stands (C5), without significant admixture (D5) or with significant admixture (D5PX) predominate. Elm (stand type D5P7) occurs as a significant admixture at floodplain sites (FMG No. 19). Stand types with dominance of elm D7P5 are further areally significant stand types at floodplain sites (1,027 hectares). The evaluation of ST presented within functional management group No. 19 is given in Table 5.

The real potentials of social forest functions for functional management group No. 19 at FMPA Židlochovice

The respective forest stands of areally most significant functional management group No. 19 at FMPA Židlochovice are mostly characterized by value grade 2 (low RPFF) in the hydric-hydrological function. All forest stands of this functional management group are included in it. Nearly 100% of forest stands within functional management group No. 19 is also included in value grade 3 (RPFF average) – social-recreational function. The occurrence of value grade 2 (low RPFF) in the edaphic soil-conservation potential – nearly 90% and value grade 4 (high RPFF) in the sanitary-hygienic function – 80% is also statistically significant. Value grade 5 (very high RPFF) predominates in the bioproduction function over value grades 4 and 6 (high and exceptional RPFF) that

Table 5. Areal representation of respective stand types within functional management groups No. 19 at FMPA Židlochovice

Stand type	Area (ha)	Number of stand groups
C3	54.53	58
C5	1,847.4	880
C7	641.64	400
C7e	66.76	75
C9	488.02	409
D1	38.63	88
D5	848.96	285
D5P7	468.38	137
D7	692.94	231
D7P5	1,027.33	246
D9	247.81	187
D9e	354.28	270
M3Z5	11.22	9
M5P7	324.99	73
M5P9e	26.45	18
M5P9x	183.52	55
M5Z7	480.67	89
M5Z9x	316.25	49
M7P9e	48.47	30
M8P9x	70.08	66
M9xZ5	229.83	124
Z5Z7	675.74	142
Z5Z9x	90.58	29
Total	9,234.48	3,950

Table 6. Representation of RPFF of forest stands for functional management group No. 19 at FMPA Židlochovice

Function	RPFF	Area (ha)	Area (%)	Number of stand groups
Bioproduction	3	452.92	4.9	295
	4	1,773.51	19.2	1,172
	5	5,160.65	55.9	1,603
	6	1,847.4	20.0	880
Ecological-stabilization	0	66.76	0.7	75
	1	935.46	10.1	825
	2	5,392.22	58.4	2,286
	3	768.29	8.3	327
	4	2,071.75	22.4	437
Hydric-hydrological	2	9,234.48	100.0	3,950
Edaphic soil-conservation	2	8,094.52	87.7	2,987
	3	1,139.96	12.3	963
Social-recreational	2	175.47	1.9	229
	3	9,059.01	98.1	3,721
Sanitary-hygienic	2	392.91	4.3	358
	3	1,458.58	15.8	898
	4	7,382.99	80.9	2,694

are nearly identical. Value grades 0–4 are represented in the ecological-stabilization function, grade 2 (low RPFF) predominates (see Table 6).

As for clear-cut areas, the existing clear-cut areas of functional management group No. 19 at FMPA Židlochovice reached the highest RPFF in the bioproduction function with very high RPFF. High RPFF was determined for the sanitary-hygienic function, an average value (grade 3) was reached by the social-recreational function and RPFF for the rest of the functions – ecological-stabilization, edaphic soil-conservation and hydric-hydrological was low (grade 2). The total real potential of social forest functions has the value 18 – average potential (class III of tot. RPFF) (see Table 2).

An overall evaluation of the real potentials of social forest functions for forest stands at FMPA Židlochovice within the concrete functional management groups was carried out by weighted arithmetical means of RPFF for concrete functions. The number of stand groups is a weight of the calculation where the given value grade of RPFF is included. Average RPFF of concrete groups of social forest functions are given by an example of functional management group No. 19 in Table 7.

DISCUSSION AND CONCLUSION

On the basis of the results obtained by an application of the chosen method (VYSKOT et al. 1996–2002) at Židlochovice Forest Enterprise we can draw the following conclusions:

The evaluated forest stands are characterized by a high or very high potential ability for fulfilment of the bioproduction function and by an average to high potential ability for fulfilment of the sanitary-hygienic

Table 7. Average RPFF of forest stands for functional management group No. 19 at FMPA Židlochovice

FMG	BP	ES	HW	EC	SR	SH	Tot RPFF
19	4.8	2.1	2.0	2.2	2.9	3.6	17.6

function. On the contrary, low potential ability to fulfil the social forest functions was determined in ecological-stabilization function, hydric-hydrological function and edaphic soil-conservation function. The respective forest stands of functional management group No. 19 at FMPA Židlochovice reached an average potential in the social-recreational function.

Presented results of RPFF evaluation ensue from the used method. The criteria applied for RPFF creation reflect the average state of forest ecosystems. It means for example that although floodplain forests have a high positive influence on flood water retention, their RPFF in the hydric-hydrological function is low (RPFF 2).

As for the evaluation of the used method, we can claim that it was completely suitable for this purpose. Although it is constructed on average values of indicators of social forest functions for all forests in the Czech Republic in principle, it gives satisfactory results even in specific conditions of Židlochovice Forest Enterprise. We can further state that the method is really suitable for an evaluation of potential functional effects of forest stands in large areas (FMPA, district, protected area, etc.). The usage of manual-automatic data processing of FMP enables to speed up the process of entering analysis. The format of an output for the evaluation of forest types by the chosen method is proposed in such a way that it corresponds with an output common in forest practice – tables, charts and it is compatible with widely used forest software – maps.

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Reálné potenciály celospolečenských funkcí lesa vybraných lesních porostů LZ Židlochovice

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ABSTRAKT: Na území LZ Židlochovice byly hodnoceny celospolečenské funkce lesa aplikací metody VYSKOT et al. (1996–2002). Pro všechny porostní skupiny zahrnuté do platného LHP předmětného lesního závodu byly determinovány reálné potenciály celospolečenských funkcí lesa. Výsledky hodnocení byly zapracovány do databází a zobrazeny v prostředí GIS. Vyhodnocení výsledků bylo provedeno tabelárně a graficky. Na základě obdržených výsledků lze konstatovat, že lesní porosty zkoumaného území jsou charakteristické značně vysokou potenciální schopností naplňovat celospolečenskou funkci bioprodukční a naopak nízkou potenciální schopností plnit celospolečenskou funkci ekologicko-stabilizační, hydricko-vodohospodářskou a edaficko-půdoochrannou. Výsledky hodnocení reálných potenciálů celospolečenských funkcí lesa LZ Židlochovice jsou prezentovány na příkladu lesních porostů hospodářského souboru 19 LHC Židlochovice.

Klíčová slova: lužní lesy; celospolečenské funkce lesa; reálný potenciál celospolečenské funkce lesa

Cílem práce bylo vyhodnotit potenciály celospolečenských funkcí lesa rozsáhlého území. Jako výzkumná oblast bylo zvoleno území LZ Židlochovice. Vyhodnocení reálných potenciálů celospolečenských funkcí lesa bylo provedeno metodou VYSKOT et al. (1996–2002). Tato metoda byla zvolena zejména z důvodu požadavku objektivizace hodnocení.

Jako výchozí podklad pro zpracování byla využita data LHP LZ Židlochovice (Lesprojekt Brno 2000), jejichž základní datová struktura byla upravena pro následné hromadné zpracování reálných potenciálů celospolečenských funkcí lesa.

Reálné potenciály celospolečenských funkcí lesa (RPfl) byly vyhodnoceny pro všechny porostní skupiny uvedené v LHP v členění na stojící porosty a holiny. Podle zvolené metody byly porostním skupinám na základě dřevinné skladby a stanovištních podmínek přiřazeny porostní typy (PT) v rámci funkčních hospodářských souborů (FHS). Pro takto identifikované porostní typy byly diferencovány reálné potenciály funkcí bioprodukční, ekologicko-stabilizační, hydricko-vodohospodářské, edaficko-půdoochranné, sociálně-rekreační a zdravotně hygienické.

Reálné potenciály funkcí lesa byly zpracovány pomocí PC (tzv. standardizované porostní typy), substitucí nestandardizovaných porostních typů za standardizované a pomocí navržených nových porostních typů v rámci stávajících funkčních hospodářských souborů. Celkem bylo zpracováno 7423 porostních typů (porostních skupin).

Získané RPfl pro jednotlivé PT byly zapracovány do databází a zobrazeny pomocí GIS TopoL ve vrstvách podle jednotlivých funkcí lesa.

V článku je prezentována část obdržených výsledků na příkladu na LZ Židlochovice plošně nejvíce zastoupeném FHS 19.

Na základě získaných výsledků lze konstatovat, že lesní porosty FHS 19 LHC Židlochovice jsou charakteristické vysokou až velmi vysokou potenciální schopností k plnění celospolečenských funkcí lesa ve funkci bioprodukční a průměrnou až vysokou potenciální schopností k plnění funkce zdravotně-hygienické. Naopak nízké potenciální schopnosti plnit celospolečenské funkce mají ve funkci ekologicko-stabilizační, hydricko-vodohospodářské a edaficko-půdoochranné. Průměrného potenciálu aktuální lesní porosty FHS 19 LHC Židlochovice dosahují ve funkci sociálně rekreační. Uvedené výsledky vycházejí z charakteru použité metody, která uvažuje pro hodnocení RPfl průměrný stav lesních ekosystémů popsaný pomocí

souboru určitých determinačních kritérií, jejichž hodnoty jsou v porostním prostředí dlouhodobě stabilizované. Krátkodobé jevy extrémního charakteru (povodeň) mají v tomto pojetí nízkou statistickou významnost a jejich vliv se v hodnocení RPfl prakticky neprojevuje.

Pokud se týká zhodnocení použité metody, pak lze konstatovat, že pro daný účel se ukázala zcela vyhovující. Ačkoliv je principiálně konstruována na průměrných hodnotách indikátorů jednotlivých celospolečenských funkcí lesů pro lesy celé České republiky, poskytuje i ve specifických podmínkách lesů LZ Židlochovice uspokojivé výsledky.

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