

## PRINCIPLES OF FOREST TYPES CLASSIFICATION AND FOREST MANAGEMENT PLANNING METHODS OF THE CZECH REPUBLIC AND THEIR IMPLEMENTATION FOR UKRAINIAN CARPATHIANS

**O. HOLUSHA, PhD**  
Branch Fridek Mistek of Czech Institute for  
Forest Management (UHUL);  
**V. I. PAPAN, Prof., Y. S. SHPARYK, Dr.**  
Ukrainian Research Institute for Mountain  
Forestry.

**Analysis of the Czech experience gives a chance to implement their principles of the forest type classification for the Ukrainian Carpathians forests. Forestry action planning within forestry complexes is possible for 18–20 groups of forest types. The introduction of this planning system would significantly increase the area of managed forests in the region.**

**Keywords:** classification, forest type, forestry complexes, silvicultural actions.

The main tasks of forestry are the sustainable use of forests for obtaining the maximum volume of wood and byproducts per hectare, improving forest health and timber quality, and conservation, using, and restoring multifaceted functions of forests. Successful completion of these tasks is possible under forest management based on forest typologies. In the classification of Ukrainian Carpathians' forest types used typological principles of Pogrebnyak P. S., and Vorobjov D. V., which were adapted to mountainous conditions by Ostapenko B. F., Shevchenko S. V., Fedets' I. P., Molotkov P. I., Pasternak P. S., Gerushynskij Z., et al. The result of detailed soil typological survey of the region during 1960-th years was inventory of forest types in the Ukrainian Carpathians [1]. In practice it fined out that the forestry planning has to be done within groups of forest types. Similar groups were proposed by Holubets' M. A., Herushynskij Z. Y., Stojko S. M., Papan V. I. [1-4].

Principles of forest type classification and methods of forest management planning in the Czech Re-

public are close to Ukrainian. For possible use of the Czech experience a joint research in «Nadvirna Forestry» enterprise and in «Gorgany» Natural Reserve was done. Work within international project «System of forest management in forest ecosystems in the Ukrainian Carpathians» held last six years and ended in 2010. Their main results are prepared methods of differentiated planning of forest management, including: forest management actions within of forest type groups; the use of satellite images for mapping of forests; planning of ecological network for forest areas; identification of natural habitat in the Ukrainian Carpathians forests [5].

Planning of forestry in the Czech Republic based on the forest type classification of Pliva (1991), developed on the basis of biogeocenological system of Prof. Zlatnyk (1976). According to this classification gives 7 main series of soil conditions (extreme, acid, mezotrophic, megatrophic, gleyed, flooded, and peaty) and 10 altitude stages of vegetation (Table 1). Forest type is determined according to the vegetation stage and to the soil conditions [6–9]. For example, the index of the forest type «5A» has a name «fir beech forests on stony megatrophic soils».

In the field determining the forest types indexes are clearer. To the vegetation stage number researchers should add a soil series index, a number of the hydrological conditions, and specific notes. For example, most common forest type on the pilot project area in the Ukrainian Carpathians according to the Czech classification has index 5B3e and name – «fir beech forests normal watering on the slopes». For the planning of forest management similar forest types within a one (maximum – two adjacent) vegetative stage together in forestry complexes [5]. Forest management actions for the most common forest type on the project pilot area processed on the base of the field study results (Table 2) confirm a reasonability of their applications in the mountain forests of the Ukrainian Carpathians.

Table 1

Classification of the forest type groups in the Czech Republic (Pliva, 1991)

FSC*	Extreme (X,Z,Y)	Acid (M,K,N,I)	Mezotrophic (S,F,C,B,W,H)	Megatrophic (D,J,A,L,U,V)	Gleyed (O,P,Q)	Flooded (T,G)	Peaty (R)
VS**							
altitude stages of vegetation							
9 – Mountain Pine	9Z,9Y	9K	–	–	–	–	9R
8 – Norway Spruce	8Z,8Y	8M,8K,8N	8S,8F	8A,8V	8O,8P,8Q	8T,8G	8R

FSC*	Extreme (X,Z,Y)	Acid (M,K,N,I)	Mezotrophic (S,F,C,B,W,H)	Megatrophic (D,J,A,L,U,V)	Gleyed (O,P,Q)	Flooded (T,G)	Peaty (R)
VS**							
altitude stages of vegetation							
7 – Beech-Spruce	7Z,7Y	7M,7K,7N	7S,7F,7B	7V	7O,7P,7Q	7T,7G	7R
6 – Spruce-Beech	6Z,6Y	6M,6K,6N,6I	6S,6F,6B,6H	6D,6A,6J,6L,6V	6O,6P,6Q	6T,6G	6R
5 – Silver Fir-Beech	5Z,5Y	5M,5K,5N,5I	5S,5F,5C,5B,5W,5H	5D,5A,5J,5L,5U,5V	5O,5P,5Q	5T,5G	5R
4 – Common Beech	4X,4Z,4Y	4M,4K,4N,4I	4S,4F,4C,4B,4W,4H	4D,4A,4V	4O,4P,4Q	4G	4R
3 – Oak- Beech	3X,3Z,3Y	3M,3K,3N,3I	3S,3F,3C,3B,3W,3H	3D,3A,3J,3L,3U,3V	3O,3P,3Q	3T,3G	3R
2 – Beech-Oak	2X,2Z,2Y	2M,2K,2N,2I	2S,2C,2B,2W,2H	2D,2A,2J,2L,2V	2O,2P,2Q	2T,2G	–
1 – Oak	2X,2Z	1M,1K,1N,1I	1S,1C,B, 1W,1H	1D,1A,1J,1L,1U,1V	1O,1P,1Q	1T,1G	–
azonal vegetation stage							
0 – Scotch pine	0X,0Z,0Y	0M,0K,0N	0C	–	0O,0P,0Q	0T,0G	0R

\* FSC – forest site (soil) conditions, \*\* VS – vegetation stages.

Table 2

**Forest management action plan for the forestry complex No. 51 «Disadvantageous site conditions»**

Complex No. 51	Name: DISADVANTAGEOUS SITE CONDITIONS (exposed site conditions on high altitude – steep slopes, rock deposits; sandstones, argillites)		Area:			
			5991 ra	62,4%		
Forest types:		5, 6; A, AB, B, BC, C, BD, CD; 3, 3-4, 3-5, 4, n, e, f				
Main forest species*:		PA, AA, FS				
Secondary forest species:		–				
Basic species composition**:		PA 3-6, FS 2-4, AA 1-3, APS 0-2				
MAIN FORESTRY ACTIONS:						
Minimal part of melioration and stable species, %:	Melioration and stable species*:	Economic type:	Forestry method:			
30	FS, AA, APS, U, T	High stem seed-cultural forest	strip-grandual felling, natural regeneration			
FORESTRY ACTIONS WITHIN STAND TYPES:						
Stand	5111 – Norway spruce		512 – Silver fir		516 – Common beech	
Basic forestry recommendations	Age of felling: 110	Period of restoration: 30	Age of felling: 120	Period of restoration: 40	Age of felling: 130	Period of restoration: 40
	Start of restoration: 91	Forestry method: strip-grandual felling, natural regeneration	Start of restoration: 91	Forestry method: gradual felling, natural regeneration	Start of restoration: 121	Forestry method: strip-grandual felling, natural regeneration
Dominant height of stand	30–40 m		28–34 m		26–32 m	
Natural regeneration success	Spruce – below middle, Fir and Beech – middle		Fir – under middle, Beech – middle, Spruce – low		Beech – middle, Spruce – low, Fir – under middle	
Forest tending: – plantations	Trend on quality		Trend on quality		Trend on quality	
– young stands	Felling for negative characteristics		Felling for negative characteristics, Beech and Spruce tending		Felling for negative characteristics, Maple, Fir, and Spruce tending	
– close to ripe stands	Felling for positive characteristics from upper level		Felling for positive characteristics, Beech and Spruce tending		Felling for positive characteristics, Maple, Fir, and Spruce tending	
Recommended technology	track-type tractors, cable-transport systems					

\* – species: PA – Norway Spruce, AA – Silver Fir, FS – Common Beech, APS – Maple, U – Elm, T – Lime-tree.

## CONCLUSIONS

1. Czech Republic methodical principles of forest type classification can be used for preparing a system for differentiated forest management in the Ukrainian Carpathians, and forest management action plans – on a base of Ukrainian ecological forest classification.

2. European practice of the problem solution is based on forestry complexes, which compiled a forest management action plan within existing stand types for. The development a system of forestry complexes in the region should include 18–20 groups of forest types, which are united by phytocenotic principle.

## ВИСНОВКИ

1. Методичні засади класифікації типів лісу Чеської Республіки можна застосовувати при опрацюванні систем диференційованого ведення лісового господарства в Українських Карпатах, а лісогосподарські заходи – з урахуванням української еколого-лісівничої класифікації.

2. Європейська практика розв'язання проблеми ґрунтується на основі господарських комплексів, для яких складений перелік лісогосподарських заходів в розрізі існуючих типів деревостанів. Розробка системи господарських комплексів в лісовому господарстві регіону повинна включати 18–20 господарських груп типів лісу, що об'єднуються за фітоценотичним принципом.

## LIST OF LITERATURE

1. **Герушинський З. Ю.** Типологія лісів Українських Карпат. – Львів: Піраміда, 1996. – 208 с.
2. **Голубець М. А.** Ретроспектива і перспектива лісової типології. – Львів: Поллі, 2007. – 78 с.
3. **Стойко С. М.** Дубові ліси Українських Карпат: екологічні особливості, відтворення, охорона. – Львів: Меркатор, 2009. – 220 с.
4. **Парпан В. И.** Структура, динамика, экологические основы рационального использования буковых лесов карпатского региона Украины. / Автореф. дисс. докт. биол. наук за спец. 03.00.16. – Днепропетровск, 1994. – 42 с.
5. **Голуша О., Парпан В. И., Шпарик Ю. С.** и др. Инструменты регионального и хозяйственного лесного планирования для Украины/ Отчёт проекта No. 134/05-07/MZE/B. – Фридек-Мистек: Леспроект ЧР, 2007. – 198 с.
6. **AMBROS Z.** 1991: Charakteristiky skupin typů geobiocenů ČSFR. – Folia Universitatis agriculturae, VŠZ Brno, Brno. – 94 pp.
7. **BUČEK A. & LACINA J.** 1999: Geobiocenologie II. – MZLU v Brně, Brno. – 240 pp.
8. **PLÍVA K.** 1991: Typologický systém ÚHÚL. – Ústav pro hospodářskou úpravu lesů Brandýs nad Labem, Brandýs nad Labem. – 90 pp.
9. **ZLATNÍK A.** 1976: Lesnická fytoocenologie. Vydání 1. – Státní zemědělské nakladatelství, Praha. – 495 pp.

PRINCIPLES OF FOREST TYPES CLASSIFICATION  
AND FOREST MANAGEMENT PLANNING  
METHODS OF THE CZECH REPUBLIC AND THEIR  
IMPLEMENTATION FOR UKRAINIAN CARPATHIANS

**O. HOLUSHA, PhD**

**Branch Frídek Mistek of Czech Institute for  
Forest Management (UHUL);**

**V. I. PARPAN, Prof., Y. S. SHPARYK, Dr.**  
**Ukrainian Research Institute for Mountain  
Forestry.**

Analysis of the Czech experience gives a chance to implement their principles of the forest type classification for the Ukrainian Carpathians forests. Forestry action planning within forestry complexes is possible for 18-20 groups of forest types. The introduction of this planning system would significantly increase the area of managed forests in the region.

**Keywords:** *classification, forest type, forestry complexes, silvicultural actions.*

ПРИНЦИПЫ КЛАССИФИКАЦИИ ТИПОВ ЛЕСА И  
МЕТОДЫ ПЛАНИРОВАНИЯ ЛЕСНОГО ХОЗЯЙСТВА  
ЧЕШСКОЙ РЕСПУБЛИКИ И ИХ ВНЕДРЕНИЕ В  
УКРАИНСКИХ КАРПАТАХ

**O. ГОЛУША, д-р наук**

**Филиал Фридек-Мистек Чешского института  
управления лесами**

**В. И. ПАРПАН, д-р биол. наук, Ю. С. ШПARIK,  
к. с.-х. наук**

**Украинский научно-исследовательский инсти-  
тут горного лесоводства.**

Анализ чешского опыта позволил сделать вывод о возможности применения их принципов классификации типов леса для условий Украинских Карпат. Планирование мероприятий по ведению лесного хозяйства в разрезе хозяйственных комплексов возможно для 18–20 групп типов леса. Внедрение такой системы планирования существенно увеличит площадь лесов хозяйственного предназначения.

**Ключевые слова:** *классификация, тип леса, хозяйственный комплекс, лесоводческие мероприятия.*