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Study of the state of forest resources of zhytomyr region

The state of forest fund is studied; the volume of forest use and reforestation in the region was analyzed, resources of Zhytomyr region is investigated in this work; the structure of the forest, the main reasons for unsatisfactory state of forests were revealed. It has been established that the forests of Zhytomyr region as a whole, and especially pine trees, are characterized by disproportion of the distribution of plantings by age.

During the writing of the work, legal acts and legislative documents of Ukraine, textbooks, manuals, monographs, scientific publications devoted to the subject of research were used. The analysis of statistical data on the structure and condition of the forest fund of Zhytomyr region was carried out, the dynamics of its structure was determined, existing information on the representation of natural forest crops in the region of research was supplemented, the main problems of protection and rational use of forest ecosystems were outlined.

The main reason for the unsatisfactory state and death of forests in the territory of Zhytomyr region is the lack of timely forestry care, which is natural for the given region, since a significant part of the forest resources of the region suffered radioactive contamination after the Chernobyl accident.

Keywords: *forest; forestry; bonitet; care treatment; forest pests.*

Topicality. Saving and rational use of forest resources is no less important than any other national problem. For reforestation, decades or sometimes hundreds of years are required. Efforts of foresters and investments will be redeemed only in the distant future, and the mistakes made today are unlikely to be fully corrected. Qualified approach to forestry, responsibility and conservation of the genetic fund of forests, their rational composition, increase of stability and productivity of forest stands are of great importance in the conditions of intensive anthropogenic loading and in connection with the need to provide Ukraine's economy with wood products.

The purpose and tasks of the study. The main purpose of this work is to study the state of forest resources of Zhytomyr region, to identify the main ecological problems of the forest industry in the region.

To achieve this goal, the following tasks are formulated:

- To study the structure of the forest fund of Zhytomyr region;
- To analyze the volume of forest use and reforestation in Zhytomyr region;
- Assess the state of the forest resources of the region;
- Identify the main causes of unsatisfactory state of forests of Zhytomyr region.

The object of the study is the taxation indicators of forest plantations of Zhytomyr region.

Subject of research is forest plantations of Zhytomyr region.

Research methods. To realize this goal, the following general scientific methods were used: empirical and theoretical generalization, analysis of statistical material, observations, description and commonly used methods of comparative ecology, forestry studies and forestry, forest tax, forest protection from pests and diseases, mathematical statistics.

During the writing of the work, legal acts and legislative documents of Ukraine, textbooks, manuals, monographs, scientific publications devoted to the subject of research were used.

Scientific novelty of the obtained results. The analysis of statistical data on the structure and condition of the forest fund of Zhytomyr region, the dynamics of its structure, the existing information on the representation of natural forest crops in the region of research, the main problems of the protection and rational use of forest ecosystems are outlined.

Obtained results and conclusions. The total forest cover of Zhytomyr region is quite high. The average forest area of the region is 33,0 %. However, the distribution of forest resources in the region is not very uniform. The forests are concentrated mainly in northern areas. The highest value of woodiness in Olevsky district (63,8 %), the least - in Ruzhinsky (5,3 %). Average provision of Zhytomyr inhabitants with forest is 0,57 hectares.

According to the Zhytomyr Regional Department of Forestry and Hunting, as of January 1, 2018, the total area of the forests of Zhytomyr region amounted to 1096,4 thousand hectares, of which 747,9 thousand hectares (68,2 %) are intended for forestry and subordinated State Forestry Committee of Ukraine, 348,6 thousand hectares (31,8 %) are subordinate to other departments and ministries.

Forests of nature conservation, scientific, historical and cultural purposes in the Zhytomyr region occupy 101111,1 hectares, which is 13,5 % of the total forest area subordinated to the Zhytomyr Regional Department of

Forestry and Hunting, recreational and wellness forests occupy 86468,5 hectares (11,5 %), protective forests – 48413,4 hectares (6,5 %) and operational forests – 513779,6 hectares (68,5 %).

The analysis of the dynamics of the distribution of land for forestry showed that there were no significant changes in the last reporting period. However, it should be noted that there is a slight increase (by 26,1 %) of the areas not covered by forest vegetation of forest areas, mainly due to fences and areas with unrestricted forest crops, which is certainly the result of intensive exploitation of forest resources.

The peculiar forests are the determining ecological and economic role in the area covered by forest vegetation of Zhytomyr region. According to the forest fund account as of January 1, 2018, the share of pine plantations was 60 % of the forest covered area of which 59 % is pine (Fig. 1). Hardwood occupies only 19 %, of which oak chereshchaty – 17 % and softwood – 21 %, of which birch hung – 16%.

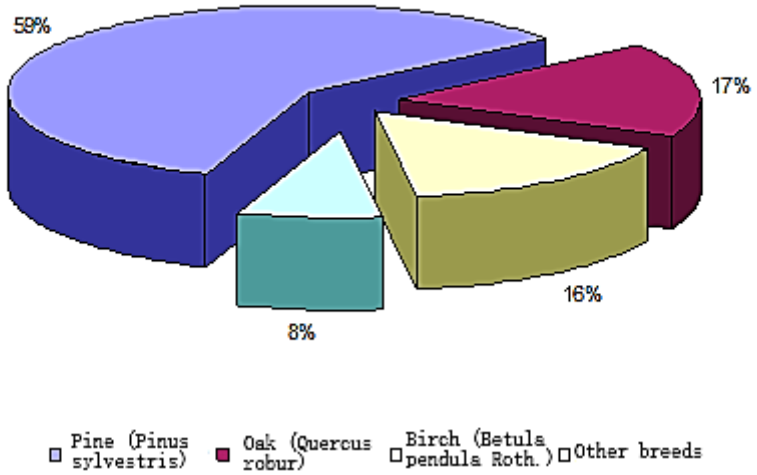

Fig. 1. Distribution of covered forest areas of Zhytomyr region by basic breeds, in percentages

In addition to wood resources in the territory of Zhytomyr region, the use of by-products of the forest has taken significant proportions: the harvesting of wild berries and mushrooms, grazing of cattle, hay-making, etc.

According to the data for January 1, 2018, the main use felling is carried out on the territory of 46515,2 hectares per year and gives an opportunity to obtain the volume of wood harvesting in the amount of 13012,51 thousand m^3 (Table 1).

Table 1

Placement of main use cuttings during the revision period

Category	Area, hectares	Stock, thousand m^3
Recreational and recreational forests		
Solid cuttings	4245,9	1185,82
Gradual felling	234,1	24,11
Total	4480	1209,94
Protected forests		
Solid cuttings	2056,5	604,56
Gradual felling	-	-
Total	2056,5	604,56
Operational		
Solid cuttings	39578,8	11158,8
Gradual felling	399,9	39,21
Total	39978,7	11198,01
Total		
Solid cuttings	45881,2	12949,18
Gradual felling	634	63,3
Total for the Zhytomyr Regional Department of Forestry and Hunting	46515,2	13012,51

In addition, the forestry of the region carries out harvesting of forest resources in the amount of 10190,14 hectares (Table 2).

Table 2

Calculations of the annual size of logging forests for the period from 2009 to 2020

Variety of cuttings of care	Foundation for cutting grooves, hectares	The annual size of the cuttings of care, hectares
Lighting	7557,6	1846,3
Clearing	13084,5	2616,9
besides deadwood trees	10,9	
Chopping	20662,6	2953,3
besides deadwood trees	879,1	
Passage cuttings	27754	2775,4
besides deadwood trees	7316,7	
Together	69058,7	10190,14
besides deadwood trees	8206,7	
In addition, forestry care for unbroken forest crops	7210,9	

For balanced forest use, the area of reforestation should correspond to the territories that were cut down. Forestry renewal during the audit period amounted to 40863,9 hectares and includes established forest plantations, forest crop areas are translated into the forest-vegetation category and the area of unbreakable forest crops. This volume is somewhat smaller than is necessary based on the volume of cutting of the main use and should be taken into account in subsequent years. In addition, it should be noted a significant increase in the proportion of artificial trees, almost complete lack of young animals of natural origin.

As for January 1, 2008, 5472,9 hectares of forest areas affected by forest pests were found on the territory of Zhytomyr region. During the period from 2008 to 2018, 10904,2 hectares of pest cells were eliminated, 9119,2 hectares was damped, and damage was 16157,9 hectares again. As a result, at the end of the reporting period (as for January 1, 2018), there were 1607,4 hectares of affected pests, of which 426 hectares were required to be carried out. Among the pests found in the forest, the largest areas are affected by the bark beetle. In 2016-2017 (Fig. 2), the centers of this pest amounted to 89.9 thousand hectares, which corresponds to 13% of all pine forests of Zhytomyr region. The main reason for the active development of balding apical is the climate change. Since the last several years of winter were quite warm, the number of pests is growing rapidly.

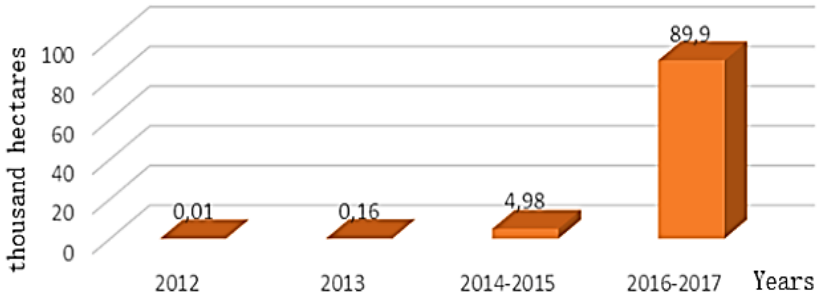

Fig. 2. The total area of the identified branches of the bark of the apical on all forest users of Zhytomyr region

Among other pests found in the forest, the largest areas were affected by Pilshik Rud (1177,9 hectares), Winter Clay (271,2 hectares) and Khrushchev West May (85 hectares) (Fig. 3).

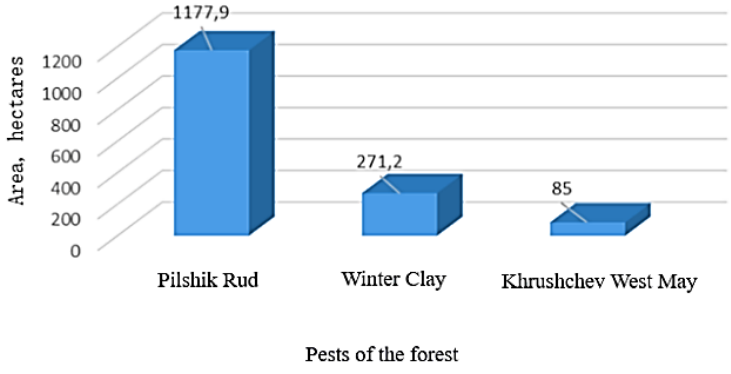

Fig. 3. The area of the pests of the forest

As for January 1, 2008, 21560,8 hectares of forest areas affected by forest diseases were found on the territory of Zhytomyr region. In the period from 2008 to 2018, 10554,7 hectares of disease centers were eliminated, 626,0 hectares were damped, and 13415,3 hectares of defeat arose again. As a result, at the end of the reporting period (as for January 1, 2018), 23795,4 hectares of affected pests remained, of which 11439,0 hectares were required to be carried out. The largest areas among the affected forest diseases were occupied by the cells of the root lobe and amounted to 11089,5 hectares (Fig. 4).

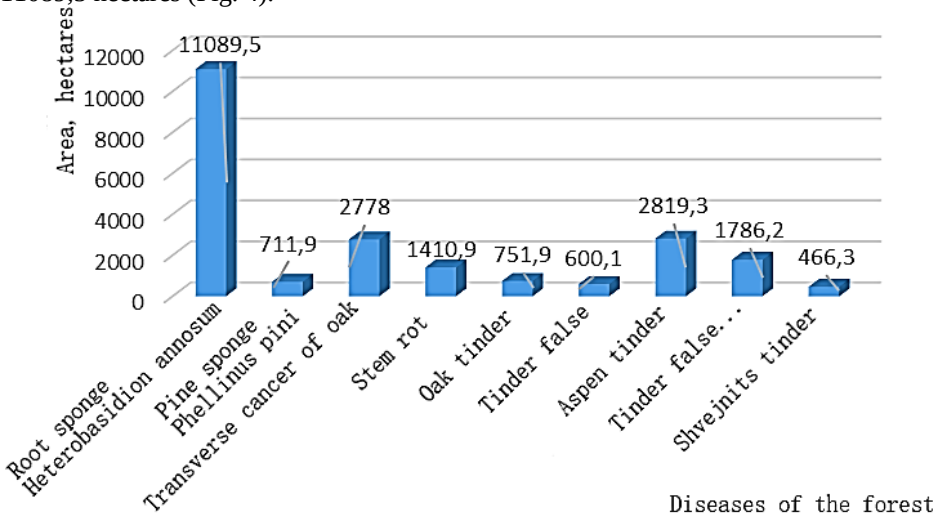

Fig. 4. The area of the centers of forest diseases

The main reason for unsatisfactory state and death of forests on the territory of Zhytomyr region (Table 3) is the lack of timely forestry care, which is natural for this region.

Table 3

Causes of forest crops death

Causes	Area, hectares	Area, %
Felled forest crops		
Total	2320,8	100
including for reasons		
- drought	195,4	8,42
- damaged and destroyed by fires	22,3	0,96
- damaged by diseases and pests	98,7	4,253
- roaring	245,9	10,6
- violation of the technology of forestry creation	3,3	0,142
- unsustainable forestry care	1426,9	61,48
- insufficient and poor-quality agronomic care	1,6	0,07

A significant part of the forest resources of the region suffered from radioactive contamination after the Chernobyl accident. As a result, forest areas where the pollution density of ^{137}Cs exceeded 15 Ki/km^2 were removed from forest use. In these territories, all forestry activities, including the care of tree-stands, were discontinued.

Conclusions. The distribution of the total forest area by land category shows that, compared with each other in 2008 and 2018, its total area has increased by 1903 hectares. In total, the forest area increased from 699,400 hectares to 710225,5 hectares, and the area covered with forest vegetation, on the contrary, reduced 662056 hectares to 661699,4 hectares, almost 400 hectares. Also, the number of plantings with artificial restoration of the forest has increased. Unpredicted areas of forest vegetation have grown due to unrestricted crops, fences, fires and other categories of land - from 37344 hectares to 48526,1 hectares.

The main uses are held on the territory of 46515,2 hectares per year and allow the volume of timber harvesting in the amount of 13012,51 thousand m^3. In addition, the forestry of the region carries out harvesting of forest resources in the amount of 10190,14 hectares.

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