SOLUTIONS FOR NORMALIZATION YIELD POOL IN THE CASE OF DEMINISHED WOOD HARVEST

Dorog Lucian Sorin*

*University of Oradea, Faculty of Environmental Protection, 26 Gen. Magheru St., 410048 Oradea; Romania, e-mail: dorogs@yahoo.com

Abstract

Normal state is defined as a state of maximum functional efficiency, the state of a forest combining the most favorable way station and vegetation conditions so that stands to be able to function priority set.

These conditions do not take care of themselves in forests cultivated but is achieved through interventions that lead to specific structures.

Yield pool production is characterized by a structure and size are closely related to stationary conditions and management measures applied.

Romanian forests have undergone major changes over the last 25 years in terms of ownership structure and directors influences and unintended consequences on the structure of production yield pool.

Thus arose production units with surplus or shorthage of exploitable timber.

The calculations presented in this paper are meant to lead to normalization of production yield pool a longer or shorter size relative scarcity of timber exploitation.

Key words: yield pool, deminished wood harvest, structure yield pool.

INTRODUCTION

Forest is required to contribute continuously to meet the needs of timber and accessories products and protective functions assigned. These condition are not achievable by itself in a forest but when touching representation of the size and age of trees is such that every year the wood equivalent volume of forest growth reach exploitability (Leahu I., 1984).

Regarding the performance of the functions of production and protection is achieved only when they are directed towards suitable structure stands assigned functions. Production yield pool varies from forest to another and is characterized by a certain structure and size in relation with the stationary and household actions taken (Dorog S., 2007). Extraction of wood from the trees is paramount role structure stands near their assigned functions and structures on the other hand will achieve production yield pool structure near normal structure (Ministry of forests, 2009). The normal state is called maximum functional efficiency and that yield pool is called the normal production yield pool. Existing yield pool currently in production is real deviate more or less than the corresponding normal structures (Wong C., Dorner B., Sandman H., 2003).

The development projects are trying yield pool structure production guidance for the optimal or normal but most of the times some believe that these structures are optimal after management plan and after two or three cycles of 10 years which is not so confirmed or due to occurrence certain disturbing factors or simply due to factors that were not taken into account (Leahu I., 1976).

The structure of production is the result of temporal and spatial relationships of components from individuals represented by trees of different species and ages, continuing with stands of different ages with different structural characteristics (Bertault JG., Sist P., 1997).

Forests of Romania in the last 25 years has undergone major changes in the ownership structure and directors. One of the immediate consequences which arose here are related to changes in the structure of production units. Thus arose surplus of the yield pool others have deficits larger or smaller in terms of harvested wood table. This paper aims to analyze and provide solutions in terms of production units deficient exploitable timber. Solutions must be considered in the context of administrative territorial units facing serious problems regarding profitable production units.

MATERIAL AND METHODS

The simplest case is the forest comprises pure stands of even aged trees and the same productivity. This production yield pool to be distributed evenly over the ages to be respected the principle of continuity. For even age stands of even aged trees must be evenly distributed on the surface and the relatively even aged trees stands each age class should be equally represented on the surface. This helps to analyze complex situations encountered in practice .

Another more complicated case is the pure stands of different productivity. In this situation the production stands at the same age are not equal. Normal distribution is when the surfaces age classes are inversely proportional to productivity.

The third case and the complex is represented by stands of different classes of mixed production. In these trees knowing stationary conditions and their influence on different species is studied as the substance of production and on the other hand can be defined and those proportions mixtures Continuity maximum production (Milescu I., Avram C., 1993, Leahu I., 2001).

Calculation of the normal distribution of age classes calculation involves the following steps:

- distribution of each species production classes and age groups;
- calculate the total area for each age class;
- calculated for each class production and species total area;
- production is taken from tables by species and production class of normal production;
- calculate the total for each species and production class;
- Normal production is determined by age class;
- determine actual production by age class;
- determine the surface normal for each age class.

Normal area by age class is determined using the following ecuation:

$$S_n = \frac{P_n}{P_r} \times S_r \text{ în care:}$$

- S_n is the surface normal of age classes
- P_n represent normal production
- P_r represent actual production by age class
- S_r represent the actual size by age class

The case analyzed in this paper is the most complicated because it consists of different trees with different blends that different production classes. Normal state can be represented in two ways: the state most favorable to the conditions most favorable state stationary and compared with those of the mixture. Yield pool can not match real production than normal production yield pool determined in relation with the existing mix stand (Huth A., Ditzer T., 2001). Determinations that were made are consistent with the calculation algorithm previously and take into account on the one hand stationary conditions which vegetate on the other hand stands algorithm for determining the normal production yield pool.

Determinations and presented in the next section are intended to help achieve those forestry in favorable conditions for production guidance yield pool for normal structure. Will occur during the normalization depends on the size of deviations from normal and the presence of disturbing factors which in some cases may adversely affect the production development yield pool.

RESULTS AND DISSCUTIONS

Production Yield pool is considered an area of 1393.7 ha, has the following structure on species production classes and age classes in the table below.

The structure of production presents unbalanced structure in terms of age class distribution areas. Thus it is worth deficit emphasized enough age class VI which shows that this yield pool production as it is structured deficient exploitable timber. To address this situation have been proposed operating sacrifices minus, which means that part of the surface age class V consists of stands will be placed in all preexploatable operation which means that some of the trees will be placed in operation .

Table 1

The initial structure of the yield pool production

Species	Class production	Age classes					
		CV I	**CV II**	**CV III**	**CV IV**	**CV V**	**CV VI**
		Surface(ha)					
Go	I	36,7	56,9	36,2	44,7	44,5	36,5
	II	68,8	56,2	45,6	57,6	67,7	24
	III	23,7	13,4	44,7	31,6	36,7	25
Fa	I	42,5	68,6	46,8	23,6	101,9	26,7
	II	64,4	13,5	48,3	86,9	72	48
Total	**-**	**236,1**	**208,6**	**221,6**	**244,4**	**322,8**	**160,2**

The following table is determined yield pool structure in the original production. After calculations it was found that the actual structure than normal is very different age classes V and VI. In class VI age while there is a shortage of age class V is found an excess to the actual surface
After applying the algorithm to normalize production yield pool following areas have been determined by age class (the last line of the table below).

Table 2

The structure of production including normalizing calculation areas by age class

Speciers	Class production	CV I	CV II	CV III	CV IV	CV V	CV VI	TOTAL	Normal production	Total producrion
		Surface (ha)						ha	mc/ha	mc
GO	I	36.7	56.9	36.2	44.7	44.5	36.5	264	600	158400
	II	68.8	56.2	45.6	57.6	67.7	24	329.6	520	171392
	III	23.7	13.4	44.7	31.6	36.7	25	177.4	430	76282
FA	I	42.5	68.6	46.8	23.6	101.9	26.7	339.7	750	254775
	II	64.4	13.5	48.3	86.9	72	48	344.5	650	223925
Real surface (ha)		**236.1**	**208.6**	**221.6**	**244.4**	**322.8**	**160.2**	-	-	-
Normal surface (ha)		**245.6**	**237.8**	**249.1**	**249.3**	**297.2**	**245.1**	-	-	-

To normalize production yield pool part of the surface age class V was last age class VI, stands which are exploitable minus operating sacrifices. It was determined that an area of 61.5 ha in terms of the structure stands allow the start of treatment with 10-15 years earlier than the age exploitability. Once the calculations are observed that production background looks much better in terms of normalization. Differences between actual and normal areas determined are insignificant.

Table 3

Structure of production by applying minus operating sacrifices to normalize surfaces

Species	Class production	CV I	CV II	CV III	CV IV	CV V	CV VI	TOTAL	Normal producrion	Total production
		Surface (ha)						ha	mc/ha	mc
GO	I	36.7	56.9	36.2	44.7	36	45	255.5	600	153300
	II	68.8	56.2	45.6	57.6	58	33.7	319.9	520	166348
	III	23.7	13.4	44.7	31.6	34.4	27.3	175.1	430	75293
FA	I	42.5	68.6	46.8	23.6	72.3	56.3	310.1	750	232575
	II	64.4	13.5	48.3	86.9	60.6	59.4	333.1	650	216515
Real surface (ha)		**236.1**	**208.6**	**221.6**	**244.4**	**261.3**	**221.7**	-	-	-
Normal surface (ha)		**234.4**	**226.9**	**237.7**	**237.9**	**229.5**	**227.5**	-	-	-

By applying the Kruskal-Wallis test for determining differences (Chiţea Gh., 1997) between real surfaces and normal age class distribution is found in the following table are insignificant differences in terms of areas. However be taken into account that the volumes vary in relation to production classes, which shows that the size of age classes may be even lower as the stands are top class (Dorog S., 2008).

Table 4

Kruskal-Wallis Statistic test and semnification level for real and normal surfaces

	HI^2 values	Semnification level	Probability
Kruskal-Wallis Statistic test	Yield pool structure and normal surface per age classes – real and normal surfaces comparing		
	7,1538	N.S. (P>0.05)	0,2094
	Yield pool structure by applying less wood harvest for age class surfaces normalizationreal and normal surfaces comparing		
	6,6153	N.S. (P>0.05)	0,2508

CONCLUSIONS

Due to significant differences between actual and normal surfaces calculated by age class production yield pool normalization can be done without problems in one or two planning periods of 10 years. However, it is interesting to note that the calculations are intended to guide production yield pool for the normal structure without taking into account potential confounding factors that may change again conditions underlying forest structure.

Deficit wood harvest situation in this case can be solved relatively easily by operating minus sacrifices but they will not adversely affect the yield pool's future structure of production.

Calculation algorithm presented by age class distribution of trees and production classes take account of the Station, which leads to the idea that normalization will be consistent with the potential species respond the favourability of the resort.

REFERENCES

1. Bertault JG., Sist P., 1997, An expermental comparison of different harvesting intensities with reduced impact and conventional logging in East Kalimantan Indonesia, For Ecolmanagement 94:209-218
2. Chiţea Gh., 1997, Biostatistică, Editura Universităţii Transilvania, Braşov
3. Dorog S., 2007, *Noţiuni teoretice şi practice de amenajarea pădurilor,* Editura Universităţii din Oradea
4. Dorog S., 2008, *Biostatistică forestieră*, Editura Universităţii din Oradea,
5. Huth A., Ditzer T., 2001, Long term impacts of logging in a tropical rain forest: a simulation study, For Ecol management 142: 33-51
6. Leahu I., 1976, Structura şi gradul de organizare a fondului de producţie, Buletinul Universităţii Braşov vol. XVIII
7. Leahu I., 1984, Metode şi modele structural-funcţionale în amenajarea pădurilor, Editura Ceres Bucureşti
8. Leahu I., 2001, Amenajarea pădurilor, Editura Didactică şi Pedagogică, Bucureşti
9. Milescu I., Avram C., 1993, Amenajarea pădurilor, Editura Didactică şi pedagogică R.A. Bucureşti
10. Ministry of forests, 2009, Variable density yield projection, Volume I VDYP7, Overview version 2.0 Forest analysis and inventory branch, BC (www Document) British Colombia Ministry of Forests
11. Wong C., Dorner B., Sandman H., 2003, Estimating historical variability of natural disturbances in British Colombia, BC Ministry of Forests, Research Branch, Ministry of Sustainable resource management, Resource planning branch, Victoria BC