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MODEL OF COMPENSATION PAYMENT TO THE OWNERS ON NATURE 2000 FOREST SITES

MODEL PLAĆANJA NAKNADE VLASNICIMA NA ŠUMSKIM LOKALITETIMA NATURE 2000

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Abstract

Ecological Network (Natura 2000) is a system of areas for protection of endangered species and habitats on European Union level and presents the biggest coordinated network of nature protection areas in the world.

When Croatia becomes the member of EU, its biological and landscape biodiversity will be a part of this network. According to the Regulation on habitat type categories, habitat map, endangered and rare habitat types (NN 7/06, NN 119/09) which includes National habitat classification, forest ecosystems have 104 categories (NN 7/06).

Regardless of the interpretation method, there are three evaluation methods: according to the historical costs (time of establishment), current market value, and evaluation through expected participation in future incomes and benefits. Forest evaluation needs determining of economical (wood and secondary forest products), non-wood forest functions (ecological and social), and assimilation of forest functions. For those purposes, different market and non-market evaluation methods, as well as qualitative description methods and point systems have been used.

Key words: forest economics, forest policy, value assessment, Natura 2000

Sažetak

Ekološka mreža (Natura 2000) je sustav područja za očuvanje ugroženih vrsta i staništa na razini Europske unije i predstavlja najveću koordiniranu mreža područja očuvanja prirode u svijetu. Kada Hrvatska postane članicom Europske unije svoju će biološku i krajobraznu raznolikost uključiti u tu mrežu. Prema Pravilniku o vrstama stanišnih tipova, karti staništa, ugroženim i rijetkim stanišnim tipovima (NN 7/06 , NN 119/09) koji uključuje Nacionalnu klasifikaciju staništa, na šumske ekosustave odnose se 104 kategorije (NN 7/2006). Neovisno o načinu interpretacije, postoje tri načina vrednovanja vlasništva: prema povijesnim troškovima (vremenu nastanka), sadašnjoj tržišnoj vrijednosti, i kroz očekivano sudjelovanje u budućim prihodima i koristima. Vrednovanje šuma iziskuje utvrđivanje vrijednosti gospodarskih (drvo, sporedni šumski proizvodi), općekorisnih (ekološke i socijalne funkcije) i asimilacijskih funkcija šume. U tu svrhu se koriste različite tržišne i netržišne metode procjene, ali i metode kvalitativnog opisivanja i bodovni sustavi

***Ključne riječi:** ekonomika šumarstva, šumarska politika, utvrđivanje vrijednosti, Natura 2000*

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INTRODUCTION
UVOD

It is considered that natural resources are a given and that they represent a fixed offer because in many cases they can not be quickly increased or are difficult to discover or multiply. For example, forests in some areas increase, almost always in a certain quantity; mineral resources like coal, oil, mineral iron and many others regenerate very slowly on their own and are therefore considered non-renewable. However, many basic resources can be increased or at least transformed from one into another usable form. Forest can be regenerated with caring sustainable management. Based on this, natural resources are defined as production factors – inputs (costs), which, combined with human mental, entrepreneurial and physical labour as well as with capital, produce goods and services.

Natural resources are considered unique input factors; out of which many have features that make them similar to capital factors. Foremost, in order to be used for consumption or in the production process, the majority of natural resources must be separated, dug, cut, etc.

Time is also an important precondition in analysis of natural resources use. It helps in distinguishing different types of resources. Annual adjustments can not be done in forest management. Improvements or aggravations which can arise as a result of economic, management or forest management and silvicultural interventions, become visible only after several years. For this reason, the role and possibility of implementing technological rationalizations is minor. Forest management on forest and forest land is based on the Forest management plan made by the company Croatian forests ltd, approved by the Ministry of Agriculture. Present Forest Management area plan is valid from the year 2006 to 2015 with management projections until the year 2045. The Plan represents the base for the Croatian forest policy and is revised every 10 years. According to that document the total forest land in Croatia covers 2688687 ha, out of which private forests take 22% and state forests 78%. The average growing stock according to the First National forest inventory is shown in table 1.

Table 1. Grow stock (source: First national forest inventory RH 2010)
Tablica 1. Drvna zaliha (izvor: Prva nacionalna inventura šuma RH 2010)

Ownership *Vlasništvo*	Grow stock *Drvna zaliha*						
	Total area *Ukupna površina*					Area without young stands *Bez mladih sastojina*	
	Grow stock *Drvna zaliha* (α=0,05)			*sp*	Udio *Share*	Grow stock *Drvna zaliha*	*sp*
	m³/ha	1000 m³		%		m³/ha	%
State forests *Državne*	255,57	468035	458112 - 477957	2,12	84,61	278,16	2,21
Private forests *Privatne*	155,84	85143	80775 - 89511	5,13	15,39	170,26	5,36
Total *Ukupno*	232,22	552146	541103 -563189	2,00	100,00	253,45	2,09

NATURA 2000 is a basic program of European Union nature protection whose aim is to provide favourable conditions for endangered species and habitats through establishing ecological network of the most important areas for their preservation. All EU member states are obliged to proclaim this network on their territories, as well as establish a suitable management system and systematically follow the condition of preservation of each specific species and habitat stated in the annexes of Directive on protection of natural habitats and wild fauna and flora, and report regularly on the matter to the European Commission. Monitoring reports are fundamental for following the implementation success of the NATURA 2000 program. Altogether, for the needs of NATURA 2000, 241 localities of the total surface

area of 41 666 ha or 2.5 % of forest in the Republic of Croatia have been suggested (Vukelić et. al. 2008). Different levels of nature protection will limit and change present activities of private forest owners and therefore decrease their income. One of the main aims of NATURA 2000 is to ensure implementation of measures necessary for preservation with the least possible limitations and with implementing appropriate remuneration and incentives for users of an area. The basis of implementing Natura 2000 network in forestry sector means respecting the principles of sustainable management (EK, 2003). Implementation of this general viewpoint shows certain regional differences – in middle and North-Western Europe the majority of Natura 2000 areas are either small or medium sized, and forests within those areas are managed according to the strict principles of nature protection. On the other hand, in South and East Europe the majority of Natura 2000 areas are vast expanses managed through supporting the traditional ways of land usage such as forestry and agriculture. Certain Natura 2000 areas contain species and habitats of priority European interest, in which all economic activities are forbidden. But, as already stated, in most forest locations within Natura 2000 network in Eastern and Southern Europe it is enough to comply with the principles of sustainability in their management (in accordance with Annex I. And Annex II. Of the second Lisbon resolution from 1998 within MCPFE process).

Before full EU membership, the applicant country is obliged to submit its proposal of Natura 2000 areas, a list of measures for managing those areas and a list of areas for which co-financing is needed in order to achieve favourable preservation conditions of species and habitats of European interest. After that, European Commission reviews the areas in need of co-financing, in which the main criteria are the representative quality of the area and availability of financing sources. For the areas recognized by the Commission as areas in need of co-financing for which there is no adequate funding, member state must ensure that there are no activities which might disturb its preserved condition. It is estimated that annual cost of implementing Natura 2000 network on the level of 25 EU countries is about 6.1 billion € (EK, 2007)

AIMS AND PROBLEM MATTERS
PROBLEMATIKA I CILJEVI RADA

Determining the total economic forest value, as well as the value of a particular function is needed for effective management of natural resources and better making of investment decisions in forestry (Figurić 1996). The classical forest evaluation methods are based on calculation of growing stock value (stand) and land value. Quantitative inventory is conducted on stand level (forest unit), due to the heterogeneous characteristics based on stand quality, coverage, tree species etc.

Some stands have different biological parameters and evaluation methods because of their different location (Posavec et. al. 2006). Received incomes depend on the transport costs and on possibility of using different working methods and assets. In practice, for assessment of forest and forest land value specific regulations are used. There is a need to define production costs for growing stock (stand establishment costs, silviculture, protection and administrative costs) which is almost impossible due to long production process. All these facts make the assessment complicated and specific individual approach is need. In cases where it is possible to calculate material incomes and costs, the yield of money will still be dependent on the insecure wood price fluctuation. Forest resources values are not constant, but are constantly changing according to the needs of the society (Karppinen 2000).

Legal regulation for financing of Natura 2000 network is the article II. Habitat directive, according to which, before making decisions about the Network, social, economic and cultural significance of the area should be taken into account. It is in line with article VII. EU Declaration on human rights, where it is defined that application of measures based on the EU regulations should accept principles of compensation for loss of income. According to the European Court of Justice (C-71/99 and C-220/99), definition of the Natura 2000 sites could be based only on the scientific knowledge. Other factors such as economic, social, cultural, regional or local could be taken in account for the development of area management plans (EK, 2006). EU funds for financing of NATURA 2000 network were closely tied to the

LIFE funds until the end of 2006. With the new joint agricultural policy from the beginning of 2007 network financing is a part of EU Cohesion and Structural Funds from the year 2007 until 2013 with the annual budget of 49.6 billion €. Access to those large sources of financing has a negative side – in comparison to LIFE funds, the currently valid calculation period demands much more significant involvement from the applicant and implies much bigger competition.

The main EU financing sources for NATURA 2000 network presently are:

- European Agricultural Fund for Rural Development –EAFRD with annual budget of 77.66 billion €.
- European Fisheries Fund (EFF), annual budget of 615 million €
- European Regional Development Fund (ERDF), annual budget of 1.9 billion €
- European Social Fund (ESF). The fund promotes social inclusion, education and training (annual budget of 10.7 billion €).
- Cohesion Fund. Fund gives support to Trans-European transport networks and to environmental project in compliance with Community environmental protection policy (annual budget of 10 billion €).
- LIFE+. Has three components: Nature and Biodiversity, Environmental Policy and Governance; Information and Communication (annual budget is 250 million €).
- 7th Research Framework Programme (FP7). The primary focus of Fund are trans-national researches related to environment (especially climate change) and to aeronautics. Research related to food, agriculture, fisheries and biotechnology are also eligible (annual budget is 7.2 billion €).

For reaching conservation goals on private forests another mechanism is introduced – Contract conservation. This instrument is meant to serve as a balance to forgone income due to implementation of the Natura 2000 network. By this scheme the landowners themselves can perform conservation measures, or they can be performed by third party (NGOs, contractors). The compensation can be in a form of direct payment, tax breaks, compensatory land-use right, etc. Direct payment are mostly decided on case-to-case basis, and can greatly vary; from 80 €/ha in Spain up to 4000 €/ha in Sweden (for the owners of agricultural and forest land).

There is no unique methodology for calculation of compensation to forest owners for discrepancy from "normal" management. The highest compensation to forest owners was 6898 €/ha/annually in Finland as a part of the METSO programme of NEWFOREX project.

Detailed theoretical analysis of different compensation models were made by Anthon et al. (2010), whose analysis discovers how such compensations often result in too high amounts considering results, because they do not take into account the moral risk of compliance with a contract and the natural variability of stand. Authors also recommend that forest owners who find it difficult to change the conditions in their forests should get contracts for low value compensations with no regard to the results of their implementation. On the other hand, active forest owners should be offered high value compensations through contracts offering a bonus if forest owner accomplishes significantly better stand conditions than with "normal" forest management.

The main forest resources in the Republic of Croatia are in state ownership. State Department for Natural Protection is responsible for implementation of NATURA 2000 network. What are the main financing instruments for NATURA 2000 network? Basically, the answer is simple, monitoring and reporting are responsibility of EU state members. Croatia will have to implement EU standards for nature protection before EU accession. Croatia has proposed NATURA 2000 sites for more than 250 species and 70 stand types.

Establishment of relevant compensation presents an important component for rural development regulated with Lisbon strategy. In article 224 of the Strategy 158 million euros are reserved for compensations. Only 5% of that amount is realised. Only 11 EU state members provide regulations for compensation payments.

In this paper, on the sample Educational and Experimental Forest Site Dotršćina, with use of modern forest evaluation methods and estimation of lower income in protected areas (such as: prohibi-

tion of management, hunting, collecting of non-wood forest product, lower annual cut, longer rotation period, care for preservation of endangered and rare wild species and continuous monitoring) possible calculation of compensation will be presented.

MATERIALS AND METHODS
MATERIJAL I METODE RADA

The object of research is Education and Experimental Forest Site Dotrščina (EWEFS), University of Zagreb, Croatia. Although the object is not included by Natura2000 proposal it is chosen because of data availability. Dotrščina was used as an example for determining the value of benefits for certain forest areas in the Republic of Croatia. EWEFS makes one management unit Dotrščina, size of 180.75 ha. The management unit is located in the northwest Croatia, Zagreb, and it is part of even-aged forests. Sub-compartment 2a is chosen as the research plot. Forest stand is size of 7.12ha, 49 years old and grows on IV site quality-class. Stand has normal canopy density, southwest exposure and it is located on altitude of 185 m. Middle age stands of sessile oak, beech, hornbeam and other hard broadleaves with a mixture ratio of 70:30 (sessile oak : beech). Sessile oak occurs in the upper canopy layer and the trees are of good quality, beech and hornbeam occur in lower layer.

Table 2. Structure of sub-compartment 2a, Management unit Dotrščina, at age of 49
Tablica 2. Strukturne značajke odsjeka 2a, Gospodarske jedinice Dotrščina u 49-toj godini starosti

Tree species *Vrsta*		Sessile Oak *Hrast kitnjak*	Beech *Obična bukva*	Hornbeam *Grab*	Other broadleaves *OB*	Total *Ukupno*
Site quality-class *Bonitet*		IV	IV	IV	IV	
Number of trees [N/ha] *Broj stabala* [N/ha]		291	251	153	10	705
Basal area [m^2/ha] *Temeljnica* [m^2/ha]		14,31	5,33	2,42	0,12	22,18
DBH 1,30 [cm] $d_{1,30}$ [cm]		27,50	17,50	12,50	12,50	
Height [m] Visina [m]		19,95	17,74	14,62	14,18	
Growing stock *Drvna zaliha*	[m^3/ha]	149,42	46,95	17,84	0,87	215,08
	[m^3/subcomp.]	1063,87	334,28	127,02	6,19	1531,36
	[%]	69,47	21,83	8,29	0,40	99,99
Current annual increment *Tečajni prirast*	[m^3/ha]	5,36	1,80	0,71	0,04	7,91
	[m^3/subcomp.]	38,16	12,82	5,06	0,28	56,32
	[%]	67,76	22,76	8,98	0,51	100,01

All data required for calculation were taken from Management plan Dotrščina (1994-2003).

Method
Metode

Methodology for determining of remuneration due to limited management was made according to the model made for the Republic of Finland (Leppane et. all 2005). Model adjustments were made for Croatian forest management system and legislative requirements.

The model determines the amount of compensation for the absolute prohibition of forest stands which are managed by even-aged system. It is primary to determine the current financial value of the

forest sub-compartment, then a certain financial value at the end of the prescribed rotation. Payments for ecosystem services are also calculated but not considered in further calculations, because forest stand and forest land ownership does not change, only the economic functions are replaced with the protective one. From forest economics perspective the preferred payment method is a one-time fee.

The amount of one-time fee for forest plot ownership which is managed regularly is calculated by the formula (1)

$$(1)\ NPV = \frac{Cn}{\frac{U_{N-n}}{\frac{r}{100}}}$$

Where is: (*NPV*) net present value (amount of financial compensation), (*Cn*) value of forests at the end of the rotation, (*U*) time period from preservation to the end of the rotation (*N*), (*n*) current age of the stand, (*r*) interest rate.

The presented model is an adaptive model of a perpetual annul series. It is used when assessing the value of forests. Forest value should be equal to interest of amount invested in the bank perpetually. Interest rate is constant and interest stays equal perpetually, ie. $n \rightarrow \infty$ (Klemperer 2003).

According to the Ordinance of compensation establishing for the transferred and limited rights to the forest and forest land (NN 131/06) current estimate is made for researched sub-compartment.

Using data from the Management plan Dotrščina (growing stock by tree species), assortment tables Croatian Forests Ltd. Zagreb and the Price list of major forest products Croatian Forests value of growing stock on the stump is estimated.

The present cutting value method is an economic value of forest that can be calculated from selling prices of timber assortments. In this method of determining the economic value, forest is considered as a final product that can be cut and sold immediately. Consequently, this method is often recognized in literature as value of forest stand which is cut and sold at any age. To determine the value of the stand based on the amount of its assortments it is necessary to take prices of assortments. Content of assortments must be multiplied by current price. Obtained result is the market value of the stand. This value is very low for young stands and it grows with age of the stand.

Payments for ecosystem services were carried out according to the method prescribed in the Regulations establishing fees for the transferred and limited rights to the forest and forest land (NN 131/06). Also according to the same Regulations future value of growing stock was estimated of (for the end of the rotation).

$$(2)\ Cn = C_0 \cdot \left(1 + \frac{r}{100}\right)^n$$

To determine the future value of forest stand used in the formula (2), where is: (C_0 current growing value, (*r*) interest rate, (*n*) is the number of years, (*Cn*) future value.

For accurate assessment every tree species was separately investigated. According to the calculations of Croatian Forests Ltd, the reforestation cost of sessile oak stand is 6944.53 EUR / ha, which is in this case the invested equity. Costs related to the reforestation period refer to the first 20 years. It is therefore necessary that all costs are discounted to the start of the rotation using the formula (3).

$$(3)\ C_0 = \frac{C_n}{\left(1 + \frac{r}{100}\right)^n}$$

Interest rate determining is of great importance. The exact interest rate is the one which discounted all costs to rotation beginning and compounds them to rotation end. Computed value must be equal to estimated value using formula 2.

The interest rate was tested by Leibnitz's formula (4)

$$(4)\ r = 100\left(\sqrt[n]{\frac{C_n}{C_0}} - 1\right)$$

Where is: (r) interest rate, n time period (years), (Cn) value of forests at rotation end, ($C_{0)}$ current value of growing value.

RESULTS
REZULTATI

On the basis of the above presented methodology the current stumpage value of forest is 3500.08€/ha. The growing stock in a 120 year old stand (end of rotation period) is estimated according to Increment-Yield tables and according to the Ordinance on forest management (Official gazette no. 111/2006). The researched stand falls into the management section of pedunculate oak, class IV. After determining growing stock using the sortiment tables of Croatian Forests Ltd. Zagreb, the future value of the forest on the end of rotation period was determined by application of the method of present yield value. The value of the stand at the end of rotation period is 12012,53 €/ha (Formula 2). Based on the field survey and the marking of the "ecological" functions of forest, the respective forest is marked with 31, and according to the Ordinance its value is 56375.83 €/ha.

Table 3. Value of forest sortiments for 1 ha, compartment 2a, at age of 49 years
Tablica 3. Vrijednost šumskih sortimenta za 1ha, odsjek 2a, u 49-toj godini starosti

Tree species *Vrsta*	Assortment Sortiment	Percentage[%] *Udio[%]*	Assortmentm³ *Sortiment* m³	Stumpage price [€/m³] *Vrijednost sastojine*	Price [€] TOTAL *Ukupna vrijednost*
Sessile oak *Hrast kitnjak*	t2	19	28,390	41,87	1.188,59
	t3	6	8,965	25,60	229,51
	to	5	7,471	20,53	153,40
	pd	57	85,169	12,93	1.101,52
Common beach *Obična bukva*	to	0,015	0,704	15,20	10,70
	pd	0,935	43,898	12,93	567,75
Hornbeam *Grab*	pd	0,96	17,126	13,87	237,49
Other broadleaves *OB*	pd	0,9216	0,802	13,87	11,12
					3.500,08

T2 – second class sawn wood; t- third class sawn wood; to- thin sawn wood; pd – fuel wood
t2- pilanski trupci druge klase, t3- pilanski trupci treće klase, to- tanka oblovina, pd- prostorno drvo

For the needs of calculations the percentage of wood sortiments has been taken from the current General forest management plan. For a detailed calculation the present and future distribution of trees per diameter classes should be taken into consideration. The calculation may also include the wood debris that could be used as energy wood.

By applying different interest rates a figure of 0.5495% was calculated, due to the fact that it fulfils the conditions defined by discounting and capitalizing. Based on the formula (3) the discounted value of costs of establishing the stand (reduced to the beginning of the rotation period) is presented.

$$(3)\ C_0 = \frac{C_n}{\left(1+\frac{r}{100}\right)^n}, 6223,64Eur = \frac{6944,53Eur}{\left(1+\frac{0,5495}{100}\right)^{20}}$$

Based on a formula (2) the capitalized value on the end of rotation period (120 years) is calculated

$$(2)\ Cn = C_0 \cdot \left(1 + \frac{r}{100}\right)^n, 12012{,}53 Eur = 6223{,}64 Eur \cdot \left(1 + \frac{0{,}5495}{100}\right)^{120}$$

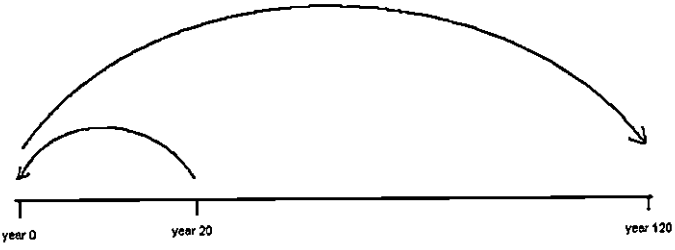

Figure 1. Determining the interest rate by discounting and capitalizing
Slika 1. Utvrđivanje kamatne stope diskontiranjem i kapitaliziranjem

For the management class of pedunculate oak the Ordinance on forest management proscribes a rotation period of 120 years. According to this statement the time of compounding equals to 71 year. When assessing the future value it should be taken into consideration that the stand was up to its 49th year managed by the principles of regular management, and for the purpose of this article it is presumed that all future management activities are prohibited. Literature review did not find a model by which the costs that occur when the stand surpasses 120 years, although the model of infinite rent can be applied (Leppanen, 2005). By using the calculated interest rate we can get future values of invested funds (Table 4)

Table 4. Determining the interest rates
Tablica 4. Utvrđivanje stope složenog ukamaćenja

Discount factor [%] *Šumarski kamatnjak [%]*	Present value *Sadašnja vrijednost*	Future value *Buduća vrijednost*
0,5165	6.264,64	11.624,62
0,5220	6.257,79	11.688,40
0,5275	6.250,94	11.752,53
0,5330	6.244,11	11.817,00
0,5385	6.237,28	11.881,83
0,5440	6.230,46	11.947,00
0,5495	**6.223,64**	**12.012,53**
0,5550	6.216,84	12.078,42
0,5605	6.210,04	12.144,66
0,5660	6.203,25	12.211,27
0,5715	6.196,47	12.278,23

Although the researched stand is in the development phase of a young stand, according the data available from the Forest management plan there were no thinning operations in it, and thus there were no revenues. For that reason it was not necessary to capitalize revenues of thinning in the end of rotation period, and it was not necessary to discount its costs in the beginning of the rotation period. Stands in

which thinning was done have a more complex calculation of interest rates due to the multiple discounting and capitalizing of costs and revenues at different time intervals.

$$(1)\ NPV = \frac{Cn}{\frac{U_{N-n}}{\frac{r}{100}}}, 30789,32Eur = \frac{12012,53Eur}{\frac{71god}{\frac{0,5495}{100}}}$$

By usage of the formula (1) the value of a single payment for 1 ha in the "EEFS" Dotršćina, compartment 2a, is 30789.32 €. In the final value the "ecological" functions of forests were not taken into consideration due to the fact that the forest and the forest land does not change its ownership, and that the economical function was replaced by the protection function.

CONCLUSIONS
ZAKLJUČCI

Because of different characteristics of forest stands, the presented method of calculation must be applied individually for each stand, and then subsequently for the entire forest. In case that the forest taken into consideration is managed by an uneven-aged regime, it is necessary to make alterations to the model. The amount of single payment to compensate for the inability to perform felling activities is almost three times larger than the value of the forest determined by the method of current felling value. The reasons for this discrepancy are the "ecological" functions of the forest. The analysis presented in this paper did not take into consideration these "ecological" functions, because they are not affected by the payment system that compensated forest owners their loss of forest management rights.

The presented model has its limitations. First, the model assumes the halting of active management of the forest compartment, which in practice is not a common case. Most of the measures prescribed for forest areas that fall within Natura 2000 network have management recommendations that affect "normal" management regime in a manner that they limit the allowed time span of forest activities to the intervals in which the sensitive stages (like breeding) of species and habitats of EU importance are not disturbed. Other type of management recommendations favours activities by which the conservation status of habitats is improved (like continuous grazing of mountain pastures), or certain ecological requirements are added to forestry activities (like silvicultural activities which take care of the diversity of forest edges). All these cases require its own specific approach to calculation, and all of them would have their calculated values smaller that the one presented in this paper.

Also, the presented model assumes single payment. This would be hard to implement in practice owing to difficulties in securing long term status of prescribed management. For this reason most of the EU countries use a system of long-term contracts (e.g. 30 years). On the level of EU 25 the average annual cost of implementation of the Natura 2000 network for all types of land cover is 63€/ha (Gantioler et al, 2010). Introducing a single payment is applicable to higher, regional level for a certain measure or a habitat type. Due to the changes in ownership or inheritance, it is probable that most of the forest owners would accept a single payment system. The transaction costs of drawing up a contract and determining payment for a single private forest owner are too high. Such contracts are applicable only to forest owners with relatively large forest lots, where it should be strived towards an active management system which has for a goal the improvement of the conservation status of habitats and species of EU interest. On the basis of presented findings, it is difficult to apply the method for different habitat types. For these reasons it is important to conduct additional research and calculations on different management classes, so that the level of compensations for the loss of management right over forest under Natura 2000 for forest owners could be calculated.

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