ANTIMICROBIAL ACTIVITY OF ESSENTIAL OIL OF *PISTACIA LENTISCUS* GROWING IN FOREST OF BOUMERDES

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ABSTRACT

Pistacia lentiscus L. family (Anacardiaceae) is an evergreen shrub native to the Mediterranean region and Middle East. The leaves of *P. lentiscus* (mastic tree) *P. lentiscus* samples were collected in October in a forest ecosystem of northeastern Algiers (Khemis El Khechna).The leaves were air dried in a shadowy place, then ground into powder. The essential oil from the leaves of *Pistacia lentiscus* grown in Algeria was obtained by the hydrodistillation method, separating the components of the extracts was performed by the method of thin layer chromatography. We conducted microbiological tests on gram-positive and gram- negative bacteria, on fungi and yeasts. His action is more important yeast *Candida albicans* and *Aspergillus niger* mold whose growth was strongly inhibited in comparison with bacterial strains.

Keywords*: Pistacia lentiscus,* essential oil, forest ecosystem, Algeria, bacteria and fungi

ANTIMICROBIAL ACTIVITY OF PHENOLIC EXTRACTS OF FLOWERS *CALENDULA OFFICINALIS* CULTIVATED IN ALGERIA

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ABSTRACT

The concern is one of the best known plants by Western herbal medicine, the petals of its flowers are effective in case of inflammations and skin irritations, for their healing and antiseptic properties prevent the risk of infection and speed healing. The concern is also a purifying and detoxifying that are prescribed in tinctures and infusions to treat chronic diseases plant. The plant material used consists of *Calendula officinalis* flowers was collected in April 2013 in Algiers region Dergana. The results of this study show that *Calendula officinalis* is rich in total polyphenols, is 12.63 g. Saponins have a yield of 20.76 %. Antimicrobial activity is manifested by the appearance of inhibition zones around the disks impregnated with active ingredients. While the latter was moderately *Staphylococcus aureus* and inhibitrrice for *Bacillus subtilis* is a diameter (24-26mm). In other *Pseupdomas aeruginosa* and *E. coli* showed no sensitivity so they are resistant to extracts of *Calendula officinalis* flowers.

Keywords: *Calendula officinalis,* polyphenols, saponins, Antimicrobial Activity

CHANGES OF CHEMICAL CHARACTERISTICS OF FOREST SOIL AND BIOMASS OF *PICEA ABIES* (L.) KARST. SEEDLINGS AFTER SINGLE WOOD ASH APPLICATION

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ABSTRACT

Wood ash produced by heating plant which incinerate only chemically non-contaminated dendromass, is possible to use in forests to improve soil characteristics and input elements back to the soil. The paper is focused on changes in nutrients (Ca, P, Mg and K) and heavy metals content (Cu, Fe, Mn, Zn, Pb and Cd) in forest soil as well as biomass of juveniles of Norway spruce (*Picea abies* (L.) Karst.) after single wood ash application. Needles and stems of 2 – 3 years old spruces were analyzed. Wood ash was applied in autumn 2010 in the central Slovakia. In the forest was used grate ash in amount of 5 $t.ha^{-1}$. Spruce biomass as well as soil samples were collected during vegetation period 2011. Results show increased content of all analyzed nutrients in spruce juvenile biomass and no significant input of heavy metals to forest soil.

Keywords: wood ash, juveniles, *Picea abies,* nutrients

CLIMATE CHANGE IMPACTS ON THE FOREST LANDSCAPES OF CENTRAL PART OF SMALL CAUCASUS

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ABSTRACT

The main purpose of this work is to determine climate change impacts on the forest landscapes of central part of Small Caucasus. The research is based on the Concept of spatial-temporal analysis and synthesis of landscapes, developed at Tbilisi State University under the guidance of Prof. N. Beruchashvili. In the work mainly are used field materials, gathered in different landscapes of central part of Small Caucasus and, also forestry data, scattered in different scientific and statistical sources, etc. During forwarding, about 300 filed plots were described and analyzed practically in all sorts and kinds of a landscape.

The impacts of climate change were valued considering 3 main parameters, such as the change of forest area, the degree of fragmentation of landscapes and the productivity of vegetation.

This region, which is not rather well investigated from point of view of climate change, encompasses approximately 5.4 thousand sq km. It is represented by 4 types, 6 sub-types and 9 genera of landscapes. The most area of forests is concentrated in middle-mountain landscapes with prevalence of beech and dark-coniferous species, which occupies roughly 20 % of total area of region.

Landscape approach allowed determining modern condition, forest productivity trends and risks of change to climate change of different landscapes. The special place is assign to determining productivity of forest landscapes according to different daily geo-conditions, which give possibility to fix quite exactly the resources of phytomass in different landscapes and its dynamics. In this term, a high risk landscapes occupies rather big territory, therewhy reveal its risk to climate change is one of the main scientific result of research. Here are analyzed the mutual interaction between forest valuation parameters and some physiographic factors.

On the complex analysis the degree of sensitivity of landscapes was determined. The middle- mountain forests are characterized by low and very low sensitivity, but here are areas with high risk to climate change. The research has allowed allocating two territories, which are offered to give the status of a protected landscape. Conditionally these territories refer to Dzama and Bevretiy areas.

Keywords: Climate change, Landscapes approach, Forest landscapes, Small Causasus

DEPENDENCE OF FILTRATION COEFFICIENT OF FOREST SOILS TO ITS DENSITY

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ABSTRACT

The aim of the study is to obtain the variation range of the filtration coefficient of the upper (organic) forest soil layer with its density change caused by harvester and logging machines traffic. This article presents laboratory results of the Filtration coefficient of forest soils to its density. The studies were carried out in the laboratory of the Department of Logging Technology jointly with the Department of Timber Land Transfer, St. Petersburg State Forest Technical University named after S.M. Kirov. Hundred samples of soil picked in summer period 2013 near LLC «Kirishi-LESPROM» in the Leningrad Region were tested. Experiments were carried out according to standard methodology regulated by RF State Standard. Hundred soil batches, each is about 400g in the dry state, were investigated. Dependence of Filtration coefficient of forest soils to its density was acquired with and according to experimental data results. As well as filtration coefficient variation limit was assign. This article presents regression relationship valuation of organic forest soil filtration coefficient. Regression relationship is based on experiment`s outcome and presents as exponential function. As well confidence interval limit (p = 95%) for the filtration coefficient is assigned.

Keywords: soil compaction, filtration, forest management ecoefficiency

ECONOMIC TOOLS OF MULTIFUNCTIONAL FOREST MANAGEMENT IN THE SLOVAK REPUBLIC[1]

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ABSTRACT

Forestry, due to its specifics, is highly affected by special conditions resulting from the nature of production processes as well as from the external impacts, including legal statutes. The main objective of the Slovak forest policy, which is based on the EU Forestry Strategy, is to provide sustainable multifunctional forest management. The multifunctional forest management shall harmonize fulfilment of different forest functions, such as production, ecological and environmental functions. In order to secure such management, it is necessary to create suitable economic conditions. This paper analyses the system of support of multifunctional forest management in the Slovak Republic, using the set of legal provisions together with the direct financial support at the national as well as international level. Considering legal provisions, the measures for decreasing the tax burden of forest enterprises are analysed. Then, the principles of direct financial support from the SR state budget as well as from the EU sources are described. To conclude, it is possible to state that the Slovak Republic does not dispose of sufficient economic environment in order to provide fulfilment of all forest functions at the appropriate level.

Keywords: multifunctional forest management, forest enterprises, financing, economic tools

FLORISTIC COMPOSITION OF THE FORESTS OF ÇIÇAVICA MASSIF MOUNTAIN (SOUTHWESTERN PART)-REPUBLIC OF KOSOVO

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ABSTRACT

Çiçavica mountain massif presents an interesting region within the flora and vegetation of the Republic of Kosovo. Is Located almost in the central part of Kosovo, and on the western edge of the Valley of Kosovo as a natural border between the Valley of Kosovo and Drenica. Southwestern part of Çiçavica has an area of 12.26 km^2, while the altitude ranges from 540 m (Grabovc i Epërm) to 1091 m (the highest peak of the massif). Geological base of the Paleozoic formations, diverse pedology and middle continental climate are important factors for floristic composition of the explored forest territory. Although during the past two decades in these forests was evident negative actions of anthropogenic factors, they are in a relatively good condition and especially during the last years are observed good positive actions in the management and sustainable use of them. Analyzed in the floristic aspect, explored terrain is represented by all groups of vascular plants dominated by the *Magnoliophyta*. From the phytocoenological aspect, the vertical extension of Çiçavica mountain massif (Southwestern part), from the foot to the top of the mountain, we concluded this stretch of forest vegetation represent deciduous forests of *oak* (*Quercus*) and *beech* (*Fagus*) which belong to class *Querco-Fagetea* respectively of orders: *Quercetalia pubescentis* and *Fagetalia sylvaticae*.

Keywords: Flora, Vegetation, Forests, Kosovo, Anthropogenic factor.

FOREST MANAGEMENT AT THE UPPER TREELINE IN JESENIKY MOUNTAINS (CZECH REPUBLIC)

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ABSTRACT

The paper deals with forest ecosystems and their management at the upper tree line in study area Jeseniky Mountains (east part of the Czech Republic). This mountain area (1100 - 1350 metres above sea level) is considered as future national park and this fact is the reason of wide scientific discussion about forest management at the upper tree line in the frame of conservation biodiversity of mountain forest ecosystems. Based on analyse of history and current state of mountain forest ecosystems in this study area, authors formulate principals for forest management of future national park Jeseniky in the frame of targets of Natura 2000 European network.

Keywords: conservation targets, mountain forest ecosystems, Natura 2000, spruce forests.

IMPACT OF IMPROVEMENT FELLING ON SOIL CARBON CONTENT IN COMMERCIAL FOREST STANDS (NORWAY SPRUCE MONOCULTURE)

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ABSTRACT

Most European forests are used for commercial purposes. Spruce monoculture stands cover about 66% of total Czech forested area while 25% are broad-leaved forests. Due to their extent, monocultures play an important role in the context of global climate changes. The CO_2 exchange between soil and atmosphere is one of the most important components of the carbon cycle in forest ecosystems is the CO_2 exchange between soil and atmosphere. Hence, forestry management has the potential to change the CO_2 flux in forests and the sink of CO_2 in forest soils. The objective of this study was to analyze and compare soil respiration in a Norway spruce (Picea abies (L.) Karst.) plantation during the 2010 and 2011 vegetation seasons (April to November). The research plots were located in the Drahanská vrchovina Highlands (at the eastern edge of the Bohemian Massif). In the Czech Republic, optimum conditions for cultivation of Norway spruce stands were found here (at altitudes of 600-700 m). Measured soil respiration data and other soil characteristics were evaluated in young monoculture stands subjected to different kinds of forestry management. In spring 2010, we carried out two kinds of thinning of: 1/ subdominant trees in one stand; 2/ dominant trees in the other stand. The average amount of carbon released from the soil of the first stand was within the range of 8.0 – 11.2 $t.ha^{-1}$ while from the other stand it was within the range of 10.0 – 10.28 $t.ha^{-1}$. The respiration rates measured at 10 °C were, respectively, 3.73 $\mu mol.m^{-2}.s^{-1}$ in and 2.95 $\mu mol.m^{-2}.s^{-1}$.

INSTALLING FOREST VEGETATION ON DEGRADED LANDS, A SOLUTION FOR A SUSTAINABLE MANAGEMENT

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ABSTRACT

At European level, one of the methods indicated and supported by law consists in ecological reconstruction by afforestation of degraded lands. Also, forest vegetation is recommended for the protection of a special category of lands. More often than not, putting this into practice is difficult, and the complete success of a certain action is conditioned by its efficient organizational management. It is worth noting that considerable expense is involved in installing forest vegetation, starting from land preparation for planting and going to tree consolidation, especially on lands degraded by human actions, where the risk of compromising the vegetation is very high. In addition, it is impossible to give general and complete technical solutions regarding the installation and maintenance of forest cultures, as it is impossible to give any guarantees for their effectiveness. Still, many projects of this sort have enjoyed real success, with degraded lands reinstated into the productive circuit. Thus, the observations made in these locations, for forest crops already installed, can offer local and particularized solutions and valuable information to the managers of similar projects.

The area under analysis is approximately determined by coordinates 44o54'08'' - 45o10'23'' north and 21o47'15'' - 21o58'43'' east, in production unit III Steierdorf, Semenic Mountains, Romania. The production unit covers the upper Minis valley, and the total surface of the land, on land use categories, according to the records in 2003, is 190.1 ha. We identified mine dumps, and in the neighbourhood of our research areas, the soils were cambisols with two subtypes, according to the Romanian Soil Taxonomy System. Of this land, 63.5 ha is degraded land, 7.6 ha are not productive, 2.6 ha are represented by forested slopes, 116.4 are covered by forests, and 64.2 ha represent land to be afforested. In terms of climate, the average temperatures in winter range from -17o C to 4.8o C, and in summer are between 12o C and 18o C. The unit comprises stations that have not been affected by degradation, covered by forest vegetation specific for hills and mountains, but also an area that has strongly been affected by degradation generated by human activity.

Keywords: degraded lands, management, dumps, afforestation, sustainable development

LAND USE EFFICIENCY IN FORESTRY IN LATVIA

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ABSTRACT

The research aim is to assess indicators of use of forest land (FL) in the administrative units of Latvia to identify opportunities for the intensification of exploitation of FL. In Latvia, forest land occupies 3.3 million hectares (ha) or 52% of the total area, which determines the need for the efficient use of it. To precisely identify the relationships between the indicators of FL, a factor analysis was carried out. The results show that the situation with the use of FL in 511 Latvia's parishes is different. Approximately in half of the parishes, the indicators of FL use correspond to the average in Latvia, yet, in a third of Latvia's parishes, these indicators are very low, which indicates extensive and non-commercial forestry that might be improved in the future.
Keywords: forest land, efficiency, indicators, parishes

MAPPING BASED ON DEAD WOOD AVAILABILITY.

LOCATING BIODIVERSITY HOTSPOTS IN MANAGED FORESTS

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ABSTRACT

The main objective of this work is to investigate the suitability of dead wood accumulation in managed forests to act as a viable indicator of biodiversity clusters. In the context of modern forestry, sustainability needs constant evaluation and monitoring through various indicators and methods. Dead wood abundance is regarded as one of the key indicators for biodiversity and forest health under the MCPFE Criterion 4. In the present study various dead wood sampling methods are examined in order to design the optimum sampling protocol to assess biodiversity in a managed Mediterranean forest. In general terms, dead wood can be defined as "*above and below ground*" woody detritus, [1]. In order to simplify the sampling procedure, dead wood below ground as well as dead wood attached to living trees is excluded from inventory since it presents a great difficulty in quantifying [1]. The dead wood which is taken into consideration is above a certain diameter limit and is commonly referred as Coarse Woody Debris (CWD). Suitability maps for biodiversity conservation purposes can then be produced through CWD interpolation with a second forest biodiversity indicator using the clustering tools of a Geographic Information System (GIS). Modelling potential distribution of biodiversity hotspots and production of suitability maps based on CWD presence for further enhancement of sustainability in managed forests, can be achieved through GIS analysis and modelling, in correspondence to habitat suitability models generated for single species in specific areas.

Keywords: dead wood indicator, suitability models, managed forest, biodiversity hotspots, GIS

MASS LOSS AND THE MEASUREMENT OF BEECH AND OAK PULPWOOD MOISTURE CONTENT

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ABSTRACT

The purpose of this paper is to determine beech and oak (sessile oak and oak) pulpwood mass loss as a result of its drying on a storage period of three months and to establish a measurement methodology of its moisture content. During the storage period wood mass decreased by 16...26.48% in beech and by 9.81...18.42% in oak species. The measurement methodology of wood moisture content involves the following aspects: (i) choosing the method of moisture content determination (with the electric humidometer or by drying in the oven); (ii) size and setting up of a batch of sample logs and (iii) extraction place for wood slices. As far as the first aspect is concerned the method recommended for determining stacked wood moisture content is the one by drying in the oven. The batch size was determined statistically according to the variation coefficient of the number of logs from the stack and according to the stack surface. A number of 19 logs for beech and of 22 logs for oak species is usually sufficient for determining wood moisture content in stacks with a surface ranging between 10 and 30 m^2. With regard to the wood sample extraction place, research has demonstrated that the moisture content measured in the section situated 10 cm away from the ends of logs is representative for the moisture content of the entire log.

Keywords: European beech, oak, pulpwood, mass loss, moisture measurement

NEW APPROACH FOR FOREST PRODUCTION STOCKTAKING BASED ON ENERGY COST

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ABSTRACT

This article is devoted to energy intensity assessment of different species production of forest use. Summary data on forest stands` biomass of pine, spruce, birch and aspen is presented. It is obtained by analysis of reference data for the conditions of the North-West Russia. Using the data on the relative moisture in freshly-cut state, estimates of dry biomass amount per 1 ha of forest area depending on site class and specie are obtained. Also it is analyzed the "energy cost" of dry biomass per 1 ha of forest area depending on stand` site class and specie. According to data analysis on the progress of model stands growth for the conditions of the North-West Russia the dynamics of maximum "energy cost" changes for Ia site class is obtained. The analyze shows that in term of environmental (energy) efficiency preferably to make crop rotation of deciduous to soft-leaved. It is also assessed "energy cost" of biomass concentrated in different parts of the tree which has reached the age of maturity (120 years for deciduous and 60 for broadleaved species).

Keywords: stocktaking, energy consumption, wood biomass energy

PHYTOGEOGRAPHIC AND SYNECOLOGICAL ANALYSIS OF SOME ASSOCIATIONS IN FOREST STEPPE AND OAK FORESTS ZONE OF MOLDAVIA, ROMANIA

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ABSTRACT

Composition analysis of bioforms and geo-elements of phytocoenoses of Aceri tatarico – Quercetum roboris Zólyomi 1957, Piptathero virescentis – Quercetum dalechampii – Carpinetosum orientalis Chifu, Sârbu and Şerban 2004 and Lathyro venetus – Fagetum Dobrescu et Kovacs 1973, Chifu 1995 nom. novum, provides data on the evolution of ecological relations of a region over time, and also about migrations of species from certain areas of origin and integration in groups of the type specified. Synecological analysis reveals particularities related to the systematic of plant groups, but also to the geographic area of the stations. Thus, for the moisture factor there is a spread in the xero-mesophytic – mesophytic domain in the association of pedunculate and downy oak forest with maple and clear quartering in the mesophilic domain in the other two associations; temperature factor analysis indicate for the three associations a single ecologic group (mesotherm domain) and the trend to thermophily by the pedunculate and downy oak with maple phytocoenoses; soil chemical reaction factor indicates for the sessile oak with common beech phytocoenoses and the common beech with silver linden ones, lime acid soils; soil trophicity factor reveals a greater diversity among pubescens and downy oak with maple phytocoenoses and sessile oak with common beech phytocoenoses and some uniformity between the common beech with silver linden phytocoenoses. Synecologic analysis of phytocoenoses groups allow more complex interpretations within the association.

Keywords: forest associations, bioforms, geo-elements, synecological analysis

PROFITABILITY ASSESSMENT OF THE OYSTER MUSHROOM CULTIVATION ON CHOSEN WOOD SPECIES IN CONDITIONS OF THE FORESTRY PRACTICE

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ABSTRACT

The current article presents the results of an economic evaluation of a large-scale experiment aimed at testing the possibility of using different species of wood-destroying fungi targeted for degradation of different wood fractions and evaluating the fruiting bodies production of these fungi. Especially, we focused on the economic evaluation of the fruiting bodies of the oyster mushroom *Pleurotus ostreatus* (Jacq.) P.Kumm. production inoculated into beech (*Fagus sylvatica* L.) wood blocks for the period of five years. Economic return has been measured by dynamic indicators of the investment projects evaluation. Results of the net present value (NPV=798.80€), as well as the profitability index (PI= 2.52), and discounted payback period (DPP≈ 2years) point at the high profitability of such project type in given conditions.

Following the achieved results, we can make a statement that proper use of the abilities and attributes of wood-destroying fungi in given operating environment leads not only to enhancement of growth conditions for forest trees, to reinforce of the forest stands stability, but also to another option of generating the incomes from forest management.

Keywords: oyster mushroom, economic return, profitability, forestry practice

REGIONAL ANALYSIS OF ENVIRONMENTAL AND CLIMATIC HAZARDS FROM THE PERSPECTIVE OF EFFECTIVE FOREST MANAGEMENT

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ABSTRACT

The paper presents a conceptual approach to risk assessment in the sphere of forest management at a regional level, as well as the results of pilot testing this technique on the example of forest-swamp zone of Western Siberia. The study designated those natural factors from the entire ecosystem, that could be dangerous for the investigated business entity or its activity and might also lead to the degradation of forest ecosystems; the sources, form, structure and parameters of natural hazards were identified. Integrated indicators were developed, characterizing the degree of negative impact from the factors of different origin on the condition of forest stand and the efficiency of logging and forestry operations. The values of ecological and forest resource potential were calculated. Preliminary assessment of risk based on the variable characteristics of the hazards structure was conducted, including the impact on forest management and forest potential levels in the Tomsk Oblast.

Keywords: forest resource potential, risk assessment, forest ecosystem

SOFTWOOD HARVESTING AND PROCESSING PROBLEM IN RUSSIAN FEDERATION

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ABSTRACT

Presented article provides an overview and analysis of softwood harvesting and processing problem in RF. Research is aimed to show that for RF timber industry effectivization is to be focused on new technical and technological developments for softwood harvesting and processing on timber yards of logging companies. Factors affect on timber industry development analyzed in this work. It has been shown in the article that the main factors are: collapse of science, research and design organization; decline in domestic logging machinery; stagnation of wood and paper-based domestic market, which, according to economics, can consume in 2- 2.5 times more than currently; backlog in timber processing technology, particularly for softwood spices. Factors affect change of natural conifer timber stand to softwood in next generations are also analyzed. Information on changes that have been occurred over the last 70 years in the RF forests is presented. It is notably associated with changes in the average species composition formula in favor of softwood subsidiary crop that are replacing the coniferous stands in natural gen. It is shown that, for example, according to Vologda Region Forest Plan data (2007), for the period from 1961 to 2006, the area stands with a predominance of conifers in this region decreased by 9.3 % due to the spruce. There is information about softwood stand increase (37.6 %, due to birch and aspen, grown up on spruce felling site). A decrease in the area of coniferous stand in Russia was the result of its intensive use and further natural reforestation of felling with birch and aspen. It is shown that due to the poor use of birch and aspen stands and intensive use of conifer stands, area of mature and overmature conifer stands decreased by 16.1% and its growing stock- by 24.7 %. At the same time softwood mature and overmature stands increased by 208.1 %, and their stock - by 297.6 %. Analyzing Forest Plans of other RF Regions authors confirm that this trend is typical for all developed forest area.

Keywords: softwood harvesting, sustainable forest management, forest stands dynamics

SURFACE FOREST FUEL SPATIAL AND VOLUME DISTRIBUTION – CASE STUDY FROM SLOVAKIA

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ABSTRACT

In the paper we introduce the results of mapping and spatial analysis of volume [t.ha-1] distribution of particular fuel types in the forests of the Slovensky raj National Park that were affected by a fire in 2007. To map and quantify the particular fuel types in study area we used the Trimble GeoXT device to record the position of individual study plots, which the weight and the height of particular forest types (layers) were measured on. Data measured were processed in ArcGIS Desktop 10 environment. Results were saved in tables and raster layers with the spatial resolution of 2 meters. These results contain information on volume of surface forest fuel types in different types of terrain. The most of fuel was stored in valleys with lower value of curvature, and the least of fuel was stored in ridge positions with higher value of curvature. We introduce also the values for different altitudes, aspects and slopes. The information on forest fuel distribution and its volume is required as input information for modeling of forest fire behavior in the majority GIS based fire behavior models, e.g. FARSITE, FlamMap. To know the behavior of forest fore ahead is a very good prerequisite for planning of effective fire preventive and mitigation measures to protect the human lives, their property, but also environmental and economic interests and values.

Keywords: fire modelling, forest fuel, GIS, mapping, Slovensky raj National park

THE COPPICE FOREST MANAGEMENT IN THE ECOLOGICAL NETWORKS IN CENTRAL EUROPE

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ABSTRACT

Floodplain forest ecosystems along lowland rivers in Central Europe were subject to long-term and strong human impacts. In history, floodplain forests were usually managed using the coppice-with-standards silvicultural system. Therefore, floodplain forests are valuable habitats with respect to its biodiversity. Rich biodiversity is the main reason of including of the most of floodplain forest ecosystems to ecological networks in lowland landscapes along big rivers. Currently, historical coppice-with-standards management is considered to be appropriate for floodplain forests, which formed core zones of ecological networks in lowland areas. This paper presents case study about applying coppice-with-standards management to ecological network from the Czech Republic taking into account conservation targets of Natura 2000 European network.

Keywords: biodiversity, coppice-with-standards, ecological network, floodplain forest.

THE EXTERNAL DEFECTS AND THE PARTICULARITIES OF THE TREES CROWNS LOCATED INTO THE GREEN AREAS OF BRAŞOV

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ABSTRACT

The analysis of the defects detected at the standing trees, located into localities, is very important because in this way it can highlight potential risk at the mature trees, especially at those who are isolated and whose growth is influenced to a large extent by human intervention. Besides the indisputable beneficial effects of the trees, a green areas indispensable component of the localities, they, after a certain stage of development, may present a very high potentially of risk in areas where they are located. Potential level of risk is given in a largely of morphological features of trees reached adulthood.

Based on this finding the authors have proposed to highlight some features of the defects and to study the asymmetry of the crowns for the trees located on streets, in the Braşov city. In the conducted research was included a batch of 259 trees of next species: common linden (*Tilia cordata* Mill.), Norway maple (*Acer platanoides* L.), sycamore (*Acer pseudoplatanus* L.) and horse chestnut (*Aesculus hippocastanum* L.).

From the results of the research it must be specified that the highest frequency of curvatures and knots appears at *Acer pseudoplatanus*, and the highest frequency for ovality, forking, hollows and frost-crack at *Acer platanoides*.

Regarding the crown asymmetry it was found that the ratio between the maximum radii length and minimum radii length of a tree is between 3.68 and 9.57. This aspect associated with the greater values of standard deviations, in many cases greater than 40% , leads to the conclusion that this parameter should be analyzed by taking into account other influencing factors.

Keywords: defects of the trees, asymmetry of the crown, the radii of the crown.

THE IMPACT OF POLLUTED RIVER SITNICA IN FLORA AND VEGETATION AROUND THE RIVER

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ABSTRACT

During the year 2012-2013 we have investigated the vascular flora along the Stream of Sitnica River, in particular woody plants, bushes and Liana (Liane) that dominates and establish the associations of which most important are associations: *Salicetum Elbe fragilis* and *Salici -Populetum Nigeria.*

Sitnica River enters under a slow flow rivers and passes through the localities that are heavily influenced by the anthropogenic and industrial pollution. This river originates in the village Sazli and traverses about 90 km of the territory of Kosovo until the spill into the river Iber.

The purpose of this study has been the investigation of vascular flora along the river flow Sitnica, the impact of polluted river water in the flora and vegetation and the impact of these plants on environmental protection.

To investigate the impact of polluted river water Sitnica flora and vegetation that grows in the area attacked by contaminated water we have researched heavy metal accumulation of these plant species: *Typha angustifolia* L., *Urtica dioica* L., *Ranunculus sardous* Crantz., *Rumex Crispus* L. Plant species surveyed are taken during the vegetative stage, while heavy metal analysis is done in the laboratory. The method of attack against: Tackling was conducted in microwave with HNO_3 + H_2O_2 mixture in accordance with the instructions of the device manufacturer.

Keywords: Sitnica River, Pollution, Typha angustifolia, Urtica dioica, Ranunculus sardous, Rumex Crispus.

THE NATIONAL NATURE RESERVE HRONČECKÝ GRÚŇ (THE SLOVAK REPUBLIC) – STATE AND DEVELOPMENT OF THE FOREST STANDS

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ABSTRACT

The National Nature Reserve (NNR) Hrončecký Grúň is situated in Central Slovakia in the Poľana Mountains, and from the viewpoint of nature protection it belongs to the Protected Landscape Area Poľana, which is included among the Biosphere Reserves of UNESCO. The natural forest is composed of seven climax woody species with high qualitative and quantitative production abilities: European beech (*Fagus sylvatica* L.), European ash (*Fraxinus excelsior* L.), sycamore maple (*Acer pseudoplatanus* L), Norway maple (*Acer platanoides* L.), wych elm (*Ulmus glabra* Stok.), Norway spruce (*Picea abies* L. Karst.) and silver fir (*Abies alba* Mill.).

Evaluating the health status of plants is done on the research transects that were stabilized in 1991 at the characteristic of each subcompartment and at that time were made up of 100 live trees. The assessing the health status of the trees was followed according to the rules of paneuropean monitoring, and one of the most important indicators of the vitality of the tree is considered to be the loss of leaves or needles - defoliation. The largest decrease of the living trees was recorded for elm (95.7%), it is also great for a fir (46.2%), spruce (40.9%) and ash (39.6%). The smallest loss of trees recorded beech (23.7%) and sycamore (25.5%). Similar ranking of trees may be generated in the evaluation of defoliation.

An important element in a comprehensive assessment of the status and prospects of forest stands and the future remains spectrum valuation species of higher fungi. The overall share of the wood-inhabiting species is up to 63%, of which parasitic species constitute more than 23%. Saprophytic species have available a huge amount of substrate from dead trees and parasitic species in turn the amount of physiologically weakened and mechanically damaged trees. Occurrence of terrestrial, especially mycorrhizal fungal species, however, compared decaying fungi significantly lower. Mycorrhizal percentage reaches only about 18%. The main reason is probably declining vitality of mature trees and lack of natural regeneration.

It is evident the tendency of the elm dieback, as well as moderate ill-health hardwoods, mainly ash and relatively peaceful state of vitality of conifers.

Keywords: National Nature Reserve, health status, defoliation, macromycetes

THE PARTICULARITIES OF THE CROWNS FOR POPLAR TREES LOCATED IN ALIGNMENTS AND FORESTS

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ABSTRACT

The purpose of this paper is to analyze the main characteristics of the crowns of poplar that grows in different conditions. Thus, were studied 124 black poplar trees (*Populus nigra* L.) located in alignment and 124 white poplar trees (*Populus alba* L.) in the forest. The measured elements in the field (the stem diameter, the total height of the tree, the height of crown base and four rays of the crown) have been interpreted in such a way as to be able to determine the influence thereof on the crown-projection area. Following the interpretation of the results it appears that, in addition to the stem diameter, the conditions where the trees grow, plays a crucial role in the development of the crown.

Keywords: crown-projection area, the rays of the crown, height of the crown base.

THE POTENTIAL FOR COMPLETE BIOMAS UTILIZATION IN THINNING YOUNG STANDS OF NORWAY SPURCE

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ABSTRACT

In the northern hemisphere Norway spruce (Picea abies Karst.) as one of the most productive and fast-growing conifer species has long been cultivated over vast areas. According to the literature data the spruce plantations in Europe take up some 6 to 7 million hectares.

In the territory of present-day Latvia pure stands of spruce were established in woodlands already in the 19th century. Starting with the 1980s, spruce plantations for short rotation cultivation (till the age of 40 years) were on a larger scale established also in abandoned agricultural lands. Between 2000 and 2012, the area under similar plantations has reached 28,700ha. At first commercial thinnings at the age of 15 years the number of trees in the plantations is normally reduced to 1,500 stems•ha-1. In such a situation the major challenge is how to utilize the biomass thinned out. In the given study we have investigated the structure and amount of woody biomass that may be recovered in thinning 15-year pure stands of spruce.

According to the field data, the weight of above-ground biomass of one tree in 15-year pure stands of spruce is on average 142.9kg (100%), of which stemwood makes 65.7 kg (46.0%) and tree foliage 76.9kg (53.9%), respectively. The biomass of green branches comprises the fraction of needles (38.1 kg or 49.5%) and young shoots (7.2kg or 9.4 %), which in biomass studies is known as tree foliage. In 21 to 25-year pure stands of spruce the above-ground biomass of one tree weighs on average 372kg (100%), of which stemwood is 244.5 kg (65.7%) and tree foliage 117kg (31.5%), respectively

In similar spruce plantations the number of trees removed in the first commercial thinnings is 1,210 trees ha-1 with the yield of pulpwood 27.1m3ha-1, or stem biomass 21.5t ha-1, and tree foliage 17.8t ha-1. When thinning 21to 25-year plantations, on average 877 trees ha-1 are thinned out, with the yield of pulpwood 109m3ha-1, or stem biomass 86.3t ha-1, and tree foliage 21.6t ha-1. The profit calculations, when utilizing also tree foliage, show that in thinning 15 to16-year spruce plantations the gross profit is 1.8 times higher, compared to the case when only pulpwood is utilized. For 21 to 25-year plantations this increase in gross profit is 1.2 times higher compared to utilizing pulpwood alone.

Keywords: Norway spruce (*Picea abies* (L.) Karst.), plantation cultivation of spruce, above-ground biomass, stemwood, tree foliage, economic gain.

THE WAY TO REDUCE ECOLOGICAL IMPACT ON FOREST SOILS CAUSED BY WOOD SKIDDING

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ABSTRACT

This article regards logging machines impact on ground, consist of two layers: wood harvesting wastes (top layer) and skidroad soil (bottom layer). Authors propose mathematical model of rut formation, taking into account changes soils characteristic after machine passover, and the algorithm for rut depth calculation in case of multiple passover through same area . To determine rut depth, formed on run by logging machinery, strengthen with wood harvesting wastes, it is used two-layer ground compaction model under compressive load. According to modeling results regression equation is obtained, which allows to determine in practice soil relative compaction (and further formed rut depth), without complex calculations. Receipt equation takes into account the influence of average wood harvesting wastes layer thickness on soil deformation, as well as passover number along the route. Calculations are performed using author program for numerical solution of initial simultaneous equations. Comparison of calculation results with the results of earlier experiments demonstrate adequacy of the methodology for rut depth determination considering multiple passovers and strengthen wood harvesting wastes.

Keywords: forest soils, ecological affect, soil compaction, wood harvesting wastes

TIME TO CHANGE THE MANAGEMENT OF THE FOREST EXPLOITATION IN ROMANIA - A NATIONAL PRIORITY –

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ABSTRACT

The thesis, the statements, the observations and the solutions of the identified problems are based on the following: Experience in the logging for a long period in two specific savings of Romania: centralized economics in the socialist period and the market economy today, with a long transition between the two phases; Diversified experience in the forest culture field and exploitation from the position of the Manager at Forest Districts, County Forestry Department, local authorities, wood logging companies to higher education fields and forestry researchers; Experience of logging and wood working in the private companies, after socialist period until now, where we observe closely the developments in the forestry sector of activity; Diagnostic tests performed on the types of companies mentioned above; The Ph.D. thesis, published by the researchers, within the field of higher education; The analyzes and the results of the work of Foresters Association of Romania (ASFOR); The careful observation of the phenomenon and forest exploitation activities in Romania and Central and Eastern European countries, similar in terms of the social and economic organization in the period 1980-2013, in order to determine the best model on the basis of experience in this field. This research presents concrete forestry management' measurements to reduce and even eliminate the pressure of these companies (for their economical benefits) on forestry staff.

Keywords: forest exploitation, management, diagnostic tests, wood, logging companies

VALIDATION OF ECOLOGICAL EFFICIENCY ASSESSMENT FOR FOREST MANAGEMENT METHODOLOGY

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ABSTRACT

This article proposes a universal approach to estimate ecological efficiency for forest management. It is consist in comparison power inputs for wood production and its energy output. The aim of the study is validation of omnibus methodology that allows a unified approach to assess effectiveness and quality of forest management in different natural and industrial conditions.

This article discusses the most diffused opinion on harvesting quality - namely refuse of final harvesting with maximum possible preservation of main species undergrowth, in order to reduce the rotation period. Versus to previous authors show that undergrowth preservation on significant area is not profitable due to its poor development prospects, or due to its insufficient amount.

According to large-scale survey on cuttings in Western and Central Siberia 15 - 95% and sometimes 100% preserved and viable conifers undergrowth dies. Similar data were obtained on some loggings in Russian North- West Region, in particular, undergrowth waste (20 years age at felling time) over a five year period after final harvesting (Krestetsky Logging Enterprise) formatting in forb spart, small reed spart and spart-types was respectively 18.5 % , 57.3 % and 100 %.

Thus concludes that percentage of preserved undergrowth saved during logging can`t be a decisive quality criterion. Further shown that refuse of final harvesting, also can`t be a quality index for forest management.

As a universal quality index for forest management, that takes into account all the differences in the natural conditions and production location of timberland, is proposed efficiency energy index. It is shown that the evaluation of the energy "net cost" and assessment of obtained wood product energy "cost" does not cause methodological difficulties. Thus, difference between energy "net cost" (energy consumption at all phases of wood producing) and energy "cost" (energy output) of products can be considered a universal quality index.

Keywords: energy consumption, energy output, energy cost, forest management, ecoefficiency