

Prądnik. Prace Muz. Szafera	4	9–26	1991
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JERZY DZIEWOLSKI

Zakład Ochrony Przyrody i Zasobów Naturalnych PAN  
ul. Lubicz 46, 31-512 Kraków

**KIERUNKI PRZEMIAN DRZEWOSTANÓW W PARKACH  
NARODOWYCH POLSKICH KARPAT W WARUNKACH OCHRONY  
ŚCISLEJ I CZĘŚCIOWEJ**

**Directions of changes of forest stands in national parks of Polish Carpathians  
under strict and partial protection**

**ABSTRACT.** This paper contains the results of studies on forest stand characteristics, which change as a result of natural regeneration and economic rebuilding of forests. These forests had earlier' been deformed by overuse and improper management.

**KEY WORDS:** strict reserves, partial reserves, deformed forest stands, forest changes, native forest regeneration.

SUMMARY

Protected areas have been established on those terrains, which had been intensively utilized and improperly managed leading to extensive deformation of the stand structure. In mountain areas, spruce has expanded excessively, creating single species and evenaged stands, restricting the occurrence of fir, beech and other additional species and highly lowering the timber stock.

As a result of protection applied in national parks, some effects of forest regeneration are visible. Coniferous trees are receding so that deciduous species can expand (see fig. 1 and 3A). As to this, a regularity is visible on all forest areas investigated. On four out of six areas where changes in species composition were evaluated, spruce recession is compensated by fir and beech increasing, their participation. This is the direction taken by changes on areas evaluated earlier, but lately fir has shown some recession (see fig. 2). On the average, the share of spruce has decreased, while there is more fir and beech (see fig. 3 B).

Structural changes of stands take place by three processes: self-sown and undergrowth appearance, loss of trees during natural forest development, and wood up-growth. The complexity of the process is shown schematically in fig 4. The real values are taken from Pieniny National Park, from an area under strict protection on Trzy Korony massif, and from an area under partial protection in the western part of the national park (see tab. 1 to 4).

As an effect of different increment, up-growth and loss displayed by various species, species composition of forests (see fig. 8), tree diameter structure (fig. 5, 6) and stand volume (fig. 9) change. Assuming that the speed of changes will remain as it is, the shares of deciduous and coniferous species will become equal in between 10 and 20 years, and their volume – later on (see fig. 7).

These results confirm the assumption that national parks forests, strictly or partially protected, will gradually return to their native form. What is not so reassuring, however, is the weakening and recession of fir which has been taking place during the last decades. The stand volume loss is lately nearly equal to stand increment, which slows down the tree stock regeneration.

Prądnik. Prace Muz. Szafera	4	27–37	1991
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EWA SYMONIDES, BARBARA SOLIŃSKA - GÓRNICKA

Uniwersytet Warszawski  
Zakład Fitosocjologii i Ekologii Roślin,  
Al. Ujazdowskie 4, 00-478 Warszawa

**STRUKTURA POPULACYJNA DRZEWOSTANU W REZERWACIE  
LAS BIELAŃSKI JAKO WSKAŹNIK PRZEKSZTAŁCENIA BIOCENOZY**

**Population structure of forest stand of the Reserve Las Bielański as an indicator of biocenoses transformation**

**ABSTRACT.** This paper is concerned with the distribution, density and size structure of tree populations of the Reserve Las Bielański in Warsaw. Preliminary results suggest transformation of the forest stand, i.e. regression of *Alnus glutinosa*, *Ulmus laevis* and *U. campestris* populations and increase of population density and area size of *Carpinus betulus* and *Acer negundo*.

**KEY WORDS:** forest trees, size structure, spatial structure, population density, population recruitment.

SUMMARY

The paper reports on the distribution, density and size-age structure of the main tree populations of natural inland forest in Warsaw. The study area (94) was divided with the net of permanent geodetic points, located 100 m apart. The trees above 130 cm height were counted and trunk diameter were measured on 100 m<sup>2</sup> plots around each point; trees 51-130 cm height were only counted. Seedlings and individuals below 51 cm height were counted and measured on the eight 1 m<sup>2</sup> plots around each point.

The studies have shown: (a) regression of *Ficario-Ulmetum* flood-plain species: *Alnus glutinosa*, *Ulmus laevis* and *Ulmus campestris* (fig. 1 and 2), (b) great proportion of seedlings and juvenile individuals among *Tilio-Carpinetum* oak-hornbeam populations (fig. 3), (c) increase of population area of some oak-hornbeam species: *Carpinus betulus* and *Acer platanooides* and *Quercus robur* (fig. 4,5 and 6, respectively), (d) invasion and local expansion of alien tree species *Acer negundo* (fig. 7).

Results obtained suggest some significant transformation of the biocenoses structure (recession of flood-plain forest), influenced by a decrease in the ground water level (due to the neighbourhood of transport routes and housing estates), recreative exploitation of forests and close vicinity of parkways with alien tree species (Chojnacki & Mróz 1984, Solińska-Górnicka & Symonides 1990).

Prądnik. Prace Muz. Szafera	4	39–47	1991
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RÓŻA KAŻMIERCZAKOWA

Zakład Ochrony Przyrody i Zasobów Naturalnych PAN  
ul. Lubicz 46, 31-512 Kraków

**PRZEMIANY ZESPOŁU ŚWIETLISTEJ DĄBROWY W REZERWACIE  
KIATÓWKA NA WYŻYNIĘ MAŁOPOLSKIEJ W CIĄGU 25 LAT  
OCHRONY**

**The changes of the xerothermic oakwood *Potentillo albae-Quercetum* community in the Kwiatówka nature reserve on the Małopolska Upland during 25 years of protection**

**ABSTRACT.** During the last 25 years the multispecies layer of shrubs and younger trees of the patch of *Potentillo albae-Quercetum* has developed luxuriously causing the considerable impoverishment of a herb layer. The share of photophilous and thermophilous species as well as those characteristic of coniferous forest and meadows has decreased while that of species typical of the order *Fagetalia sylvaticae*, and particularly of the alliance *Carpinion*, increased. Changes that started after taking this forest under protection lead to the transformation of *Potentillo albae-Quercetum* into *Tilio-Carpinetum medioeuropaeum* with but small share of photo- and thermophilous species.

**KEY WORDS:** *Potentillo albae-Quercetum*, community instability, vegetation dynamics, protection in nature reserves.

SUMMARY

The xerothermic oakwood *Potentillo albae-Quercetum* is an extrazonal forest community in Poland. Many nature reserves have been created for its protection, among others – the Kwiatówka nature reserve on the Małopolska Upland. This reserve covering an area of 11.25 ha was established in 1966 as a partial reserve. Since then no measures have been carried out in the forest, except felling a small number of trees.

At the moment the reserve was created it was a light forest (crown density – 65%) and its stands were composed of oaks *Quercus robur* and *Q. sessilis* with the admixture of pine *Pinus sylvestris*. The undergrowth, though multispecies, was poorly developed (cover below 5%). The herb-layer was luxurious and rich in species (cover 95%) and it formed the typical of this community patchwork of xerophilous, photophilous, grassland, meadow, pinewood, and mesic deciduous forest. In 1965-1967 studies on the production of a herb-layer were carried out in this reserve, within the framework of the International Biological Program (Kaźmierczakowa 1971).

After the forest was taken under protection and forest labours (consisting mainly in removing undergrowth) were stopped, its composition and structure began to change. *Corylus avellana*, *Carpinus betulus* and other species of trees and shrubs appeared in great numbers. A considerable growth of the shadow of the forest floor caused a decrease in the biomass of the herb-layer and changes in its species composition. The number of species in the particular physiological units (fig. 1) as well as their group abundance (fig. 2) in a phytosociological record and the biomass of the herb-layer (fig. 3) have changed greatly. In the beginning the species characteristic of the order *Quercetalia pubescentis*, class *Festuco-Brometea*, *Molinio-Arrhenatheretea*, and *Vaccinio-Piceetea* were limited in number and next almost completely eliminated; on the other hand the share of species belonging to the class *Quercu-Fagetea* and order *Fagetalia sylvaticae* increased.

An inventory of trees and shrubs made in the same 10 areas study area after a lapse of 25 years has revealed the luxurious development of the undergrowth (fig. 4). Its lower layer is formed by *Tilia cordata* and *Carpinus betulus*. From among shrubs *Corylus avellana* and *Crataegus* sp. have developed abundantly.

Changes that started after the creation of the nature reserve lead to the transformation of the xerothermic oakwood *Potentillo albae-Quercetum* into a deciduous lime-hornbeam forest *Tilio-Carpinetum medioeuropaeum*. Thus, this xerothermic oakwood has appeared to be an anthropogenic community which needs active protection.

Prądnik. Prace Muz. Szafera	4	49–56	1991
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JAN LOCH

Gorczański Park Narodowy, Rzeki  
34-607 Szczawa

**REGENERACJA DRZEWOSTANU GÓRNOREGŁOWEGO BORU  
ŚWIERKOWEGO ZNISZCZONEGO PRZEZ ZASNUJĘ  
WYSOKOGÓRSKĄ *CEPHALCIA FALLENI* (DALM.) NA  
PRZYKŁADZIE MOSTOWNICY W GORCZAŃSKIM PARKU  
NARODOWYM**

**Regeneration of upper mountain spruce forest stands destroyed by *Cephalcia falleni* (Dalm.), such as those on Mostownica mountain of Gorce National Park**

**ABSTRACT.** The author compared three different ways of the regeneration of stands in the spruce forest of the upper mountain forest zone in the Gorce National Park, destroyed by *Cephalcia falleni* (Dalm.).

**KEY WORDS:** clean eatings, natural regenerations, artificial regenerations, succession, growth dynamics, composition of species.

SUMMARY

In 1989 permanent study plots were established on an area of forest destroyed by *Cephalcia falleni* (Dalm.). Studies, whose aim is to observe changes in undergrowth vegetation and dependence of undergrowth and seedlings on each other have been conducted there. Moreover, various forms of planned regenerations management, as well as species composition, distribution and dynamics of growth of natural and planted regenerating trees have been compared.

Those study plots are located in the 35<sup>th</sup> division of Gorce National Park, on the north-western slop of Mostownica mountain, between 1180 and 1230 m a. s. l.

Various ways of forest regeneration have been compared on those plot. In the course of this comparison upper mountain spruce forest has been shown to possess a strong ability to regenerate, while restitution conducted by man has proved imperfect.

Prądnik. Prace Muz. Szafera	4	57–64	1991
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STEFAN MICHALIK

Zakład Ochrony Przyrody i Zasobów Naturalnych PAN  
ul. Lubicz 46, 31-512 Kraków

**MONITORING BIOLOGICZNY NA STAŁEJ POWIERZCHNI LEŚNEJ  
„CHEŁMOWA GÓRA” W OJCOWSKIM PARKU NARODOWYM,  
JAKO PODSTAWA DO OCENY ZACHODZĄCYCH ZMIAN**

**Biological monitoring of a permanent forest study plot “Chelmowa Góra” in  
Ojców National Park as a basis for evaluation of changes happening there**

**ABSTRACT.** Between 1984 and 1989 on a permanent forest study plot in Ojców National Park, *Abies alba* was observed to die out in the stands, as a result of industrial air pollution. Depending on the type of forest association, from 15% to 100% of *Abies alba* specimens became extinct. Deciduous tree species, mainly *Acer pseudoplatanus*, visibly increased their number.

**KEY WORDS:** biological monitoring, permanent study plot, forest associations dynamics, extinction of *Abies alba*, Ojców National Park.

SUMMARY

In Ojców National Park a network of permanent study plots has been established, in order to observe biocenoses succession. The study plot designed to investigate forest association dynamics covers the area of 18 ha. It is divided into 450 permanently marked squares, whose sides are 20 m long. Detailed measurements of tree stand, scrub and herb layers were conducted there in 1984 and 1989, using precise dendrometric, cartography and ecological methods (tab. 1,2). These measurements allow to make a precise description of plant cover (fig. 1, 2).

During the 5 years period between measurements, strong expansion of deciduous tree species (mainly *Acer pseudoplatanus*) and some mountain herb species (a. g. *Lunaria rediviva*) took place. At the same time, coniferous tree species, especially *Abies alba*, were dying in great numbers because of intensive air pollution. *Abies alba* became totally extinct in the montane sycamore maple forest *Phyllitido-Aceretum* and fertile variant of carpathian beechwood *Dentario glandulosae-Fagetum* associations. In acidophilous forest associations, where fir's share in the stands is large its extinction is not so rapid: in acidophilous beech forest *Luzulo pilosae-Fagetum* 20% of fir died out, and in mixed acidophilous forest *Pino-Quercetum* – 15% did.

Prądnik. Prace Muz. Szafera	4	65–71	1991
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STEFAN MICHALIK

Zakład Ochrony Przyrody i Zasobów Naturalnych PAN  
ul. Lubicz 46, 31-512 Kraków

## ZMIANY POWIERZCHNI ZESPOŁÓW LEŚNYCH W OJCOWSKIM PARKU NARODOWYM, W OSTATNIM TRZYDZIESTOLECIU

### Changes in forest associations' area in the Ojców National Park during the last three decades

**ABSTRACT.** After the establishment, in 1956, of Ojców National Park, a spontaneous regeneration of native forest associations took place. The are of deciduous forest (*Tilio-Carpinetum*, *Dentario glandulosae-Fagetum*, *Phyllitido-Aceretum*, *Carici-Fagetum*, *Luzulo pilosae-Fagetum*) has markedly increased. The mixed acidophilous forest (*Pino-Quercetum*) with dominating secondary (antropogenous) coniferous stands has decreased its area by 78% and will probably became extinct by the year 2010.

**KEY WORDS:** Changes of forest associations' area, vegetation dynamics prognosis, biodiversity protection problem, Ojców National Park.

### SUMMARY

Present day species composition and spatial distribution of forest associations in the Ojców National Park are to a great extent the result of man's past economy. After the establishment of Ojców National Park in 1956 and restricting exploitation of the forests, the regeneration of native biocenoses started. The area occupied by various forest and scrub associations has greatly changed during the last three decades (tab. 1). Deciduous forests have markedly spread. The area of mixed acidophilous forest has shrunk by 78%. The extinction of this forest, which on this terrain is probably anthropogenous association, was speeded by industrial air pollution which causes coniferous stands to wither. A very strong reduction of xerothermic thickets' area has also been observed.

On the basis of these tendencies, a prognosis of forest association's area changes for the next 20 years can be given (tab. 2). These changes will result in a decrease of biodiversity. The most unfavourable process is the fading away of xerothermic thickets, as a result of overgrown wood stands shading the sunny rock massifs. In this way the refuges of very rich flora and fauna, containing rare south and south-east geographic elements, shrink and disappear.

Prądnik. Prace Muz. Szafera	4	73–79	1991
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WOJCIECH ZĄBECKI

Zakład Ochrony Lasu i Łowiectwa AR  
Al. 29 Listopada 46, 31-425 Kraków

**WPLYW ZDROWOTNOŚCI I STANU SANITARNEGO JODŁOWYCH  
DRZEWOSTANÓW OJCOWSKIEGO PARKU NARODOWEGO NA  
ZACHWIANIE STABILNOŚCI TYCH BIOCENOZ**

**Influence of health and sanitary state of fir stands in Ojców National Park on  
their stability**

**ABSTRACT.** Severe anthropogenic pressure on forest associations of strict and partial reserves in Ojców National Park causes the wholesome health state of tree stands containing fir to worsen. The weakened trees provide good conditions for reproduction of cambiohagous insects, which accelerate the degeneration of fir stands. Passive protection based on noninterference into these processes only result in impoverishment of one the most precious associations in Poland.

**KEY WORDS:** fir extinction, cambiohagous insect, protection methods.

SUMMARY

Forest stands occupy a majority of Ojców National Park area. Some of them, including stands containing fir, are the optimal stands for this environment's conditions. The anthropogenic degradation advancing in there has disturbed fir stands stability, caused rapid decay and even extinction. Therefore, analyzing the influence of up-to-date reserve management on stands containing fir seems essential.

Investigations carried out in strict and partial reserves have shown extensive decay of fir infested with cambiohagous insects. In strict reserves, where no sanitary measures were applied, this decay was more intensive than in partial ones. Meanwhile, as a result of the proximity of fir stands where different reserve management was applied, cambiohagous insect incidence remained the same, even though infested trees were removed. It seems that strict protection of unstable fir trees leads to their degeneration into scrub. This process is already visible in certain parts of Ojców National Park.

Basing on these observations, it is clear that strict reserve management is not the best way to protect certain ecosystems. Broad National Park goals, mainly the protection of its biocenoses taking place in plant and animal associations, especially so if there is any human pressure present. Therefore, main directions of protection and it's goals should be formulated separately for particular elements protected in a national park, and the methods tailored to the needs of safeguarding their existence.

Prądnik. Prace Muz. Szafera	4	81-90	1991
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KRYSTYNA PENDER

Uniwersytet Wrocławski, Instytut Botaniki  
ul. Kanonia 6/8, 50-328 Wrocław

**OCENA STANU ROŚLINNOŚCI W REZERWATACH LASÓW  
BUKOWYCH: W SUDETACH, NA PRZEDGÓRZU SUDECKIM I  
WALE TRZEBNICKIM**

**The estimation of the state of vegetation condition in the beech forests: in  
Sudety Mts., on the Piedmont of Sudety and in Ridge of Trzebnica**

**ABSTRACT.** The decay of trees within the stands of some beech reserves: in Sudety Mts., Piedmont of Sudety and in Ridge of Trzebnica, causes serious changes of their herbaceous vegetation. This article presents vicarious communities of nitrophilous marginal vegetation and also communities connected with human activity, formed on clearings.

**KEY WORDS:** The changes in the tree and herb layer in beech forest reserves.

SUMMARY

Observations carried out in beech forest reserves: in Sudety (Bukowa Kalenica) in Piedmont of Sudety (Muszkowicki Las Bukowy) and in Ridge of Trzebnica (Las Bukowy w Skarszynie) enable the estimation of changes of vegetation resulting from both: dynamics of stands of trees and anthropogenic influences.

Changes of light conditions within the phytocenoses connected with the decay of trees lead to the expansion of nitrophilous marginal and thicket species. Clearing in forests are occupied by the following plant associations and communities:

- Ass. *Urtico-Aegopodietum* Tx(1947)1967
- Ass. *Chareophylletum aromatici* (Gutte 1963/1964) Nhslova, Nhs. et Hejny 1969
- Ass. *Torlidetum japonicae* Lohm. apud Oberd. 1967
- Ass. *Alliario-Cherophylletum* (Kreh 1935) Lohm. 1949 em. 1967
- Ass. *Epilobio (montani)-Geranietum robertiani* Lohm. ap. Oberd. 1967
- Ass. *Lysimachio nemori-Impatientetum* Brun-Hool 1975
- Community of *Sambucus nigra*.

In connection with the penetration of the area vicarious plant communities of treaded places are formed (ass. *Prunello-Plantaginetum*). In the natural communities few anthropophytes occur.



Prądnik. Prace Muz. Szafera	4	91–102	1991
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ZBIGNIEW KRZAN

Tatrzański Park Narodowy  
ul. Chałubińskiego 42a, 34-500 Zakopane

**GRZYBY JAKO NATURALNY CZYNNIK PROCESU PRZEMIAN  
DRZEWOSTANÓW W REGLU DOLNYM TATRZAŃSKIEGO PARKU  
NARODOWEGO**

**Fungi as a natural factor of the process of stands development in the Tatra  
National Park**

**ABSTRACT.** Paper presents results of the investigations on the influence of fungi communities from wood and roots of woody plants on the development of natural and man made stands of the Tatra mountains. The role of different groups of fungi in destruction of the old stands, and in the development of a new forest generation have been discussed to state a way and kind of changes which are naturally going on in the protected forests of Tatra National Park.

**KEY WORDS:** Tatra National Park, mountain stands, rebuilding, fungi.

SUMMARY

Studies were conducted in the stands of the Tatra National Park to recognize the role of different fungi, and groups of fungi in the processes of stands destruction and their natural restoration. The comparative investigations have been made in natural stands of carpathian beech wood (*Dentario glandulosae-Fagetum*) and in man made spruce monocultures.

It was shown that the spruce heart rot was the most important causative agent of destruction of the old stands. The real extend of the disease can be stated in general as 50% of trees, but an intensity of the occurrence of the disease was much higher in spruce monocultures, especially in young stands, than in natural forest. It was stated too, that *Heterobasidion annosum* was the main fungus causing the disease, and in spruce monocultures there was no effective interaction of other fungi isolated from wood against the pathogen. It means, that the stability of monocultures was lower than natural stands in the Tatra National Park.

The role of fungi in natural forest restoration have been investigated on 5 plot fold both in natural and artificial stands. The comparison of qualitative composition of seedlings shows, that in natural stands this composition was adequate to the biotope (i.e. contains: fir, spruce, beech and other deciduous species), when in spruce monocultures there were only spruce and fir seedlings growing. That means, that in natural restoration processes changes in monocultures were not going to rebuild future stands to be adequate to biotope, and that the human activity is necessary for their successful reconstruction.

Fungi that occupy the root system of young seedlings play an important role in restoration processes. There were few groups of fungi found, one of which is root pathogens such as : *Cylindrocarpon destructans*, *Heterobasidion annosum*, *Phoma* sp. or rare in seedling roots *Cryptocoriopsis* sp. which can eliminate seedlings causing their diseases. The other group of fungi – antagonistic to the pathogens was composed by: *Trichoderma* sp., *Penicillium* sp., *Phanerochaete gigantea* and *Mycylium radialis atrovirens*.

Acting together, the fungi determine the future trees composition of the stands. Studies shows, that in spruce monocultures roots of seedlings were more commonly infected by the pathogens, and less frequently by their antagonists than the roots of seedlings grown in natural stands. Comparing different seedling species it was shown that beech, and other deciduous species were more often occupied by pathogens and worst chances to survive than seedling of spruce.

Studies have to be conducted for closer determination of the role of fungi species during processes oncoming both in natural and artificial stands, and to identify correlations of different groups of fungi from seedlings roots in natural development of protected forest of the Tatra National Park.

Prądnik. Prace Muz. Szafera	4	103–111	1991
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LECH BUCHHOLZ

Katedra Entomologii AR  
ul. Dąbrowskiego 159, 60-594 Poznań

**STAN AKTUALNY I PERSPEKTYWY KSZTAŁTOWANIA SIĘ  
EKOSYSTEMÓW PUSZCZY BUKOWEJ KOŁO SZCZECINA ZE  
SZCZEGÓLNYM UWZGLĘDNIENIEM JEJ CZĘŚCI  
REZERWATOWEJ, NA PODSTAWIE OBSERWACJI FAUNY  
CHRZĄSZCZY Z NADRODZINY SPREŻYKÓW (*COLEOPTERA*,  
*ELATEROIDEA*)**

**The present state and possible changes of the ecosystems of the Puszcza Bukowa primeval forest near Szczecin, with particular regard to its part protected as a nature reserve, based on the observations of the fauna of the beetles (*Coleoptera*) from the suprafamily *Elateroidea***

**ABSTRACT.** The four year's observations of the fauna of *Elateroidea* in the Puszcza Bukowa primeval forest near Szczecin have revealed the far advanced impoverishment of the zoocenosis of this group, caused by the present forest management. This impoverishment concerns both utilized forests and nature reserves. There is a need to stop certain forest labours, at least in nature reserves, to prevent the growing degradation, of forest ecosystems.

**KEY WORDS:** *Elateroidea*, nature reserve, forest management, impoverishment of biocenoses.

SUMMARY

Owing to the ecological characters of particular species, beetles of the suprafamily *Elateroidea* are good bioindicators of long-term changes occurring in the ecosystems effected by different man's economic activity. The four year's investigations of the click beetles in the Puszcza Bukowa primeval forest near Szczecin have demonstrated the grate impoverishment of the zoocenosis of *Elateroidea*, concerning both the number of species and the intrapopulation structure of particular species. The impoverishment observed in nature reserves created in Puszcza Bukowa was similar to that in utilized forests. All observations indicate that these great changes have been caused by activities carried out in this area (including nature reserves) within the framework of forest management for many years. The potential biotopes of many important components of forest ecosystems have been destroyed due to sanitation or occasional felling. If this activity is continued, it certainly will result in the development of extremely impoverished phytocenoses, non-resistant to various factors, whose homeostatic capability will be reduced to minimum. Consequently, zoocenoses and mycocenoses will be poor, deformed, and unable of performing their functions in the ecosystems. The author postulated stopping certain forest labours at least in nature reserves, to counteract the growing degradation of forest ecosystems.

Prądnik. Prace Muz. Szafera	4	113–123	1991
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STANISŁAW BALCERKIEWICZ

Zakład Ekologii Roślin i Ochrony Środowiska UAM  
Al. Niepodległości 14, 61-713 Poznań

**WYBRANE PROBLEMY OCHRONY REZERWATOWEJ NA TLE  
DEGENERACJI FITOCENOZ LEŚNYCH W WIELKOPOLSKIM PARK  
NARODOWYM**

**Selected issues of the reserve protection against the background of degeneration of forest phytocoenoses in the Wielkopolski National Park**

**ABSTRACT.** Main forms of degeneration of forest phytocoenoses in the Wielkopolski National Park were characterized. The attention was paid on relations between the degeneration processes and forest-reserve management. The necessity was pointed, of the more precized discernment and definition of particular categories of reserves.

**KEY WORDS:** phytosociology, forest communities, degeneration of phytocoenoses, forest management, reserve protection.

SUMMARY

Main forms of degeneration of forest phytocoenoses in the Wielkopolski National Park developed as the consequence of anthropopressure were characterized. Examples of uniformity of treestands (monotypization), excessive growth of shrub layer (fruticetization), sod forming processes (cespitation), increasing role of some groups of mosses (bryophytization), invasion and dominance of geographical alien species (neophytization) were presented. Forest management was recognized as one of the main factors of degeneration and threat of forest communities in the national parks. The necessity of more detailed protection projects and changes in organization and management of the reserves was emphasized. Also the need of more specified repartition of reserves according to categories corresponding with permissible forms of influence of man and stability of protection rules was pointed.

Prądnik. Prace Muz. Szafera	4	125–133	1991
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KAZIMIERZ GADEK

Zakład Ochrony Lasu i Łowiectwa AR  
Al. 29 Listopada 46, 31-425 Kraków

**AKTUALNY STAN ZAGROŻENIA PARKÓW NARODOWYCH  
POŁUDNIOWEJ POLSKI I ICH FUNKCJE ORAZ METODY  
OCHRONY**

**The endangerment of national parks in Southern Poland, their functions and  
methods of protection**

**ABSTRACT.** This paper treats of the state of the endangerment of nine national parks in Southern Poland, lying within the geographical range of fir. Unfavourable processes occurring in the ecosystems of strict and partial nature reserve of these parks can be used in biological monitoring. The author propounds some postulates concerning recognizing and recording changes in the ecosystems of national parks.

**KEY WORDS:** national park, fir, spruce, insects, conifer stands degradation.

SUMMARY

Out of 17 national parks created in Poland, 9 are located in Southern Poland. They cover 57 516 ha, while the total area of Polish parks is 176 389 ha. The forest area of these parks constitutes 45.5% of the total forest area of national parks in Poland (45 577 ha). Forests occupy in this region 79% of its area, arble land – 2%, and others – 19%. Thus, forest ecosystems have a decisive role.

In Poland 29% of the forest area of national park lie within strict nature reserve (28 405 ha). In Southern Poland out of 25 150 ha included in strict nature reserves, 16 276 ha (65%) area covered by forests, which makes for 36% of the forest area of national parks in this region.

All the national parks of Southern Poland lie within the limits of the natural range of fir, a very sensitive species which has specific ecological demands and forms characteristic ecosystems. The oak, beech, and spruce are, beside the fir, main components of the natural forest ecosystems protected in nature reserves in upland, submontane, and mountain areas. Unfavourable changes occurring in the ecosystems of strict and partial nature reserves of Southern Poland, where the above mentioned species prevail in forests, can be used in biological monitoring.

The natural and anthropogenic factors of a various intensity depending on the species composition and structure of stands ecological and orographical conditions, and distance from the sources of industrial emissions, destabilize stands and frequently cause their quick degradation and dying, which concerns also strict nature reserves. A detailed analysis of the present causes and rate of changes occurring in natural ecosystems could be made only in strict nature reserves. They are irreplaceable study objects and reference systems in which the kind, extent and consequences of the processes of degradation occurring in certain areas have been stopped and not deformed or blurred by man's economic activity.

In view of the increasing pressure of anthropogenic factors connected mainly with industrial emissions, we should apply different methods to protect stands in the national parks of Southern Poland. In the partial reserves the possibilities of active protection and conversion of stands are becoming wider and more selective (excluding the use of pesticides). On the other hand, man's interference in strict nature reserves is and should be limited to exceptional situations, when stands, this main element of the ecosystem, are threatened with a total degradation. However, the use of pesticides should absolutely be excluded. One should indicated these elements of the ecosystems of strict nature reserves whose great value justifies the use of protective measures in special cases.

The functions of the buffer zones of national parks should be determined separately, but these areas must be included in the strategy of protection in nature reserves. The way of their management should enable an easy transition between utilized forest and areas of a different protective regime.

Prądnik. Prace Muz. Szafera	4	135–138	1991
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BOLESŁAW RUTKOWSKI

Katedra Urządzania Lasu AR  
Al. 29 Listopada 46, 31-425 Kraków

**ZASADY URZĄDZANIA LASÓW W PARKACH NARODOWYCH I  
REZERWATACH PRZYRODY**

**Principles of forest management in national parks and nature reserves**

**ABSTRACT.** This paper enumerates and comments of four basic principles, which should be respected by the system of forest management in national parks and nature reserves: forest stability, preparing a conception of the desired forest state, varied protection measures, forest control.

**KEY WORDS:** forest management, forest stability, age and species structure, continuous forest inventory.

SUMMARY

There are four principles, which should be respected by the system of forest management in national parks and nature reserves. There are : forest stability, preparing a conception of the desired forest state, varied protection measures and forest control. Experimental testing, if the amount and structure of forest resources remain at a stable level, as a result of loss, up-growth and increment of tree stands is the only measure of forest stability. Having a clear vision of the desired form of the forest is necessary to define the aim of protecting it. According to that vision and to natural conditions, the protection measures and the kind of forest management should be determined. The processes of loss, up-growth and increment in the forest under protective management should be continuously controlled on permanent study plots using statistic methods.

Prądnik. Prace Muz. Szafera	4	139–144	1991
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BOHDAN WAŻYŃSKI

Katedra Urządzania Lasu AR  
ul. Wojska Polskiego 71c, 60-625 Poznań

## PODSTAWY URZĄDZANIA LASÓW W PARKACH NARODOWYCH I REZERWATACH PRZYRODY

### The basics of forest management in national parks and nature reserves

**ABSTRACT.** A new idea of reserve forest management by a functional (scientific) method is presented here. Forest categories (A, B, C), the type and form of forest biocenoses should determine the direction to be taken by management. The effectiveness of this new management method is to be tested using natural experimental and control plots.

**KEY WORDS:** forest management, forest protection, forest reserves, national parks.

### SUMMARY

The author propounds his own concept of forest management in protected areas in Poland, based on a scientific method. It consists in functional division of forests into three categories: A – under strict protection, B – under partial protection, C – forests lying between reserves. The classification of habitats is based on “the type of forest biocenoses”, phytosociological unit (plant association) distinguished within the framework of a habitat type of forest; it is a potential plant association. “The aspect of forest biocenoses” is a present type of biocenoses, constituting a basis for distinguishing forest units (subcompartments). Units in forest belonging to category A are natural experimental areas – experiments are performed by nature itself. Units in the forests of category B are different forms of special protection, depending on the accepted goal of protection: the protected element of biocenoses is precisely determined and appropriate indications concerning management are given. The units of forest representing category C do not include any protected elements of biocenoses. The direction of forest management: to obtain the state of forest of the character of a potential type of biocenoses. There are distinguished three kinds of forest: a) consistent, b) partially consistent, and c) inconsistent with a potential type of biocenoses. Beside, three types of stands are distinguished: a) model stands (control study areas), b) deformed stands – part of them constitute permanent experimental areas, c) stands – natural experimental areas for the observation of changes occurring in the course of the conversion of biocenoses.

The presented above method of the management of forest in nature reserves prefers an active direction in the protection of forest which are under special legal protection.

Prądnik. Prace Muz. Szafera	4	145–151	1991
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RYSZARD ZARĘBA

Katedra Urządzenia Lasu i Geodezji Leśnej SGGW-AR  
ul. Rakowiecka 26/30, 02-528 Warszawa

**PROBLEMY ORTODOKSYJNEJ OCHRONY ŚCISŁEJ I PRÓBY  
REWIZJI INSTRUKCJI URZĄDZANIA BIOCENÓZ LEŚNYCH W  
PARKACH NARODOWYCH I REZERWATACH PRZYRODY –  
OSIĄGNIĘCIA, ROZCZAROWANIA, OCZEKIWANIA**

**Issues connected with orthodox strict protection, and ventures at revising  
forest biocenoses management in national parks and nature reserves; achieve-  
ments, disappointments and expectations**

**ABSTRACT.** The author, a forest, on the basis of his outdoor studies discusses nature protection and proposes a change in the management of protected areas. He does not agree with naturalists that noninterference in nature is the best way of its protection. Naturalists' approach is suggested to be dogmatic and mystic.

**KEY WORDS:** forest management, strict reserves, active protection.

SUMMARY

The author presents his views based on conclusions of his work on valorizing and cataloguing protected areas. Their management, revising some instruction of it, and various master and doctors' theses have also been helpful to him.

Naturalists support a dogmatic and mystic form of passive protection of forest ecosystems as the only one in accordance with scholastic philosophy.

It is an utopia to use this type of protection in the present phase of ecoclimate changes and environment degradation. It leads to ecologic catastrophe in the protected area, or to fast climax succession eliminating a large part of flora and fauna.

Protected areas management is the duty of National Forest Administration, and foresters work also in the Ministry of Nature Protection. Investigations which are proposed to them are those, whose results are known to forestry for a century already.

The majority of management measures meets naturalists opposition, especially concerning the form of wood harvesting in partial reserves, which harvesting is considered to be an exploitation of the valuable wood of rotting trees.

Naturalists know little, and people of technical education – nothing about the basic laws of forest ecology. Based on it is forest management leading to the maintenance of protected areas. Forest management is different for various forest associations.

The principles of the new protected areas management instruction are overdone, and this instruction has become a manual to scientific investigations. Its realization has halted.

The programs of management of reserve and national park forests are used to catalogue protected resources, while economic plans are not realized there. This leads to degradation of the reserves' nature, and to extinction of the species, for whose protection the reserves were established.

Also the nearly mystical philosophy of nature protection treats man as a potential criminal.

For whom are landscape parks established, when their recreation and touring usage is forbidden, together with building of sanatoriums, hospitals and hotels; while tent sites and primitive huts are proposed?.

Prądnik. Prace Muz. Szafera	4	153–159	1991
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JERZY SZWAGRZYK

Zakład Botaniki Leśnej i Ochrony Przyrody AR  
Al. 29 Listopada 46, 31-425 Kraków

**DYNAMIKA LASÓW NATURALNYCH A KONCEPCJA OCHRONY  
REZERWATOWEJ: ŹRÓDŁA KONFLIKTU I PROPOZYCJE  
ROZWIĄZAŃ**

**Natural forests' dynamics versus nature conservation concepts: sources of  
conflict and tentative solutions**

**ABSTRACT.** Recent achievements in research on forest dynamics suggest, that a clear distinction shall be made between strict nature conservation, which means protecting natural processes from direct human activity, and active protection, which means maintaining given patterns in nature.

**KEY WORDS:** forest dynamics, nature conservation, pattern and process.

SUMMARY

Contemporary concepts of nature conservation in forest communities are to a large extent based on past imaginations on how the dynamics of forest communities not influenced by man looks like. Recent achievements in researches on dynamics of natural forests imply some general conclusions and a few practical remarks. First of all, a natural forest is subjected to constant, profound changes, and our opinions on forests' stability result from the very slowness of those changes. Secondly, dying of not only single trees, but also group of trees and even entire forest stands (depending on the type of forest community) may be a purely natural process. Thirdly, problems of forest dynamics and stability of forest communities shall be displayed against the background of actual spatial scales: stability in periods of time comparable with the longevity of trees may be ascribed only to relatively big forest tracts. Taking this into account, a clear distinction shall be made between strict nature conservation, aimed at allowing observations of nature processes undisturbed by direct human activity, and active nature conservation, directed towards conserving given patterns in nature, what usually imply a need of multiple human interventions, based on a specified target and plan of action.



Prądnik. Prace Muz. Szafera	4	161–166	1991
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ANDRZEJ GRUSZCZYK, HENRYK ŻYWIÓŁ

Katedra Urządzenia Lasu AR  
Al. 29 Listopada 46, 31-425 Kraków

**INDYWIDUALIZACJA ROZWIĄZAŃ SYSTEMOWYCH  
FUNKCJONOWANIA PARKU NARODOWEGO (ZAGADNIENIA  
DYSKUSYJNE)**

**Individual solutions the functioning of polish national parks (questions open  
to discussion)**

**ABSTRACT.** The authors demonstrate that national parks fulfill unsatisfactorily their primary tasks. In view of this propose individual system solutions for national parks, based on specific conditions in which these parks function.

**KEY WORDS:** polish national parks, system of protection.

**SUMMARY**

The work of the polish national parks has shown that two basic tasks aren't fulfilled in practice:

- the realization of complex research on environmental changes,
- the protection of environmental phenomena.

In such circumstances the role of the national parks, referring to the tasks given above, must be precisely determined. The following questions should be answered:

- what should be protected, where and why?
- in what why?
- what should be researched and by what methods?

The answer to these questions require new inventarizations organizational and planned tasks, which are discussed in this article. The whole reasoning process is shown on enclosed posters.

Prądnik. Prace Muz. Szafera	4	167–174	1991
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RYSZARD KAPUŚCIŃSKI

Świętokrzyski Park Narodowy, Pracownia Naukowo-Badawcza  
Święty Krzyż, 26-004 Bieliny

**UWAGI DOTYCZĄCE DEFINICJI ORAZ FUNKCJONOWANIA  
REZERWATÓW ŚCISŁYCH I CZĘŚCIOWYCH NA PRZYKŁADZIE  
ŚWIĘTOKRZYSKIEGO PARKU NARODOWEGO**

**Comments on the definition and functioning of strict and partial reserves,  
based on the example of Świętokrzyski National Park**

**ABSTRACT.** This article contains comments on reserve management in national parks in the light of present regulations and various existing opinions. Using particular examples from Świętokrzyski National Park, the author comments others opinions negating the value of strict protection, and those criticizing the effectiveness of up-to-date partial protection. Several improvements of reserve management are presented and new definitions of strict and partial reserves are suggested.

**KEY WORDS:** aims of preservation, methods of preservation, strict reserves, partial reserves, reserve designation.

SUMMARY

The author criticizes the current regulations defining categories of nature reserves, their aims and ways of functioning. He considers unequivocal definitions of partial and strict reserves as necessary for reserve management in national parks. The definition of strict protection (strict reserve) needs immediate correction, as it contains erroneous expressions: - according to this definition, strict protection can be lifted and than restored – instead of being continuous; - particular natural entities are the object of strict protection – instead of the whole ecosystem and the processes taking place in it.

The definitions of strict and partial reserve proposed here designate the object, aim and methods of protection. The definitions of reserves which will finally be accepted should be given forth in the amended regulations, especially in the Council of Ministers decrees about the establishment of particular national parks.

Answering to many critical remarks being expressed about strict protection, the author justifies this kind of protection, as the most valuable for science as well as for the preservation of biodiversity and natural functioning of ecosystems. What is more, he provides the main reasons for ineffectiveness of active protection, realized so far in partial reserves. He blames inadequate knowledge of the protected object and the lack of clear definitions of aim and method of protection as these main reasons.

Prądnik. Prace Muz. Szafera	4	175–180	1991
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ROMAN ZIELONY

Katedra Urządzania Lasu SGGW-AR  
ul. Rakowiecka 26/30, 02-528 Warszawa

**WYKORZYSTANIE WYNIKÓW OKRESOWYCH INWENTARYZACJI  
LASU DO OCENY SKUTECZNOŚCI OCHRONY REZERWATOWEJ (  
NA PRZYKŁADZIE LASU KABACKIEGO)**

**Using the periodical forest listing results to appraise the value of reserve  
protection, as done in Kabacki Forest**

**ABSTRACT.** In Kabacki Forest near Warsaw, forest management plans have been used to appraise the effects of forest biocenoses protection. Between 1938 and 1987 timber stock per 1 ha rose from 76.1 to 267.5 m<sup>3</sup>, and the share of *Pinus sylvestris* decreased greatly.

**KEY WORDS:** Kabacki Forest, protection effectiveness appraisal, forest reserves.

SUMMARY

The effectiveness of nature protection in forest reserves can be judged on the base of result from systematic scientific investigations, or of data from forest management plans.

This paper presents the usage of data from management plans to appraise the effectiveness of Kabacki Forest protection. This forest was designated a recreation area for the inhabitants of Warsaw in 1936. The devastation of Kabacki Forest stands between 1939 and 1947 halted the realization of this goal. In 1948 regeneration of the forest was started, improving natural and recreation values of this forest, which kept becoming more and more popular among the people of Warsaw.

Between 1948 and 1987 the average age of this forest's stands (in 1980 established as a nature reserve) rose from 46.1 to 64.7 years. The average timber stock per 1 ha also increased, from 76.1 to 267.5 m<sup>3</sup>, while the share of *Pinus sylvestris* in the timber resources decreased from 90 to 50%.

Prądnik. Prace Muz. Szafera	4	181–191	1991
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STANISŁAW SZYMAŃSKI, JAN CEITEL, JACEK ZIENTARSKI

Katedra Hodowli Lasu AR  
ul. Wojska Polskiego 69, 60-625 Poznań

**WYKORZYSTANIE BADAŃ HODOWLANÝCH W GÓRSKICH  
REZERWATACH LEŚNYCH SUDETÓW DLA PROJEKTOWANIA  
SKŁADÓW GATUNKOWYCH UPRAW I PRZEBUDOWY  
DRZEWOSTANÓW NA RÓŻNYCH WZNIESIENIACH N.P.M. (NA  
PRZYKŁADZIE REZERWATÓW: „PUSZCZA ŚNIEŻNEJ BIAŁKI” I  
„NOWA MORAWA”)**

**Using cultivation studies in mountain forest reserves of Sudety Mts. to design  
the species composition of cropping and to reconstruct the stands according to  
their elevation (exemplified by reserves: „Puszcza Śnieżnej Białki” and „Nowa  
Morawa”)**

**ABSTRACT.** This paper presents an analysis of the structure and species composition of mixed forest stands in „Nowa Morawa” and „Puszcza Śnieżnej Białki” reserves in Bialskie Mts. (East Sudety Mts.). Also presented are the possibilities of using the study result, and the role reserves play in the proper forest economy.

**KEY WORDS:** forest stand structure, forest reserve, Bialskie Mts.

SUMMARY

The extinction of spruce stands in Sudety Mountains requires studies on optimal species composition of forest cultures planted on the site of the dead forest. This paper present an analysis of the structure and species composition of nearly mixed forest in „Nowa Morawa” and „Puszcza Śnieżnej Białki” reserves in Bialskie Mts. (East Sudety Mts.). Results of this analysis can be used to cultivate forest on this area. The importance of forest reserves for forest economy has been emphasized, as reserves are the only place where growing old and disintegration exist. These two phases of stand development, absent in economy forest, enable us to understand the development processes taking place in forest.

Prądnik. Prace Muz. Szafera	4	193–199	1991
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JACEK HERBICH\*, MARIA HERBICHOWA\*, PIOTR HERBICH\*\*

\*Katedra Ekologii Roślin i Ochrony Przyrody Uniwersytetu Gdańskiego  
Al. Marszałka J. Piłsudskiego 46, 81-378 Gdynia

\*\*Instytut Hydrogeologii i Geologii Inżynierskiej Uniwersytetu Warszawskiego  
Al. Żwirki i Wigury 93, 02-089 Warszawa

**PROBLEMY I PROGRAM CZYNNEJ OCHRONY ZBIOROWISK  
LEŚNYCH NA PODŁOŻU TORFOWYM (NA PRZYKŁADZIE  
WYBRANYCH REZERWATÓW POJEZIERZA KASZUBSKIEGO)**

**Problems and programme of active protection of communities on peat habitat  
(on example of some nature preserves on the Kashubian Lakeland, northern  
Poland)**

**ABSTRACT.** Paper presents the general idea and the detail project of active protection of peat bog forest and non-forest communities, changed as a result of drainage.

**KEY WORDS:** methods of nature conservancy, active protection, nature reserves, management of water conditions, degeneration of vegetation, monitoring, raised bog vegetation.

**SUMMARY**

The endangerment and changes of forest communities occurring on peat-bogs are poorly known in comparison with the problem of the protection of non-forest peat-bog vegetation. Meanwhile, many phytocoenoses of *Vaccinio uliginosi-Pinetum* and *Betuletum pubescentis*, seemingly quite natural, have developed as a result of the drainage of peat-bogs. These communities are now objects worthy of protection. Simultaneously they undergo a quick degeneration due to changes in their habitats. The protection which has been given to them in nature reserves has appeared ineffective.

The program of the active protection of plant cover vegetation was illustrated by the example of Kurze Grzędy and Staniszewskie Błoto nature reserves in the Kashubian Lakeland (northern Poland). This program includes, among others, the discussion about different concepts of the protection of particular peat-bog communities, definition of the principles of an optimum solution, and the plan of management. The chief point of this program is the appropriate regulation of water conditions which would enable the effective protection of the most valuable forest communities, that developed in part due to drainage, and the same time – the partial reconstruction of the vegetation of open peat-bogs. The program is also an attempt to work out the general principles of the protection of peat-bogs, the habitat conditions and vegetation of which have been changed.

Prądnik. Prace Muz. Szafera	4	201–204	1994
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WŁADYSŁAW DANIELEWICZ

Katedra Botaniki Leśnej AR  
ul. Wojska Polskiego 71 d, 60-625 Poznań

**ZNACZENIE BADAŃ NAD DYNAMIKĄ POPULACJI DRZEW W  
KSZTAŁTOWANIU BIOCENOZ UWOLNIONYCH SPOD PRESJI  
GOSPODARKI LEŚNEJ W WIELKOPOLSKIM PARKU  
NARODOWYM**

**The importance of studies on tree population dynamics in shaping the biocenoses which have been exempted from forest economy in Wielkopolski National Park**

**ABSTRACT.** Wielkopolski National Park encompasses mainly the area of formerly utilized forest. After this utilization was halted, spontaneous changes of forest biocenoses took place. They are expressed, among other things, by actual dynamic tendencies of tree population.

**KEY WORDS:** forest disturbance, population dynamics, secondary communities, Wielkopolski National Park.

**SUMMARY**

Artificial introduction of *Pinus sylvestris* and geographically foreign trees species is still visible in the forests of Wielkopolski National Park. Presently, as result of old age, *Pinus sylvestris* recedes from these stands. This is very favorable for the regeneration of natural species composition, which is clearly visible in the lower layer of tree stands. This regeneration is halted in those stands, which comprise shade-loving species (e.g. *Fagus sylvatica*), or synanthropic tree species (e.g. *Robinia pseudacacia*, *Quercus rubra*). Therefore, in tree stands deformed by past human economy, measures stimulating natural processes of regeneration should be applied.