

The relationship between close to nature management and life stages in the development of a virgin forest

Matić, Slavko

Source / Izvornik: **Glasnik za šumske pokuse: Annales Experimentis Silvarum Culturae Provehendis, 2007, 42, 1 - 11**

Journal article, Published version

Rad u časopisu, Objavljena verzija rada (izdavačev PDF)

Permanent link / Trajna poveznica: <https://um.nsk.hr/um:nbn:hr:108:447190>

Rights / Prava: [In copyright](#)/[Zaštićeno autorskim pravom.](#)

Download date / Datum preuzimanja: **2024-05-23**



Repository / Repozitorij:

[University of Zagreb Faculty of Forestry and Wood Technology](#)



THE RELATIONSHIP BETWEEN CLOSE TO NATURE MANAGEMENT AND LIFE STAGES IN THE DEVELOPMENT OF A VIRGIN FOREST

VEZA IZMEĐU PRIRODNOG GOSPODARENJA I ŽIVOTNIH FAZA
U RAZVOJU PRAŠUME

SLAVKO MATIĆ

Hrvatska akademija znanosti i umjetnosti
Zrinski trg 1, HR – 10000 Zagreb

Received – *Prispjelo*: 15. 10. 2007.

Accepted – *Prihvaćeno*: 15. 1. 2008.

In forest management, the forestry profession advocates the principle of sustainability, also known as the principle of sustainable development. According to this principle, tending treatments are applied with the goal of improving the existing forests while regeneration treatments are aimed at raising new generations of forests. Thanks to the principle of sustainability, which has been continuously applied to Croatian forestry since 1765, Croatian natural forests have survived to the present day. Close to nature management is based on forest tending and regeneration treatments, whose core postulates are found in a virgin forest. This refers both to selection forests (fir-beech forests) and regular forests (forests of all other tree species in Croatia). Due to their stability and eternity, naturally managed forests provide a firm ecological and commercial stronghold in all life conditions, including adverse ones. A forest which develops under the influence of man, who applies nature-based tending and regeneration activities since the beginning, is a natural commercial forest. Conversely, a forest which has always developed without any human impacts is a virgin forest. During its development of several centuries, a virgin forest undergoes developmental cycles that alternate through three different stages. These are the initial, the optimal and the terminal stage. The stages coincide with developmental stages, such as, for example, the stage of ageing, decomposition and selection. The time period lapsing between the occurrence and the disappearance of a generation in a virgin forest of fir and beech is about 400 to 500 years. Of this long period, slightly less than half relates to desirable, stable and productive structural conditions for forest growth. The longer part of this period, between 200 and 300 years, relates to unfavorable structural and physiological conditions. The first, favorable and desirable period,

comprises those stages that are applied to selection forest management (selection and initial optimal stage), and to regular forest management (optimal and initial stage). By applying tending and regeneration treatments with selection cutting in a selection forest in which the growing stock is maintained at approximately 400 m³/ha before and 300 m³/ha after the cut, we preserve the natural structure that favors optimal natural regeneration, maximal increment, desirable biological diversity, naturalness, stability and eternity of selection forests. Tending operations in a regular forest eliminate superfluous and poor quality individuals from stands similarly to natural mortality that takes place during virgin forest development. Regeneration treatments in a regular forest, which has matured and reached a structure similar to that in the optimal stage of a virgin forest, are intended to regenerate it naturally and ensure its eternity. The above treatments in commercial natural forests mirror the events in virgin forests, with the only difference that a tended natural forest, unlike a virgin forest, always puts forth good quality commercial and non-commercial production. When it reaches the ageing stage, it is naturally regenerated. In today's disturbed ecological conditions, forests lacking the natural structure are the most susceptible to dieback. It is owing to close to nature management that Croatian forests are among the most stable in Europe. However, some legal acts, probably written under the strong pressure of "nature lovers", green activists, "environmentalists" and similar groups, show lack of understanding about how forests function, erroneously prescribe passive protection and ban tending and regeneration treatments. If we want to preserve good quality natural forests for future generations, these acts should urgently be mended. We all love our forests, but love should be complemented with knowledge of forests. Love alone will surely lead our forests to ruin.

Key words: close to nature management, natural forest, virgin forest, tending, regeneration

INTRODUCTION UVOD

Uncontrolled cutting of forests that took place during the early stage of capitalism in Europe led to a number of devastating consequences, such as a reduction in the forest area, absence of regeneration and catastrophic ecological and economic impacts. This prompted urgent establishment of the forestry profession, whose main task was to protect, exploit and regenerate forests on the basis of specialist and scientific knowledge (Matić 1990).

In Croatia, then a part of the Habsburg Monarchy, the Military Border was established in 1702. The forestry service based on military principles was introduced in 1746 over the entire area (Klepac 2001). The area of eleven regiments comprised 741,908 ha of forests. A military forestry service was set up in each of these areas. The year 1765 deserves special mention, because it was the year when the first management plan was drawn up and the first forest offices were founded (Krasno, Oštarije and Petrova Gora). The Krasno forest office is still active (Matić et al. 2001).

A well organized forestry profession follows the principle of sustainability, also known as the principle of sustainable development. Its application ensures permanent survival of forests in an area. The principle of sustainable management has always played an important role in the Croatian forestry legislation. This is confirmed by the Forest Order issued by Maria Theresa (1769), the forest laws of 1852 and 1894, and the many progressive forest laws issued since (Matic 2004).

Nature-based management, the implementation of the above laws, and probably the fact that forestry was part of the military administration were all responsible for the preservation of natural forests in Croatia today. Owing to this, the Republic of Croatia has 2,688,687 ha of forests and forestland, of which 98% is of natural character. These forests contain 398 million m³ of growing stock. Growing stock increases by 10.5 million m³ annually, corresponding to the amount of the annual current increment.

Forests in Croatia are natural because they originate from natural seed regeneration. Seed reaches the forest floor from the crowns of mature trees before they are cut. These forests are tended and regenerated in accordance with the basic principles that reign in a virgin forest. Virgin forests are natural forests which develop exclusively under the influence of natural factors.

Depending on different biological properties and ecological requirements of tree species and their adaptation to certain site conditions, there are two basic methods of forest tending and regeneration. One method involves forest stands of even-aged structure, and the other forest stands of selection structure. An even-aged stand contains trees of similar heights, breast diameters and ages, because they have sprouted almost simultaneously from the seeds of mature trees. Selection stands relate exclusively to the distribution range of silver fir accompanied by common beech and sometimes by common spruce. Since these species and silver fir in particular, are skiophilic, they are capable of forming a selection structure. Such a stand contains trees of different heights and breast diameters per surface unit. In the structural and light conditions, selection stands of fir, in community with beech and spruce, have an excellent regeneration and survival rate. An even-aged and selection structure of a forest stand may also be formed in a virgin forest. However, each represents only one of the several life stages of a virgin forest.

Close to nature management is the most perfect method of forest management. Forests managed according to natural principles maintain the optimal natural structure, which ensures their naturalness, diversity, stability, maximal production, optimal natural regeneration and eternity. Conversely, the clear-cutting management method still applied in some European countries, achieves contrary effects and leads to site degradation and the disappearance of climatogenic or basic tree species and their stands. This is the reason that Croatian forests have for centuries been managed according to natural principles. As a management method, clear cutting has always been banned by law, which is one of the particularities of Croatian forestry.

In close to nature management, forest tending and regeneration follows the results of research in the life stages of a virgin forest. Thus, the application of natural laws stemming from the selection phase of a fir-beech virgin forest is important in the management with a fir-beech selection stand. Even-aged stand management relies on the

insights related to the optimal virgin forest stage. However, in the several-hundred-year life cycle of a virgin forest there are periods of dieback, rotting and decomposition. Viewed from generally beneficial (ecological, social and socio-ecophysiological) and management standpoints, these are periods with negative effects.

Only one period in the long developmental cycle of a virgin forest is acceptable and useful for man and the environment: This is the period of selection and a part of the optimal phase. The remaining period of a virgin forest development relates to the decomposition of the old and the formation of the new generation of a forest stand.

Those who insist on permanent and passive protection of forest, and particularly of forests in national parks, are often ignorant of the above facts. If naturally managed forests are not tended and regenerated and are allowed to grow spontaneously, they will gradually assume the structure of secondary virgin forests. In this manner we expose them to the above mentioned processes of forest structure decomposition and the accumulation of growing stock. This cannot be a model for natural commercial forests, from which we expect eternity and stability, as well as the provision of both non-commercial and commercial goods.

The value of virgin forests as natural amenities that serve for extensive natural-scientific research is exceptional. There are currently ten virgin forests in Croatia extending over a total area of 848.41 ha (Anić 2004). Of these, six are beech-fir virgin forests, two are beech forests, one is a beech-sessile oak forest and one is a pedunculate oak virgin forest. The diversity, quantity and area of virgin forests place Croatia among the richer European countries.

The objective of this work is to present tending and regeneration treatments in natural forests and their relationship to spontaneous processes occurring in a virgin forest. Special focus will be placed on the frequently applied and harmful practice of passive forest protection, which causes forests to convert into secondary virgin forests due to the absence of tending and regeneration treatments. Without human intervention, they are gradually self-decomposed, while their regeneration is generally long-lasting and of unsatisfactory quality. The man, the society and the environment thus lose both non-commercial and commercial values that a natural commercial forest is capable of providing.

DEVELOPMENT OF VIRGIN FORESTS AND CLOSE TO NATURE FOREST MANAGEMENT RAZVOJ PRAŠUME I PRIRODNO GOSPODARENJE ŠUMAMA

The forest is represented by the forest soil coherently covered with forest trees, shrubs and ground vegetation, which permanently produce wood matter and goods of general benefit expressed in ecological (protective), social and socio-ecophysiological forest functions. It is characterized by a balance between life community or biocoenosis (plants, animals, microorganisms) and site (soil, climate, relief) (Matić 1996a).

A forest which has always developed without any organized human impacts and has prospered exclusively under the impact of natural factors is a virgin forest (Prpić et al. 2001). A naturally managed forest is a forest developed under the organized impact of man, who follows the principles of virgin forests in tending and regeneration (Matić 1990).

In its growth of several centuries a virgin forest goes through developmental cycles which, according to Korpel (1996), alternate and intertwine in three different stages: the initial, the optimal and the decomposition stage. Each of these stages has a characteristic structure, growing stock and duration. These developmental cycles and stages constitute the life cycle of a virgin forest. It embraces a period from the establishment of one generation of trees to the death of the very last tree of that generation. This period lasts about 400 to 500 years for fir-beech virgin forests (Korpel 1995, Mayer et al. 1980).

A virgin forest lacks a homogenous structure. Indeed, it displays a variety of developmental phases which differ in terms of tree heights, wood volume, the amount of dead wood, quantity of young generation, tree vitality, crown canopy and similar (Anić 2004). The developmental phases extend over 0.5 to 1.5 ha and are distributed mosaic-like across the virgin forest area. These stages are called the initial, the selection, the optimal and the terminal stage with the sub-stages of ageing and decomposition.

The terminal phase with the sub-phases of ageing and decomposition is marked with breakdown and decomposition of growing stock and the simultaneous occurrence of a new, young generation. Such a structure in a fir-beech virgin forest may last for 80 to 120 years (Saniga 2002). During this period, trees of the old virgin forest generation decompose and a new generation starts to form. The next phase is the initial phase marked with intensive growth of trees of the new generation and their penetration from the lower to the upper stand layers. The selection phase is next. It is marked by tree species which are characteristic for a selection forest and selection structure. This is a short phase lasting for only 20 to 30 years (Saniga 2002). In beech-fir virgin forests in the Dinaric range, due to the mosaic of microsites caused by karst phenomena and varying soil depths, the selection structure is formed in almost all developmental stages and phases of a virgin forest (Prpić et al. 2001). The initial and the selection stage in a beech-fir virgin forest last for about 100 to 140 years. Next is the optimal phase, in which the basal area and the volume achieve maximal values, the canopy is complete, the number of trees per surface unit is large and regeneration is poor. This phase, lasting for 80 to 120 years, is characterized by the attainment of maximal values of growing stock of about 1,400 m³/ha. The optimal phase is followed by the terminal phase, in which the old generation of the virgin forest is decomposed and the new one is formed.

During the life cycle of a virgin forest lasting for several centuries, natural regeneration becomes more intensive at the end of the optimal phase. This is marked by the gradual reduction of the growing stock, the formation of light and soil conditions for seed germination and the growth of the young generation. The selection stage is too short for the young generation to survive. It disappears due to intensive

growth of dominant trees, the formation of the horizontal canopy and the lack of light. This leads to the rapid disappearance of the selection phase and the onset of the optimal phase, in which conditions for natural regeneration are minimal.

In selection management, the structure of the selection and the initial part of the optimal phase is permanently maintained. In a commercial selection stand mature trees are cut and natural regeneration is stimulated. If these operations are missing, the structure of the stand will assume the features of the optimal, and later of the terminal virgin forest phase.

In order to maintain the selection stand in optimal structural conditions, permanent silvicultural treatments should be applied. This involves selection cuts in which the value of the increment is cut and the optimal growing stock maintained (Matić et al. 2001). During the entire life cycle of a fir-beech virgin forest, the recorded tree mortality ranged from 21.41 to 29.24%, or 25% on average (Saniga 2002). This result firmly confirms the fact that the cutting intensity of 25% in selection management has been properly determined and that it conforms to nature. If silvicultural treatments are lacking or are misapplied, e.g., if lower cutting intensity is applied, the selection stand will lose its optimal structure, while over-mature and physiologically weakened trees will decline and die. Natural regeneration in such a forest is absent, increment is reduced and so is the production of commercial and non-commercial goods.

The structure of the optimal phase in a virgin forest offers insights on tending and regeneration of even-aged stands. The structural features of old even-aged stands are almost identical to the structure of the optimal phase of a virgin forest. In the developmental stage of the old stand, a decrease in the increment and visible physiological weakening of trees call for the application of treatments based on natural regeneration. In the course of two to five cuts the number of trees is gradually reduced, while simultaneous protection of the soil encourages the growth of the new stand generation. Thus, by adhering to natural processes which occur relatively briefly in one of the phases of virgin forest growth, we ensure optimal natural development of an even-aged stand.

In regular forests with silvicultural forms of high forest, coppice with standards and coppice, natural regeneration includes silvicultural treatments of tending and regeneration. Tending begins after natural regeneration and lasts almost throughout the stand's life or rotation, i.e. since the beginning of regeneration. Tending ensures the optimal, natural structure which forms good stand climate, develops the forest soil and allows optimal production of market and non-market values, biological diversity and the possibility of natural regeneration (Matić 1996). Regeneration of regular forests involves the replacement of an old and mature stand, using shelterwood cuts, with a young one. In the process, any stresses for the forest floor and the young generation are avoided. Further tending treatments maintain the optimal natural structural and site condition in all age classes. Such an optimal condition in a regular forest may be compared with the optimal stage in the development of a virgin forest.

Nature-based silvicultural tending and regeneration treatments in regular forests maintain the natural development of a forest, similar to that in a virgin forest

(optimal stage and growing stage) (Korpel 1995, 1996). The decomposition stage has thus been purposefully avoided and those useful natural processes occurring in the most natural of all forests – the virgin forest – have been consequently followed. Our treatments accelerate the processes and increase the quality of a stand.

SOME EVENTS THAT JEOPARDIZE CLOSE TO NATURE MANAGEMENT

NEKE POJAVE KOJE DOVODE U PITANJE PRIRODNO GOSPODARENJE ŠUMAMA

During the 20th century close to nature management was abandoned in many European countries. Clearcutting as a method of management and establishment of forests was introduced in practice for reasons of economic nature. However, in current ecological and economic conditions profit in forest management is a rather dubious category.

It is important to determine what amount of financial means should be returned to a forest through tending and regeneration so that the forest soil is saved from degradation and the quality of commercial and non-commercial forest functions is preserved. Non-commercial forest functions are divided into ecological (hydrological, water-protective, anti-erosion, climatic and anti-emission), social (aesthetic, health, recreational and tourist) and socio-physiological functions (genetic, biological-diverse, natural-protective and physiological) (Prpić 2003). The society makes good use of these forest products. Their quality is higher if close to nature forest management is more intensive and better. Regrettably, these functions do not have any market value at present day and are therefore not calculated as income realized by forests and forestry.

The present is marked by disturbed global ecological conditions and frequent ecological disasters caused by human activities which, among other things, result in the weakening, dieback and mortality of forests (Matić 2003). To counteract such a situation, a large number of citizens' associations and political parties ("lovers of nature", "green activists", "environmentalists", and similar) have been established with the mission to alert the public of this problem. Despite not having proper knowledge on forests and forestry, they generally blame all the problems on foresters, oppose any treatments in forests and insist on the protection of large natural forest complexes and their exclusion from normal (natural) management.

Such an attitude is, unfortunately, becoming a rule of conduct even in those countries which still have natural forests and in which clearcutting is banned by law. The example of Croatia illustrates that forested areas under some kind of protection are increasing almost on a daily basis. In such areas natural management is either not allowed or is reduced to the minimum (Matić 1999). The total forest area enjoying some kind of protection amounts to 610,510 ha or to 29.4% of all forests in Croatia (Matić 2006). Management is completely excluded from some of these areas. In others, it is allowed but is strictly limited. As a rule, limitations are set by those circles and institutions which cannot boast many forestry experts. It should be pointed

out, however, that it was precisely the Croatian forestry experts who have created our natural forests during 240 years of organized management.

Passive forest protection excludes close to nature management, gradually depletes the optimal natural structure and significantly decreases non-commercial and commercial forest values. In addition, it causes worsened site conditions, aggravates regeneration, increases the number of old and physiologically weakened trees, debilitates the vitality, stability and productivity of forests, reduces the diversity of flora, fauna and microorganisms, etc. All the above is responsible for the fact that such forests assume the character of virgin forests in the subphases of ageing and decomposition. Sadly, forests with a disturbed structure provide minimal commercial and generally beneficial goods.

CONCLUSIONS ZAKLJUČCI

Sustainable management, applied in central Europe since the 18th century, is the principal reason that natural forests and close to nature management has survived to date. Close to nature management focuses on tending and regeneration, as well as the production of commercial and non-commercial values. At the same time, it maintains the optimal natural stand structure and ensures permanent protection and development of forest soil.

Close to nature management in selection and regular forests is based on natural laws reigning in a virgin forest, with the only difference that the applied silvicultural treatments accelerate natural processes and achieve better quality and eternity of forests.

Clearcutting as a management method has contributed to the loss of respect for forestry as a profession on the European scale. This method is motivated by economic indicators in which profit has a dominant role at the detriment of natural forests and functions of general benefit.

Forests lacking close to nature management are heading towards destruction. Close to nature management has been and will be the only guarantee of protection, survival and eternity of forests. All those that insist on passive forest protection and mask their ignorance with “love” for forests, should know that they take enormous responsibility. They should also know that love alone leads forests to destruction.

REFERENCES LITERATURA

- Anić, I., 2004: Prašume i njihovo značenje za gospodarenje šumama u Hrvatskoj. Glasnik zaštite bilja 6: 85–96.
- Anić, I., S. Matić, M. Oršanić, 2005: Natural Forests of Pendunculate Oak (*Quercus robur* L.) in Croatia. U: Commarmot, B., Hamor, F. D. (ur.): Natural Forests in Temperate Zone of Europe—Values and Utilisation. Swiss Federal Research Institute WSL, Carpathian Biosphere Reserve, Birmensdorf-Rakhiv, pp. 135–141.

- Klepac, D., 2001: Razvoj gospodarenja u jelovim šumama. U: Prpić, B. (ur.), Obična jela (*Abies alba* Mill.) u Hrvatskoj, Akademija šumarskih znanosti, Zagreb, 25–89.
- Korpel, Š., 1995: Die Urwälder der Westkarpaten. Gustav Fisher Verlag, Stuttgart-Jena-New York, str. 310.
- Korpel, Š., 1996: Razvoj i struktura bukovo - jelovih prašuma i njihova primjena kod gospodarenja prebornom šumom. Šumarski list CXX (3–4): 203–209.
- Matić, S., 1990: Šume i šumarstvo Hrvatske–jučer, danas, sutra. Glasnik za šumske pokuse 26: 35–56.
- Matić, S., 1996: Uzgojni radovi na obnovi i njezi sastojina hrasta lužnjaka. U: Klepac, D. (ur.), Hrast lužnjak (*Quercus robur* L.) u Hrvatskoj, Hrvatska akademija znanosti i umjetnosti, Hrvatske šume, p. o. Zagreb, Zagreb-Vinkovci, 167–212.
- Matić, S., 1996a: Šumarstvo Hrvatske od osnivanja modernog sveučilišta u Zagrebu (1874.) do danas. U: Mrzljak, P. G. (ur.), Znanost u Hrvata: prirodoslovlje i njegova primjena. Ministarstvo znanosti i tehnologije Republike Hrvatske, Zagreb, 516–533.
- Matić, S., 1999: The forests of Croatia – country report. U: Diaci, J. (ur.), Virgin forests and forest reserves in Central and East european countries, Department of forestry and renewable forest resources, Biotechnical faculty, Ljubljana, 17–24.
- Matić, S., I. Anić, M. Oršanić, 2001: Uzgojni postupci u prebornim šumama. U: Prpić, B. (ur.), Obična jela (*Abies alba* Mill.) u Hrvatskoj, Akademija šumarskih znanosti, Zagreb, 407–460.
- Matić, S., 2003: Neki problemi koji opterećuju hrvatsko šumarstvo u današnjim gospodarskim, društvenim i ekološkim uvjetima. Šumarski list 5 – 6 (CXVII): 211–216.
- Matić, S., B. Prpić, I. Anić, M. Oršanić, 2003: Bukove prašume. U: Matić, S., (ur.), Obična bukva (*Fagus sylvatica* L.) u Hrvatskoj, Akademija šumarskih znanosti, Zagreb, 414–434.
- Matić, S., 2004: Održivi razvoj hrvatskih šuma ugrožen je zbog nepoštivanja Ustava i Zakona o šumama Republike Hrvatske. U: Maceljki, M. (ur.), Alternativna biljna proizvodnja u strukturnim promjenama hrvatske poljoprivrede, Hrvatska akademija znanosti i umjetnosti, Znanstveno vijeće za poljoprivredu i šumarstvo, Zagreb, 82–84.
- Matić, S., 2006: Natural management as an important factor of forest protection and survival. U: Diaci, J. (ur.), Nature-based Forestry in Central Europe, Alternatives to Industrial Forestry and Strict Preservation, Department of Forestry and Renewable Forest Resources-Biotechnical Faculty, Ljubljana, 19–26.
- Prpić, B., S. Matić, J. Vukelić, Z. Seletković, 2001: Bukovo-jelove prašume hrvatskih Dinariida. U: Prpić, B. (ur.), Obična jela (*Abies alba* Mill.) u Hrvatskoj, Akademija šumarskih znanosti, Zagreb, 479–494.
- Prpić, B., 2003: Općekorisna uloga bukovih šuma. U: Matić, S. (ur.), Obična bukva (*Fagus sylvatica* L.) u Hrvatskoj, Akademija šumarskih znanosti, Zagreb, 213–227.
- Saniga, M., 2002: Štruktura pralesa. U: Slavik, D. (ur.), Dobročsky prales–Narodna prirodna rezervacia, UVVP LVH SR, Zvolen, 30–34.

VEZA IZMEĐU PRIRODNOG GOSPODARENJA I ŽIVOTNIH FAZA U RAZVOJU PRAŠUME

SAŽETAK

Šumarska struka u gospodarenju šumama primjenjuje načelo potrajnosti ili načelo održivog razvoja. Na taj se način zahvatima njege šuma unapređuju postojeće, a zahvatima obnove ili pomlađivanja šuma podižu nove generacije šuma. Zahvaljujući načelu potrajnosti, koje se u hrvatskom šumarstvu primjenjuje od 1765. godine, naše prirodne šume su opstale do današnjih dana. Prirodno gospodarenje se temelji na zahvatima njege i obnove šuma kojima temeljna načela nalazimo u prašumi. To se odnosi kako na preborne (jelovo-bukove šume), tako i na regularne šume (šume svih ostalih vrsta drveća u Hrvatskoj). Tako gospodarene šume su stabilne i vječne. One predstavljaju čvrsto ekološko i gospodarsko uporište u svim, pa i nepovoljnim životnim uvjetima. Ako se šuma od svog nastanka razvija pod utjecajem čovjeka koji obavlja radove njege i obnove temeljene na prirodnim načelima tada govorimo o prirodnoj gospodarskoj šumi. Nasuprot tome, ako se šuma oduvijek razvijala bez utjecaja čovjeka, onda je riječ o prašumi. Prašuma u svom višestoljetnom razvoju proživljava razvojne cikluse u kojima se izmjenjuju tri različita stadija: inicijalni, optimalni i terminalni stadij. Stadiji se preklapaju s razvojnim fazama, primjerice starenjem, raspadanjem i prebornom fazom. Razdoblje od nastanka do nestanka jedne generacije u jelovo-bukovoj prašumi traje približno 400 – 500 godina. Nešto manje od polovice toga razdoblja šume provedu u poželjnim, stabilnim i produktivnim strukturnim prilikama. Dulji dio toga razdoblja, 200 do 300 godina, ona se nalazi u nepovoljnim strukturnim i fiziološkim prilikama. Povoljno i poželjno prvo razdoblje obuhvaća faze koje primjenjujemo u gospodarenju prebornom šumom (preborna i početak optimalne faze) odnosno regularnom šumom (optimalna i inicijalna faza). Obavljajući zahvate njege i obnove prebornom sječom u prebornoj šumi održavamo drvenu zalihu od približno 400 m³/ha prije i 300 m³/ha nakon sječe, osiguravamo prirodnu strukturu u kojoj se događa optimalno prirodno pomlađivanje, maksimalan prirast, poželjna biološka raznolikost, prirodnost, stabilnost i vječnost prebornih šuma. Isto tako, obavljajući zahvate njege u regularnoj šumi elimineramo iz sastojine prekobrojne i nekvalitetne jedinice, slično prirodnom mortalitetu koji se događa tijekom razvoja prašume. Zahvatima pomlađivanja u regularnoj šumi koja je doživjela zrelost i strukturu sličnu optimalnoj fazi u prašumi, prirodno je obnavljamo i osiguravamo joj vječnost. Navedeni zahvati koje provodimo u gospodarskim prirodnim šumama imaju uzor u prašumama s razlikom što njegovana prirodna šuma, za razliku od prašume, uvijek ima kvalitetnu gospodarsku i općekorisnu proizvodnju, a u fazi starenja je prirodno obnavljamo. U današnjim poremećenim ekološkim uvjetima najviše se suše šume koje nemaju prirodnu strukturu. Zahvaljujući prirodnom gospodarenju naše šume spadaju među najstabilnije u Europi. Ipak, neki naši zakonski akti, vjerojatno napisani pod jakim utjecajem «ljubitelja prirode», «zelenih», «ekologa» i sl., zahvaljujući nepoznavanju funkcioniranja šume, pogrešno insistiraju na pasivnoj

zaštiti, bez zahvata njege i obnove. To ugrožava kvalitetu i opstanak šuma. Ako ne želimo u budućnosti ostati bez kvalitetnih prirodnih šuma to treba hitno mijenjati. Svi mi volimo naše šume, ali pored ljubavi moramo o njima dovoljno i znati. Ljubav bez znanja je put koji šume vodi u propast.

Ključne riječi: prirodno gospodarenje, prirodna šuma, prašuma, njega, pomlađivanje