

urban forests

A different Trademark for Cities and Forestry



PROCEEDINGS - Book of Summaries

8th IUFR0 European Forum on Urban Forestry

8. IUFR0 Evropski forum o urbanem gozdarstvu
10. - 12. maj 2005, Celje, Slovenija

The forest and the city

are two extremes: the forest on one side as highly developed natural ecosystem, and the city on the other as the most perfect man made (eco)system. They are both integrated in an urban forest.

Modern man is rediscovering the value of physical, emotional and mental well-being. Forests, as the most preserved natural land ecosystems are an ideal environment for a human being to practice »re-creation«.

Although it perfectly fits to the prevailing economic standards of society (low cost & cost effective), the social values of forests still seem to be underdeveloped and inadequately utilised. It is definitely a challenge and an opportunity for forestry and related professions.

The **European Forum on Urban Forestry** (www.efuf.org) is an initiative of the International Union of Forest Research Organisations (www.iufro.org), Workgroup 6.14.00 (Urban Forestry) and the European Urban Forestry Research & Information Centre (www.urbanforest.info). It is an unique venue where urban forestry professionals meet scientists and policy-makers within the field. The forum meets yearly, hosted by one of the members.



URBAN FORESTS

– a different trademark for cities and forestry

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PREFACE

The context of urban forests and forestry in Slovenia

Slovenia is one of the European countries with the highest share of forests and with one of the lowest levels of urbanisation. The forests are relatively natural and well preserved with a diverse natural structure. The concept of close-to-nature forestry, based on natural regeneration and moderate small-scale intervention, has been developed and practiced in a majority of the Slovenian forests for the last half a century. In this context, urban forests and forestry may not have such a significance as in some other more urbanized countries.

Yet, more than half the Slovenian population lives in the urban areas where the forest cover is about 25%, which is significantly lower than the country's average of 57% (in 2003). The social forest functions, such as recreation, aesthetics or education, are most strongly expressed in the forests in and around the cities. Their recognition requires adapted forest management, which should include also new, non-traditional knowledge, like participatory planning,

conflict management, public relations, marketing, lobbying, etc., all of which deal with the people.

Development of new concepts in forestry may be significant also in a wider context. One of the Slovenia's strategic future economic activities is tourism, based on landscape diversity and well preserved natural environment, where forests are its vital essence. Urban forestry in this context may represent the core for future development of »landscape forestry« in Slovenia, dealing with the research, management and marketing of the environmental and social functions of the forests as an inseparable part of the Slovenian cultural landscape.



Robert Hostnik

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Can Urban Forestry assist with banishing the City Blues?

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Although most of us in the West are now living and working in urban areas, the word ‘urban’ still, for many of us, has rather negative connotations. In spite of the pro-urban rhetoric of the media or professional journals, there is definitively a feeling of ‘urban blues’ amongst many members of the general public.

It is perhaps ironic that this urbanisation has occurred at a time when many of our towns and cities are at a point in the urban system life cycle when they have shifted from an industrial to a post industrial economy, and thus are beyond the stage of stable maturity and are entering into a cycle of decline. This has resulted in a frenzy of city marketing and promotional activity as key aspects of an attempt to create a positive image or ‘place selling’ for the post-industrial city or its city region. It would be a mistake however to think that such activity is new; it has been around for a long time.

This illustrated paper will briefly trace the three main stages in the life cycle of urban and regional systems where ‘place selling’ is evident. It will however specifically focus upon post-industrial cities, where the author will suggest that, at best, imagery is based upon cultural vibrancy, spectacle and diversity, or at worst, a constant and uncritical replication of formulaic features, such as ‘iconic buildings’, ‘urban design’ or ‘urban place-making’, which are assumed to express ‘urbanity’ and make us feel better about our urban areas.

Whilst it can be argued that the projected image of a city can play a greater role than its reality in shaping the views of visitors, investors and even residents, the author will suggest that such a stance is essentially unsustainable. This paper will conclude therefore with considering whether urban forestry can help to banish the city blues by providing a much more rational, memorable and sustainable vehicle for ‘imaging’ the declining city or city region and if so, what step-changes are required from urban foresters in order to sell this concept and achieve this goal.

Alan Simson is a chartered landscape architect and urban forester. He has gained extensive professional experience in the UK new towns, private practice and higher education. Currently, he is a Reader in Landscape Architecture + Urban Forestry at Leeds Metropolitan University, involved in research, teaching, and consultancy, both in the UK and abroad. He has been involved in several EU research projects on urban forestry. He is chairman of Concourse, a regional centre for art, architecture and urban design, chairman of the Landscape Institute (Yorkshire & The Humber Region), chairman of the White Rose Forest (a sub-regional community /social urban forestry initiative) and is a member of the Forestry Commission’s Regional Advisory Committee.

Branding the Urban Forest – European Insights and Opportunities

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Europe's urban foresters are struggling on a daily basis to keep urban forestry issues high on the (municipal) political agenda. Although politicians and other stakeholders generally agree that woodland and other green space make positive contributions to their city or town, the reality is that urban forestry issues are still far too easily pushed down the political priority list. This paper will argue that urban foresters need to become better at »selling« the urban forest and its multiple contributions to attractive and healthy cities. Successful efforts to do so will require the involvement of experts of public relations and marketing. Together with the local woodland and greenspace managers, they can apply principles of »branding« to generate broader political and public awareness and support.

A »brand« is the proprietary visual, emotional, rational, and cultural image that you associate with a company (for example: the municipal forest service) or a product (the urban forest and its multiple functions). Good branding will result in good first impressions and evoke positive associations, i.e. the attributes that customers think of when they hear or see the brand name. Thus local urban forests could become directly linked to, for example, human health and wellbeing, adventure and relaxation, natural elements of good cities, and city identity.

Branding has been coined the most powerful idea in the commercial world. In urban forestry, however, successful application of it to better compete with the many other interests in the political and public arena has been scarce. After an introduction of branding principles and successes, examples of recent branding efforts in forestry and urban forestry will be presented. These include, among other, a national campaign to promote forestry and its products in Britain, as well as successful branding of the National Forest in England. In the latter case, effective branding created the image of a large forested landscape even before the effect of tree planting was really noticeable. Other branding examples in urban forestry include the North-American Tree City USA programme, various »The Forest of ...« initiatives, as well as the local example of host city Celje where city administration and state forest service jointly created a brand for the urban woodlands.

The examples show that some valuable experiences with branding in urban forestry have been obtained. Further study of these examples as well as marketing theory and applications can be used to ensure that branding has an added value for urban forestry in Europe.

Cecil Konijnendijk, a Dutch national, obtained a PhD in forest policy and economics from the University of Joensuu, Finland. After employment with the European Forest Institute and the Danish Centre for Forest, Landscape and Planning, Cecil set up woodSCAPE consult at the end of 2004. His work focuses on the development of strategies for urban forestry, while popular scientific dissemination also has his special interest. Cecil has coordinated several international activities within urban forestry, leads IUFRO's Working Party on Urban Forestry and serves on the Board of EFI. With Thomas Randrup he founded scientific journal *Urban Forestry & Urban Greening*.

Technology, Synergy and Urban Forestry: Is Our Future Going Gray or Green?

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At the dawn of the 21st century, as population growth profoundly impacts our communities, cities and towns across the globe are scrambling to develop planning initiatives that deal with dramatic growth forecasts. These go by many names: Sustainable Planning, New Urbanism, Smart Growth! and similar programs are proliferating across the United States. Many of these programs are reactive, driven by the ill-effects of population growth . . . from sprawl to transportation issues to energy and health and the pollution of soil, water, and the air we breathe. These issues dramatically affect our economy and our people, from the business sector to health costs, insurance and energy costs, pollution compliance and much more. For that reason, TreeLink has worked with a California multimedia production company to develop a 12 minute presentation called Going Green to enlighten land planners, policymakers, organizations, educators and, most important, the general public - to show the importance of Urban and Community Forestry and to show why green infrastructure is not just “nice to have,” but MUST be included in growth strategies for sustainable communities.

This interactive presentation is designed to enlighten and awaken those decisionmakers without whom urban forestry practitioners are merely “preaching to the choir.” We have the knowledge and now we have the technology to re-invent our cities to grow both economically and environmentally. Produced by Compass Rose Media, this downloadable multimedia product (also available in CD) combines cutting edge content and technology to deliver a compelling message. “Going Green” shows how and why to include community forests in sustainable growth strategies. This is a communications outreach tool designed to accompany (not compete with) local presentations.

The U&CF movement is resonating in the USA, and the sound that people are hearing is harmony. It continues to grow as a national movement and a discipline taught in universities from coast to coast, despite budget constraints, through public/private partnerships.

Today strategic partnerships are forming between the forces of urban growth and the movement for a sustainable environment. The truth is: We need not choose between the two. Urban forestry offers both, and we need to tell decision makers that this is a solid opportunity for economic enhancement.

My desire is to show this multimedia presentation, which I wrote, as a U.S. perspective, recommend tools available to anyone within reach of technology, discuss what’s working in the USA and, beyond this, to learn what’s working in Europe.

Pepper Provenzano is the founder and director of TreeLink, a web information and networking centre in the USA. TreeLink was established in 1996 with grants from the USDA Forest Service and the George and Dolores Eccles Foundation. Mr. Provenzano has 20 years experience in newsprint journalism and 17 years in urban forestry. He is the founding president of TreeUtah and cofounder of the National Alliance for Community Trees. Pepper lives with his family in Salt Lake City.

New International Master's programme in Urban Forestry & Urban Greening

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Cities are growing rapidly; in 50 years more than 80 per cent of the world's population will live in an urban environment. Urban green areas such as parks and gardens, woodlands and forests with socio-cultural values are important for urban life, but as the urban population increases the condition of these areas and the populations' requirements change. If an urban green development is to succeed, new strategies and tools must be developed to meet these changing circumstances.

Urban Forestry & Urban Greening (UFUG) is a new academic field, with forestry and landscape architecture as the two major academic components. Combining humanistic and social aspects with economic and ecological issues in planning and management, working interdisciplinarily, there is a lot to gain within the field of UFUG.

The core of UFUG is the **urban green resource**; its development defines the tasks to be fulfilled. Basically, the urban green resource includes all green components – from the individual street tree and urban park to the forest outside the urban agglomeration adjacent to dwellings.

In September 2005 the Swedish University of Agricultural Sciences together with the Royal Veterinary and Agricultural University in Denmark, and three other Nordic universities, will start a one-year Master's programme in Urban Forestry & Urban Greening. The programme emphasizes the different levels of planning, design and management of the urban green resource, and stresses communication with people in the public and private sectors in the process.

The programme is aimed at Nordic and International students and practitioners who hold a Bachelor degree, or equivalent, in Forestry, Landscape Architecture and other relevant biological and planning related subjects, such as urban forestry, biology, ecology, geography, town planning and architecture.

The strength of the programme is the combination of disciplines looking at the urban green resource as a whole; this involves working closely with research and practice, using interdisciplinary tools and methods in order to create a sustainable and more vital green resource for the benefit of the society. Here, the students' variety of backgrounds plays an important role. The students will be expected to draw on their own experience during the studies, which will allow them to take an active part in discussions, seminars and projects. Mutual respect and understanding are valuable assets of the program. The courses will develop both good academic and operative knowledge; providing tools such as methods for analysis, communication and presentation.

Joining the Nordic expertise in a joint Master's programme is a good start widening the global network of UFUG research resources, finding new strategies and methods for the local and global urban green resource.

Ulrika Åkerlund is a landscape architect and research assistant at the Department of Landscape Planning at the Swedish University of Agricultural Sciences at Alnarp. She has been working with the urban forestry research project NeighbourWoods and since March 2004 she is co-ordinating the new Master's programme in Urban Forestry & Urban Greening, which will start in September 2005. Currently she is also working at FAO with urban forestry in Western and Central Asia. Her special field of interest is sustainable urban development and Russian and post-soviet landscapes.

Dr. Thomas Barfoed Randrup is professor in Park Management and Urban Greening at the Danish Centre for Forest, Landscape and Planning, KVL. Thomas is a Danish national and holds a doctoral degree in Landscape Planning from the Royal Veterinary and Agricultural University (KVL) in Denmark. Thomas' own research concentrates on urban abiotic growing conditions, strategic management and policy development for urban green space. Thomas is co-ordinating the international Master's programme 'Urban Forestry & Urban Greening', and is together with Cecil Konijnendijk, founder and editor-in-chief of the scientific journal Urban Forestry & Urban Greening. Furthermore, Thomas has been a member of the board of the International Society of Arboriculture (ISA) since 1999.

Using Urban Forest Management in Santiago, Chile as a Cost-Effective Air Quality Improvement Policy

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An existing policy in Santiago, Chile aimed at improving air quality through urban forest management was analyzed using policy, urban forest transpiration-deposition, and economic models. Once the Greater Metropolitan Santiago's 36 autonomous municipalities were divided into 3 socioeconomic strata, field measurements and the Urban Forest Effects (UFORE) model quantified Santiago's urban forest structure and environmental functions. Air Photo interpretation and randomized-stratified field sampling across the 967-km² study area measured urban vegetation parameters regardless of tenure, land use, or socioeconomic conditions. Santiago, home to 40% of Chile's population, is located in a semi-arid, Mediterranean climate, evergreen shrubland area and has an estimated 6.2 million trees and 643 km² of combined tree and shrub leaf area. Tree density was significantly greater as was overall cover, size, and condition in the high socioeconomic stratum. *Robinia Pseudoacacia*, *Prunus spp.*, *Cirtus limon*, *Acacia cavens* and *Populus deltoides* were the most commonly sampled trees; comprising 32% of Santiago's tree population. 57% of the tree population is privately owned and managed.

Urban forest parameters and real-time meteorological and pollution concentration data were then used along with the UFORE model to estimate that tree and shrub cover across the 3 socioeconomic strata improved air quality, via particulate matter (PM₁₀) removal, a mean monthly average of 3.0% during 1 year; a total of 2,790 metric tons removed. Tree PM₁₀ removal per area of urban forest cover (8.0 g/m²/year) was higher in the low-income strata despite the high-income strata having a significantly greater leaf area and leaf area index. Results indicate that carbon storage and sequestration vary among Santiago's urban forests and overall carbon offsets from Chile's urban forests are greater than those of industrialized countries'. Santiago's urban forest composition also influences volatile organic compound emissions, which in combination with nitrogen oxides might lead to subsequent ozone formation.

A survey of representative municipalities in each socioeconomic stratum determined that an average of 4.4%, 4.4%, and 5.0% of the total municipal budget was allocated to urban forest management in the high, medium and low socioeconomic stratum, respectively. These costs can be extrapolated to the Greater Santiago's 36 other municipalities. Results from the cost-management survey and the UFORE model were combined to determine a cost-effective metric that analyzed the use of urban forest management for air quality improvement. A cost-effectiveness metric in PM₁₀ incremental abatement cost per area of municipal urban forest cover (Ch\$/ton/PM₁₀) for each socioeconomic stratum was compared to existing technologies, policies, and literature and it was determined that urban forestry is a cost-effective air quality improvement policy in Santiago according to Chilean environmental policies and guidelines from the World Bank.

Urban forest management can provide municipalities the incentive to use the urban forest's technological pollution abatement function in an air pollution market-trading program. Thus, urban forest management's pollution removal ability and this repeatable, simple and enforceable approach can be effectively used and applied in the context of Chile's existing environmental and economic policies.

Francisco Escobedo Montoya received a PhD in Environmental and Natural Resource Policy, a Masters of Science in Watershed Management, and a degree in Agronomy. He is currently employed by the United States Forest Service as an air and soil quality specialist. His professional and research interests include urban and periurban environmental quality, policy and economic analysis, economic development, urban forestry, and fire management. Recently he was the principal investigator in a University of Chile funded multi-year joint project with the State University of New York-College of Environmental Science and Forestry and the United States Forest Service.

The Meaning and Importance of “Wild Urban Forest Areas” for People and Nature

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The decline of old heavy industries in the Ruhr Area of Nordrhein-Westfalen, Germany, offers areas of different size, which -as time goes by- will be forested by means of natural regeneration. Those areas challenge municipalities as well as urban planners, foresters and ecologists. The question at stake is: what are we going to do with these areas and whom will they serve. The decrease of population in the bigger cities of the Ruhr Area like Essen, Duisburg, Bochum, Gelsenkirchen together with an economic crisis let it seem to be unlikely that the whole of these areas will be used as new industrial sites or for housing facilities.

This gives the historical opportunity to let them be “wild areas” at the doorstep of people's neighbourhoods. The State forest administration of Nordrhein-Westfalen therefore launched a programme called -Industrial forests - which means forests that follow industry.

The main aims of this programme are:
to study the return of nature on derelict land and to look into the ecological factors and functions this “new nature”, mostly forests, have
to examine the social values of these “wild areas” for the people living close by
to invite people, especially children, to explore these areas either on their own or organised by the state forest administration

The presentation will focus on the results of research which has been carried out (and still is going on) in the fields of

(wild) urban forests and nature education - a case study with six primary schools in the Ruhr area
patterns of use and perception of wild urban areas : how do people look at them and use them
perceptions of wild urban areas of minority immigrant groups in the Ruhr area
an interdisciplinary approach to communicate nature and cultural heritage sites: the case of the Kokerei Hansa (Hansa Coking plant in Dortmund).

The presentation will show the meaning and the importance wild urban forest areas have and will have in future times in rapidly changing cities. It will be shown that they offer social as well as ecological and cultural benefits which can be communicated as well as experienced without guidance.

Renate Spaeth received a diploma degree in forest engineering in 1984. After that she worked at two different local forest districts in Nordrhein-Westfalen in urban regions before changing to work at the ministry for environment and nature conservation, agriculture and consumer protection. □ At the ministry she worked with different topics like silviculture, forest policies, regional planning, nature conservation and forests, forest law, environmental education and public relations. Since 2004 she is a member of the FAO/ECE/ILO Team of Specialist on Gender and Forestry. Most recently Ms Spaeth has launched a couple of studies dealing with the perception of nature and urban forests in the Ruhr area of Nordrhein-Westfalen.

Towards a City's Identity: Developing the Urban Dimensions of the Forest of Celje, Slovenia

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Background

The share of forests in the Celje urban area is 26 %. They are covering the slopes of the surrounding hills and only a few small forest sites remained on the flat plain.

The social functions of forests close to the city have been recognized to an extent more than a century ago. From 1885 to 1892 the Municipality bought 29 hectares of private forests on the slope above the city park. After that new walking paths were constructed and equipped with benches, pavilions and even with the sightseeing tower. The city park and nearby forests were popular for recreation and had been suitably maintained until about the 1960's, when better citizens' mobility and the heavily-polluted environment caused a decline in interest for these areas and subsequent abandoning of regular management.

Recent development

The recent development of urban forest management in Celje started at the beginning of the 1990's. A survey of environmental and social functions of the forests and emerging conflicts between private and public interests stressed the need for a long term oriented forest management. The City Council accepted the initiative: in 1996 it confirmed the strategy and management plan elaborated by the local unit of the Forest Service, which pointed out five guidelines and priorities for urban forest development: (1) protection of urban forests by local law, (2) improvement of the ownership structure by redemption of private forests, (3) development of recreational and educational potential, (4) intensive and constant public relations and (5) assuring stable financial resources for management. The strategy also identifies a priority area for management for the **urban forest Anski vrh**, the one closest to the city and with the highest background of potential users.

Management results of the last decade

1996	Elaboration of Strategy and long-term Management Plan;
1997	The City Council confirmed the local law for protection of the urban forests of Celje, which defines the protected area, regulates their management and provides part of the funds for adjusted management as well as for redemption of private forests and for compensations to the private forest owners. It was the first local decree of this kind in Slovenia.
1997 - 2004	The Municipality of Celje purchased most of the private forests in the urban forest area of Anski vrh at prices 15-25% higher than for regular forest land. In general, the Municipality doubled its ownership share of protected urban forests.
2000 -2004	A network of multipurpose and recreational forest paths have been constructed and equipped in the urban forest Anski vrh with the total length of more than 8 kilometres.
1997-2004	Over 100 articles on the Celje urban forests were published in the press and electronic media, mostly in local newspapers, television and radio.
2005	The Slovenian Forest service, in cooperation with the local Municipality, launched a non-commercial brand »Mestni gozd Celje« to promote the values of urban forests and to raise awareness.

Vision Urban forests as high quality urban living environments are carefully managed so that their environmental and social sustainability is assured. They may become the city's new identity with strong public and consequently political support. Important future activities will involve environmental education and forest pedagogy.

Robert Hostnik graduated in forestry at University of Ljubljana. He work as a forest manager at the Slovenian Forest Service and have 14 years of experience on the fields of forest management planning, silviculture, forest protection and wood production in private and state forests. His major fields of interest and expertise are related to urban forestry, social forest functions, nature education and protected areas management. He is concluding master degree study programme on Conservation of Natural Heritage at University of Ljubljana. For the last 10 years he has been actively involved in urban forestry development in Slovenia.

Specific Regeneration Cuts in Prague Urban Forests

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Urban forests provide many environmental services of which the most important is recreational function. All these environmental services are influenced by forest characteristics such as tree species composition, age and/or height of the stand, vertical and horizontal stand structure etc. Silviculture alters stand structure and therefore it has specific targets in urban forests to fulfil public expectations.

The major urban forest complexes in Prague metropolitan area can be found in and near by southern suburbs. The urban forests include Natural Protected Areas which increase ecosystem quality of Prague urban forests. On the other hand it makes silviculture more delicate to be applied in these forests. Deciduous species are dominant in Prague urban forests, which makes situation different from the general conditions in the Czech Republic where coniferous species are prevailing. New Forest Act is forcing to use deciduous species in Czech forests which makes natural regeneration in urban broadleaved forests a preferable method and it should be used more frequently. A shelterwood system should be used prevalently in the Czech forest according to Forest Act but for urban forests is not always “the best option”.

Forest stands of Prague Urban forests are sorted based on two criteria: (A) type and intensity of recreation (which describe the public demand), and (B) forest stand characteristics (stand structure and species composition). It is supposed the public demand will not change dramatically in the near future as number of Prague capital inhabitants is quite stable at present. Stands which meet similar criteria A & B are associated in one cluster. Forest management rules specific to criterion (A) are under preparation for each of these clusters. Stands within the cluster are sorted into two groups. Stands which fulfill the public demands in recreational services and stands which are rather poor in this aspect. The second group of which age are higher than half of the rotation period will be through silvicultural intervention transformed into the stands with more suitable structure following criterion (B).

The criteria A&B serve also for more precise definition of Prague Urban Forests perimeter which will be evidently widen as one of the crucial output of the project.

***Dr. Ivo Kupka** is an Associated Professor of Silviculture at the Faculty of Forestry and Environment in Prague. His research interests are reforestation and regeneration in all type of forests including urban forests. Actually his research team is working on a large Research project for Management of Prague Urban Forests. The main purpose of the project is definition of the new Prague Urban forest area and new Forest Management Plan which pay special attention to the area under heavy recreational pressure. His professional carrier includes two year stay at European Forest Institute in Finland. He is active in IUFRO working group as well as in domestic Foresters Society.*

The Systemic Silviculture in the Management of an Urban Forest: Castelfusano Italian Stone Pine Forest (Rome)

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Castel Fusano and Ostia Stone pine (*Pinus pinea* L.) forests cover about 1100 ha in the south-western part of Rome. It represents an area of high naturalistic and social value as it plays important ecological, recreational and cultural functions. The history of that woodland starts at the beginning of XVIII century when stone pine stands were planted on sandy dunes to make productive a mostly marshy zone. After the land reclaiming of Rome littoral (end of XIX century) the surface covered by pine stands was increased by new plantations and was assigned new landscape and recreational functions. During the last fifty years the urban area has surrounded the pine forests and made more and more precious the services the ecosystem can offer to the people who live in the neighbourhoods around it. At the same time, the fast and disorderly growth of Rome towards the Tyrrhenian coast has caused negative impacts (specially air and water pollution) on the stands which, along with the lack of silvicultural tendings, have started a worrying tree dieback. The ruinous fire in the 2000 summer has raised again the interest for the conservation of such woodland and determined important protection initiatives. However, the multifunctional character of the pine forests within the peculiar urban context, asks for an innovative forest management approach, integrated tools of silvicultural, social and economical nature as well as a more strict collaboration with the urban planning process. In particular, the care of the pine forest should follow the principles of the Systemic Silviculture. Therefore, each treatment should be established on the basis of the stand structure characteristics, which are very variable also within small areas, without any pre-defined normal model, aiming at improving the resistance and resilience of the forest systems by means of Cautious, Continuous and Capillary interventions.

Luigi Portoghesi, graduated in forestry, is associate professor at the Faculty of Agriculture of the University of Tuscia, Viterbo, Italy. He has been carried out for twenty years researches on different aspects of multifunctional management of Mediterranean forests dealing, in particular, with systemic silviculture and public participation as means to solve conflicts between different forest uses and values. He took part in two EU funded Concerted Actions (Mufoma and Bioforum) on these issues. For the last five years he has been working on the application of these concepts also in the management of urban forests.

Urban Forestry in Practice around Budapest

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In Hungary most of the forests around municipalities are state-owned or private forests. It is a fact that traditional forestry can not satisfy entirely the recreational demand of the local inhabitants. The biggest problem is when the mostly even aged stands approach the rotation age because people are against the final cuts. Consequently the transition of these even-aged stands to uneven-aged stands is a main object in Hungarian forestry today.

In beech stands silvicultural experiments with group selection, gap cutting group selective felling were started in sub-mountain beech (*Fagus sylvatica*) forests in order to analyze the transition and the economic consequences of the conversion. It was determined how beech can grow in volume from the age of 100 years to 150 years. Economical calculations were carried out with respect to the transformation of even-aged stands towards uneven-aged forests by group selection. Beech proved to be able to produce a considerable amount of volume increment even over the age of 100 years. The mean annual increment from the age of 100 years to 150 years was 7.5 m³ per hectare. These results and the economical calculations in connection with group selection together imply that in long-term group selection could be at least as profitable as the traditional rotation forestry.

Silvicultural experiments in oak stands with gap cutting and small scale regeneration felling would seem the most appropriate methods. The main distinctions are that the average final cuts are less in area and the remnants tree number is greater.

The transformation of coniferous stands into native forest types with thinning is done in black pine forests that were established on extreme sites on bare dolomite surface in the first part of the last century. In the shelter of the pure black pine stand, the soil development could start and later other native broadleaved tree species appeared under the canopy. Here the main goal is to follow these natural, successional processes and to enforce the proportion of the native species by the means of thinnings or small scale gap-cuttings where considerably amount of broadleaved can be found in a certain size.

Peter Csepanyi was graduated from the University of Forestry and Wood technology in Sopron in 1989 as a forestry engineer. He has been working for the state forestry companies, at the Pilis Park Forestry Company from 1996. He is the Head of Forest Management Department of the company dealing with silviculture, forest management, wildlife management, and recreation at the company. He received diploma as nature conservancy engineer in 1992 and in Master Business of Administration in 2000. He was a founder of the Hungarian Pro Silva in 1999 and he has been managing the Pro Silva Demonstration Forest in the Pilis Mountain. He has taken part in Urban Forestry since 1998 and organized the European Forum on Urban Forest in 2000 at the Pilis in Budapest.

Strategic Goals and Planning in an Urban Context

- Experiences from Swedish Forestry

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The French-Swedish EU Life project Urban Woods for People had the aim to demonstrate ways to increase the recreational benefits of urban woodlands. One of the activities was to recreationally adapt a traditional Green forest management plan. The aim of the activity was to find ways to increase the recreational values of private owned forest and to decrease any inconvenience for the private forest owner due to increased recreational pressure.

The traditional Green forest management plan specifically deals with two values of the forest; economic- and nature values. The addition of recreation to the Green plan affects the whole planning process and the forest planner as well as the planning system. The addition of recreation to the existing two values creates many new factors to consider, for example the decision making process during fieldwork.

A new goal classification system based on the traditional system was suggested. Goal classes show the long term direction of the management on stand level. In urban areas the importance of the plan maps increases because the plan in these areas becomes a tool for co operation and communication.

The concept was tested on three private forest estates in the south of Stockholm.

Roles of Forestry Engineering in Urban Forests

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Forestry engineering is a part of forestry – we like it or not. It comprises operations related to wood harvesting as well as infrastructure construction and maintenance. In most urban forests engineering should provide some traditional activities and some extra measures that have to be implemented at policy, planing and operational level. In the presentation the examples of good and bad engineering practice at each level are illustrated and discussed.

At policy level engineering limitations shall be addressed to landscape planers, ecologists and various publics. Before setting the urban forest legislative frame the engineering information regarding existing infrastructure, areas with higher risks, guidelines for realistic operation limitations and over costs assessment have to be collected. *Engineering involvement* in the policy process reduce conflicts with the other management objectives at planning and operational level.

At planning level the responsibilities of forest engineering is the highest. Crucial engineering decisions are made including the impacts that will be associated with them. Plans must refine details that make urban forest attractive. The bases for good engineering plans are adequate data about terrain, forests and consumers. In urban forests data collection must rely on a field reconnaissance individual tree survey and needs of target groups. Engineering solutions must be technically, environmentally, economically feasible and socially acceptable. To make the engineering activities socially acceptable the investor must provide the proactive *public participation* in every stage of plans and designs.

At the operational level the transparency of forest engineering is the highest. The operations themselves bring the ideas into life or cause various conflicts. Major source of conflicts is poor scheduling of operations and lack of *communication*. Well motivated and skilled operators are essential, however daily control of the job site is inevitable. Real cost accounting is a guaranty for good products. Well informed and organized consumers can decrease the vandalism during and after works.

Urban forests are challenge for forestry engineering and engineering is a challenge for urban society. Engineers have to strive for good examples and better acceptance of their work. Vast space for innovations exists but more social skills are needed to work for urban people.

Robert Robek is a forester with M. Sc. in harvesting impacts on forest soils. He is full-time researcher at the Slovenian Forest Institute. His professional and research interests is forest engineering in particular road construction, traffic optimization and minimizing the harvesting impacts on forest ecosystem. He is an active member of IUFRO 3.11.00 group »Forest operations and environment protection« and licensed road designer. For the last decade he has been involved in national, EU and FAO harvesting and biomass projects for the non-industrial private forest owners. His recent projects are focused on access improvements in parks and protected forests. He has been actively involved in infrastructure development of urban forests in Celje.

Communicating about Nature-Based Forest Management: Forest Development Types and Profile Diagrams

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Worldwide forest management is being modified in order to fulfil the demands of sustainability. For the Danish Forest and Nature Agency, this implies a replacement of 250 years of age-class silviculture in favour of more nature-based silvicultural systems. This necessitates that a whole new framework of understanding is to be developed and concepts for describing and communicating about nearness to nature in stand development are called on. This paper describes how the ‘forest development type’ concept in combination with its description by means of profile diagrams are used as tools to communicate and create a sense of ownership of nature-based management across the organisation.

On a national scale 19 forest development types were described to provide a framework for discussions and identification of future management goals for specific stands. However, as the professionals were in short of experiences of the complex structure of vegetation likely to develop in stands subjected to nature-based management, describing the scenarios verbally and numerically did not provide a common platform for discussion. The professionals simply generated different mental images and interpretations from the descriptions. Visualising each of the 19 scenarios through principal profile diagrams was therefore used pro-actively throughout the process to support the communication and further elaboration of the anticipated structural development and forest dynamics.

In an early stage, the scenarios were discussed with the forest managers. Based on these discussions the scenarios were refined and sketched in profile diagrams, followed by new rounds of discussion. The development of the scenarios spiralled through such stages of discussion and refining until agreement was reached and a shared understanding created.

In conclusion, the forest development type concept in combination with its visualisation by means of profile diagrams communicated the principles of nature-based forest development in a way which was easily comprehended by the forest workers and managers. As such, it provided a platform for discussion and elaboration of the silvicultural methods for long term management goals – in this dialog a shared understanding and sense of ownership was created throughout the whole organization.

Further, the scenarios visualised through profile diagrams builds an excellent platform in the forthcoming dialogue with the users and other stakeholders, crucial in highly urbanised societies.

Anders Busse Nielsen is a landscape architect and PhD-student. His professional and research interests include communicative aspects of the ongoing conversion to nature-based silviculture in Denmark, where he has studied natural dynamic forests and developed new tools for communicating about nature-based forest management. Also he has studied the recreational merits of nature-based management in a Danish context. He is a member of the COST action E33 and an active member of the Urban Forestry group at Forest & Landscape, where he also teaches in “urban woodland silviculture”.

Creative Management in Young Landscapes

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A high percent of the urban woodlands in Europe are just established or young as landscapes. In these stages they are too often left for themselves or thinned in a standardized technical-biological way like as everyone is waiting for the woodlands to become old so they can become enjoyable rather than to develop the charm of the youth by a creative management. Why such a creative management in practice is marginalized today can be discussed from many perspectives. Here, the presentation will focus on what an increased interest and competence in creative management could mean practically, what can be gained from it, by using a few concrete situations in a local recreation area, in which there is also an emphasis on a parallel production outcome and a high biodiversity.

As examples we take “The hazel hall”, “The orchard of apple trees”, “The children mosaic landscape”, and “The beech tunnel and the baby pillar hall”. In the project several professional competences have been involved, including landscape architects, landscape engineers, artists, horticulturists, and plant ecologists. Here, it should be noticed that a goal with the project has been to make it particularly future directed: all the participators in the project are young as professionals, enabling it to show (1) how classic or traditional concepts can continue to live, (2) but also how brand new concepts which there is a need of today will become found. As part of the project tests groups have been invited, such as children and teachers in schools and children day care, politicians, and park managers, foresters and landscape architects as professionals. This rhetoric research approach will become even more stressed in the final year of 2005. To make the design process explicit and communicative-lead has therefore become stressed.

Jan Šesták has a master degree in landscape architecture. During studies enriched with one year study experience in Alnarp - SLU, Sweden he focused on the topic of biotop design, landscape planning and landscape management. In the last five years, starting during his studies, he actively joined research within Urban Forestry. He worked mainly with management, maintenance and monitoring of young woodlands and landscape, both theoretically and practically. The research derives benefit from the Landscape Laboratory in Alnarp, SLU Sweden.

Dana Hladikova has a master degree in landscape architecture. During studies she focused on cultural heritage issue, enriched with one year study experience in Dresden, Germany, where she took part on international student workshop. In the last five years, starting during her studies, she actively joined research in Urban Forestry. She worked with management, maintenance and monitoring of young woodlands and landscape, both theoretically and practically. The research derives benefit from the Landscape Laboratory in Alnarp, SLU Sweden.

On Arboricultural Practices, Vitality and Safety of Urban Trees in Slovenia

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Trees are probably the most important natural element in the urban landscape and it does not surprise that their environmental, social, psychological, esthetical and economical importance is increasing with rapidly growing population in cities. Only sustainable management can establish sound and safe trees which could fulfill their numerous functions in urban areas. Unfortunately, these topics received only limited attention in Slovenia until recently.

The aim of this research was assessment of vitality and hazard status of urban trees as well as survey on arboricultural practices in larger municipalities of Slovenia. Vitality of trees was assessed by visual inspection of crowns, measurement of electrical resistance of the cambial zone, and anatomical research of tree tissues. Evaluation of hazard potential of trees involved identification of growth defects as well as the frequency and distribution of mechanical wounds. The extent of decay was identified from wood cores and by drilling to assess the color, odor and consistency of the wood particles. Combination of several adverse factors seriously diminished vitality of investigated trees. Trees growing in harsh conditions along the streets exhibited low vitality, evidenced by dieback of branches, irregular seasonal oscillations of electrical resistance of the cambial zone, shorter periods of cambial activity, decreasing annual wood increment, formation of traumatic structures, and high mortality. The main factors creating hazardous trees were improper and unnecessary pruning, absence of regular tree care, vandalism, traffic accidents and building operations around root systems.

We conclude that decreasing vitality of trees and the increasing rate of hazardous trees in cities of Slovenia is due to anthropogenic factors. Condition of urban trees could be improved by the application of contemporary arboricultural practices and sustainable management. This could be achieved only with strong and consistent co-operation between municipality management services, practitioners, and research institutions.

Primož Oven is assistant professor teaching and investigating tree biology, cambial activity, properties of wood, response of trees to wounding, secondary changes of wood, compartmentalisation, pruning and arboriculture at Department of Wood Science and Technology, Department of Forestry at the Biotechnical Faculty in Ljubljana and at Academy of fine arts. He is leader of research group Technology of wood since and active member of ISA, IAWA, IUFRO and COST technical committee on Forests and forestry products. In last decade he has been working on implementations of practical and scientific aspects of modern arboriculture in Slovenia.

Lena Marion is PhD student in the field of arboriculture at Biotechnical faculty in Ljubljana, Department of Wood Science and Technology. Before she worked at private forestry company where she was coordinating and supervising arboricultural work. Her research interest is problem of vitality and safety of urban trees.

The Comparison of the Quality of the Urban Street Trees in Contemporary Landscape Practice in Berlin and Shanghai

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In order to improve the urban living quality and urban ecological environment, Shanghai government has taken great efforts on urban green development, which has led to urban green booming since 1994. Many urban greenery projects have been carried out. By year 2020, 2145.65 km² of greenery will be established according to Shanghai urban greenery system plan 1999-2020. Since 1998 Shanghai has set out a city-wide green program called 'Big tree, come into city!' which has brought 300,000 big trees to Shanghai by 2003. Immediately this program became a trend for urban green development copied by many other Chinese cities.

However, lots of problems resulted from this program are dispersed in the whole process of the urban green development. In large scale Trees are dug out directly from nature for transplanting into cities, poor urban soil is not improved before planting, construction without professional knowledge aggravates the living condition for tree growth. This aroused a hot debate between the academic society and the government in China.

This paper is a study of the quality of the contemporary street tree practice by comparing the quality of street tree in Shanghai urban green development with the street tree quality in Berlin's contemporary urban green practice. It gives an overview of the problems in contemporary urban street tree practice in Shanghai and indicate their consequences. The experience and knowledge of urban street tree from Berlin's practice and research will be used as a reference to compare the urban tree quality between two cities.

Two landscape projects, 'Century Avenue' in Shanghai and 'Band des Bundes' in Berlin as two case studies, are compared in detail. Both of them are significant landscape projects that represent the state of the art knowledge and technique in urban street tree practice of each city. The comparison is based on five sections for quality evaluation, which are landscape design, landscape construction, greenery management and care, life span of the green and landscape evaluation.

The paper discusses the strategies and solutions for the problems in contemporary urban street tree practice, which aim at a sustainable ecological and healthy development in urban greening or urban forestry.

Jialei Xu is a master student of landscape architecture in Germany. She has a MSc. in dendrology and a Bachelor of Agriculture in landscape architecture. Her professional and research interests include urban green planning, design and care, ecological landscape planning and design, Chinese classic garden design. She had an internship study of tree care in Berlin and tries to incorporate tree care and plant knowledge into urban greenery planning and design for its sustainable development. Contemporary, she is working on her master thesis.

Trees in an Urban Environment – the Bond between Forest and City: the Protection of Exceptional Trees in Celje Municipality Area

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The Institute of Republic of Slovenia for Nature Conservation, Regional Unit of Celje (Institute) among other legally determined tasks also collects data on the condition of natural values (natural heritage) and biodiversity and prepares expert proposals for measures of protection .

On the initiative of some citizens and in cooperation with the Municipality of Celje and with the Slovenian Forest Service, the Institute prepared an expert proposal for protection of exceptional trees for the Celje municipality area in 2001.

This document served as the base for a legal act passed by the City Council of Municipality of Celje, by which 20 trees were protected as natural monuments. Due to incomplete legislation this legal act was only temporary. In 2004 another temporary act passed for 2 years. At the end of the year 2004 legislation was completed, and will allow permanent protection in 2006.

The now existing legal act will allow us to take a more active part in spatial planning in the future. We consider this a big achievement.

Meanwhile a Program for Management of Protected Trees has been prepared, by the Institute, which set the foundation for measures on trees and their growing spaces.

Among 20 protected trees there are: 7 Common oaks (*Quercus robur*), 6 Planetrees (*Platanus acerifolia*), 2 Douglas firs (*Pseudotsuga menziesii*); 2 European beeches (*Fagus sylvatica*), 1 Pear tree (*Pyrus sp*) 1 Hornbeam (*Carpinus betulus*); that is a part of the maintained garden. 1 Lime tree (*Tilia platyphyllos*); With an appropriate maintenance of growth space and tree conditions, protected trees are becoming some kind of a model for the maintenance of other trees in an urban environment.

Trees in an urban environment are of exceptional importance. In comparison to forests as natural environment for trees, an urban environment presents an extremely changed habitat for them. Trees there live in extreme conditions. At the same time trees in an urban environment are the last remains of forest in a city environment and thus the last bond with forest (nature) for people in the cities. Trees in an urban environment have many positive effects on the climate in cities and offer many habitats for other species. With increasing number and quantity of trees we can therefore preserve or even increase biodiversity. Apart from that one should not ignore the fact that trees contribute essentially to the better quality of life and wellbeing of people living in cities which is an immeasurable quality.

Matej Demšar is a forest engineer and has been for the last 5 years employed at the Institute of Republic of Slovenia for Nature Conservation, Regional Office of Celje. His professional interests and tasks include trees as natural values, natural conservation directions for different forest management plans and other spatial planning, research of forest habitat types and cooperation with public especially that concerning NATURA 2000 project in Slovenia, etc.

With his contribution in the process of protection of exceptional trees in the Celje municipality area, he has been involved in the development of urban forests in Celje.

Ecological and Functional Values of Standard Typologies of Urban and Periurban Green Areas

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Urban and periurban green areas are more and more perceived as vital spaces because they absolve important functions other than those strictly ecological-environmental, thus they are considered elements of vital importance for the improvement of the social, economic quality of urban life.

In this scenario, the research intends to set out the basis for a multitask approach, through the acquisition of coordinated and synergic scientific knowledge regarding the issue of urban and periurban green areas. Particularly, the project plans to create a starting point in order to realize and to manage, also in Italy, urban and periurban green areas in a context of sustainability, according to the Agenda 21 framework.

Specific research has been and will be carried out with the following objectives:

- 1) Characterization of standard typologies of urban and periurban green areas;
- 2) Monitoring of habitat biodiversity in terms of vegetation and animals species;
- 3) Evaluation of the relationship among vegetation/microclimate/environment;
- 4) Evaluation of the relationship among vegetation/pollutants/environment.

On the basis of the described targets it is important to evidence that the research, without expecting to give an exhaustive and final picture of the issue, has the ambition to supply a first background outline in the Italian forestry research framework. Such outline, not only will facilitate the work of the technician and the designer of urban green areas, but will also allow choices based on realistic data and could represent, in the future, a valid starting point for further scientific activities.

The results so far obtained show different classification systems on green typologies in Italy.

Francesco Ferrini Graduated in Horticultural Sciences at the University of Florence. He received his PhD in Horticultural Sciences at the University of Pisa.

At present he is associate Professor of Urban Arboriculture and Parks and Gardens at the University of Milan – Italy where is carrying out research on planting site modification, nursery techniques and plant selection for the urban environment.

He is the President of Italian Arboricultural Society Italian Chapter of the International Society of Arboriculture (ISA) from February 2005 Member of the Working Group 3 of E39 Cost Action.

Pest and Disease Related Problems in Urban Forests in Croatia

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Pests and diseases can significantly influence the trees' health, from the ecological, aesthetical and sociological point of view. Pest and disease monitoring is very important in the process of diagnosis and prognosis of trees' health, as well as for the specific requirements in application of the control measures in urban forests.

During the last ten years the main diseases of urban trees have been caused by several fungal organisms and semiparasitic plants. The occurrence and injurious impact on their hosts varied on yearly basis, during which a few fungal pathogens have caused serious illness or dieback. The most affected tree species (genera) and their pathogens recorded in the last decade were: *Pinus nigra* and *P. leucodermis* attacked by *Sphaeropsis sapinea*, *Platanus acerifolia* by *Apiognomonia veneta*, *Quercus* spp. by *Microsphaera alphitoides*, *Betula* spp. by *Piptoporus betulinus*. Various decay fungi have been frequently found in broadleaf tree species. Semiparasitic plants (mistletoes) were recorded in urban and periurban trees. *Viscum album* ssp. *abietis* has been found colonizing *Abies alba*, and *Viscum album* ssp. *album* colonizing more frequently species of *Quercus*, *Populus*, *Acer*, *Betula* and *Aesculus*, while *Loranthus europaeus* was found in oaks.

High summer temperatures and drought situations spurred the buildup of various pest insects. Mites, scales, aphids, true bugs and other insects with sucking mouthparts benefitted from climatic conditions and caused significant damages, mainly of aesthetical and molesting nature. Leaf eating insects have also proliferated and some of these marked the decade by the intensity and severeness of their population buildup with *Cameraria ohridella* surely holding the highest position in the row of important species. However, some lepidopteran and hymenopteran species also appeared as serious pests locally, such as: *Tomostethus nigrinus*, *Phyllonorycter platani*, *Parectopa robinella*, *Argyresthia thuiella*, *Tortrix viridana*, *Lymantria dispar*, *Thaumetopoea pityocampa* and others. In relation with drought stress, which is even more emphasized in urban environment, bark beetle problems became more pronounced and many trees succumbed due to their attack. Regarding the xylophagous insect group, other cerambycid and curculionid species have been recorded too. Luckily, some of the very threatening species, like asian longhorn beetle, have not been encountered. Intensity of insect attack in some instances and locations urged direct counter measures and some insecticidal treatments were applied in the past ten years, mostly with IGRs and nicotinoid or pyrethroid insecticides.

Demanding urban landscape, possible sociological issues and undecisive legislative, burden specialists dealing with disease and pest care. Negative impacts on management of urban forests have been experienced, primarily in the field of necessary financial input and unexpected organizational alterations.

Insect and disease pest scene in urban forestry in the past decade seems to be dynamic and developing and more research will be needed in order to grasp the problem and produce acceptable solutions.

Boris Hrašovec is a forester with MSc. and PhD., currently working in the Forest Protection Department within the Faculty of Forestry, Zagreb University, where he holds a position of Associate Professor. His professional and teaching backgrounds fall within the field of forest entomology and integrated pest management. He has been dealing mostly with insect pests important for Croatian landscape some of which include: lymantrid and geometrid defoliators, oak and fir seed pests, bark beetles and other xylophages. In recent years, some of his research entered the field of urban pests and various aspects of their control. Most of his primary targets include acknowledged pests like *Cameraria ohridella*, *Corythuca ciliata* or *Thaumetopoea pityocampa* but also some less known, locally important ones like recently rising populations of *Tomostethus nigrinus*.

Danko Diminić is a forester with MSc. and PhD., currently working in the Forest Protection Department within the Faculty of Forestry, Zagreb University, where he holds a position of Assistant Professor. His professional and teaching backgrounds fall within the field of forest pathology, urban trees pathology and integrated forest protection. Since 90-ties he has been involved in forest and urban trees and shrubs pathology in several scientific projects, and have published some research results in European and Croatian journals. The diseases of pines, poplars, planes, maples, common fir and horse chestnut trees have been the main research issues.

Safety in the Urban Forest: a Comparison of the PICUS Sonic Tomograph and the Digital Microprobe in Accurately Detecting Decay and Cavities in Trees

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The safety of urban trees planted in proximity to sites of various human activities is a major concern of urban forest managers. Decay is a major cause of tree failure and the size of decay, thus the potential for failure, is sometimes difficult to detect and estimate. A number of decay detection instruments are available in the market to help make these decisions.

This paper will compare the accuracy of two instruments in detecting decay and cavity: the PICUS Sonic Tomograph (PST) and the Digital Microprobe (DMP). PST uses the principle that sound waves travels faster in solid wood than in decay wood to detect differences in wood density within a cross-section, and uses the relative difference in speed of sound waves to generate tomograms in which brown, green, purple, blue and white indicate areas of decreasing velocities of sound wave. It is less invasive, but more time-consuming in operation and expensive than DMP. As the small drill bit (0.9mm) of DMP enters a tree trunk, its rotation speed per second (rps) is digitally recorded. Decrease in rps indicates decrease in wood strength. 25 trees located in roadside, urban parks, and picnic areas of country parks in Hong Kong with signs of decay or cavity were used in this study. DMP results were taken at the same levels where PST results were obtained. Using the length, entrance and exit position of drillings, drilling paths can be located on colored tomograms generated by PST, and results from the two instruments were compared qualitatively and quantitatively.

Qualitative comparison of results involved visually evaluating DMP results and recording length of segments with rotation speed below 5 rps. These segments were then matched with the different colors on tomograms. Only 12.5% of all colored areas except brown matched segments with DMP results below 5 rps. It was more likely for PST to overestimate than underestimate the size of decay or cavity shown by DMP. The remaining 43% of colored areas on tomograms did not coincide with DMP results below 5 rps. For quantitative comparison of results, colors on tomograms along drilling paths of DMP were recoded to form an ordinal variable, and continuous DMP results were transformed into an ordinal variable.

The two variables were cross-tabulated and fitness of categorical DMP data into their corresponding colors from PST was examined. Brown areas rarely had the lowest DMP results. The other colored areas were more likely to be located at their corresponding category of DMP results.

These results showed that tomograms tended to overestimate the actual size of decay or cavity. Brown areas were not always solid wood; green areas should at least be considered incipient decay; and purple, blue, and white areas should almost always be considered serious decay or cavity.

Colette Yan is a PhD candidate in the Department of Geography at the University of Hong Kong. Her PhD research is a systematic evaluation of the management of urban trees in Hong Kong. In the future, she would like to perform research in improving the planting condition of roadside trees, and study the effects of air pollution on the growth of urban trees.

The Use of Compost in Urban Green Areas

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The major problems of plants in the urban green areas are most often related to soil conditions. The low quality soils, less suitable for plant growth, causes the street trees to die long before they reach mature ages. This causes large costs for the municipalities and for private actors in the urban green sector. Though there has been done much work on the growing medias for trees in the last 10 – 20 years, the use of the knowledge on soil conditions is still not widely adapted in the planning and implementing of urban green landscapes. In the use of compost, there is a need for the development on several levels, in order to secure that the compost products give good effects, according to the tailored use it may be produced for. The use of compost for soil amendment and mulching can increase quality in establishment and management phase of urban green areas. Also the costs, especially in the management phase can be decreased. However, many conditions must be fulfilled before the benefits can be fully realised. The high quality composts must be well described, so that the green industry can predict the effect of the composts use on growth and development of the plants where these products are used. The users should make specific demands on the compost quality, based on how the compost shall be used and the wanted effect in urban green areas. The general quality factors that must be fulfilled are related to stability, salt content, the absence of unpleasant smell and absence of substances inhibiting germination and growth. The specific demands should be related to nutrient content and particle sizes. There will never be one “perfect” compost product, but rather several, of which each should be designed for its specific use.

As a soil amendment to shrubs and trees in the establishment phase, amounts of compost should be limited to what supplies the trees and shrubs with 120 kg N ha⁻¹ (plant available).

For mulching, the total thickness should not be more than 10 cm, of which the lower 2 – 5 cm may be with a small particle and nutrient rich compost and the top layer should be 5 – 8 cm of nutrient poor compost with large particles. In this way nutrients are supplied to the trees and shrubs and the weeds are not given a good seed bed.

The good use of compost products is still hindered by the lack of knowledge on the area, both for planners and practitioners in urban forestry. To promote a positive development, it is necessary to increase the knowledge and urge the end-user to be specific about the properties of the products they want to use.

In the presentation we will focus on the different types of compost and compost qualities, benefits from the use of compost in urban green areas for soil amendment, mulching, weed control and erosion control.

Arne Sæbø received diploma degree in horticulture, and a doctoral degree in applied biotechnology. He is senior researcher at The Norwegian Crop Research Institute. His professional and research interests include ecophysiology of trees. The last five years he has made studies of nutrients in trees and the use of compost in urban green areas.

Francesco Ferrini Graduated in Horticultural Sciences at the University of Florence. He received his PhD in Horticultural Sciences at the University of Pisa. At present he is associate Professor of Urban Arboriculture and Parks and Gardens at the University of Milan – Italy where is carrying out research on planting site modification, nursery techniques and plant selection for the urban environment. He is the President of Italian Arboricultural Society Italian Chapter of the International Society of Arboriculture (ISA) from February 2005. Member of the Working Group 3 of E39 Cost Action.

Citizens' Perceptions and Behaviors Towards Urban Forests

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Urban forests, trees and natural spaces are thought to contribute significantly to certain psychological, social and cultural needs of urban dwellers. Understanding citizens' perceptions and behaviours towards urban forests is a complex task that relies with socioeconomic, cultural, and environmental issues and constraints, like green spaces availability and accessibility. Recent studies on citizens' perceptions and behaviours toward urban green areas have shown the complexity and the multidimensional character of the people-nature relationship in the city: inhabitants' use of green spaces appears to be driven by the need for psychophysical restoration with relevant psychosocial implications.

In this paper, we provide a critical review of research findings coming from two major studies promoted in selected Italian cities: Rome (Central part) and Bari (Southern part) that have different characteristics in terms of urban forestry cover (e.g., the average availability of public green spaces per inhabitant is 12.2m² in Rome and 2.9m² in Bari). We combine *urban forestry* and *environmental psychology* sciences in a unique and holistic framework (i.e., fully ecological), thus illustrating how the presence of green areas within urban settlements affects the inhabitants' perception of urban environmental quality, as well as the psychological health of citizens. In particular, the analysis showed how citizens' perceptions and behaviours towards urban forests had different meanings in the two locations that vary considering layering variables such as: age category, gender, social context, and urban structure. People living in the two cities appeared to share a common sense of 'satisfaction' towards green areas available in their own districts. Moreover, the two studies showed how people's expectation is for "functional" green areas that can provide services for a wide range of age categories and people's needs. Specifically, the research conducted in Rome demonstrated how people's perceptions and behaviours towards urban forests do not correspond to an adequate knowledge of the ecological value associated with these areas. Complex urban-forest-patterns perceived as ecological meaningful from a scientific perspective can be judged as not attractive and not safe for people. The safety in urban green areas is therefore a prerequisite for creating a solid relationship between people and urban forests in the two locations. Considering an integrated approach between *urban forestry* and *environmental psychology* sciences is also an essential requisite.

We conclude with some guiding principles for enhancing the environmental and social benefits of urban forests through collaborative projects and scientific co-operation between 'Green' (Environmental and Forestry) and 'White' (Environmental Psychological and Clinicians) scientists.

Giovanni Sanesi is Associate Professor of Urban Forest and Forest Planning at the University of Bari, Italy. His research has been related to many aspects of trees, forests and open spaces in urban and periurban landscapes. He is the national delegate and member of the Management Committee for the implementation of the European research action - COST Action E39: "Forests, trees and human health and wellbeing" (2004-2008). He is the scientific supervisor of greenlab (www.greenlab.uniba.it) that is part of the national consortium of forestry geomatics labs: forestlab (www.forestlab.net). He has authored and co-authored peer-reviewed articles on sustainable planning and management of urban forests and integration between urban forestry and landscape ecology.

Comparing Recreational Use Pattern in Viennese Urban and Suburban Forests

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Comparative analysis of use patterns of visitors to urban and suburban forests deepens the understanding of recreation use and leads to a better forest management. Prerequisite is the application of visitor monitoring methods in a comparative manner. Particularly, the use of long-term monitoring approaches and the combination of several methods provides in-depth insights into the recreational use of heavily used urban forests.

Long-term use levels, temporal distribution of user types, and user characteristics were investigated in three forests in and around Vienna between 1998 and 2003. Year-round time lapse video recording was the centerpiece of a complex visitor monitoring scheme which included interviews, counts by human observers at access points on selected sampling days, and infra red sensors.

The three urban forests are heavily used by various user groups with different demands and different temporal use pattern. Paramount in these forests was the high share of unleashed dogs resulting in user conflicts, and perceptions of crowding due to the high use pressure. Significant differences in user density, the temporal distribution of use levels, the composition of user types, and user characteristics were found based on the closeness to residential areas, the provision and allocation of recreational infrastructure, the blossom of plants etc.

Arne Arnberger received diplomas degrees in landscape planning and architecture and in environmental engineering, and a doctoral degree in landscape planning and architecture. He is a teaching and research assistant at the Institute of Landscape Development, Recreation and Conservation Planning of the BOKU - University of Natural Resources and Applied Life Sciences in Vienna, Austria. His professional and research interests include outdoor recreation in protected areas, forests as well as in urban settings, where he has carried out several visitor monitoring projects. He is improving and developing methods for visitor counting, for assessing user needs and for social carrying capacity/crowding measurement. He has written a number of articles on urban forest recreation and visitor monitoring methods. He is just involved in the Cost Action E33 Forests for Recreation and Nature Tourism. He was one of the founders of the conference series on 'Monitoring and Management of Visitor Flows in Protected and Recreational Areas', held biannually.

Analysis of Access to Urban Forests for People with Disabled and Elderly Citizens – a case study of Ljubljana

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We are living in an urban society, which has developed different level of awareness and relationships to nature as has been developed in the rural society of the near past. A cult of youth, power, beauty and success is strongly encouraged nowadays and any departure from this ideal is regarded as a failure. Yet not everybody is young or healthy and there are always citizens with disabilities among us who may have even a greater need for access to forest than an average citizen, yet they are facing different type of obstacles.

We may think of an adolescent, spending most of her day in room. Due to the inherent heart disease the doctors recommended her to spend as much time as possible in the fresh air, yet walking on a steep forest path is already quite a challenge for her and she is avoiding this effort even when it is a part of her schooling. There is another girl in the school who cannot walk and her movement in nature is limited to the path suitable for access with her wheelchair. Two stories, two pictures and the same forest in vicinity yet with completely different possibility for access due to different slopes and walking paths.

Ljubljana is the largest city and a capital of Slovenia. Forests are one of the most important categories of open green space. However forests are distributed unequally in Ljubljana, two biggest forests patches Golovec with 662 ha and Rožnik with 335 ha are taking up together 70% of all urban forest cover. Both of them are highly important for daily recreation of citizens, yet access to them is quite different. There are 25 possible “entrances” into the forests in both cases, yet most of them are no more than a small trail. In the presented study we compared technical infrastructure (access from city bus stations, possible parking places, quality of footpath...) with natural and social givens (steep slopes already on foothills, distribution of settlements...) that may render the visitors access to urban forest with special emphasize on elderly and disabled citizens.

We should not forget that technical givens of forests paths together with natural givens are highly important for the decision which part of urban forest someone is going to visit and which part is “closed” without extra effort and help. The society, which is mainly aiming at a higher production level, has lost a great deal of humanity. Yet the measure of humanity may be also counted by a level of happiness that is balanced in a society and in personal level. Forest is the last ecosystem in an urban landscape where citizens can experience contact with nature not just purely intellectually but with all their senses. In case of citizens with disabilities this is one of the most important aspects of the green space.

Janez Pirnat is a forester, MSc and PhD Landscape Ecology from University Ljubljana. Assistant Professor for Landscape Ecology and Urban Forestry, University of Ljubljana, Biotechnical Faculty. Participation in various workshops and conferences in IALE and in Action COST E12 (“Urban Forests and Trees” and COST E39 (“Forests, Trees and Human Health & Wellbeing”).

Professional interests: Research on Landscape planning and management with an emphasis on solitary trees, tree corridors and forest patches in agricultural, suburban and urban landscapes. Temporal landscape structure change; GIS and Remote sensing; Environmental ethics. Personal interests: good books (too many to name), storytelling, Waldorf education, long walks.

Empowering the Management Planning Process

- Integrative Approaches with Emphasis on Social-Cultural Aspects in Urban Woodland Planning

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Management planning of urban forests is too often reduced to a technocratic process, taken through as a process by one or a few specialists, hidden in the shadows of the society. Stand and habitat descriptions, based on a highly generalized knowledge rather than a search for the special and the unique, take a dominating role. Furthermore, it does very little relate to a landscape perspective. Landscape is interpreted as belonging to another, larger scale. Aesthetics is often reduced to a question of main recreation facilities and a collection of anonymous opinions collected by enquires. Local resources related to key persons and connoisseurs are often trivialized and marginalised. Local politicians are not really aware of the ongoing management planning process. No doubt, sometimes a good management plan made by a single professional might come out of it. However, if so, the local engagement still stays low and distant, users hardly do not know who are the managers, and the political interest stays low or is maybe even absent.

The presentation aims to focus on management planning as a process, which is the centre rather than a technical end or an embrace for engaging people and sharing views between professionals and connoisseurs. A lot of practical-theoretical experiences were gained from the case studies in the European research project NeighbourWood, and this will here be the main platform here for the suggestions which are put forward here. Particularly two of the Swedish case studies will become referred to. Part of it was presented in the Stockholm conference at the 7th Forum, but most of the tools tested have been not been evaluated earlier than November-December 2004, because of the ongoing and outdrawn process, telling us of how successful the tools really were. Even if we can not brag that we have come to an end solution being able to present a final method for management planning we in the research group are able to pick out some few points which we find are of a principle value and discuss these at the Forum.

5 Most Important Conclusions from the EU Life project “Urban Woods for People”

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The French-Swedish EU Life project ‘Urban Woods for People’ had the aim to demonstrate ways to increase the recreational benefits of urban woodlands. Some 40 activities have been carried out during the past four years in four pilot recreational forests located in the vicinity of Paris and Stockholm. Production of handbooks, examples of multi-management plans for different user groups, courses and excursions are examples of activities that have targeted urban foresters and urban planners. Guided tours, development of nature trails, educational programmes, different types of public participation and creation of web-sites for communication between users and managers are examples of activities that have targeted the general public. One focus has also been on private urban forest owners and ways to increase the recreational values of their forests and at the same time minimise any negative impact by visitors.

The most important conclusions from the project are:

Waste management based on public involvement works. Litter is a growing problem in most urban environments. A waste management plan based on public involvement resulted in a decrease of litter of 85% in the pilot recreational forest of Sénart, France.

Guided nature tours are a feasible tool for multi-cultural integration. Immigrants spend less time close to nature compared with native Swedes. There is no distinct immigrant-specific perspective on how immigrants perceive and utilise Swedish nature but much can be done to improve the situation. Information, preferably oral and organised activities are good ways to help immigrants to take part in their environment. Native Swedes in urban areas also need help to find their way to nature. More than 10,000 inhabitants of Huddinge, Sweden took part in guided tours arranged by the project.

A Forest Charter creates a productive link between the forest and its stakeholders. The preferred characteristics of an urban forest differ among stakeholders. Enough time and opportunities to meet and discuss specific issues will not only decrease the amount of conflicts and disagreements but also increase the understanding of different interests between stakeholders. A methodology for public participation was formed, tested and evaluated.

A multi-purpose forest management plan is a tool for efficient urban forest management. An urban forest contains economic, biological, cultural and social values that a manager has to consider at all times. A multi-purpose management plan describes the values, presents the goals for each area of the forest together with a management suggestion. The plan is most efficient when it is available on the internet.

‘People centred’ handbooks now available. There is an interest for contemporary knowledge regarding the social values of the forest among Managers. Management methods for urban forests; methods for measuring recreation; methods to increase the accessibility for the disabled and a presentation of the positive effects of forest recreation on health are four subjects recently published by ‘Urban Woods for People’.

Johanna From is the leader of the unit “Urban Forests” at the Regional Forestry Board of Mälardalen, Sweden. The aim for the unit is to pave the way for cooperation agreements. The agreements are intended to allow the mutual objectives for urban forests involving all stakeholders to be achieved. Recently she finalised the EU Life project Urban Woods for People and is member of COST Action E39: Forests, trees and human health and wellbeing. She has written a number of reports on the issue of the social values of forests for the National Board of Forestry and has also represented Sweden at international symposiums on the same issue.

What Kind of Forests for the “Average” European City?

Case study of Limoges, France”

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The recent development of average cities implies a new reflection on the quality of life. This aspect has become one of the recurring issues in local policies for development and promotion. The environment is at the core of the debate. These towns have the particularity to open on to nearby countryside; yet, in the wake of the main European cities, the question of green recreation spaces seems to find an answer with the example of the forest.

Does the average European city need forests managed for urban dwellers? If so, according to which indicators? Which types of spaces have to be prioritised?

In order to answer these questions, we shall study the example of Limoges, an agglomeration of 250 000 inhabitants located in an administrative area with a rural connotation : the Limousin.

People visiting forests open to the public is today the best proof of the existence of a real expectation, which goes beyond the simple urban garden. However, during the investigations, this expectation becomes more complex, even paradoxical. The forest, the symbol of wild nature, must be domesticated and managed while preserving the illusion of nature. The forest has to aim at fulfilling people's needs which are sometimes contradictory. In fact, there is no ideal forest for the whole population.

It shows that today, cities need several types of woodland to be accessible to all inhabitants. We can determine some standard spaces according to the direct (immediate environment, noise) and indirect (signs, installations) urban reference marks. The forest park is the most integrated into urban spaces, an environmental framework often situated near urban center, with wide alleys and easy access, with many facilities (benches, training circuit, playgrounds for children). The forest is then an attraction for the town dweller who looks at it like a zoo visitor looking at animals. On the other hand, the forest is managed with a concern for the conservation of the rural character, the paths are narrow, even bumpy and the signs are discreet.

These various kinds of forest maybe localized at several places, but it is also possible to have all in one within a larger forest. “These” forests must be integrated into the “green infrastructure” of cities with the aim of a global network for landscape improvement, recreation and leisure facilities ; for a better quality of life in and around our city.

Julien Dellier is a Phd student in Geography. He is member of GEOLAB, a French research team with CNRS label. His research concern is the relationship between urban development and green space, especially forest, in an “average” European city. He has an interest in geographycal modelization. With this aim, he is working on some examples across Europe : Grenoble (Fr), Limoges (Fr), Rouen (Fr), Swindon (GB), Braga (Por).

Green Infra - structure Integrating Urban Forestry with City Regions Undergoing Urban Expansion

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The attainment of sustainable economic growth in the ‘city regions’ of developed societies requires an emphasis to be placed on the ‘quality of life’ of urban residents. This can be termed the ‘the liveability agenda’ and includes a spectrum, of public goods and services. The green infrastructure of the city region can contribute to these goods and services for instance by providing access to informal recreation, close to nature living, health benefits and better housing quality.

Green Infrastructure is achieved by placing trees, woodlands and greenspace at the heart of healthy urban living. Just as growing communities need to upgrade their grey infrastructure such as roads, sewers and utilities, so too, they need to upgrade their green infrastructure such as open spaces, woodlands, wildlife habitat, water, parks and other natural areas [1]. All open space is important, and the green infrastructure approach emphasises the value of a continuous linked network of varied landscapes, both within and between built-up areas.

The development of green infrastructure differs from conventional approaches to open space planning by looking strategically at an overall city region from a natural sciences perspective whilst acting in concert with land development and built infrastructure planning. The dividend is to enable land management to be more proactive, less reactive and better integrated with efforts to manage urban growth.

This paper will introduce the strategic objectives for green infrastructure in and around the city regions of North East England [2] and an assessment on how they have been received by the political and planning sector. From this experience pertinent lessons for other regions in Europe will be drawn.

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Securing Multiple Benefits from the Woodland Environment in Urban West Scotland

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Scotland has some beautiful wooded landscapes but woodlands within its urban core are more likely to be associated with negative social images. The relationship between people and woodland is no longer a symbiotic one. The Central Scotland Forest was established in 1995 and is located in an environment affected by past heavy and extractive industry. Urban west central Scotland has very particular challenges:

Degraded former industrial land
Worst public health record in western Europe
Unemployment rate of 7.3% (UK 4.9%)
Car ownership by household is as low as 50% so restricting access to jobs and services
A degraded and fragmented urban woodland

Even successful new landscapes take time to grow. Existing urban woodlands represent an opportunity to make cultural change now, rather than waiting for the maturing attitudes along with maturing trees. Woodlands in and around towns are often local authority owned, in riparian corridors, lie close to areas of social exclusion and are used by the few in a manner that excludes the many. Local people have little say in how woodland is managed or awareness of their potential to add value to their life. Day to day social issues are often more pressing. This paper considers some of the steps being taken to change this culture in three woodlands.

Policy towards the urban forest is rapidly changing for the better in Scotland:
Scottish Forest Strategy (2000)
Central Scotland Forest Strategy re-drafted (2004)
Local Authority Open Space Strategy
Funding for urban woodlands is available through the Forestry Commission € 5.5m over 3 years

Project example	Previous	Current	Sustaining change
Green Link	(2003) 27 burnt out cars removed dens dismantled	(2005) cycleway and footpaths linking communities with parks, services and jobs youth shelters high quality materials used	Project team set up to promote use, volunteering, new skills. A community forum is to be established.
Viewpark / Fallside	(2001) 150 year history of quarrying and waste tipping had left a dangerous derelict site	(2004) Major landscape works arts programmes for local young people use of conservation volunteers (health referral scheme)	Continuity issues being faced with local authority staff.
North Calder Heritage Trail	(2002) little local awareness motor bike use	(2004) robust barriers health and education walks local families visiting the river and woodland	Trail Forum and Officer. Heritage reflected in signage and a school fish breeding programme; local volunteers leading walks.

These projects show how local people are successfully working with professional partner staff. Changing the pattern of use changes attitudes, though people accept utility benefits before lifestyle change. Urban woodland is increasingly offering social and economic outcomes so investment is becoming easier for multi-benefit projects. It remains easier to fund capital works and so high specifications are becoming the norm to minimise revenue funding.

Mike Batley gained an honours degree in Geography before completing a postgraduate diploma in Land Surveying and a Masters degree in Arboriculture. He is a full member of the Institute of Ecology and Environmental Management.

His role as a Development Officer with Central Scotland Forest Trust combines strategic, technical and community skills in progressing the Forest with local partners.

Mike has a particular interest in the restoration to woodland of derelict and degraded land from working with British Coal Opencast. He is a supporter of sustainable transport, regularly cycling the 50 km from home to work and back.



The City of Wageningen - An Urban Forestry Success Story

George BORGMAN

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In 2001 an interesting process started in the Dutch town of Wageningen. The City of Wageningen being the only city in the Netherlands with an extreme high academic education level of its population per square kilometre has this Dutch mountain, called The Wageningse Berg. This foothill of the Veluwe Massif has been the “talk of the town” for centuries. Numerous foresters and landscape architects started their careers from this Dutch mountain. Here you’ll find a variety of academic chairs at the University of Wageningen. All these chairs are related to our daily work in the field.

At the start

The inhabitants of the City of Wageningen have an extreme involvement with their urban space.

In 2001 an interesting process started when the City council gave a commission to the special established mountain committee.

The Mountain Committee (Bergcommissie) is an independent committee of experts in various fields of rural techniques. The Mountain Committee advises the city council and the board of Major and aldermen concerning the management and development of the Wageningse Berg Area of 50 hectares.

The Mountain Committee contains 8 members including a council official.

The council clerk provides the committee with administrative support and maintains the official contacts with the organization of the city.

The commission: The Mountain Committee has given the commission to develop a new management plan for the Wageningse Berg based on existing material and new insights.

A part of the commission is to accompany the execution of the plans.

The commission in details: develop a new management plan, incorporate existing plans, test the new plan on demands of the public and accompany the realisation of the management plan.

Urban Forestry at your service

In June 2002 the concept management plan was launched and approved by the City Council.

The management plan contains all the traditional elements including the traditional things you do not want to be in it.

Here the actually interesting part starts where Urban Forest Service comes in to the realization of the plan in consensus with the population of Wageningen.

My paper and presentation will give more insights in this process.

George Borgman is managing director of Borgman Beheer Forestry Consultants which he started in 1992 as a private company. His professional background in the field of nature preservation combined with forestry techniques enables him to develop Urban Management Techniques for the daily practice. These techniques are applied in the projects lead by Borgman Beheer Consultants.

As a consultant he is active in the “playfield” of Urban Forest Management, where George works to communicate the forest in the urban context.

From Multiple-use Forestry to Landscape Forestry

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Abstract

Multiple use forestry, urban forestry and landscape forestry are all parts of one and the same forestry. Searching for (dis)similarities among them can only contribute to creating a new image and contents of forestry that has been searching for new identity. No matter how different they seem to be – each of them has a lot to contribute to the new overall picture of modern forestry.

Multiple use forestry is one of the three main principles of modern forestry. However, it seems to be difficult to bring it into everyday forestry practice. Some of related problems are being dealt with in this article. Landscape forestry is being introduced as part of the possible solution to the problems mentioned and some of the parallels between landscape forestry and urban forestry are being stressed.

Key words: multiple use, urban forestry, landscape forestry, forest functions

Foreword

Multiple use forestry, urban forestry and landscape forestry seem to have very little in common – at the first glance at least.

Nevertheless, they are all parts of one and the same forestry. They may operate under most different circumstances. They may require different ways of thinking; yet, their common denominator is the relationship between man and forest.

Thus, searching for common traits, analysing their potentials and problems they share can only be beneficial to each of them.

Multiple use forestry seems to have the longest history of the three. Formally it is one of the pillars of contemporary forestry in the developed world. It has been officially recognized in a series of international documents produced worldwide – from Rio to ministerial conferences on the protection of forests in Europe. Yet the notion of multiple use forest seems to have been eclipsed by one function only, by wood production, even in the richest parts of the world. Somehow the idea with so long a history of informal forest multiple use just does not seem to be able to take off.

It could be said in a way that phenomenon of a city is the antithesis of the forest. The relevance of urban forestry has been growing with the increasing numbers of urbanites and with the growing deterioration of urban environment. In a city tree or forest fragment are certainly not valued for their timber in the first place. The role and the image of urban forestry significantly differ from traditional ones. And yet there is a lot they have in common.

Landscape forestry is a relative latecomer on the scene. A hybrid between landscape ecology and (multiple use) forestry it advocates temporal and spatial continuity of the forest on a larger scale. It views it as a constituent part of landscapes which is interacting with the other landscape ecosystems. The share of the forest, positioning of its patches and corridors and their shape are determined not only by natural and socio-economic givens but also by the functions forest is expected to perform.

Thus, the parallels among multiple use, urban and landscape forestry could not be more obvious. Each has a lot to learn from the other.

Introduction

The notion of multiple use forestry used to be – next to sustainability and close-to-nature management – one of the three basic postulates of modern forestry.

It still is. Since time immemorial people have known that forests yield many goods and services. Slovenian Forest Act (2002) alone lists 17 such forest functions, broadly dividing them into production, environmental and social ones.

People use them in one way or the other at one time or the other – without asking too much – they are simply part of a culture of an individual, of local community or of a nation that has lived close to the forest for ages.

It is surprising, indeed, how poorly has the idea of multiple use been developed and applied by the institutional forestry.

Particularly now that forestry world over has been searching for a new identity it should be aware that the idea of multiple use forest appeals to many stakeholders – possible allies – that by far exceed the scope of timber market in numbers and increasingly so also in political influence.

A quiet walk in the forest, a cool breeze from the forested hill, a woodpecker's greeting to the spring are not commodities easy to sell. Is there a market for them? More and more people are beginning to appreciate them. If forestry is truly an art and science and not just a craft it should not find it too difficult to create such a market.

Do forest functions and related uses stand a fair chance?

Forest functions and resulting goods and services are duly mentioned in international resolutions and many national documents and acts.

However, the main problem lies in the fact that the profession itself does not believe in them entirely. At best they are considered as time and money consuming nuisances. There is very little education and training on them and even less research. One of the greatest delusions concerning them is in the all too frequently repeated statement that “forests that best perform the timber producing function equally well satisfy the needs for other functions”. What an ignorance of the laws these functions abide by, of their spatial and temporal dimensions and of natural and socio-economic givens they require. This platitude is only being used as an alibi – for doing nothing. It is true they are hard to quantify, hard to express in monetary terms, there are many undefined and highly unpredictable markets for them at the moment – yet this should be taken as a challenge rather than a reason to quit dealing with them.

In practical everyday forestry, functions often mean (un)welcome visitors to the forests, pressures by different interest groups, unrest, disturbances, yet another possible battlefield for which foresters are ill equipped and poorly prepared. On the other hand, however, with a different understanding of the mission of our contemporary forestry this (un)welcome invasion could be viewed as an excellent opportunity to start building different public relations – and a different image of forest and forestry in the eyes of the public.

It is ironic that many early and even contemporary authors consider division of forests into compartments, etc. to be the dawn of modern forestry.

Artificial forest land division copying the agricultural one was certainly crucial to development of planning wood producing forest function and to development of the idea of sustained yield – or to the rise of the notion of sustainability in theoretical forestry.

However, by accepting the agricultural land division pattern forestry subconsciously accepted the philosophy of the artificial gridlike land division which was subject to one and one function only, that is of production of biosubstance.

A steady flow of timber was viewed (and still is) as the most important source of income to the forest owner. Wood eclipsed all the other forest goods and services with very few largely local exceptions.

Timber growing function has its own spatial and temporal laws. Wood grows practically everywhere, regardless of the size of the lot. Tree growth is subject to the species growth dynamics. It can last from several decades to several centuries. This is why it is arguable to say that a stand that produces timber well, renders equally well other goods and services recognized and required by a given society: no wilderness can be created on an acre and biodiversity that would include bear, wolf, or lynx requires vast expanses of relatively undisturbed contiguous forest. Some functions (e.g. protection of natural or cultural monuments) may require small areas, the others are less firmly spatially defined -, for example, a hillside, dotted with blossoming cherry trees. All these functions/states of the forest seem to have only one thing in common: they do not fit into the artificial boundary grid that exists with one and only one function in mind.

Intensive multiple use management (if and when needed) would inevitably bring about a chain of legal and economic consequences. Nobody has tackled this Pandora's box yet. Legal provisions regarding compensations are available, yet obviously nobody has tried them out yet. The State is reluctant to buy such properties because of an assumed lack of funds.

Despite this bleak outlook for vigorous changes that should follow the promising words on festive occasions, the multiple use practice has continued on a small scale – personally, locally. The institutional forestry has been more or less blind to it. The philosophy of multiple use was tolerated yet seldomly dealt with seriously – in theory let alone in practice.

Stalemate? Hardly. It looks like forestry too (if only willing) should resort to the old political wisdom: “If you cannot solve a small problem make it bigger!”

The issue of multiple use forestry enhancement is a case in point. There is a silent majority of people growingly aware of their needs – not for timber but for social and environmental forest functions. Why has nobody tried to make the multiple forest use a political issue? With a steadily declining share in GNP forestry is hardly an economic proposition any longer to anyone – with the exception of the slim but influential logging lobby. There is nothing wrong with it, as long as interests (including those of the forest) are justly balanced, as long as society recognizes that forest in this country is also an important component of the quality of life – and acts accordingly. No longer is forest only an economic category, it is increasingly becoming also an infrastructural proposition.

Things seem to be moving in the right direction; not as fast as one would wish – but nevertheless. The current Slovenian Forest Service yearly reports (Veselič, 2004) still hardly mention any of the remaining 16 forest functions. Whom does such writing address? A handful of specialists, accountants and loggers – but certainly not the hundreds of thousands of forest visitors – actual or potential. This is how forest and forestry are losing their friends. And yet one should stay optimistic: In 1978 we introduced an interim methodology for non-timber forest function evaluation (Anko 1978). It was an adapted version of what Henne and co-workers (1974) did in Germany. The proposal was accepted as something time and money consuming – something close to science fiction.

Five years later it was proven (Kranjc 1989) that evaluation of forest functions was quite feasible and not quite as expensive at all. At that time the time and money expense of evaluation amounted to about 3,5 minutes and an equivalent of 0,2 EUR per hectare. The calculation was transparent and obviously it convinced the greatest doubters. In 1993 the evaluation of forest functions was required as part of the forest management plans by law (Forest Act 1993, Art. 10, 11). Article 13 of the same Act requires definitions of “guidelines and measures for simultaneous maintenance and enhancement of ecological and social forest functions... by individual forest ecosystems or their parts respectively”.

In 1995 the Programme of development of forests in Slovenia (1996) required inter alia “preparing of spatial plans for presenting the importance of functions and development of guidelines, measures and restraints for the management of areas with individual functions of outstanding importance.”

In 1998 the Rules for forest management and silvicultural plans (Pravilnik 1998) offered detailed instructions considering forest function evaluation, containing:

- division of functions into ecological, social and production ones with brief definitions of individual functions;
- guidelines for evaluation of function intensity, dividing them into three levels:
 - (1) function determines forest management,
 - (2) function significantly influences forest management,
 - (3) function influences forest management only partly;
- detailed mapping instructions (scale 1: 25.000);
- presentation and explanation of function specifics by forest management region and its units.

All the regional forest management plans for the current decade (2001 – 2010) thus have forest function maps on the scale 1: 25.000. This is the real beginning. It seems like we have reached the watershed in our dealings with multiple use forestry; shall we continue following the old ways or shall we avail ourselves of the new opportunities offered?

In a way the situation is similar to the moment when we had (most of) our forest standing stock measured by full inventory – tree by tree. The enormously extensive exercise of full inventories was repeated time and again – not as something self-sufficient, but rather as a tool for developing basic understanding of tree and stand growth, yield, allowable cut, sustainability in general, etc.

Let us try to estimate the enormous amount of field work and scientific effort invested into the timber producing function and let us compare it to the amount of time and money invested into research of other 16 functions (according to the Slovenian Forest Act) potentially present on the same hectare.

No comment is needed.

Are we ready for a change?

The Slovenian language dictionary (SSKJ 1979) defines forestry as “economic activity dealing with silviculture and with forest exploitation.” Can we really live with this definition in the XXI. century? The simple question is: do we want to change the profession or should we rather sail into oblivion as glorified lumberjacks?

The Slovenian situation, however, may very well apply to any European situation. Silviculture ought to be respected and timber utilization is (in most cases) a necessity. Yet there is so much more to say about forests today. Forestry will not change by abandoning silviculture and forest utilization, by increasing or reducing the yearly cut or by introducing harvesting machinery – at least not in the eyes of the majority of the people. It is the forest that will change.

What forestry needs to change is changing its mission statement from “planting and cutting trees” to “building understanding and awareness of the precious contributions of forests to the quality of life of all kinds of stakeholders in the XXI. century.”

This will require not only opening the profession to the public but also to the other disciplines whose collaboration is indispensable in dealings with all the forest functions.

This is exactly why urban forestry is of such importance to the general forestry thought: it is free of preoccupation with the trunk. When growing a tree in urban environment people seldomly think of it. Rather, they are concerned with all the other tree functions. The trunk may come at the very end as a welcome byproduct – and not the other way around. In addition urban forester is subject to scrutiny in everything he does and cannot avoid a dialogue with anyone who comes by – whether the person is right or wrong. Again a situation we are not used to in the vast forest expanses – where foresters are the “experts” and laymen “should keep quiet”...

The core of the profession seems to be stubbornly resistant to the changes occurring on its periphery. Why? Because it is reluctant to admit that forest is no longer its absolute domain but is in many ways becoming interest and concern of a growing number of interest groups.

To what extent is multiple use forest a reality?

Profession ought to take a hard and honest look at the many obstacles a forest practitioner encounters when trying to manage a forest in a multiple use way.

We are talking about the eternal forest ecosystem, we compare it to the ocean... In reality the first obstacle a forest planner and practitioner alike encounter are the many kinds of boundaries which remind us that forest is a part of the total human ecosystem (Naveh, Lieberman 1994) i.e. of a social sphere, superimposed upon the nature of the forest.

State borders, municipal borders etc., and the specific socio-economic realities they contain may strangely change the management priorities.

The second sort of borders is the old geometric grid division of forests. In many cases it dates back more than two centuries (e.g. Flameck 1771) when forestry was still just planting and felling trees. It will not be abandoned – at least not for awhile. There is too much information on the forest tied to it. Most of the other functions, however, do not stop on these compartment boundaries.

Considering the Slovenian situation there is another grid hampering active development of non-timber forest functions: About 815.000 hectares of privately owned forests (Veselič 2004) in Slovenia are said to be owned by about 300.000 individuals. On the average this means a 2.7 hectare forest holding (further split into several lots) per owner. Nobody has a clear picture of how many forest lots that would amount to. They may be adjacent but they are small, characterized not only by diverse site conditions but also by the diverse stand histories as well as owners' needs and wishes...

A present day valorization of forest functions has produced yet another maze of boundaries: criss-crossing all the previous boundaries, showing that several functions may overlap over the same forest stand... This map is not only something new in the form. It also introduces a new – let us call it non-agricultural - way of thinking about forest and its functions. It is an indispensable tool in spatial planning and in studying the fundamentals of individual forest functions. It is easy to draw, to change and to maintain by means of modern remote sensing technologies. It remains to be seen, however, to what extent it will contribute to the enhancement of the multiple use practice. It offers an approach which is most intensive, but considers mostly the public (and not the owners') view of functions – and lacks developed management methods (e.g. silvicultural measures to begin with) for each individual function. It is a sound and refreshingly new approach though.

The second cluster of problems, related to application of multiple use forestry that forest practitioner (as well as the profession) faces is related to the multitude of interests that need to be reconciled. The interest of the forest, of general public and that of the many owners which are not necessarily compatible. Some people own forest for timber, the others just for the sake of owning a piece of land, and so forth. The foresters' impossible task is to build a consensus among all these interests and to formulate it as a clear set of management goals. Are foresters trained for this challenge which has more to do with people than with trees?

The next problem area can be summed up by the question: "To what extent is multiple use forestry sustainable?" From ecological point of view most forest functions are in fact disturbances of forest ecosystems. Yet, precious little is known about the ways they disturb forests and there are no universal rules regarding related carrying capacity of the forests.

From the social point of view it is very hard if not impossible to reach a social acceptance of various forest functions among all the stakeholders involved.

From the economic point of view it is also hard to talk about economic sustainability of multiple use forestry as long as the value of functions will not be expressed in monetary terms. There is no doubt that general attitude toward forest functions and multiple use forest would change greatly if this were the case. Certainly this would not be an easy task but it is surprising that there is so little will to tackle the economic aspect of multiple use.

And finally it has to be pointed out that foresters, willing to make any kind of progress in this field face many other obstacles. There is considerable lack of coherent backing of the profession in this regard. While some

practitioners still believe that forests that optimally produce timber equally optimally perform all the other functions, the others are discovering “new forestry” (Franklin 1990) or the so called “ecosystem management” (Moote et al. 1994) or are simply puzzled by the problem of maintaining sustainable functional diversity on a small lot within a relatively short time span.

Changes require flexibility

It looks like the profession has reached the end of the cul-de-sac. Lost in details it has lost the broader overall view and only a radical cut can solve the problem.

Why should not we return to the beginnings? Not all over the country and all at once. Forestry often acts just like a huge tanker: it changes course hopelessly slowly and all at once. Considering the natural and socio-economic diversity of the environments in which our forests grow and our forestry operates a call for more flexibility is a matter of survival of the profession. There are certainly some parameters related to forest functions that need to be followed on a statewide level. The question is how many – and how balanced they should be? In the multitude of data collected from the stand-to state-level most of the data are related to production of timber – from planting, tending and silvicultural measures, to forest protection and felling.

Plants, work-days, hectares, cubic metres add up neatly. There is no attempt being made, however, to add parameters of and establish trends in the 16 other functions listed by the Forest Act.

So much about the multiple-use practice in our forestry at times when a growing share of yearly cut is marked by diseases and other natural disturbances, when timber prices have reached rock-bottom, when everybody talks about the growing relevance of forest functions – and when the social acceptability of forestry is at an all time low.

Forestry should react in a flexible way – by balancing the extensive data base among all the forest functions, by making a statewide synthesis of trends and regional similarities and dissimilarities for each individual function.

This cannot be done at once and on the state level. Rather, we should try out this new approach by means of pilot studies – comparing cost and (dis)advantages of both traditional and new planning/management approach. This comparison study ought to be made on a regional level, amended, then applied in a region with as different a natural and social environment as possible. Evaluation of these results should be followed by a synthesis and its thorough analysis, whereupon the system should be applied statewide.

Theoretical basis for such approach can be found in the concept of landscape forestry.

Is landscape forestry part of the solution?

In North American context Boyce (1995) defined landscape forestry as “the art of organizing forested landscapes to produce desired goods, services and effects that require two or more kinds of stands ordered over space and time”.

As such Boyce’s idea of landscape forestry is a step further than the notion of ecosystem management (Moote et al. 1994) still limited in space and time.

Boyce’s definition of landscape forestry may need a lot of explaining in his own words yet it is easily understood – and applicable also - in the Central European setting.

Firstly, landscape forestry is the art of organizing forested landscapes. It is art (not a craft) that stepped out of the traditional stand into a landscape. Here it looks upon the forest as a constituent part of an ecological system (landscape) of a higher level and tries to arrange its place, share and distribution pattern in a manner that will best serve its ecological and multifunctional role – in a multifunctional landscape. This is exactly what multiple use forest management is all about: it can not succeed on a stand level but by considering forest as part of the landscape. Just like most people see and understand it.

Secondly, producing desired goods, services and effects certainly broadens the scope of foresters’ tasks

beyond timber alone and inevitably brings forestry in contact and interaction with various interest groups requesting given goods and services.

And thirdly: the requirement of “two or more kinds of stands ordered over space and time” ought to be read and understood in the context of Boyce’s native Southeastern United States where clearcutting is still a common practice. Nevertheless, the concept is easily transferable into Central European situation. The accent of landscape forestry as Boyce interprets it is on providing diversity through management over space and time. A concept easy to grasp but not so easy to apply in the present forest management practice. However it is this very concept that brings together two topical modern notions pertaining to multiple use forest and multifunctional landscape: that is landscape ecology and landscape forestry.

In most contemporary cultural landscapes the natural matrix has been long gone. What is left in form of various patches and corridors are simply incidental remnants of former forests that were of no use for other traditional land uses and are being further fragmented and disconnected by new land uses.

Foresters never had any say in what is to remain forest and where. Seemingly they were satisfied with managing their forest stands. It is time to apply the considerable body of knowledge of forest ecology, forest functions and forest management in “organizing forested landscapes” which makes landscape forestry an interesting alternative to forest stand management and an alternative to traditional forestry in general.

Parallels between urban and landscape forestry

It is a matter of scientific curiosity to search for (dis)similarities among different related disciplines.

There is a lot to be learnt from comparisons between landscape forestry (based on landscape ecology) and urban forestry (with a strong social component). Urban context sheds a different light upon forest and forestry – and vice versa. Of course, fundamentals remain the same but it is the different natural and socio-economic setting that puts a different emphasis on the urban tree, forest and forestry in an environment where more and more people live, where more and more decisions concerning forests and forestry are being made.

If modern forestry is more than just planting, tending and felling trees, then it should pay much more attention to human perceptions of and attitudes to trees and forests – not only in rural but particularly in urban environment – where these related contrasts are expressed most strongly.

This is perhaps the most salient reason for looking for the parallels between urban and landscape forestry.

a) Forest in human habitats

Like in the traditional forested landscape foresters have had little to say about the share and spatial distribution of trees and forest patches in urban environment, too. They have been preoccupied by tending individual trees (the phenomenon of arboriculture is interesting in this regard) and forest remnants, rather than by looking at the forest as functional part of urban landscapes that ought to maintain some semblance of spatial and temporal continuity, thus securing the many benefits that multiple use forest represents as either open landscape or urban landscape component.

To paraphrase Boyce’s (2000) definition of landscape forestry one could also say that urban forestry too is “the art of organizing *urban* landscapes to produce desired goods, services and effects” offered by the presence of trees, forest remnants and forests proper in urban environments.

b) Forests as (ecological) infrastructure

In landscapes forest patches and corridors present part of ecological infrastructure. Forest functions as energy dam, biomass accumulation, source of biodiversity etc., it influences local climate, water flow, migrations of species etc. In the same manner urban trees etc. ought to be viewed as part of urban environmental infrastructure, significantly contributing to the quality of urban life – for humans and other living beings. However, while all the other urban infrastructure is expected to be carefully planned and maintained, urban greenery is by and large taken for granted. Like forest patches and corridors in forested landscapes, urban trees and forest remnants too grow wherever they do all too often more by chance than by foresight. Their design and their maintenance is often haphazard.

c) Quantifying and monetary evaluation of tree / forest functions

One of the greatest obstacles to development of the multiple use forestry are the difficulties related to quantifying and expressing values of non-timber forest functions in monetary terms. It is surprising how little effort has been invested in this kind of research. As if some new discoveries in this field could radically tilt the balance of power and interests among different traditional stakeholders. Who is afraid of clear reckoning? If any progress is bound to occur in this field it is most likely this will happen in urban environment, where individual tree / forest functions are most clearly expressed and will therefore be assessed most easily. Many different interests and exorbitant land prices in cities do not favour integral planning of urban greenery (trees, forests). It is difficult to fight them with equal (monetary) arguments. It is difficult to defend green areas against urban sprawl. For this reason urban (or landscape) forestry seldomly tries to get involved in spatial planning where trees and forest fragments would be located most suitably. Fighting case by case for small forest patches and individual trees – even if on fully justified scientific grounds – is a war lost in advance. There are other ways that might be more efficient.

d) Promotion of the tree / forest culture

In democracies public opinion can be even stronger a weapon than money, sometimes. If forestry failed to develop a culture of a tree and / or a forest in forested countries like Slovenia and in its many types of forested landscapes only one option seems to be open: the city. When a resource becomes scarce people start to appreciate it and probably city dwellers will become aware of the many forest related benefits sooner than people in the countryside.

This, of course, will not happen all by itself and overnight – “enlightening” people in this regard is an important task of the forestry – and it may succeed sooner in the city than in countryside. It is more likely that foresters will succeed in this regard by systematic, steady efforts than in conflict situations.

e) Going political

When everything else fails, go political. A sad but true conclusion. Classical forestry will not gain public support for forest in our landscapes unless it makes the role forest plays in our physical and spiritual environment a political issue. Examples of such practice abound.

Here too one should again recall the old political saying “If you cannot solve a small problem, make it bigger”. This is the moment for urban forestry, particularly in rich countries, to go political. Why as a rule have the most affluent parts of cities the greatest share of greenery? How many cities have realistic plans for acquisition of land suitable for urban greenery? There is no doubt that in the long run “green networks” would be beneficial to city development. They may even raise real estate prices. Yet as long term investments they are not politically expedient – without strong public / political support.

Only some most salient parallels between the two forestries have been mentioned here. To an open mind they will soon prove that, in fact, they are not differences but common traits, indeed. Both kinds of forestry need to discover them in search of their identity if they are to become two strong branches of modern everyday forestry – in the city as well as in the countryside.

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Contemporary silviculture in Slovenia: problems, challenges and future trends

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Summary

Nature-based silviculture has more than hundred years tradition in some parts of Slovenia. Since the World War II, it has been consistently applied on the whole forest area. Increasing problems within forestry sector predominantly linked with trends of the global economy are threatening its future development. This presentation is composed of two parts. First it outlines the development of nature-based silviculture and attempts to answer the question if it is able to survive on the global market. For this purpose general aims and principles as: mimicking natural processes, use of natural regeneration, forest tending through selection and education, additional measures for sustaining biotopes are discussed, and the importance of the forest reserves network as a reference is depicted. Existing three silvicultural systems: selection system, irregular shelterwood and the "free style" silviculture are briefly discussed. Further, contemporary problems and challenges as forest decline, organisational changes, delay and decrease of forest tending, and declining interest for management are presented. Possible solutions within forestry sector include optimisation, rationalisation and diversification of silviculture. Beside this many problems in silviculture and forestry in general can not be solved without close interactions with politics and society. For example support in form of subventions or as a Central European regional certification would be significant.

The response of nature based silviculture to contemporary challenges includes also diversification, and adaptation to management aims in special purpose forests. The second part of this talk is devoted to possibilities of its application in urban and recreational forests. Firstly an overview of different management possibilities is given, including non-intervention, conventional silviculture and low intensity nature-based silviculture. Based on selected case studies in Slovenia and abroad advantages and disadvantages of each approach are discussed. The experience shows that the conventional silviculture is aesthetically and ecologically inappropriate in urban forests. The non-intervention alternative is frequently applied in urban forests, however it results, after few decades, in senescence and decreased mechanical stability of stands. This limits accessibility of forests for recreation, moreover it endangers the forest work safety and increases costs. Therefore the non-intervention has to be associated with regular salvage cuttings, and this makes it economically less attractive. Nature-based silviculture has many advantages due to naturalness, low environmental impact, flexibility and especially low external and internal costs. It could be appropriate solution in family and privately owned urban forests or less frequented state owned recreational forests. In forests near large urban areas, and in state or municipality owned urban forests low intensity nature-based silviculture with planned and maintained network of non-intervention stands, special biotopes, ancient trees, coarse woody debris, and recreational equipment is an alternative.

Key words: nature-based silviculture, problems and future trends, silviculture in urban forests, Slovenia

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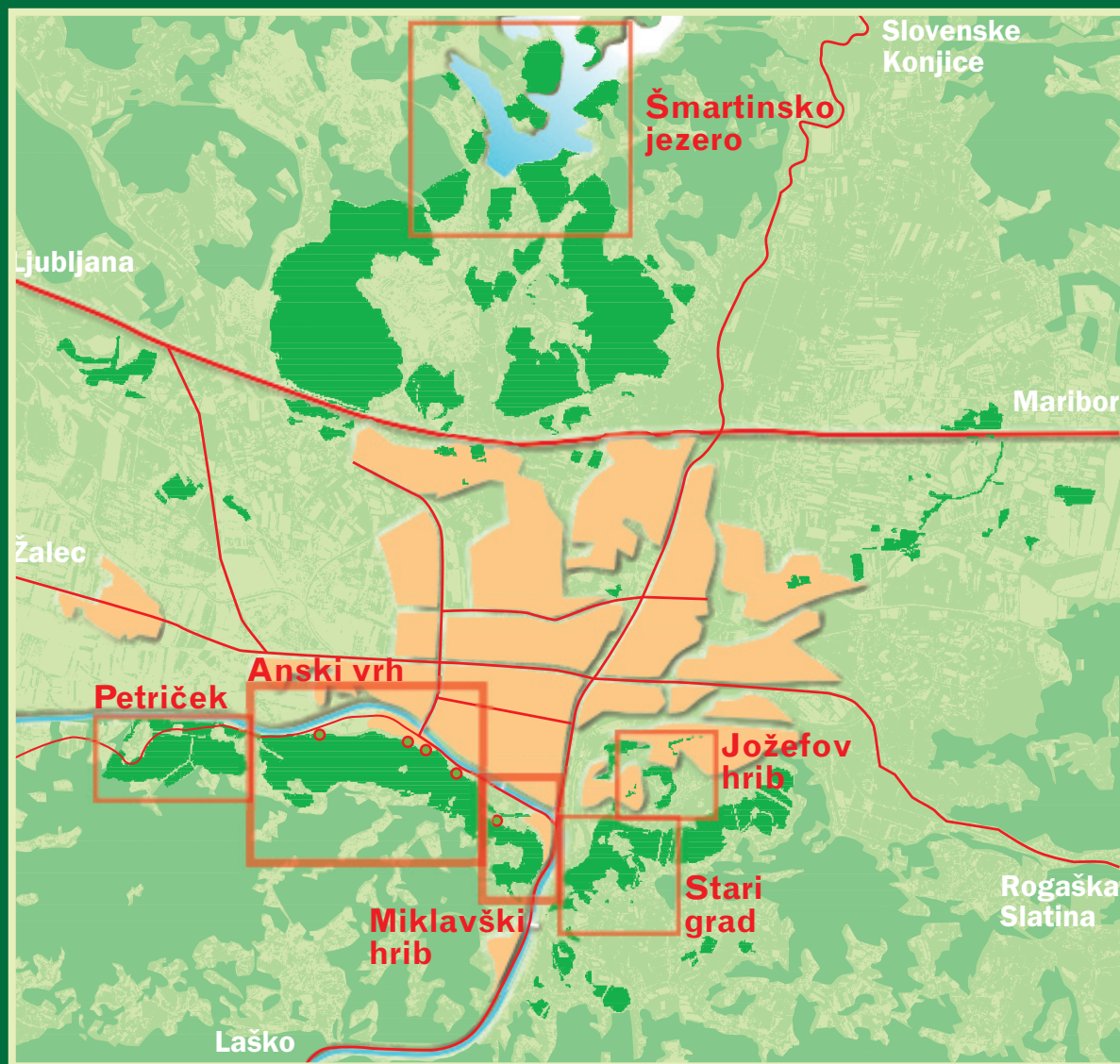
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