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Slovenia Forest Service

University of Ljubljana
Biotechnical faculty
Department of Forestry and Renewable Forest resources

**LINKING PRACTICE, SCIENCE AND EDUCATIONAL
OUTREACH FOR ADVANCING CLOSE – TO – NATURE
FOREST MANAGEMENT**

20TH ANNIVERSARY CONFERENCE OF PRO SILVA EUROPE IN SLOVENIA

Logarska dolina, 2009

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PROGRAMME OF CONFERENCE

Thursday, September 24, 2009

18.00 – 20.30	Pro Silva management committee meeting
20.30 – 21.30	Break
21.00 – 22.30	Registration & Welcome party

Friday, September 25, 2009

8.00 – 9.00	Registration
9.00 – 9.20	Opening ceremony welcome addresses
9.25 – 9.30	Cultural intermezzo
9.30 – 10.00	Prof. Dr. Dr. h.c. Jean-Philippe Schütz , president of Pro Silva Europe: "Development of close-to-nature forestry and the role of Pro Silva Europe"
10.00 – 10.20	Pro Silva Awards
10.20 – 10.30	Cultural intermezzo
10.30 – 11.00	Coffee break
11.00 – 11.30	Prof. Dr. Jürgen Bauhus ; University Freiburg, Germany "Science for improvement of close-to-nature forestry"
11.30 – 12.00	Franz-Sales Fröhlich , Forstverwaltung des Kreises Herzogtum Lauenburg: "Best practices of CTN forestry and challenges for research"
12.00 – 12.30	Prof. Dr. J. Bo. Larsen ; KVL, Denmark: "Close-to-nature forestry, educational outreach and public relations"
12.30 – 13.00	Thamas Marghescu , IUCN, Brussels: "NGO and IUCN stand point of sustainable use of forest resources and linking research and education"
13.00 – 14.30	Lunch
14.30 – 14.50	Andrej Breznikar , MSc, Slovenia Forest Service: "Review of presentations and introduction to the work-shop"
14.50 – 16.30	Work in three workshops: 1. Science 2. Practice 3. Education, extension and public relations
16.30 – 17.00	Coffee break
17.00 – 18.00	Plenary session: discussion and conclusions
18.00 – 19.00	Short visit and introduction to Logarska dolina landscape park

Saturday, September 26, 2009

8.00 – 19.00

Whole day in conference excursion
(variants **A**, **B** and **C**)

Sunday, September 27, 2009

8.00 – 19.00

Whole day in conference excursion
(variants **D** and **E**)

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PREFACE

Sustainable management of forest ecosystems for the future is becoming one of the most important, yet difficult tasks for societies due to growing environmental problems on the one hand, and increasing needs for energy, raw materials, recreational functions, biodiversity conservation and environmental services on the other. Close-to-nature forestry is one of the principal tools for bridging contrasting demands on forests. In this field Europe has a long tradition and many well established practices. These practical examples avoid clear cutting, work with natural regeneration and natural processes in general, make use of linkages between forest climate and growing stock, and respect tree individuality and quality. Therefore they operate with lower costs for forest regeneration and tending, exhibit less risk and more stability and flexibility, and thus they achieve reliable economic returns, which become more and more evident on the long term. Moreover, they demonstrate that conserving and restoring forest biodiversity can be combined with management for social and protection functions with the lowest possible ecological footprint. Pro Silva Europe is a federation connecting foresters, forest owners and forests representing this type of management on a European scale (www.prosilvaeurope.org).

In recent years close-to-nature forestry is becoming more and more recognised by public and NGO's. However, the percentage of managed forests in this way in Europe is growing relatively slowly. Close-to-nature forestry is often not appropriately acknowledged by governments or included in the legislature. Moreover, in spite of documented success, close-to-nature forestry has limited support from established forestry science. This discrepancy between many excellent practices and relatively low influence on global forestry issues could be attributed to many reasons. Close-to-nature forestry is a complex management paradigm – it is not easy to communicate and support with research, it is labour and thought intensive and often considered as an obstacle for mechanisation. Nevertheless, one of the most important reasons for its slow advancement is a weak cooperation between forestry professionals, scientists, educators, politicians and public. The goal of this conference is to bring experts from different fields of close-to-nature forestry and adjoining disciplines together to discuss gaps in knowledge, means to improve information flux, as well as collaboration among science, practice, education and interested public.

Forest management of the future will be influenced by significant changes of our natural, social and economic environment. Pro Silva Europe is broadening its sphere of activities to significantly support transformation of Europe to a sustainable society.

Prof. Dr. Dr. hc Jean-Philippe Schütz, President Pro Silva Europe
Brice de Turckheim, Treasurer Pro Silva Europe
Dr. Hermann Wobst, Management board Pro Silva Europe
Prof. Dr. Jurij Diaci, Management board Pro Silva Europe
Tone Lesnik, Chair Pro Silva Slovenia

Development of close to nature forestry and the role of ProSilva Europe

Jean-Philippe Schütz, President ProSilva Europe

Actually the challenge for close to nature forestry is to fulfil more than ever a whole range of interests. In the last decades there has been a clear trade-off in societal expectations on forest resources according to new insight like:

- Awareness for nature, not only as important heritage to be preserved, but also as basic surrounding conditions for human well being. It means to live in harmony with nature.
- Awareness that important resources like water or energy have been squandered and should be preserved and used in a sustainable way.
- Climate changes represent an important challenge for well being. Forest harvesting and sound use of timber products exert a significant influence on Carbon-equilibrium

Thus the core element of our strategic vision is a well functioning integration of all needs and interests. The master word for this is multifunctionality. The visionary aspect here is more important than the resulting forest structures or the silvicultural techniques to implement it.

This vision and resulting ProSilva principles for managing the forests are totally in line with actual expectations. This important message should be appropriately and positively communicated to a large public. Its consequence, evident for everyone in its importance, is to obtain and maintain vigorous, wealthy, stable, diverse and beautiful forests.

Change also occurred in timber utilisation. Technically there are no limits to timber processing regarding neither timber dimension nor tree species. In the past too much attention was given to producing mass products with average quality in order to reduce processing costs on the basis of scale economies. In the future, a gain in timber processing is only possible if appropriate timber quality is considered and not primary timber dimension, and if processing leads to diverse products with high added value and a good ecologic footprint. Huge changes also took place in the fuel wood sector. Emergence of new wood energy products with high added value like pellets is about to change the repartition of the main timber products. Because of the possibility of substitution of fossil commodities, fuel timber represents a substantial part of renewable energy supply and is about to be sustained with low and medium quality timber, giving pride to high value timber.

All this perfectly supports the ProSilva vision of a forest management aiming at producing high value timber and at the same time allowing good economic return necessary to encourage forest owners to endorse this kind of forest management.

The essence of close to nature vision is a sound definition of its relationship to nature. In fact nature is not the central aim but the driving belt to implementation. Natural processes are an inspiration to find the best way of achieving economic, social and protective goals in reliance and harmony with nature and without hurting it. Many natural processes allow economically efficient dealing with nature with so called biologic rationalisation, like natural regeneration under cover, natural structuralization, mixtures, and controlling by shade. Moreover, there are different ways to achieve such structures so that using the whole variety of silvicultural appropriate interventions allows us to improve habitat diversification and thus is an efficient contribution to general biodiversity. This is the meaning of our motto "Free style of silviculture" after Mlinsek.

Historically considered close to nature forestry was born in temperate forest conditions, where the growing conditions are more or less sufficient, following the visionary views of precursors like Gurnaund, Gayer and Biolley at the turn of the 20th century. Some decades after Möller extended the idea to more limited conditions in north eastern Germany. Now the

ProSilva movement regroups 24 European nations, partly with different backgrounds, past traditions and general site conditions. This is the role and big challenge for ProSilva Europe: to exchange experiences over a large range of different growing and socioeconomic conditions and to determine the common denominator of our principles and focus on the core elements of our concept, from Mediterranean to boreal regions and through other limited conditions.

Because it works with very complex ecosystem processes and is based on a large amount of practical experience, implementation of such a concept needs high silvicultural proficiency. Thus ProSilva management is far away from a kindly musing ideologic movement, but on the contrary is based on a solid scientific background and needs corresponding high scientific support. Our main goal during the following conference is to show how to bridge science and practice.

On science and close-to-nature forestry

Jürgen Bauhus and Christian Kühne

Institute of Silviculture, Freiburg University, Tennenbacherstr. 4, 79085 Freiburg, Germany

Adaptive Management is underpinning most prevailing concepts of sustainable natural resource management including those developed for forests. The necessity to be adaptive can be attributed to the constantly shifting environmental conditions, the changing societal aspirations for ecosystem services from natural systems, the rapidly developing knowledge base, and the long time periods between implementation of certain management systems and a measurable outcome. The latter is particularly true in forestry. In addition to the above factors, the complex nature of forest ecosystems makes it very difficult to predict, in the sense of cause and effect, particular outcomes from single management interventions. In adaptive approaches, management objectives and goals are therefore formulated as hypotheses to be tested. To test the hypotheses, criteria and indicators to quantify the outcomes of management activities are required. While this sounds easy and logical in theory, it is very difficult in practice. For example, the outcomes of thinning and the response of trees at the stand and individual tree level are reasonably easy to quantify in terms of growth or damage. Other, long-term outcomes such as the quality development of trees, nutrient cycling, or habitat provision, can hardly be monitored by individual forest enterprises, but must be investigated by experts. This begs the question, how practice and science interact to evaluate and to improve management approaches.

The forest functions recognised and the management options recommended by ProSilva are largely in accordance with other sustainable forest management approaches. However, in practice, in close-to-nature forestry approaches, things are often complicated by the confusion of management approaches and outcomes. Here, forest structure or the degree of tree species mixture, are often viewed as management goals and not as approaches to achieve particular outcomes such as a certain level of productivity, resistance and resilience to disturbances, or the provision of habitat and biodiversity. Recent research results and also the large and intensive current research efforts on the effects of species diversity and forest structure on forest functions demonstrate that our understanding of these interactions is still fairly limited. Other problems are that some of the recommended approaches seem to conflict with each other, i.e. maintaining mixtures and relying on natural processes such as self-thinning, and that the historical reference, the site-adapted natural forest community, may not be suitable for the future. Interestingly, many scientists working on these issues are not aware about its relevance to close-to-nature forestry, and vice versa, many of the proponents of close-to-nature forestry and members of its organisations are not aware of this research.

While there has been and still is a large amount of research being done on specific questions that are relevant to the important assumptions underpinning close-to-nature forestry, it is surprising that very little of this is done by proponents of close-to-nature forestry. In contrast, the proportion of scientists who openly support and contribute to the development of “ecosystem management”, another prevailing paradigm of forestry, i.e. in Fennoscandia and North-America, seems much higher. Why the latter is more conducive to exchange between science and practice than the former will be debated. We suggest that the fact that ecosystem management is more driven by hypotheses than convictions and that its proponents are equally open to evidence for and against the ideas, is one of the main differences to close-to-nature forestry, which appears to have a more narrow focus on evidence in support of its ideas.

Close-to-nature forestry had its origin not in scientific circles but largely among private landholders and few managers of public forests and its scientific credentials were not highly relevant. The ultimate performance measure of it was economic success. Today however, it is being applied widely to public forests, to which a large array of performance measures for all the different forest functions is applied. Thus close-to-nature forestry must be able to demonstrate to the public optimal performance in relation to all forest values. The only basis for this is a scientific approach.

The problem of how to integrate new knowledge, how to engage with researchers, how to change paradigms and ultimately how to develop truly adaptive management approaches and is not unique to close-to-nature forestry, but applies to all forest management. However, the existing network of members of close-to-nature forestry organizations offers unique opportunities to address this problem. Using common inventory protocols and common experimental designs to research questions that are relevant to the wider membership could provide very valuable and data sets for robust analyses and results with wide-spread applicability, across the boundaries of jurisdictions and landholdings. In contrast to North-America, where silvicultural systems are modelled after natural disturbance regimes, in Europe the response of tree species to different silvicultural systems might be used to gain insights into the natural disturbance regimes. However, the foremost important steps would be firstly to acknowledge that close-to-nature forestry does have substantial knowledge gaps and research needs and secondly to formulate these as hypotheses that can also serve as a basis for adaptive management. In addition, a number of measures may be taken to improve communication with scientists and to disseminate relevant scientific information among the membership.

Best practices of Close to nature – forestry and challenges for research.

Franz-Sales Froehlich, Leading Director, Salem, Lauenburg, Germany

Forest areas close to nature (CTN) structured both horizontally and vertically with trees of different ages and a high percentage of maturing trees of high quality and size are one goal of a forestry management oriented towards ecology and economy in the natural deciduous forest areas of the North German lowlands. The growth and quality of beech trees, but also other deciduous trees (e.g. oak, ash, sycamore, lime) are the result of optimal conditions with a temperate oceanic climate on strong locations well-supplied with water from the most recent Ice Age.

Making use of the self-regeneration and self-regulating forces stemming from the effects of light and shade reduces the operating costs and together with appropriate returns for high-value and large dimension timber leads us to expect a business advantage from this form of forest management. As such a forest structure comes as close as possible to the phase change in primeval forests, its ecological value must also be considered much higher than forms of age classes forest or less-structured forest structure types.

So far in the North German lowlands and in other deciduous forest areas in Germany management forms have been developed that show considerable improvements in the stand structure and the maturing of individual trees of value within the forest compared to the age classes forest. Nevertheless there are still considerable deficits with regard to the close to nature demand, and the proportion of high quality trees in the stand, that have fallen victim to felling and been taken out prematurely is considered too high.

On account of these considerations and encouraged by examples of a kind of perpetual forest structure in individual stands, the former process of “**differentiated age classes forest, shelterwood cut with delayed clearance**” has been further developed to the process of “**a structured perpetual forest with group-selection felling, also known as femel-felling**”.

In an operational study of natural, commercial and ecological parameters in stands managed according to the two different processes of forest structure types, it was established that the growth performance as a whole increased in this way and the quality of the amounts harvested did not deteriorate. These observations were then extended to take in the use of marginal interest yield calculations, on the one hand to calculate whether it was financially profitable to leave potentially useful kinds of trees standing and also to calculate what capital yield was lost, when potential growth trees were harvested too soon (differential investment calculation).

As a result it was possible **from a natural point of view** to establish that on average over many years there was a clear increase in the potential use of large dimension timber. The increase in the dimensions of the thicker trees however remained a little below that of the shelterwood cut stands, which in total was again compensated for by the larger number of tree trunks. Stock sourcing remained clearly higher at all times and the variations remained within a range of merely 200 - 400 growing stock cubic meter per hectare. **From a commercial point of view**, the advantages are also perfectly obvious. The higher profits from better performance and better yields are an additional benefit to the lower costs. These are relativised by the somewhat lower quality (tendency to knots) of the logs and the inhibition of growth to be expected in the successive generations at the gap edges. The absolute cash-flows are also considerably higher than with the process “**differentiated age**

classes forest, shelterwood cut with delayed clearance", when the large dimension timber phase is extended by around 20 years. Both processes - considered individually - already achieve a **marginal return** of 2.4% and more in relation to the time of the potentially possible decision to fell the trees when they are 120 years old (age classes forest), which is an opportunity -oriented way of looking at the costs. In this case however the process of the **differentiated age classes forest, shelterwood cut with delayed clearance** does slightly better, as the rapid capital turnover (<40 years) has a positive effect here. In a differential investment consideration between the two processes, an annuity of around 5.75 euros per hectare and year of further investment assessment was achieved in favour of the perpetual forest over the whole period.

In contrast the **ecological effects** for the process of **a structured perpetual forest with group-selection felling** are estimated to be positive in all parameters and come relatively close to the natural forests. This is especially the case if in addition selected trees or groups of trees can remain in the stand in order to serve as natural and long-term enrichment with old wood and dead wood as part of a perfected commercial and ecological concept, for which this type of forest structure is predestined.

These operationally established results should be verified by further scientific investigations and established on a broader more certain basis.

Close-to-nature forestry – Participatory planning and educational outreach

J. Bo. Larsen, Forest & Landscape, University of Copenhagen, Denmark

Conversion to close-to-nature forestry calls for new ways to describe and communicate long-term goals for stand development with forest owners, workers and managers as well as other stakeholders. The Forest Development Type (FDT) has proved to present a useful concept for communicating such “novel” long-term goals.

A forest development type describes the long term goal for close-to-nature stand development at a given site (climate and soil conditions) in order to accomplish specific long term aims of functionality (ecological-protective, economical-productive, and social-/cultural functions). The goal is described with respect to stand structure, species composition and regeneration dynamics and is also illustrated in a profile diagram depicting the stand structure and composition at “maturity”. Further the goals for production, conservation and recreation are specified.

In Denmark, a participatory process described by Larsen and Nielsen (2007) resulted in the creation of 19 FDTs, which can be grouped into 9 broadleaved dominated, 6 conifer dominated, and an additional 4 “historic” types (Table 1). Whereas all “nature-based” FDTs encompass a balance between productive, protective and recreational/social functions, the four “historical” types mainly serve the protection of recreational, natural and cultural functions. Especially the historical Forest Pasture (FDT No. 92) and Forest Meadow (FDT No. 93) can be actively used to create habitat diversity and experiential richness in forest landscapes.

Observations during and after the process of the FDT-development (Nielsen and Larsen 2006) point to FDT in combination with their illustration by means of profile diagrams as integrative and instrumental for communicating long-term goals for stand development among forest managers and workers. Correspondingly, they might serve to support active participation of local people in defining and agreeing upon long-term goals for forest stands and landscapes, in processes where managers should be flexible to adjust goals in relation to the specific social-cultural context.

Table 1: The 19 Danish Forest Development Types. The name encompasses the dominating and co-dominating species. The first digit in the FDT-number indicates the main species (1 = beech, 2 = oak, 3 = ash, 4 = birch, 5 = spruce, 6 = Douglas fir, 7 = true fir, 8 = pine, and 9 indicating a “historic” FDT). Forest Development Types 11, 21, 71, and 92 are illustrated in fig. 1.

	Species name (Latin name)
<u>Broadleaved dominated:</u>	
11 Beech	Alder (<i>Alnus glutinosa</i>)
12 Beech with ash and sycamore	Ash (<i>Fraxinus excelsior</i>)
13 Beech with Douglas fir and larch	Beech (<i>Fagus sylvatica</i>),
14 Beech with spruce	Birch (<i>Betula pendula</i> and <i>pubescens</i>)
21 Oak with ash and hornbeam	Douglas fir (<i>Pseudotsuga menziesii</i>)
22 Oak with lime and beech	Hornbeam (<i>Carpinus betulus</i>)
23 Oak with Scots pine and larch	Larch (<i>Larix kaempferi</i> and <i>x eurolepis</i>)
31 Ash with alder	Lime (<i>Tilia cordata</i>)
41 Birch with Scots pine and spruce	Mountain pine (<i>Pinus mugo</i>)
<u>Conifer dominated:</u>	Norway spruce (<i>Picea abies</i>)
51 Spruce with beech and sycamore	Oak (<i>Quercus robur</i> and <i>petraea</i>)
52 Sitka spruce with pine and	Scots pine (<i>Pinus silvestris</i>)
broadleaves	Sitka spruce (<i>Picea sitchensis</i>)
61 Douglas fir, Norway spruce and beech	Silver fir (<i>Abies alba</i>)
71 Silver fir and beech	Spruce (<i>Picea abies</i> and <i>sitchensis</i>)
81 Scots pine with birch and Norway	Sycamore (<i>Acer pseudoplatanus</i>)
spruce	
82 Mountain pine	
<u>“Historic” forest types:</u>	
91 Coppice forest	
92 Forest pasture	
93 Forest meadow	
94 Unmanaged forest	

Further, the concept of forest development types has been used in education as a planning and design tool for forest landscape restoration, both in terms of describing the development of specific forest areas but also to illustrate the anticipated landscape development as an integration of different ecosystems including different forest types, semi-open forests, glades, edges, open areas and water bodies. Applying this tool box in designing the forest landscape utilizing existing and potential variation in topography, geology and hydrology it is possible to develop robust and functional forest landscape with high recreational, aesthetic, biological and productive values. Fig. 1 presents such a forest landscape development plan proposed by a group of students attending the international master course in Urban Woodland Design and Management at the University of Copenhagen.



Figure 1: Restoration plan as proposed by a group of students. The plan in combination with the profile diagrams of the four FDT's including examples of different edge-types gives an instant impression of the anticipated goals for the urban forest landscape and for the different forested parts (stands), which can be used as a off-set for participatory planning approaches.

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Sustainable use of forest resources linking research and education: a view by NGOs and IUCN

Tamás Marghescu, former Regional Director IUCN, Brussels

The title of the presentation is very demanding, but I wish to deal with it in two separate sections first:

1. Sustainable use
2. Linking research and education
before connecting the two towards the end of my paper.

IUCN itself is not an NGO, but it represents next to Governments and government agencies also more than 800 NGOs worldwide. The glue between this very heterogenic constituency is a shared vision and mission.

IUCN's vision and mission

Our vision is a just world that values and conserves nature.

Our mission is to influence, encourage and assist societies throughout the world to conserve the integrity and diversity of nature and to ensure that any use of natural resources is equitable and ecologically sustainable.

Sustainable use is hence embedded into the central heart of IUCN. Some of the IUCN members are typical organizations promoting the sustainable use of natural resources. Let me just mention the Federation of European Hunting Associations (FACE), representing some 7 million hunters in Europe, to be found in every village and Parliament. The IUCN Commission on Species Survival (SSC) has even a Specialist Group on Sustainable Use. The entire United Nations deliberations on sustainable use, such as the so called **Addis Ababa Principles on Sustainable Use** have their origin in IUCN.

The challenges of this century have also led IUCN to review its present constituency, asking critically, whether its present constituency was the right one to tackle the challenges of the time. I personally think that IUCN needs to strengthen precisely its constituency with land owners, land user organizations, making decisions on sustainable use of biological diversity every day. Among the organizations I see a must for a relationship is: **Pro Silva**. During my time as IUCN Regional Director for Pan Europe I regarded the relationship with Pro Silva as a strategic move to promote close-to-nature forest management as the perfect way to harmonize conflicts between economic, social and ecologic objectives in the management of forests. "As over half of all proposed sites for the EU-wide ecological network Natura 2000 will include forest areas, specific guidance for forest sites is appropriate." (European Communities, 2003)

There is a very strong opportunity for Pro Silva to step beyond the *'fence of a club'* and use the opportunity of the time in strategically influencing the legal requirement of preparing management plans for forested NATURA 2000 sites in the member states of the European Union. But not only the member states of the European Union should be tackled, but the accession countries and "new neighbor" countries. This would require a large scaling up of Pro Silva after 20 years of existence. Strategic partnerships are required with partners as the European Landowners' Organization (ELO), the Federation of Private Forest Owners in Europe (CEPF), the International Union for Conservation of Nature (IUCN) of course and the Association of State Forest Enterprise in Europe (ESTAFOR), just to name a few. Is Pro Silva prepared to make this quantum jump? Member States and national government agencies are not really equipped to oversee all the different quarrels land owners, government agencies have with the management of Natura 2000 sites. One is in need of

additional, independent, science –based, but also practically oriented arbitration. Another chance for PRO SILVA....

A quite other field of necessary collaboration between IUCN and Pro Silva is emerging from the very principle discussion of – what constitutes real sustainability of using natural resources, including forests?

Already 3 years ago, I was asking for giving nature a price. This demand is now very strongly pushed by the G8, the European Commission and the United Nations Environment Programme (UNEP), who all support the work under the study : '**The Economics of Ecosystems & Biodiversity (TEEB)**'

<http://ec.europa.eu/environment/nature/biodiversity/economics/>



Giving nature a price will inevitably increase the economic value of natural resources and truly sustainable forest products, such as wood from Pro Silva promoted close-to-nature forest management operations will have a strong demand.

To achieve the advancing of close-to-nature forest management and its associated benefits for nature conservation, it is of course necessary to organize a research community with direct communication with the field, which embraces all disciplines, including conservation, economics and sociology. Again this requires a broadening of Pro Silva's very own constituency, may be through the founding of departments, and the collaboration with strategic partners. IUCN with its network of field projects, policy makers and researchers is an obvious partner for Pro Silva.

The same as for research is of course true for the education of all professionals in all disciplines and all levels. The general public needs to also have a certain foundation to provide the required support, which leads to an informed public, demanding political consequences from its elected politicians. IUCN with its **Commission on Education and Communication (CEC)** has a network, which could once again be of interest to Pro Silva in supporting the common cause:

To promote close-to-nature forest management beyond property and national boundaries for the good of people and nature in their sustainable co-existence.

I am looking forward to an intensified collaboration between Pro Silva and IUCN. Pro Silva would be in my eyes one of the strategically needed new members of IUCN to face the challenges of the time together, achieving true sustainable use of forest resources through collaboration of practice, research and policy, supported broadly by public knowledge and demand. One thing one can learn from IUCN: being a spider in the web.

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PROSILVA EUROPE 1989 - 2009

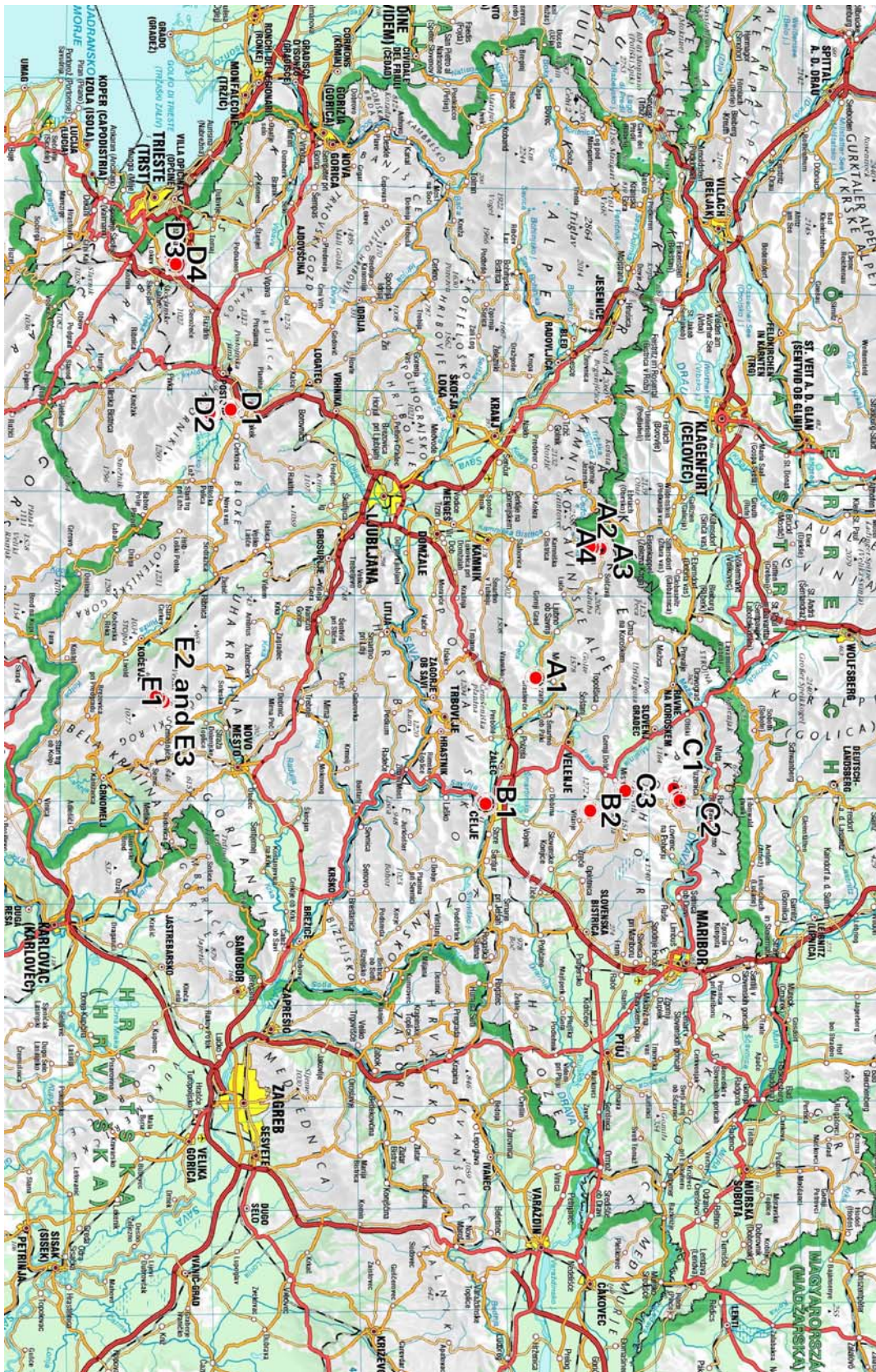
20th ANNIVERSARY CONFERENCE

LOGARSKA DOLINA 24. - 27. 9. 2009

EXCURSION PROGRAMME

Conference excursion A, 26. 9. 2009, Nazarje, Solčava, Logarska dolina
Conference excursion B, 26. 9. 2009, Celje, Paški Kozjak
Conference excursion C, 26. 9. 2009, Mislinja, Orlica – Sgerm, Pohorje
Post-conference excursion 1, 27. 9. 2009, Rakov Škocjan, Javorniki, Kras
Post-conference excursion 2, 27. 9. 2009, Kočevje, Rajhenavski Rog

LOCATION OF CONFERENCE EXCURSIONS



CONFERENCE EXCURSION A – The whole programme

Date: 26. 9. 2009

Main localities of the excursion: Nazarje, Solčava, Logarska dolina

Excursion is organised by: Forest Service Slovenia – Regional unit Nazarje, Community Solčava, Tourist enterprise Logarska dolina, University in Ljubljana, Biotechnical Faculty, Department for forestry

Accompanying person: Prof. Dr. Jurij Diaci, jurij.diaci@bf.uni-lj.si.

Time	Activity	Holder of the activity
8.30	Departure from before Hotel Plesnik	
9.00	Welcome address by the head of the Regional unit Nazarje (Forest Service Slovenia) and introduction to the regional forests and forestry	Anton Breznik, SFS ++386 41 755-378, Anton.Breznik@zgs.gov.si
9.15	Forests of Žiferje	Prof. Dr. J. Diaci
10.45	Museum Vrbovec – history of forest management, exploitation, wood industry and trade in Upper Savinja valley	Organised visit of the museum with the curator
11.45	Visit of Franciscan monastery and its old library in Nazarje	Direction of the Franciscan monastery
13.30	Lunch at Žibovt family farm	
15.00	Presentation of the results of study circle "Panoramic road"	Alojz Lipnik, SFS and mayor of community Solčava ++386 31 361-914 alozj.lipnik@solcava.si
16.00	Family farm Perk, presentation of typical close-to-nature management of a mountain family forest	Damjan Jevšnik, SFS ++386 41 657-628 Damjan.Jevsnik@zgs.gov.si
17.30	Presentation of the natural science educational trail (NSET) Logarska dolina on the spot »Olcarska bajta - Loggers cabin«	Damjan Jevšnik
18.30	Multivision about tourism in Logarska valley (replacement for NSET in case of rainy weather)	
19.00	End of the excursion	

CONFERENCE EXCURSION A – The field presentation 1

Presentation of Žiferje forests
Presentation by Prof. Dr. Jurij Diaci
Location: Žiferje, 600 m a.s.l.

Content of the presentation

Topic: Gradual transformation of Norway spruce monocultures to uneven-aged, mixed forests

Location and basic data: management unit Nazarje, compartment 3B, owner archbishopric Ljubljana

Bedrock: limestone covered with volcanic Keratophyr, Andesite and Andesite tuf

Soil: variable, predominantly a combination of cambisol and calco cambisol of various depth

Forest typology: a complex of several floristic sintaxa, predominant beech forest on moderately acidic soil (*Castaneo-Fagetum*); beech sub-mountain forest on carbonate bedrock (*Hacquetio-Fagetum*) and pockets of silver fir forest with ferns mostly in sinkholes (*Dryopterido-Abietetum*)

The stand was established by planting of Norway spruce and Scotch pine after clear cut of mixed predominantly broadleaved stand in 1890. Pockets of natural advanced regeneration were included in the plantation. According to management plant from 2003 growing stock amounts to 490 m³/ha (Norway spruce 67%, Scotch pine 19%, beech 14% and sessile oak and other broadleaves 1%). Predominant are mature stand with well established natural regeneration in gaps. Significant is a dense medium layer of dominant beech with some hornbeam. The later especially in the lower part of compartment. There are substantial risks of windthrow, snow damage and Norway spruce bark-beetle calamities in this altitudinal belt. Therefore long term goal is gradual transformation of forests to mixed and uneven-aged structures.

The broadleaves were favoured for the soil amelioration purposes in the past, however by the end of 80s they were already mechanically unstable (i.e. bow shaped). At that time decision was made that some of the beech advanced groups of the best quality were allowed – favoured to enter forest canopy. In some other parts of the stand with low quality canopy tress regeneration was induced in gaps.

In the last 15 years the “opened” beech advanced regeneration groups stabilised in the upper canopy. Beside this there are examples of successful more rapid regenerations in the near by compartments. The Žiferje forest is an example of adaptive, however diversified approach to gradual conversion by natural regeneration. The use of different silvicultural tools assures economically profitability, forest naturalness and low risk for management.

CONFERENCE EXCURSION A – The field presentation 2

Presentation of management in a private mountain forest, example of family farm Perk
Presentation by Damjan Jevšnik (Slovenia Forest Service, Head of the local unit Nazarje)
Location: Logar valley, 1.200 m a.s.l.

Content of the presentation

Topic: A short walk through the family forest Perk, spruce silver fir uneven-aged forest

State of the forest:

Growing stock: 600 m³/ha Size: 2,91 ha

Uneven-aged forest composed of N. spruce 80 %, silver fir 20 % and larch (groups).

Canopy closure loose. Timber quality good (4 of 5). Advanced regeneration present on 70 % of the area, composed of silver fir 80 %, silver fir 15 % and individual beech.

Goal:

Single to group selection forest of N. spruce 70 %, silver fir 30 % (cluster) and larch (individually)

Measure:

Selection thinning, favouring of beech and larch in all layers, focus on middle layer ("sprinter"). Felling of low quality trees and tress damaged by skidding. Clusters of regeneration reaching pole stage should be opened. Intensity of cutting 15 % of growing stock.

CONFERENCE EXCURSION A – The field presentation 3

Presentation of the results of study circle "Panoramic road". Presentation by Alojz Lipnik, mayor of the community Solčava and local forester. Presentation will take place on the family farm Žibovt.

Location:

Logar valley, 1.100 m a.s.l.

Content of the presentation

The local forester (at present also mayor of the community Solčava) developed several study circles with forest owners and local population. Study circles represent a special form of informal education and association. The general goal of study circles was to connect forest owners for joint promotion of nature conservation, preservation of cultural heritage, organised marketing of wood and family farm products. Satisfied with the outcomes of the study circle, the participants founded association Panorama, which is devoted to promotion of sustainable development of the valley. The association largely contributed to the recognition of the Panoramic road and especially farms along it. Well organised and interlinked work within local community Solčava was awarded in 2009 with the title European Destination of Excellence (EDEN) by European Commission and national tourist boards.

CONFERENCE EXCURSION A – The field presentation 4

Presentation of natural science educational trail (NSET) Logarska dolina on the spot »Olcarska bajta - Loggers cabin«: the art of wok and survival of loggers in the past

Location: Logar valley, 740 m a.s.l.

Content of the presentation

In the 1995 a natural science educational trail leading through Logarska valley was prepared by foresters of Slovenia Forest Service in cooperation with enterprise Logarska d.o.o. Every year many school children and professionals are guided on the trail by foresters.

The trail is situated on the bottom of the Logarska glacier valley. It is 7 km long and it has 300 m of ascent. The walk usually takes about 2 to 3 hours. We'll visit a part of the trail around the spot called "Loggers cabin".

" A whole group of people was placed within cabin. They were sleeping on the bed of boards along the walls of cabin. Above bed each inhabitant had its own shelf. Left at the entrance door a bucket with water was located, while on the right hand side tools were placed. In the middle of the cabin was a fire place, which was made of wood on the outside and of clay and stones on the inside. Here meagre meals were prepared. Above fire place there was so called "worm" – two parallel beams for drying firewood and also clothes if needed. Forest work was divided to felling (summer, autumn), bringing of logs to the valley (winter) and rafting (spring)."

CONFERENCE EXCURSION B – The whole programme

Date: 26. 9. 2009

Main location: Celje, Paški Kozjak

Organiser: Slovenia Forest Service (SFS) – Regional unit Celje

The excursion leader: Tone Lesnik, +386 41 598 545, tone.lesnik@zgs.gov.si

Time	Activity	Leading person
8.30	Departure from hotel Plesnik in Logarska dolina	
9.30	Reception in Urban Forest of Celje	Miran Orožim, SFS
9.45	Field presentation of adapted close-to-nature forest management in forests with social functions, forest aesthetics, management economics.	Robert Hostnik, SFS ++386 41 657 607 robert.hostnik@zgs.gov.si Boštjan Hren, SFS, Robert Hedl, SFS
13.00	Lunch	
14.00	Transfer to Paški Kozjak	
15.00	Close-to-nature forest management in private forests in mountain region	Robert Hostnik, Boris Žerovnik, SFS, Robert Bombek, SFS
19.00	Return to Logarska dolina	

CONFERENCE EXCURSION B – Field presentation 1

Presentation of adapted close-to-nature management in forest with increased social functions, forest aesthetics and management economics.

Leading persons: Robert Hostnik, Boštjan Hren, Robert Hedl

Location: Celje, 240 m a.s.l.

Content

At all-day excursion the development of a concept and results of a ten-year adapted management in the case of Celje city urban forest with increased social functions will be presented. Management, which is essentially based on the close-to-natural approach is combined with individual treatment of stands and individual trees. Particular attention is put to measures to enhance the aesthetic, recreational and educational functions, the development of recreational infrastructure, ensuring the safety of visitors, maintaining the urban forest edges, education of visitors and contacts with the general public. The afternoon excursion as compared to urban forest management aimed at presenting the "classic" close-to-nature and sustainable management of private forests with increased production capacity.

Urban forests

Forests in the urban area of the town Celje cover a quarter of all surfaces, which represents less than half the average forest cover in Slovenia. Oak woods in the flat part of the Celje basin were cut for the needs of agriculture and settlement in the past. Only few small forest areas remained, which are important as a habitat in this landscape. Larger preserved forest areas close to Celje city are located on the surrounding hills. These forests are on the steeper positions dominated by beech, while on the river terraces they compose of pine with a relatively high proportion of spruce that was planted in the past.

Similar processes of deforestation were going on also elsewhere in Slovenia in the areas that were suitable for settlement and development of agriculture. Today, all areas of major cities in Slovenia have significantly low forest cover, while these are the areas with the highest population density. This is the reason for their pronounced social function.

The development of Celje city urban forests

Social function of Celje city surrounding forests were partly recognized already 100 years ago. Between 1885 and 1892, the municipality namely bought the first 29 hectares of private forests above the city park and inside walking paths, benches, pavilions and even a viewing tower were installed. City Park and nearby forests have been properly maintained until the sixties of the last century, when better mobility of the citizens and heavily polluted environment resulted in a decline of interest in this area and, consequently, failure to regular management.

The period of re-development and systematic management of urban forests of Celje started in the early nineties. The study of ecological and social functions and the growing conflict between public and private interests have stressed the need for long term-oriented forest management. City Council of Celje municipality excepted the initiative of the Celje Slovenia Forest Service unit and in 1996 approved the strategy and management plan which is defining the following five priorities for the development of urban forests: (1) protection of urban forests by municipal order, (2) improvement of the ownership structure, by buying

more private forest, (3) adapted management and development of recreational and educational potential, (4) establishing and nurturing contacts with the public and (5) ensuring the continued financial resources for management.

The forests in the southern part of the city were indentified by the strategy as a priority for the development, because it's close to the city and the number of potential users is the greatest.

Management steps and results in last decade

1996 Basic guidelines were developed to be put into long-term management plan;
1997 City Council approved municipal ordinance to protect the urban forests of Celje, which defines a protected area, direct forest management and provides part of the funding for the purchase of private forests, and compensation for private forest owners. From this perspective, this was the first ordinance of its kind in Slovenia.

1997 – 2008 Municipality of Celje gradually bought a majority of private forests in the southern outskirts of the city. Prices were 15-25% higher than average market prices for forest land. Municipality of Celje doubled its share in the ownership of urban forests.
2000 –2007 A network of twelve multifunctional forest and walking paths with a total length of 14 kilometres were built, renovated and equipped. The new network of forest roads also allowed better access to implement forest management.

1997-2008 Over 150 articles and papers on the importance, development and management of urban forests Celje has been published in the media.

2005 In cooperation with the Municipality of Celje, Slovenia Forest Service made a design and presented a brand 'Urban Forest Celje' in order to raise awareness and promote importance and benefits of urban forests.

2008 Slovenia Forest Service and the Municipality of Celje conclude a contract on cooperation and implementation of the management plan in urban forests.

Vision: Urban forest as a trademark and an example of forestry best practice for the public.

Urban forests are high-quality urban living environment. They are carefully managed and maintained to ensure the sustainability of their environmental and social functions. They represent one of the city identities with a strong public and political support and are an important tool for environmental education of school children and of the general public and also for promotion of the profession of forestry.

CONFERENCE EXCURSION B – Field presentation 2

Presentation of close-to-nature management in private forest in mountain area.
Leading persons: Robert Hostnik, Boris Žerovnik, Robert Bombek

Location: Paški Kozjak, Smolnik, 1000 – 1090 m.a.s.l

Content

Private forests in the area and Smolnik and Paški Kozjak with prevailing production functions and economic interests of owners are a contrast to urban forest with pronounced social functions and strongly expressed public interest.

Preserved forest which consists of spruce, beech, fir and noble hardwood with high growing stock and excellent quality trees are the result of more than 40 – years of sustainable and close-to-nature management. They are the main income for forest owners in the mountain area.

The cooperation of forest owners and forestry profession in the planning, management and use of harvesting technologies, including performance, comparability and economic effects of implementing mechanical harvesting.

CONFERENCE EXCURSION C – The whole programme

Date: 26. 9. 2009

Main localities of the excursion: Radlje, Pohorje – Pahernikovi gozdovi, Orlica – Sgerm, Mislinjsko Pohorje

Excursion is organised by: Slovenia Forest Service – Regional Unit, family farm Sgerm, Pahernik foundation

Accompanying person: Zoran Grecs, ++386 41 720 227, zoran.grecs@zgs.gov.si, Andrej Breznikar ++386 41 657 751, andrej.breznikar@zgs.gov.si

Time	Activity	Holder of the activity
08:00	Departure from hotel Plesnik in Logar valley	
10.00	Welcome address and introduction to the regional forests and forestry – Management unit Radlje	Gorazd Mlinšek , SFS ++386 41 657 715 gorazd.mlinsek@zgs.gov.si
10:30	Presentation of Pahernik forest and foundation on Pohorje	Maks Sušek, manager of Paherink forest ++386 41373719 susekmaks@gmail.com
13:30	Lunch at the tourist farm Miklavc	
14.30	Presentation of forest management on family farms of Pohorje – example of ecological farm Sgerm; Sgerm Norway spruce– the highest Norway spruce in the European Union Documented success of close-to-nature management with comparison of old and new photographs of Koroška region landscapes	Jerneja Čoderl, SFS ++386 41 657 701 jerneja.coderl@zgs.gov.si Blaž Kristan, Forest owner, farmer ++386 31 799 750 Gorazd Mlinšek , SFS ++386 41 657 715 gorazd.mlinsek@zgs.gov.si
16.00	OPTION Departure to forests of Mislinja	
17.15	Sixty years of gradual conversion of Norway spruce plantations in Mislinja	Mirko Cehner, SFS ++386 41 657 708 mirko.cehner@zgs.gov.si
20.00	Arrival to hotel Plesnik	

CONFERENCE EXCURSION C – Field presentation 1

Presentation of Pahernik forest and foundation
Presentation by Maks Sušek

Geographic location of the forest on the map of Slovenia
altitude: Samec 1125 m, Pahernik Norway spruce 900 m a.s.l.

Content of the presentation

Pahernik forest – general data

Management region Slovenj Gradec, management unit Radlje

The forest encompass 551 ha on the Pohorju Mountains in an altitude from 400 to 1500 m (from river Drava to the top of Pohorje Mountain). Main forest associations are altimontane acidic beech forest and silver fir forest with ferns. Growing stock: 420 m³/ha, increment 8,3 m³/ha, allowable felling: 5 m³/ha/year

(see also <http://www.prosilvaeurope.org/docs/doc270.pdf>).

Selected examples of forest and management:

1) Irregular shelterwood, compartment 10276 A

Example of gradual conversion of Norway spruce even-aged monolayered forest stand. In 1960s a regeneration of 110 year old stand was initiated based on detailed silvicultural mapping. The regeneration was carried out with 6-years intervals of felling. Natural regeneration was favoured with the goal of achieving mixed irregular forest structure. Tending of regeneration, thickets was carried out as well as regulation of mixture.

2) Free style silviculture, compartment 10277A

Forest site: Dryopterido-Abietetum

50 years ago stand was monolayered composed of Norway spruce, silver fir and beech. During from 60s to 80s silver fir declined heavily and intensive natural regeneration was started. The management goal followed by foresters was: unevenaged, grup irregular to selection forest structure. Development of the stand was influenced on a small scale, as well regeneration, forest tending was focused on groups and even individual trees. Final finding: due to high diversity of structures and diversity of tending measures detailed silvicultural planning seems unnecessary. The control of the management success was carried out by constant monitoring of tree vitality and quality, increment and growing stock.

3) Pahernik spruce- example of natural selection and management on the level of individual trees

compartment 10279 B

Large diameter trees are important part of natural populations, therefore they must be allowed to grow. Pahernik spruce is 48,2 m high, with dbh of 133,1 cm and volume of 21 m³ brutto. The crown length is 2/3 of the stem.

CONFERENCE EXCURSION C – Field presentation 2

Forest management on family farms of Pohorje Mountains – family farm Sgerm and Sgerm spruce – the highest spruce in European union
Presented by Jerneja Čoderl, Gorazd Mlinšek, Blaž Kristan

Altitude: farm lies between 500 and 660 m

Content of the presentation

Sgerm farm

This farm is one of the biggest family farms in community Ribnica of Pohorje Mts. - cadastre community Orlica. Owners are Sgerm Kristan Tatjana and Sgerm Grega. Total area is 52.59 ha, forest area 39,08. This is ecological farm since 2000.

They have cows for raising calves. Other income sources include forest management and owners employment.

Sgerm forest

Compartment 10239 belongs to forest management unit Radlje – right ashore, local forest administration Radlje, regional forest unit Slovenj Gradec (Slovenia Forest Service). Prevailing forest community on Sgerm farm is silver fir forests with ferns. Growing stock amounts 427 m³/ha, annual increment 9 m³/ha/year. Fellings reach 60% of increment. Forests are optimally opened with forest roads 70 m/ha and skidding trails 109 m/ha.

Selection forest management on a family farm

Main characteristic of these forests are selection forest management and a small scale unevenaged management. Selection forest management has a long history in Sgerm forest. In fellings from 1940 there was a complete rotation of growing stock. But, as we can see from detailed previous inventories (from 1937 till now), that growing stock continues to accumulate. The management is based on selective felling, whereby four functions of selection forest are being carried out simultaneously: tending, formation of selection structure, regeneration and exploitation. Selection forest management has many positive sides, but also negative.

Sgerm Norway spruce

The highest Norway spruce in European union is like a symbol of relationship between Pohorje farmer and its forest. Individual trees are important alike as the forest as a whole. Sgerm Norway spruce was frequently measured, first data is from 1938 and at last from 2006. Last measurement in 2006 confirmed that Sgerm Norway spruce still grows in height and width. Today height is 61.8 m, diameter 113 cm, brutto growing stock about 30 m³.

Success of close-to-nature management as depicted on the photography of Koroška mountain forest landscape

Slovenian forests were heavily damaged and destroyed over the past centuries. Clear cutting system and pasture in forest, were main reasons that Slovenian forest landscape become unstable and susceptible to erosion. After 1948 clear cutting and pasture in forest were prohibited by law. Foresters started with close-to-nature forest management. Comparison of historical and new photographs documents the success of this 50 years

hard work. Fifty years ago Peca Mts. was furrow because of erosion, huge clearings were carried out on Pohorje, while nowadays Smrekovec and Koprivna slopes are rich with forests. Today there is no problem with erosion.

CONFERENCE EXCURSION C – Field presentation 3

Long-term gradual conversion of spruce plantations in Mislinja part of Pohorje Mts.
Presentation by Mirko Cehner, head of local forest administration Mislinja (SFS)

Altitude: 900 m

Content of the presentation

In regional forest unit Slovenj Gradec forest clearing and clear cutting began 400 years ago. Humans destroyed natural mixed stands of beech, spruce and fir on steep slopes of Pohorje, Košenjak, Smrekovec and other mountains. The largest area of unnatural spruce forest stands was in Mislinja region of Pohorje Mts. (1500 ha). These stands grow on a silicate parent material (acidic soil), many of them are placed in an altitude above 1200 m on acidophilic soil and are very labile. Besides forest structure and mixture important factors are also imbalance among large herbivores, plants and nutrition conditions in forest soil, due to changed physical, chemical and biological properties. J. Miklavžič was the first one who proposed systematic revitalisation of spruce monoculture by applying lime and planting or sowing broadleaved species (beech, maple). After 1950 large scale planting (direct conversion) proved to be expensive and ineffective (roe and red deer browsing). At that time sprouts of planted saplings were coated by combination of dung, lime and water. However the success was limited. Around 1953 foresters of Koroška began gradual conversion of spruce plantations by natural regeneration and punctually planting of broadleaves. The leader of this close-to-nature approach was Prof. Dušan Mlinšek - author of the management plan. After heavy snow break in Brička in years 1950, 1951, they started to plant beech wildlings under older undamaged spruce trees in years 1954 and 1955. The plants were protected with wool and chemical coatings. This was the first planned silvicultural experiment, how to help the nature to restore the forest in a natural way. After fifty years, planted beech saplings in Brička are partially in a medium layer and partially already in a canopy layer.

Foresters have been experimenting with different means of protection against herbivorous wild animals, e.g. smears, protection with stick, plastic caps, ribbons, metal and plastic nets, drainage tubes, plastic tubes, deprecatives, collective protection with fences. The most effective proved to be collective protection with 2 m fence (sometimes even wooden frames). About 80 fences were built in Mislinja region, with average surface about 1ha.

In fifty years of research and revitalization of spruce monocultures, field foresters gained many practical experiences. But this is not the end, new phase of forest in new circumstances require new approaches, therefore continuous monitoring and research of forests in conversion is needed.

POST- CONFERENCE EXCURSION D – Complete program

Date: 27. 9. 2009

Main field excursion points: Rakov Škocjan, Javorniki, Kras

Expert program is performed by: ZGS – Regional unit Postojna and Regional unit Sežana

Excursion attended by: Prof. Dr. Jurij Diaci 041 295 379,

Time	Activity in excursion program	Activity performed by (name, surname, telephone, e-mail)
8.00	Departure from hotel Plesnik in Logar valley	
10.00	Visit to Rakov Škocjan landscape park, visit to forests and history of forest management of Javorniki	Špela Habič, SFS ++386 41 657 308, spela.habic@zgs.gov.si
13.00	Lunch on tourist farm Hudičevcevec, at Razdrto	
15.00		
15.00	Reception and greetings Presentation of reforestation and development paths of Slovenian Karst	Milan Race, SFS, ++386 41 789 274, Milan.race@zgs.gov.si Boštjan Košiček, SFS, ++386 41 695 549, bostjan.kosicek@zgs.gov.si
16.30	Conclusion of excursion and return to Ljubljana	
18.00	Arrival in Ljubljana – parking Dolgi most	

POST- CONFERENCE EXCURSION D – Field presentation 1

Presentation of landscape park Rakov Škocjan,
2. Forests and history of forest management of Javorniki
Presentation executed by mag. Špela Habič

Landscape park Rakov Škocjan, 520 m a.s.l

Postojna forest management unit is situated in upper part of Ljubljanica river basin, which is also called "river with seven names". Snežnik is with 1796 m the highest peak in this part of Slovenia and is a part of vast, forested high-Karst plateau. In the east side of plateau lies a series of Karst fields (between 500 and 600 m a.s.l): Babno field (bordering Croatia), Log valley, Cerknica field with famous periodic Cerknica lake, Karst valley Rakov Škocjan and Planina field. Through each of them flows the same Karst water which goes underground at the end of each field and reappears on the next field- every time with a different name, of course: Trbuhovica, Obrh, Stržen, Rak and Unica. River Unica unites waters of Raka and Pivka, which flows underground after Postojna cave, before which it flows above ground as river Pivka on the western side of Snežnik and Javorniki. Unica goes underground at the end Planina field and springs in many springs of Ljubljanica on the edge of Ljubljana bog at Vrhnika.

LP Rakov Škocjan extends over 113 ha of Karst valley in Ljubljanica river basin (flows into Sava, Danube and Black sea). Area was protected in 1949 for its extraordinary Karst phenomena. Predominant bedrock is limestone. Valley is 3 km long and was made by ceiling collapse of the former cave and through which waters of periodic Cerknica lake flow towards Planina field. The remains of the former cave are visible in the upper part of the valley where several breakings are visible; one of them is 40 m above stream Rak where 20 m long arch of the Little natural bridge is visible. Lower part of the valley is older, therefore wider, beside the Rak riverbed are meadows and slopes are gentler. Few tens of meters before sink of Rak into Tkalec cave you can see one of the valley's sights, Large natural bridge with 40 m in height and the arch height of 10 m. The flow and the water level are very variable throughout the year, due to the special Karst hydrological conditions. Caves in this area are rich in cave fauna. Rakov Škocjan lies in the middle of the continuous fir-beech forest complex, but on the lower border of fir's natural sites. In the years 1960– 1990 fir was in very bad health condition, but has recovered significantly lately.

Cerknica lake is the biggest Slovenian lake with area of 26 km² (when is full). Because it is filled from Karst springs and streams, its periodic – every summer water dries up and grass is being cut on the lake bottom, with autumn rains lake refills. Lake's highest depth is 10 m. Frozen lake becomes vast natural skating ground and surface for other sports on ice. Several fish species live in the lake and has special importance for bird life; more than 250 bird species have been observed, out of which around 100 nesting bird species.

POST- CONFERENCE EXCURSION D – Field presentation 2

Presentation of forests and history of forest management of Javorniki
Presentation executed by mag. Špela Habič

Javornik, 930 m a.s.l.

Snežnik-Javornik high-Karst plateau is overgrown with vast continuous forests. On more than 40.000 ha there are no human settlements or cultivated farmland; continuous forests are interrupted by small grassland areas, remains of former pastures. Prevailing forests are fir-beech stands (Omphalodo-Fagetum) and mountain beech forests (Ranunculo-Fagetum) with various subasociations. Specialties of snežnik mountain range are deep Karst hollows which retain cold air (temperature inversion) and are visible also as vegetation inversion. Lower parts of hollows are overgrown with spruce stands (Piceetum subalpinum dinaricum), in extremes also with dwarf pine (Pinetum mugo croaticum). Dwarf pine belt is typical for upper slopes of Snežnik (from 1500-1600 m up), above upper timberline which is constituted (different than in the Alps) by subalpine beech forests (Fagetum subalpinum).

Planned management of Snežnik in Javornik forests started in the second half of the 19. century on the Snežnik estate when german duke Georg Schönburg took it over. In the same time farmers rights in the forests were reduced. Within large estates forests were divided into districts and compartments. Forests of the Snežnik estate were almost 16.000 ha in size. The first forest management plan for a part of Snežnik forests was made in the year 1864, next two, more precise were written in the years 1891 and 1902.

With the year 1912 starts the period of selection management on Snežnik, which was introduced by senior forester and latter manager of the entire estate Henrik Schollmayer-Lichtenberg. On the Karst bedrock was (is) extremely important that forest soil remains covered with vegetation at all times so that is protected from erosion. They cut only single, chosen trees which reached certain dimensions: conifers above 45 cm, broadleaves above 40 cm DBH.

Schollmayer also introduced regular measurements of all forest trees every 10 years, keeping records of cut trees and silvicultural actions, writing of chronics for forest districts. Gathering of all this data and their analysis through decades gave him information about forest development and the results of forest management interventions. This innovative approach of forest management is known as »Postojna control method«.

Thorough forest analysis in the year 1962 showed that forest structure changed so much that selection management system was not the most suitable any more. After the year 1962 we speak about contemporary forest management, where respect of specialties and variability's of sites is crucial and natural development of forest phythocenosis is taken into account.

GGO Postojna

KE Postojna

GGE Javornik

Compartment: 18 (18,6 ha): Fir – beech forest (Omphalodo-Fagetum typicum)

Growing stock: 260 m³/ha conifers, 150 m³/ha broadleaves, sum 410 m³/ha

Increment: conifers 3,0 m³/ha; broadleaves 3,8 m³/ha, sum 6,8 m³/ha

POST- CONFERENCE EXCURSION D – Field presentation 3

Presentation of reforestation and development paths of slovenian Kras.
Presentation executed by Boštjan Košiček and Milan Race.

Location:
Hill Gura at Povirje, in front of church, altitude 510 m.

Content of presentation

1. History of Kras and Istria with the beginning of excessive disafforestation around 1000 BC in the iron age and when Celtic and Lyric tribes were immigrating, regulations about ban of excessive use of natural environment and successful afforestations in the second half of 19. and in 20. century, till today.
2. Sites and tree species of Slovenian coastal region. From the warmest forest sites of the pioneer tree species which developed from the stone desert in 100 years, overgrown with forests of black pine, flowering ash, hop-hornbeam, pubescent oak, turkey oak, water oak to the warm and humid beech and hornbeam forests on eocene sediments with developed deep soils.
3. Silvicultural and protective views on forest development which has to adjust swiftly to development of forests and sites as to the new diseases and pests. Forest plant diseases are coming due to climate change, harmful insects and other organisms are consequence of globalization. Maintenance of wide variety of tree species mixture also with silvicultural approaches, which include new tree species in silvicultural systems.
4. Long history of settlements is seen in small size parcel ownership structure. Average forest parcel is around 3000 m² in size. Silvicultural aims and systems must adjust also to small production goals of forest owners.
5. Fires in natural environment will be because of the pioneer character of present developmental stage of thermofilic sites and the rise of average annual temperatures the main forest protection problem of the slovenian coastal region.

POST – CONFERENCE EXCURSION D – Field presentation 4

Presentation of coppice management on forest estate of the Agrarian estate Gorenje
Presentation executed by Boštjan Košiček and Milan Race.

Location:

Beech valleys at Divača, crossroad on the road to hunting cabin, altitude 450 m.

Content of presentation

1. Agrarian community as a form of united estate, common management. Cooperation of entire village at joint estate management.
2. Coppice management with forests of thermophilic broadleaves – encouragement of tradition, although at the expense of long term goal of the site improvement. Form of management which evolved in small size parcel ownership structure on the sites with low production capacity and very low owner demands.
3. Karst sinkhole (dolina), view from the edge, height difference ca. 70 m. Karst phenomena, temperature inversion and change in site conditions.

POST – CONFERENCE EXCURSION E – Complete program

Date: 27. 9. 2009

Main field excursion points: Kočevje, Rajhenavski Rog

Expert program is performed by: ZGS – Regional unit Kočevje

Excursion attended by: Zoran Grecs, ++386 41 720 227, zoran.grecs@zgs.gov.si
and Tomaž Adamič, ++386 (0)1 423 11 61, tomaz.adamic@bf.uni-lj.si

Time	Activity in excursion program	Activity performed by (name, surname, telephone, e-mail)
8.00	Departure from hotel Plesnik in Logar valley	
11.30	Reception and greetings Presentation of extraordinary trees Visit to Rajhenavski Rog virgin forest, history of forest management. Directing development of animal populations	Bojan Kocjan, SFS ++386 41 657 384, bojan.kocjan@zgs.gov.si Tomaž Hartman, SFS ++386 41 657 382, tomaz.hartman@zgs.gov.si Miran Bartol, SFS ++386 41 657 394, miran.bartol@zgs.gov.si ;
16.00	Lunch in Kočevje	
18.30	Arrival in Ljubljana – parking Dolgi most	

POST – CONFERENCE EXCURSION E – Field presentation 1

Presentation of extraordinary trees in Kočevsko
Presentation executed by Tomaž Hartman

Location: Kočevski Rog, 900 m a.s.l.

Mighty fir (*Abies alba*) – Queen of the Rog – is with 51 m height and 160 cm of DBH one of the biggest trees in Kočevsko. Mighty trees are mostly natural heritage but also tourist attraction which deserves protection and proper presentation.

POST – CONFERENCE EXCURSION E – Field presentation 2

Presentation of Rajhenavski Rog virgin forest and history of forest management in Kočevsko
Presentation executed by Tomaž Hartman

Location: Kočevski Rog, 900 m a.s.l.

First forest management plans for duke Auersperg's forests in Kočevsko were made by dr. Leopold Hufnagel in the year 1892. Selection management, site- specific tree species, natural regeneration... are still today's foundations of close-to-nature treatment of fir-beech forests.

Some old-growth parts were with special remark "Urwald" left to natural development. Foresters protect natural heritage also with new forest reserves; special forest educational trail and information boards present it to visitors.

Specially equipped is Rajhenavski Rog virgin forest, 51 ha big old-growth remnant of fir-beech forest, which is goal of many excursions, study days and also international research projects.

POST – CONFERENCE EXCURSION E – Field presentation 3

Presentation of directing development of animal populations in the forests of Kočevski Rog
Presentation executed by Miran Bartol

Location: Kočevski Rog, 900 m a.s.l.

Vast forests of southwest Slovenia are one of the most preserved ecosystems, home to brown bear, wolf and lynx. Animal wildlife is natural heritage, which has to be preserved and harmonized with human coexistence. Forests have been treated with adapted management for biodiversity reasons (red deer population).

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