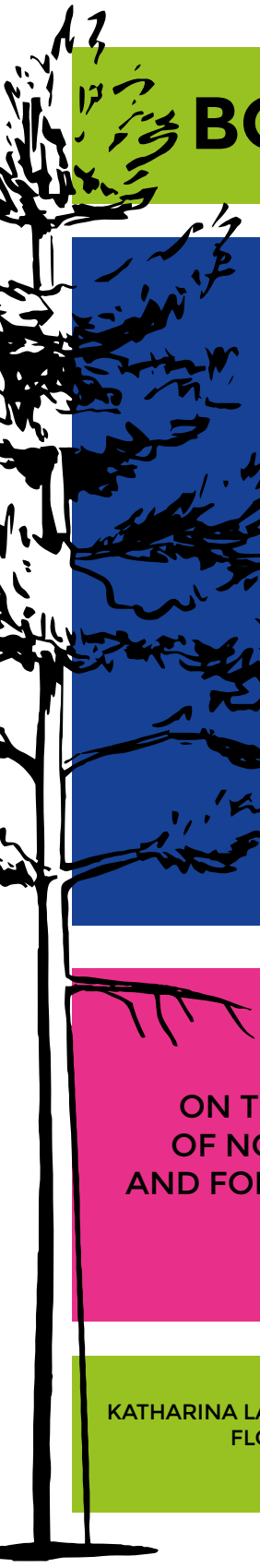

BOOK OF ABSTRACT

DIGITAL ALPTREES CONFERENCE

Interreg Alpine Space ALPTREES
European Regional Development Fund
EUROPEAN UNION

THE FIRST
DIGITAL CONFERENCE
ON THE SUSTAINABLE USE AND MANAGEMENT
OF NON-NATIVE TREES IN URBAN, PERI-URBAN
AND FOREST ECOSYSTEMS IN THE ALPINE REGION

FEBRUARY 25TH & 26TH, 2021

EDITED BY
KATHARINA LAPIN | PETRA MEISEL | THE TRUNG HOANG | GERALD SCHNABEL
FLORIAN KRAXNER | ANJA BINDEWALD | ALEKSANDER MARINŠEK

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Table of contents

Program

Day 1 - 25th of February

Plenary session with Keynote Presentations & Discussion
Chairs: Katharina Lapin (BFW, Austria) + Florian Kraxner (IIASA, Austria)

10:00 - *Welcome* // Peter Mayer, Director of the Austrian Research Centre for Forests

10:15 - *Mountain forests: A priority for the Alpine Convention* // Wolfger Mayrhofer, Permanent Secretariat of the Alpine Convention

10:40 - *Tree species to keep up with climate change comparatively tested in 57 plantations in Switzerland* // Thomas Wohlgemuth, Swiss Federal Institute for Forest, Snow and Landscape Research WSL

11:00 - *Assisted migration of tree species and seed provenances as means to improve forest resilience in climate change* // Silvio Schueler, Austrian Research Centre for Forests

11:15 - *Awareness raising and participation of citizen scientists in the early detection of alien species in forests* // Maarten de Groot, Slovenian Forestry Institute

11:30 – Discussion

****

11:30 - 12:30 Virtual Coffee Break
Join the virtual Coffee Break Lounge to talk live to other participants

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12:30 - 14:00 Session 1 | RISKS of invasive Trees
Chair: Anja Bindewald (FVA, Germany) + Katharina Lapin (BFW, Austria)

12:30 – *Framework for site-specific risk assessment for the responsible management and use of non-native trees in European forests* // Anja Bindewald, Department of Forest Conservation, Forest Research Institute of Baden-Württemberg (FVA)

12:45 – *Testing of Site-Specific Risk Assessment methodology on non-native tree species in the pilot area of Gorenjska region (Slovenia)* // Ana Dolenc, Institute of the Republic of Slovenia for Nature Conservation

13:00 – *Fraxinus pennsylvanica Marsh. in German alluvial hardwood forests: Ecological hazard or only legal issue?* // Sebastian Dittrich, TU Dresden - FR Forstwissenschaften

13:15 – *Spread of invasive tree species – what we can learn from natural regeneration assessment?* // Marcin Dyderski, Institute of Dendrology, Polish Academy of Sciences

13:30 - Black Cherry - impact perception and management options // Uwe Starfinger, Julius Kühn Institut, Braunschweig, DE

13:45 – *Black Cherry (Prunus serotina), a decision tree* // Bart Nyssen, Bosgroep Zuid Nederland & KU Leuven

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Virtual Coffee Break
Join the virtual Coffee Break Lounge to talk live to other participants

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15:00 - 17:00 Session 2 | MANAGEMENT of NON-NATIVE TREES
Chair: Aleksander Marinšek (SFI, Slovenia) + Sonia Abluton (LAMORO, Italy)

15:00 – *Basic Principles of Non-Native Trees Management In Forest And Urban Area* // Aleksander Marinšek, Slovenian Forestry Institute (SFI)

15:15 – *Stand-level growth and drought tolerance of Douglas fir, black pine and Atlas cedar on a dry site in western Switzerland* // Jan Geyer, FVA Baden-Württemberg, Germany

15:30 – *"Plattform klimafitter Wald" - Preparing forest owners for climate change* // Viktoria Valenta, Austrian Research Centre for Forests

15:45 – *Non-native trees wood products in the Alpine Space: A qualitative analysis of their uses and economic values* // Camila Maciel Viana, University of Life Sciences, Vienna - Institute of Marketing and Innovation

16:00 - *NNTs in Italian forests with particular attention to the situation in Italian Alpine Space* // Nicola La Porta, Centre of Research and Innovation, Fondazione Edmund Mach, Italy

16:15 – *Alien tree species in Piedmont (NW Italy): impacts and management best practices in forest* //Andrea Ebone, Istituto per la Piante da Legno e l'Ambiente, Italy

16:30 – 16:40 *EUSALP forestry activities: fostering dialogue in view of the new European Forestry Strategy* // Gian Antonio Battistel and Christian Hoffmann, EUSALP-Task Force on „Multifunctional Forest and Sustainable Use of Timber".

Day 2 - 26th of February

9:30 - 11:30 POLICY WORKSHOP | Developing a strategy for the sutainable use of non-native trees
Chairs: Berger Frederic (INRAE, France) + Reneema Hazarika (BFW, Austria)

09:30 - *Understanding stakeholder knowledge on risks and benefits for managing Non-Native tree species in the Alpine Space* // Reneema Hazrika (Austrian Research Centre for Forests)

09:45 - *NNT and the forest ecosystems service of natural risks prevention: the example of rockfall risk - Allies or enemies?* // Berger Frederic, INRAE

10:15 - *Multifunctional forest and EUSALP : Inputs of the French Presidency* // Antoine Patte and Benjamin Einhorn, EUSALP France

10:30 - *Basic ideas of Pseudotsuga menziesii (Mirb.) Franco management: site index & forestry* // Ignacio Diaz-Maroto, University of Santiago de Compostela , Spain

10:45 Breakout session >>Work in Groups & Discussion<<

11:10 to 11:30 – Synthesis & End

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11:30 - 13:00 Virtual Coffee Break

Join the virtual Coffee Break Lounge to talk live to other participants

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13:00 - 14:30 Session 3 | UNDER 18 Session

Chairs: Petra Meisel + Margaret Cater

>>Discussions in groups and activities of and for under 18 citizens<<

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Virtual Coffee Break

Join the virtual Coffee Break Lounge to talk live to other participants

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Plenary session with Keynote Presentations & Discussion on February 26th

Chairs: Katharina Lapin (BFW) + Florian Kraxner (IIASA)

15:00 – Welcome to the afternoon plenary session!

15:05 - *IUFRO - How to get connected* // Andreas Schindlbacher, BFW, Austria

15:15 - *Citizen science for non-native trees observation in Alpine region* // Dmitry Schepaschenko, IIASA, Austria

15:40 - *Leaf functional traits as bio-indicators of urban environment impact on trees* // Srđan Stojnić, Institute of Lowland Forestry and Environment, University of Novi Sad, Serbia

16:00 - *Can trees be used in monitoring atmospheric fine particulate?* // Paula Ballikaya, WSL Swiss Federal Research Institute for Forest, Snow and Landscape, CH-8903 Birmensdorf, Switzerland

16:20 - *Eat the Trees - How non-native trees could diversify our food and beyond* // Artur Cisar-Erlach, Austria

16:45 – Discussion

17:00 – Closing

Preface

Since the beginning of the ALPTREES project in October 2019, our team of 12 partner institutions collected data on non native tree species (NNT) in the Alpine Space. The project ALPTREES also thrived to generate new knowledge, supported by an amazing network of experts from all over Europe. Scientists who are eager to contribute to the tasks given by the project's aim - to develop a transnational strategy for the responsible use and management of non native tree species in the Alpine Space with the help of an integrated Decision Support System.
Experiences, expert opinions and local knowledge were shared, and brought new perspectives on the national and regional site-derived policy, aiming to protect and enhance biodiversity to ensure ecological connectivity and cultural resources while maintaining a high level of resilience and ecosystem services across the region.

The Digital ALPTREES Conference is one of the milestones of the project's work and aims to summarize the accumulated topics within it's two days lineup of presentations and discussions that were open for experts, stakeholders and scientists as well as for the public.

The results of this Digital Conference of the ALPTREES project will help to increase the level of sustainable valorisation of cultural and natural heritage in the Alpine Space by providing tools allowing stakeholders in the sectors forestry, nature conservation, timber industry and rural & urban planning to distinguish between negative and positive impacts of NNT species on ecosystem services and functional needs in urban and peri-urban areas and forests.

The obligation to share this knowledge in a condensed form that should be accessible to the public appeared soon after the project's start. Due to COVID-19 restrictions, our colleagues and keynote speakers could not meet in person – but that situation gave us the opportunity to win people for this lineup who otherwise maybe would have been too busy rather than to travel to our conference in person.

We are happy and proud to present this book that conducts the outputs of the first Digital ALPTREES Conference so perfectly!

A big **THANK YOU** to all our participants who made this conference such an interesting and colourful event to remember!

Day 1 - 25th of February
Digital ALPTREES conference: Welcome!

Link: https://youtu.be/9079X_Td--E

Mountain forests: A priority for the Alpine convention

Wolfger Mayrhofer
Permanent secretariat of the Alpine convention

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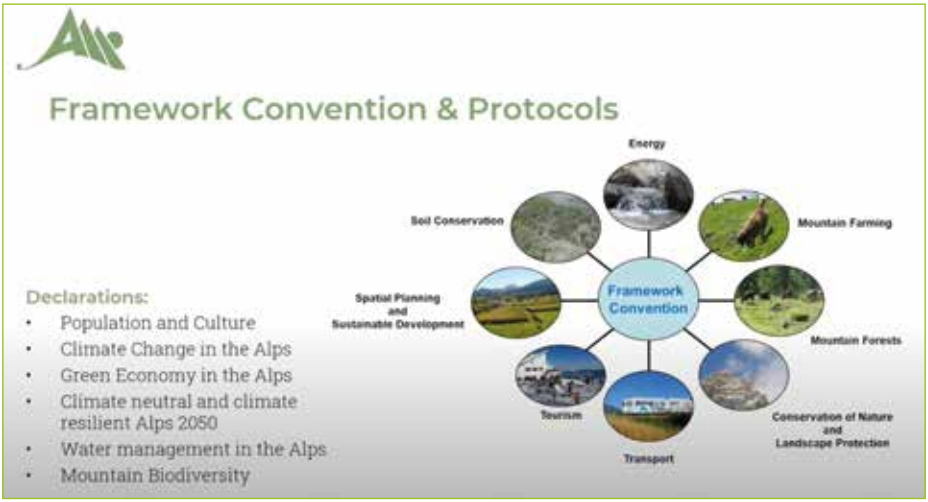
KEYWORDS: Non-native tree species, forest management, invasive species, environmental impact, risk assessment, evidence base.



https://youtu.be/dlmAOdBhYWk

Tree species to keep up with climate change comparatively tested in 57 plantations in Switzerland

Thomas Wohlgemuth, Peter Brang & Daniel Scherrer
Swiss Federal Institute for Forest, Snow and Landscape Research WSL, Birmensdorf, Switzerland

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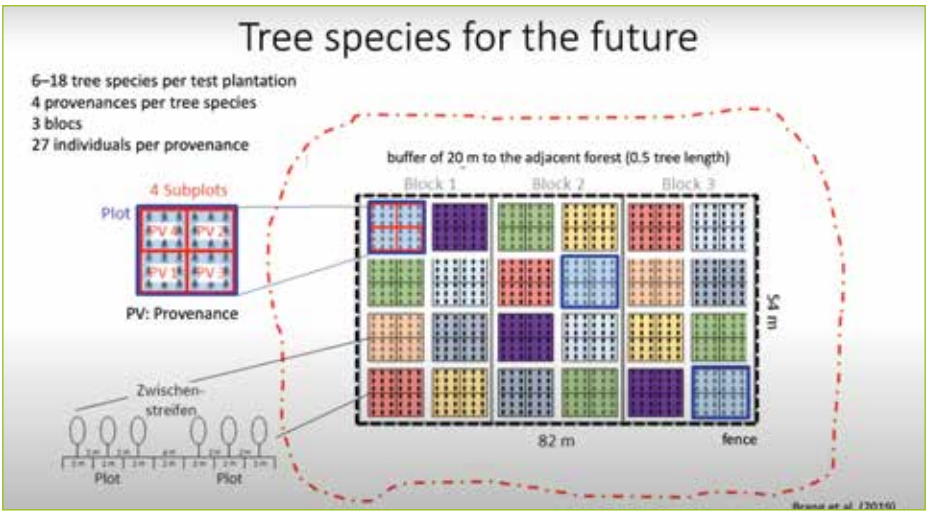
KEYWORDS: Future trees, Douglas-fir, drought, provenances

Switzerland has a long tradition of close-to-nature forestry, resulting in a comparatively low rate of non-native trees of less than one percent nationwide. Based on experiences and research regarding climate change, practitioners have started to increasingly admix Douglas fir in lowland forests. For a wider scope, Switzerland ran a program on “Forests and Climate Change” from 2009 to 2018, in which important questions on the future of Swiss forests were treated. With the new initiative of “Experimental Plantations”, both native and non-native trees will be grown at 57 different locations spread nationwide in various habitats. Success and failure of the used tree species from various provenances will evolve to an important decision support tool for the next decades.



https://youtu.be/dlmAOdBhYWk

Assisted migration of tree species and seed provenances as means to improve forest resilience in climate change

Silvio Schüler & Deboyjoti Chakraborty
Austrian Research Centre for Forests (BFW)

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KEYWORDS: Native tree, non-native trees, local adaptation, reforestation

Climate is predicted to change at a significantly faster pace than the natural migration and adaptation capacity of trees, thus disrupting the link between climate and local adaptations. Planting alternative tree species and utilizing the tree species' intrinsic adaptive capacity are considered to be the most promising adaptation strategy. In Europe, the utilization of forest reproductive material is regulated by European and National legislation which define National Regions of Provenance. These regions differ among countries and do neither reflect climate conditions nor climate change. However, climate change may render the local seed sources maladapted, while optimum seed sources may be the ones located outside of these defined regions. Therefore a transnational approach is required to integrate the link between local adaptation and climate change into reforestation policies. Based on results of the cooperation project SUSTREE, we will demonstrate how transnational delineation models for forest seed transfer and genetic conservation can be used to improve the productivity and resilience of forest in climate change.

https://youtu.be/H60sVX3VI5s

Awareness raising and participation of citizen scientists in the early detection of alien species in forests

M. de Groot [1], Š. Jagodic [1], D. Jurc [1], A. Kavčič [1], M. Kolšek [2], J. Kus Veenvliet [3], L. Kutnar [1], J. Malovrh [4], A. Marinšek [1], N. Ogris [1], B. Piškur [1], B. Rantaša [2], A. Verlič [1], S. Zidar [1]
[1] Slovenian Forestry Institute, [2] Slovenia Forest Service, [3] Institute Symbiosis, [4] Institute Republic Slovenia for Nature Conservation

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KEYWORDS: Invasive alien species, forests, citizen science, early warning and rapid response, LIFE

Invasive alien species have been shown to be a large problem in the last decades for biodiversity, economy, and health. The main pathway of introduction of invasive alien species are via human activities. However, humans can also help to decrease the likelihood that species become invasive in the first place, by detecting these species as early as possible. Although this already done by experts in many countries, there is an increasing need for eyes in the field. In the last decades large communities of citizen scientists developed which go into the field and gather a wealth of biodiversity data. Many of these citizen scientists have a much knowledge of species and are often in the field. They could be an important potential source of information for early detection of invasive alien species, so there can be rapid response to eradicate new populations. The project LIFE ARTEMIS - Awareness, training and measures on invasive alien species in forests (LIFE15 GIE/SI/000770) started in July 2016 till October 2020. The goal of the project LIFE ARTEMIS is to contribute to the reduction of the harmful impacts of invasive alien species on biodiversity by increasing public awareness and by setting up an effective early warning and rapid response framework for invasive alien species in forests. Project objectives to be achieved by the project were 1) Increase awareness of the general public, in particular of private forest owners, of threats caused by invasive alien species to forests, 2) Establish an efficient national institutional framework for early detection and rapid response for alien species in forests and 3) Improve the national capacity for early detection of alien species in forests by mobilizing and training professionals and volunteers. During this presentation we will present how people can help with the management of invasive alien species, what were the successes and the learning points during this project.

https://youtu.be/o4-8nn40sE0

Session 1 | Risks of invasive trees

Framework for site-specific risk assessment for the responsible management and use of non-native trees in European forests

Bindewald, A. [1], Lapin, K. [2], Schüler [2], S. , Starfinger, U. [3], Brundu, G. [4]
[1] Forest Research Institute of Baden-Württemberg (FVA), [2] Austrian Research Centre for Forests (BFW), [3] Julius Kühn-Institute - Federal Research Centre for Cultivated Plants, [4] University of Sassari

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KEYWORDS: Forest management, invasive alien species, environmental impact, risk assessment, evidence base.

Integration of non-native tree species (NNT) that are considered both useful and invasive is a major challenge for conservationists and forest managers. This is the case for commercially used NNT that spread from managed sites to semi-natural habitats where they can eventually pose ecological risks. Because of their perceived or actual detrimental impacts, some NNT in Europe are classified as invasive following a risk assessment. Yet, risk assessment protocols are often based on small-scale studies with unknown representativeness and uncertain data quality. This is particularly problematic when detrimental impacts of NNT are confined to particular ecosystems while providing valuable ecosystem services elsewhere. Yet, considering the context-dependence of undesired effects in risk assessments would help developing recommendations for where NNT can or cannot be planted to limit associated ecological risks, while delivering ecosystem services. Particularly the design of cost-efficient control strategies for NNT that are already too widespread and abundant for eradication, benefit on the identification of sensitive habitats. We developed a methodological framework for site-specific risk assessment that proposes a step by step guidance resulting in recommendations for responsible management of NNT. The framework is based on a stratified assessment of invasion risks posed by NNT which distinguishes among different ecosystem types or sites and which considers the effectiveness of available management strategies.

https://youtu.be/4a-wn7UgQC0

Testing of Site-Specific Risk Assessment methodology on non-native tree species in the pilot area of Gorenjska region (Slovenia)

Ana Dolenc [1], Aleksander Marinšek [2], Sonja Rozman [1] & Darja Barič [3]
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[2] Slovenian Forestry Institute;
[3] Development Agency Sora

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KEYWORDS: Site-Specific Risk Assessment, non-native trees, new methodology, forests, Gorenjska

The aim of the study was to test a new proposed methodology for Site-Specific Risk Assessment (SSRA) on non-native tree (NNT) species in the forest and urban area. The methodology was developed in the framework of the ongoing ALPTREES project. The assessment could serve as a basis for the non-native tree species management. The purpose of designing the methodology was creating a useful tool for different stakeholders, who are dealing with NNT. Due to increasing climate change and especially global warming, NNT have proven to be very successful species in individual cases, but due to their potential invasive character, extreme caution should be exercised in introducing these species.
The study was conducted for four Municipalities in Gorenjska region (Slovenia), with a total area of 412 km^2. The share of forests is 62 %. Study area also incudes two cities, which were used as an urban part of the pilot region. In the risk assessment we included available habitat data and data from other projects, while some data on the NNT and their locations were obtained by our field research in 2020. Our preliminary results of the trial of SSRA methodology are inventory of site-specific habitat features and a site-specific knowledge on the risks posed by NNT. We were able to detect areas with current and potential impact of NNT on specific sites in the pilot area. However, we note that for a better assessment it is necessary to have more data on NNT at individual sites. Good input data certainly improves risk assessment.

https://youtu.be/2SBPnB7FGgc

Fraxinus pennsylvanica Marsh. in German alluvial hardwood forests: Ecological hazard or only legal issue?

Sebastian Dittrich[1], Birte Marie Albrecht & Goddert von Oheimb

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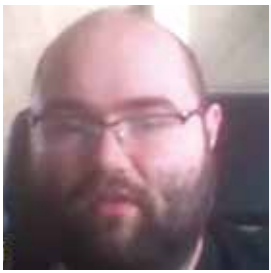
KEYWORDS: *Fraxinus pennsylvanica*, habitats directive, alien species, hardwood riparian forests, forest management

North American Green Ash *Fraxinus pennsylvanica* Marsh. (Oleaceae) has been introduced in alluvial hardwood forests and regionally established in Central and Eastern Germany. With a significant share of *F. pennsylvanica*, alluvial hardwood forests can no longer be assigned to habitat type 91F0 (European Union's Habitat Directive, FFH) . Though, the actual ecological impacts of *F. pennsylvanica* have barely been explored yet. In a multi-disciplinary approach, we investigated the impact of *F. pennsylvanica* on forest structure, ground vegetation, epiphytic and arthropod communities as well as soil properties in alluvial hardwood forests. Thereby, we compared pure *F. pennsylvanica* stands with near-natural hardwood stands devoid of *F. pennsylvanica*, as well as stands with two different admixtures (proportion of *F. pennsylvanica* either< 50 % or > 50). Additionally, *F. pennsylvanica* establishment in flood channels (including FFH habitat type 6430 (wet tall-herb fringes), which are primarily poor in indigenous woody plants) was investigated. In the alluvial hardwood forests, we generally did not find a significant influence of *F. pennsylvanica* on the studied response variables. An exception was the stand structure, for which an admixture of *F. pennsylvanica* can even be beneficial to structural heterogeneity deadwood and microhabitat availability. Outside closed forests, *F. pennslvanica* strongly colonized flood channels. This may lead to a decrease in light-demanding herbaceous species. Conclusively, *F. pennsylvanic*a cannot generally be named invasive in alluvial hardwood forests. Otherwise, its newly established stands in flood channels point to invasiveness in this habitat. This may require further monitoring and management. However, EC Habitat directive also obliges landowners and authorities to decrease the share of *F. pennsylvanica* and to convert pure stands to near-natural, mixed, hardwood forests.

https://youtu.be/i5OIe6n64EI

Spread of invasive tree species – what we can learn from natural regeneration assessment?



Marcin K. Dyderski & Andrzej M. Jagodziński, Institute of Dendrology
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KEYWORDS: light availability, *Prunus serotina*, *Quercus rubra*, *Robinia pseudoacacia*, understory vegetation

Natural regeneration is a crucial part of forest dynamics, indicating future species composition of the stand. We explored drivers of natural regeneration density, functional traits and survival of three invasive tree species: *Prunus serotina, Quercus rubra* and *Robinia pseudoacacia*. We showed the highest importance of propagule pressure for natural regeneration of the invasive species studied, while the properties of invaded habitats (e.g. soil fertility, light availability or presence of competitors) had lower importance. The studied species also differed in life strategies which allow them to survive on the forest floor. *P. serotina* and *R. pseudoacacia* presented an acquisitive strategy, increasing biomass allocation and specific leaf area. This means that the same amount of carbohydrates, produced during photosynthesis, is utilized for construction of larger leaf area. This increases the total area of photosynthesis, increasing the efficiency of this process. In contrast, *Quercus rubra* realized a conservative strategy. This species invests in the root system, increasing its persistence ability. We found low overall survival of seedlings after the first year since germination: 12.5% of *Q. rubra*, 3.9% of *P. serotina* and 0.1% of *R. pseudoacacia*. Survival was higher in stands with overstories non-invaded by the species studied. This indicates a dynamic equilibrium between limitation (by intraspecific competition and light availability limitation) and facilitation (by increased propagule pressure) of the growth of young generations of invasive tree species. These conclusions are important for risk assessments of invasions and to plan management based on silvicultural treatments, e.g. modifying light availability, competition or propagule pressure.

https://youtu.be/g6ZpQAHX6qY

Black Cherry - impact perception and management options

Uwe Starfinger & Bart Nyssen
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Email: *uwe.starfinger@julius-kuehn.de*

KEYWORDS: risk perception, management options

American Black Cherry (*Prunus serotina*) was introduced in the 17th century and planted widely for different perceived beneficial impacts. After it started to invade new areas it was later considered a forest pest. After many years of – predominantly unsuccessful – attempts to eradicate it or at least reduce its dominance there are now different approaches toward dealing with stands of the species, including a revival of old ideas to produce valuable timber. The talk tries to present black cherry as an example for changing perceptions about an invasive tree species and to use this example to discuss different options of treating unwanted tree species.

https://youtu.be/FSJ6YTeGego

Black Cherry (Prunus serotina), a decision tree

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KEYWORDS: Prunus serotina, Decision tree, Climate adaptation, Resilience, Ecosystem services

Originating from the eastern part of North America, Black Cherry (Prunus serotina Ehrh. var. serotina) was, and to some extent still is, perceived as an „enemy“ by European foresters. In the first centuries of its presence in Europe, Black cherry was popular, then it was condemned and fought hard. Nevertheless, the species is now present everywhere and practically impossible to eradicate.
In this presentation, we address the question to what extend the species affects ecological and silvicultural objectives here in Europe, and whether it can also have positive effects, for example in fulfilling ecosystem services. We show that the answer can vary depending on the context in which forest ecologists and forest managers operate. The findings make it clear that the concrete situation has to be taken into account when assessing the need and possibilities for controlling or integrating this introduced and spontaneously spreading species.
Therefore, we have developed a decision tree for Black Cherry that links the choices and objectives of the forest manager with the actual and target situation. Depending on the type of vegetation, the decision tree shows how the desired forest and nature types could be achieved. This new management tool is explained with a brief explanation of the four - often combinable - management options: control, phase out, integrate and strengthen the resilience of the forest.

https://youtu.be/Uuxj5FI2E2M

Session 2 | Management of non-native trees

Basic Principles of Non-Native Trees Management in Forest and Urban Area

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KEYWORDS: non-native trees, climate change, adaptability, adaptive management, risk assessment

The presence of non-native tree species has been a reality in the Alpine region and in the wider European area for some time. Some tree species have been promoted in forest and urban areas because of their different characteristics, as some non-native species have higher yield, higher timber value, high esthetic value, etc. Mainly because of all their characteristics, various non-native tree species have been introduced in the past, some of which have developed their invasive potential and others have not. Some came to our area unintentionally or spontaneously. Some have not established themselves in the Alpine region at all. Climatic conditions have changed since the first attempts to introduce and promote non-native tree species in our forests and urban areas. This has also changed the characteristics of certain established non-native tree species. Some have become more competitive and invasive in the new situation. We know that certain non-native tree species pose a threat because of their invasive potential, while others do not and may present an opportunity under changing climatic conditions when native tree species no longer thrive in certain forest sites. Future climate change and rising CO_2 concentrations are expected to affect site suitability, productivity, species composition, and biodiversity. Whether we see non-native tree species as a threat or a potential, they need to be systematically managed. Especially those that are naturalized and found in our area. Also, we need to be attentive to those which assume that they will come. Whether native or non-native, management actions can increase the economic, ecological, and social value of these species.

The basis for managing non-native tree species should also be based on a good knowledge of their ecological and physiological characteristics. Most importantly, our management should be based on three fundamentals: the experience we already have with certain non-native tree species, and knowledge of the benefits and risks associated with them. In the lecture, we will mainly discuss these three bases, which are important for their management.

https://youtu.be/BrlUeD8OyMs

Stand-level growth and drought tolerance of Douglas fir, black pine and Atlas cedar on a dry site in western Switzerland

Jan Geyer [1], Petia Nikolova [2] & Peter Brang [2]
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KEYWORDS: Drought response, provenances, long-term performance, *Pseudotsuga menziesii*, *Cedrus atlantica*

In 1970, a 7.5 ha experimental plot with 12 non-native and 2 native tree species was established near Romainmôtier (western Switzerland). Among others, 4 provenances each of Douglas fir (*Pseudotsuga menziesii*) and black pine (*Pinus nigra*) and one of Atlas cedar (*Cedrus atlantica*) were planted on dry beech sites. 3.7 ha of the experimental plot was reconstructed in 2017 using standard yield science methods. In addition, the response of Atlas cedar, Douglas fir, and black pine to drought was studied using dendroecological methods.
The tree species differed markedly in stand-level growth, mortality, and response to drought; in contrast, differences among provenances of the same tree species were small. After initial small diameter increases, atlas cedars have reached growth levels similar to Douglas fir over the past 20 years. The diameter increment of black pine was initially similar to that of Douglas fir, but later lagged behind it and Atlas cedar. Mean stand-level growth reached values of 8-10 m^3 a-1 in Douglas fir, 6-9 m^3 a-1 in black pine and 5 m^3 a-1 in Atlas cedar.
Black pine showed the least growth reduction after drought periods and the slowest recovery rate. Douglas fir trees reduced its diameter growth the most. Atlas cedar and Douglas fir showed similar recovery after drought. Provenances of the tree species studied differed little in their drought response.
Overall, Douglas fir performed best up to 47 years of age, with little variation in provenance. Atlas cedar initially lagged Douglas fir in growth, but is catching up. Black pine responded very well to the droughts of 1976 and 2003, but has recently shown high mortality, which severely limits its potential. Serbian spruce lags behind the other tree species in growth; in addition, few trees survived the 1976 drought, and European larch has proven unsuitable.

https://youtu.be/bqub7K-PXVc

"Plattform klimafitter Wald" - Preparing forest owners for climate change

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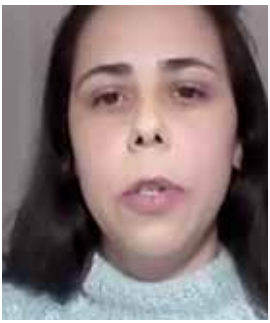
KEYWORDS: Climate Smart Forests, Knowledge Transfer

The project "Plattform klimafitter Wald" – climate smart forests is an Austrian initiative with the goal of helping forest owners, especially new ones and the ones that do not live close to their forests, to prepare for climate change and make their forest management more climate friendly.
The project started in 2019 and is a cooperation of BFW, Klimabündnis Österreich, ISS – Integrated Sustainability Solutions and the Chamber of Agriculture Styria.
The focus lies on establishing our website www.klimafitterwald.at as a central platform for forest owners with information on climate change & adaptations, forestry techniques & law and support & funds, as well as on suitable trees for the future.
Two key features on the website are the "Beratersuche", where you can search for consultants in your area, and the "Baumartenampel" – a GIS application where you can see which tree species are suitable for your location in the future climate.
This climate-based information will also be available in a printed version, tailored to each of the nine Austrian forest growing areas, which can be handed out to forest owners, disseminators and municipalities.
A key question for many forest owners is: "Which tree species are and will be suitable for my forest?" This is linked to topics of natural rejuvenation & planting, planting techniques & costs, plant provenances and native & non-native tree species on which the project "Plattform klimafitter Wald" provides information, helping forest owners to make decisions based on the future climate, rather than on the current timber market.

https://youtu.be/LP7hG6rZQPI

Non-native trees wood products in the Alpine Space: A qualitative analysis of their uses and economic values



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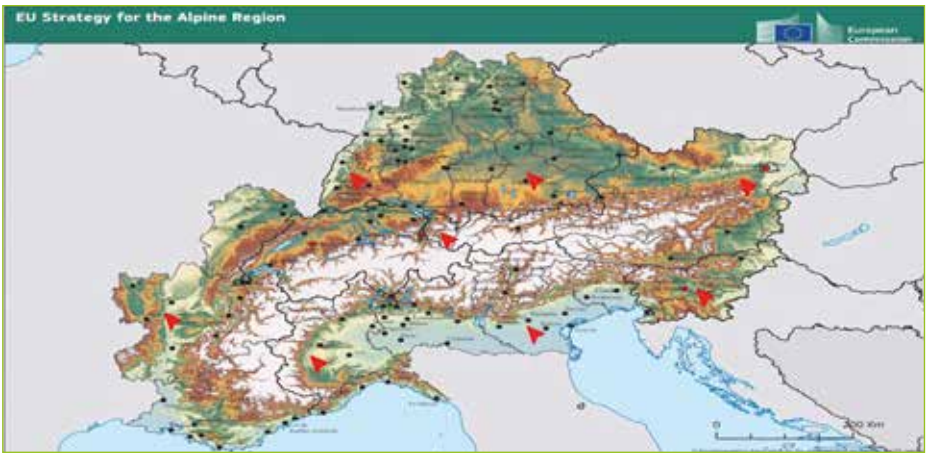
KEYWORDS: Non-native trees species, Alpine Space, wood products ,uses, economic values

Over the millennia, people have accidentally or intentionally introduced many species from one region of the world to another. The tree species, breeds, or hybrids introduced on European soil after Christopher Columbus (1942) are commonly called “non-native”, “non-indigenous”, “alien”, “introduced”, “allochthonous” or “exotic”. In this study, we will adopt the “non-native trees species” (NNT) terminology.
For their capacity of naturalization in a new environment, their ability to establish in difficult sites and for producing sufficient timber quality in a short period of time, NNT has been playing a timid but persistent role in the structuring of European forests and wood markets.
When war periods imposed the transformation of European forests into agricultural land decreasing the productiveness of native tree species, and when subsequently, forest resources became scarce for a re-growing population, the role of NNT had expanded from their traditional use as ornamental trees to species that could complement the demand for forest resources and services.
To this day, approximately 150 NNT still exist within the European forests, representing 4% of the total forest cover and providing observable influences in the forests’ C sequestration dynamics, biomass production, mitigation of natural hazards, and adaptive capacity for climate change.
With many of the NNT features being explored in the context of the Alpine Space by the ALPTREES Project, the aim of this study is to collaborate with it bringing information about the current uses and economic values that NNT wood can add to the Alpine forest activity to encourage discussions through this prism among its transregional stakeholders.



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NNTs in Italian forests with particular attention to the situation in Italian Alpine Space

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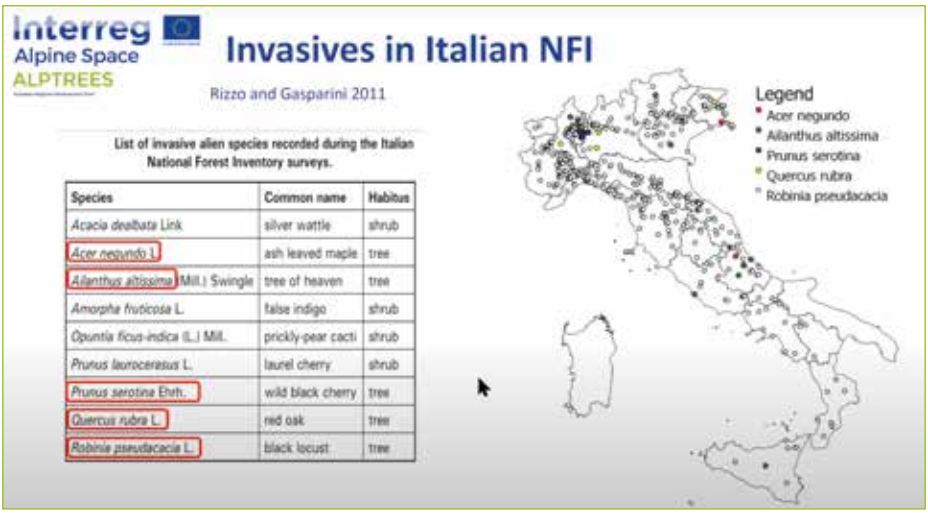
KEYWORDS: Italian NNT, archaephyte trees, Poplar hybrid plantations, Invasive NNTs.

Considering the peculiar geographic position and the specific climatic conditions, Italy is one of the European countries most affected by the presence of not native species. The country has been a center of intense exchange and colonization of non-native arboreal taxa as a result of human trade and migrations since ancient times. Prove of this is the presence of several widespread archaephyte trees that at the present play an important role in forest and/or landscape.
The inventory of the Italian NNTs shows that in Italy there are more than 100 NNT species, in particular 32 conifers, 69 broadleaves. The majority of these species have been introduced for ornamental and non-productive purposes.
Comparing the list of NNTs and the species recorded in the second Italian National Forest Inventory (INFC2005), 34 species are common to both lists, out of which 15 are naturalized, 10 are casual and 9 showed invasive behavior.
In Italy, despite the hard experimental work carried out at the beginning of the last century, the overall planted surfaces with NNTS are rather small. Only in some regions and for some species, such as Douglas fir in Tuscany, *Pinus radiata* in Sardinia, and E*ucalyptus spp*. in Sicily and Sardinia, the plantations cover large areas, causing a significant environmental and landscape impact, that was not always accepted by local people.
In the Italian Alpine Space (IAS) the main NNT species are: *Populus canadensis* (several clones of hybrids between the native *P. nigra* and *P. deltoides* and other American poplars), *Robinia pseudoacacia*, *Ailanthus altissima, Pinus strobus, Prunus serotina, Juglans nigra, Quercus rubra, Paulownia tomentosa* and few minor others. *Pinus nigra*, that actually is present in a negligible part of the IAS, was extensively planted since the end of XIX century and until the 60s on vast areas of IAS and it is now criticized and considered as an unpleasant NNT.
At the moment several IAS regional policies discourage or do not allow the use of NNTs for plantation, except for the poplar hybrids that, thanks to their fast-growing, have a long tradition in IAS, both as research and as management, and historically represented an important source of wood for industrial pulps and more recently also for short term rotations used for energy fuel.



https://youtu.be/rHJ0BBFvOrI

Alien tree species in Piedmont (NW Italy): impacts and management best practices in forest

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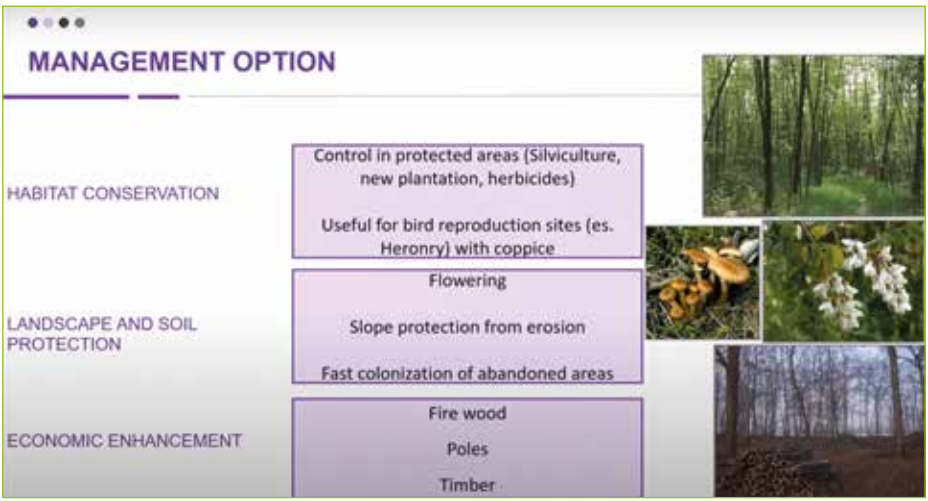
KEYWORDS: Alberi, specie invasive, foreste, gestione

La flora alloctona invasiva è una delle principali cause di diminuzione delle diversità biologica a livello mondiale. L'IPLA, società controllata dalla Regione Piemonte, affianca la regione nel Gruppo di lavoro per i monitoraggio e la gestione delle specie alloctone invasive, attraverso l'acquisizione dei dati sullo status e distribuzione sul territorio piemontese e, per alcune di esse, progetta e attua, anche in collaborazione con altri Enti (Enti gestori di aree protette, siti Natura 2000 e CREA di Casale) misure di contenimento, in particolare attraverso i Piani di gestione delle fasce fluviali. Attualmente la flora piemontese risulta composta per oltre il 10% da specie esotiche.
Nel presente contributo verranno brevemente trattate le specie invasive e naturalizzate che possono impattare negativamente non solo sulla biodiversità ma su tutti i servizi ecosistemici, con ricadute economiche non trascurabili, ma essere anche, talora, un'opportunità.
In particolare verranno analizzate le caratteristiche e le modalità di contrasto e gestione di *Prunus Serotina*, *Ailanthus altissima*, *Quercus rubra*, *Robinia pseudoacacia* e di alcune conifere (*Pseudotsuga menziesii*, *Pinus strobus*, *P. excelsa* e loro ibridi). Si tratta di specie introdotte a scopo ornamentale o per la produzione di biomassa che tuttavia solo in alcuni casi hanno contribuito allo sviluppo di filiere significative.



https://youtu.be/2V5Pc4rnWOs

EUSALP forestry activities: fostering dialogue in view of the new European Forestry Strategy

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EUSALP-Task Force on „Multifunctional Forest and Sustainable Use of Timber“

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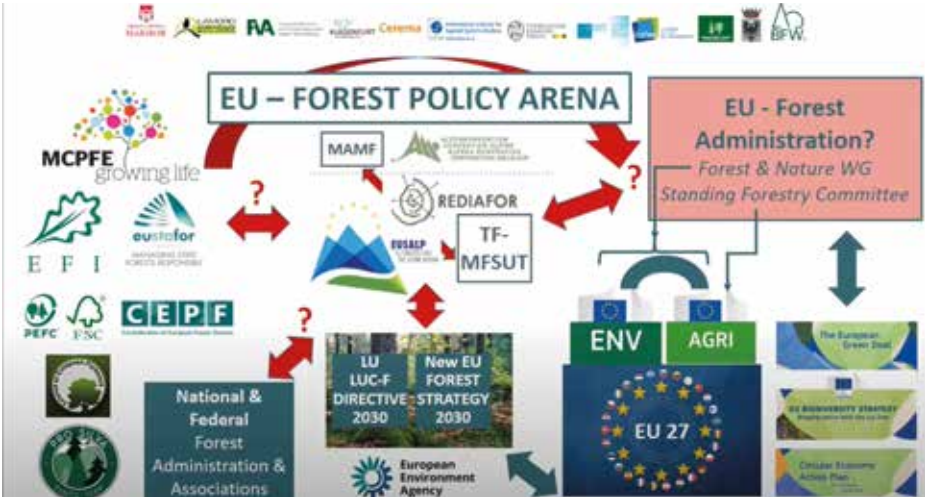
KEYWORDS: strategy, timber, value chains, circular economy



https://youtu.be/NyjFX7S47KQ

Day 2 - 26th of February

Policy workshop

Developing a strategy for the sutainable use of non-native trees

Chairs: Berger Frederic (INRAE, France) + Reneema Hazarika (BFW, Austria)

Understanding stakeholder knowledge on risks and benefits for managing Non-Native tree species in the Alpine Space

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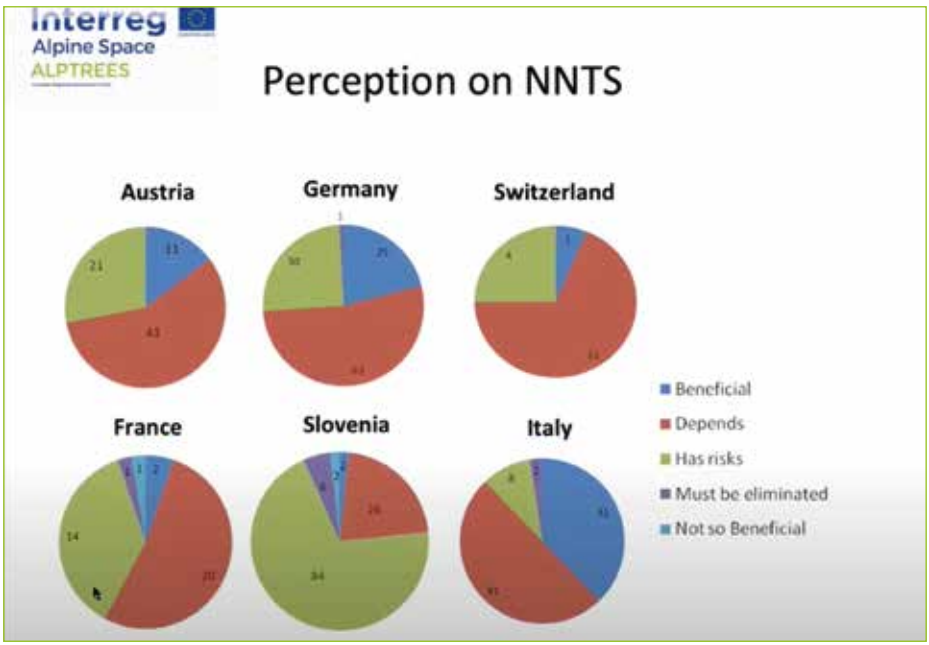
KEYWORDS: NNT, Alpine Space, ecosystem-services, perception

Discussion in forest management has increasingly focused on how humans can assist tree species adaptation/migration processes, especially when important forest ecosystem services are at risk. One option is to introduce non-native tree (NNT) species to help these forest ecosystems adapt to climate change. With potential invasiveness, NNTs face both socially and ecologically complex management challenges. Moreover, lack of awareness and negative attitudes towards the NNTs can cloud conservation policies in cases where the NNT provides beneficial ecosystem service. In this study, we aim to understand the perceptions of multiple stakeholders, associated with the urban landscapes and traditional forests, on the risks and benefits of NNTs and their management in the Alpine space. For this purpose, we have conducted an online survey in the countries of the European Alpine Space and received 457 responses. The analysis of the survey is still ongoing but the preliminary results suggest that 95% of the participants in this survey are aware of NNTs in their region and among them, most believe that the NNTs pose risk to the environment. Also, approx 50% of the respondents believe that their understanding of management policies of NNTs is inadequate.



https://youtu.be/1r66O3oduSQ

NNT and the forest ecosystems service of natural risks prevention: the example of rockfall risk - Allies or enemies?

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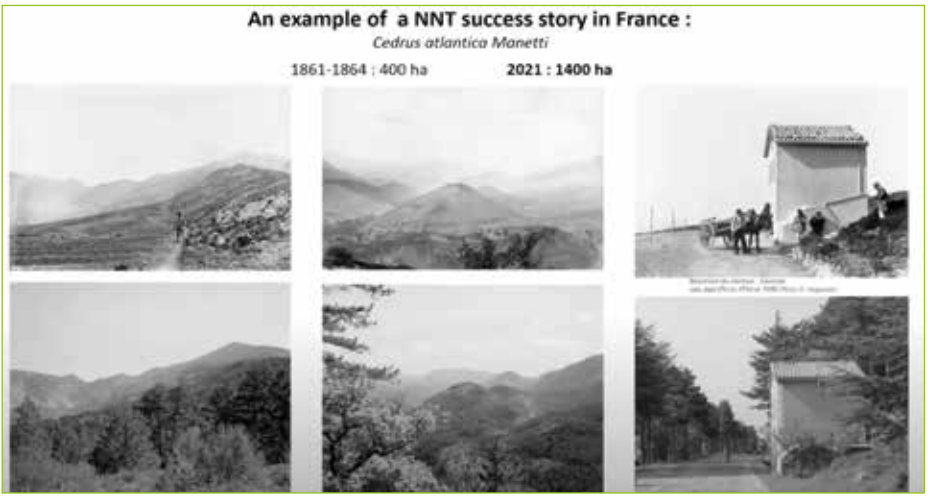
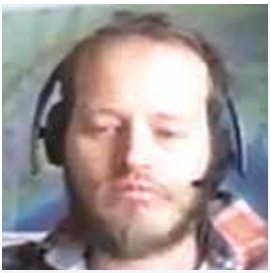
KEYWORDS: mountain forestry, protective forest, France

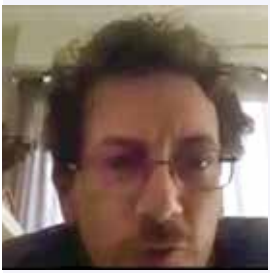


https://youtu.be/_ieaAf9ohAo

Multifunctional forest and EUSALP : Inputs of the French Presidency



Antoine Patte



Benjamin Einhorn

Antoine Patte [1] and Benjamin Einhorn [2]
[1] Union of Forest Communities in Auvergne-Rhône-Alpes (France), Member of EUSALP AG2
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KEYWORDS: wood construction, urban planning, housing, sustainability

Depuis 2018 la multifunctionalité des forets alpines catalyse de plus en plus d'enjeux stratégiques de la SUERA (Biodiversité, bois d'œuvre, energie, risques naturels, etc). La Présidence Fr de la SUERA l'a donc inscrite au coeur de sa feuille de route et encourage la vision transversale : un contexte favorable pour capitaliser sur les résultats des projets de coopérations et les apports des groupes d'actions. Demain, l'idée est de renforcer le dialogue et la gestion intégrée de la foret dans les territoires en prenant appuis sur les solutions fondées sur la natures apportées par la foret alpine

Translation :
Since 2018 the multifunctionality of alpine forests catalyzes more and more strategic issues of EUSALP (Biodiversity, timber, energy, natural risks, etc). The French Presidency of EUSALP has therefore placed it at the heart of its roadmap and encourages a transversal vision: a favourable context to capitalise on the results of cooperation projects and the contributions of the action groups. Tomorrow, the idea is to reinforce the dialogue and the integrated management of the forest in the territories by taking support on the nature based solutions of the alpine forest.

https://youtu.be/EAJOSm4TfT0

Basic ideas of *Pseudotsuga menziesii* (Mirb.) Franco management: site index & forestry

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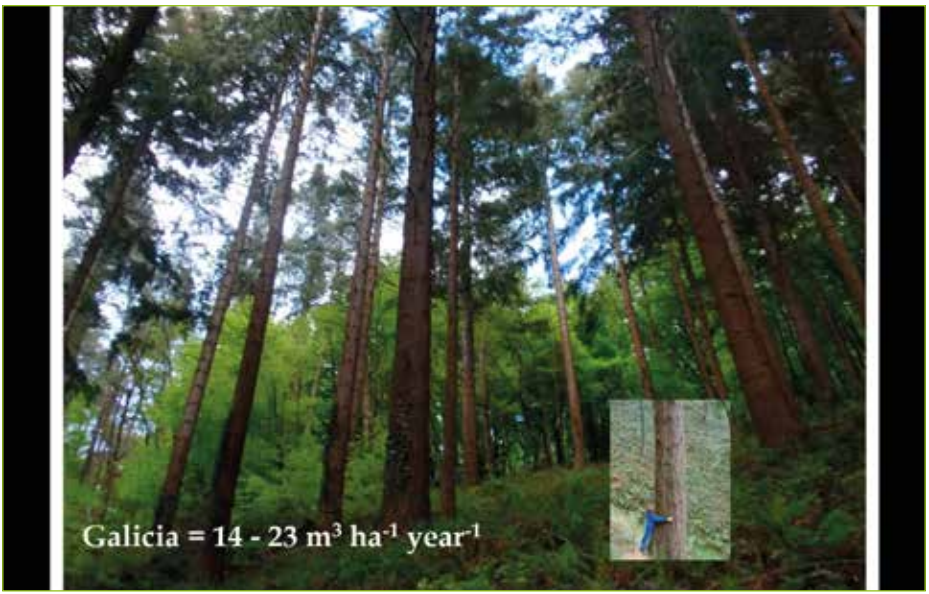
KEYWORDS: Pinaceae, Oregon pine, site index, silviculture, management

Pseudotsuga menziesii (Mirb.) Franco, –Douglas fir or Oregon pine as common name, is a coniferous tree of the Pinaceae family. The Oregon pine denomination, utilized to describe as both the species and its wood, could take to mistake, because its needle-like leaves are not sheathed, and they look more like firs and spruces. It can reach up to 100 meters height in its origin region; it was first described in 1792 by Menzies in Vancouver Island, Canada; now lives in many European countries, being able to find trees over 50 meters high. It has a great capacity to sustain continuous growth and its peculiar conical and pointed crown takes a long time to top.
The first seeds planted in Europe in 1827 were those of Douglas, hence its name as Douglas fir, probably in Scotland. It was introduced in France in 1842, and between 1844 and 1849 the first plantations were established in Portugal, always in parks or gardens of castles and palaces. The most important afforestation does not begin in Europe until the second half of the XX century. In Spain, initially also it was used as an ornamental species. During the afforestation of the Forest Heritage its utilization was punctual, especially in the northwester of the Iberian Peninsula. In other regions, forest administration used the species more in full measure. According to the latest published data (Forest Statistical Yearbook, 2018) an approximate area of 30,000 hectares is estimated. However, said area corresponds to afforestation with different conifers (Douglas fir, larch, sequoia, among others). Oregon pine lives on a wide-ranging climatic but needs even distribution of rainfall. The ideal requirements to improve production would be a humid oceanic climate with 2-3 months of drought. It is a demanding tree species edaphic conditions suitable and has a preference by deep soils, fertile, and a light texture. As for the wood, it produces high quality timber, being necessary to guide the forest treatments, mainly the pruning, so it is free of knots and to eliminate unnecessary branches. In Galicia, the maximum production range would go from 14 to 23 $m^3ha^{-1}year^{-1}$. Most of the current stands are in small forests on agricultural land and privately owned, with growth exceeding 19 $m^3ha^{-1}year^{-1}$.



https://youtu.be/waeGazddYWs

Session 3 | Under 18 Session

The ALPTREES School activity was integrated in the "Under 18 Session" on February 26th 2021, Day 2 at 1pm to 2.30pm and provided a platform for young students to present their non native tree related topics. A workshop with break out rooms gave the opportunity to discuss the information in a roleplay environment with age conform tasks. Due to legal assessment and permittances, the Under 18 Session was not recorded online.

Moderators: Margaret Carter (teacher)+ Petra Meisel (communication officer ALPTREES)
Participants: 27 students age 11-13 / 8 students age 16

In spite of the young age and the short given time, the presentations of the 11-13 year old groups showed signs of implementation of the learning matter. Chosen venues for greening the piece of land ranged from lakesides to high mountain snow slopes to central city parks.

The problems with heat and drought where anticipated predominantely and a solution based approach could be sensed. The 16 year old groups could identify with the roles given and delved into nearly political discussions about landuse in forests and the application of non native timber wood. The conclusion we draw out of the U18 experience is a very positive one and with more given time for such roleplays and maybe again personal attendance in the future we are confident that this method of compiling an abstract matter is surely one to pursue.

Besides, we received positive feedback from students as well as teachers.

https://alpine-space.eu/projects/alptrees/deliverables/alptrees_d.c.3.1_school-activity_u18_26-02-2021.pdf

Session 4 | Non-native tree species in cities and forests

IUFRO - How to get connected

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KEYWORDS: ecosystem function, emissions, carbon, microbial functionality

IUFRO is a global, non-profit, non-governmental and non-discriminatory organization established in 1892 with headquarters in Vienna, Austria. It unites about 650 member organizations in more than 120 countries representing over 15,000 scientists.
70 meetings are held on average every year. IUFRO World Congresses take place every 4-5 years. You can join any of the 9 scientific Divisions, over 50 Research Groups, more than 180 Working Parties and 10 interdisciplinary Task Forces.

https://youtu.be/Ib4r1hP6Ux0

Citizen science for non-native trees observation in Alpine region

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KEYWORDS: Global forest, biomass, land cover mapping, remote sensing application

Climate change represent a major threat to forests and urban environment. Non-native tree species can support adaption of forests and urban areas, but also can cause problems in case of invasive species. ALPTREES objective is to develop a comprehensive database on non-native tree species, predicting the current and potential distribution of non-native trees in the Alpine space under climate change scenarios.
A citizen science activity supports the collection of data on urban and forest trees, raise awareness among the general public regarding the question of alien and native trees. After carefully considering all technical option, the project team selected the using iNaturalist App, which gives the advantage to be part of a larger initiative (Global Biodiversity Information Facility – GBIF), to promote healthy life style of the citizens trough outdoor activity and the flexible to adopt to our project needs. iNaturalist is both mobile and desktop platform to collect life organism occurrence data (georeferenced photo), classify them with the help of community, learn more about tree species and nature around, contribute to biodiversity science.

https://youtu.be/QEd4WidZs0Y

Leaf functional traits as bio-indicators of urban environment impact on trees

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KEYWORDS: Stress factors, urban trees, leaf traits, acclimation

Growing in urban settlements, trees are frequently exposed to various biotic and abiotic stressors, which may negatively affects its health status and growth rate, sometimes even causing a premature mortality. Additionally, future climate change is supposed to worsen climate conditions in urban areas, posing a new and unique challenges to urban vegetation. Under influence of urban conditions trees may develop different physiological and morphological mechanisms to enhance their tolerance to multiple stress factors. Leaf traits have been recognized as one of the principal components of plants acclimation to environmental conditions, influencing their growth and vitality. Recent studies showed that leaf functional traits may become a reliable tool for measuring physiological stress in trees, as well as exploited as useful bio-indicators for assessment of urban habitat quality. Hence, in the present paper we reviewed different short- and long-term response mechanisms (e.g. physiological, morphological, anatomical) exploited by urban trees to acclimate to urban habitat conditions and accompanied stress factors, accordingly. Additionally, the implication of study results was discussed in term of selection of suitable tree species for cultivating in urban environments.

selection of urban tree species

- selection of suitable tree species for cultivation in urban areas,
- mitigation of negative effects of climate change and maximization of ecosystem services,
- promotion of inter- and intra-specific diversity,
- introduction of non-native tree species.

before we change tree species...

why not try with different provenance?

- provenances of native species,
- provenance trial,
- drought adapted provenances,
- promotion of intra-specific diversity,
- marginal provenances (e.g. rear-edge).

Source: https://www2.gov.bc.ca/gov

https://youtu.be/r1l6Ct6psuo

Can trees be used in monitoring atmospheric fine particulate?

Paula Ballikaya [1,2], Ivano Brunner [1], Claudia Cocozza [3], Ralf Kägi [4], Marcus Schaub [4], Leonie Schönbeck [1,5], Brian Sinnet [4], Paolo Cherubini [1,2,6]

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KEYWORDS: Trees; Air quality; Nanoparticles; Tree-rings

The beneficial effects that urban trees have on air quality have been broadly documented in the literature since at least the 1930s. Trees have been reported to be capable of effectively filtering pollutants out of the air, intercepting them with their bark, branches and leaves. Trees are then able to accumulate air pollutants into their wood, acting as natural bioconcentrators. Thus, the selection of suitable tree species is valuable as an unconventional measure for controlling PM2.5 pollution. However, the effect of fine particles at nano-scale is still largely unknown and their presence in tree rings unexplored.
In July 2019, a greenhouse experiment was conducted in order a) to confirm the uptake and transport of NPs in trees, and b) to determine the efficiency of different NPs entry pathways (leaves and roots). The fate of gold nanoparticles (AuNPs) was investigated in two tree species, European beech (*Fagus sylvatica* L.) and Scots pine (*Pinus sylvestris* L.). In the experiment, 40 nm AuNPs were supplied to leaves (via spraying) and to roots (hydroponically). In the leaf supply, Au concentrations were higher in leaves and stems than in roots. In the root supply, higher Au concentration was found in the roots than in the stems, whereas gold was not detected in the leaves. In conclusion, AuNPs can be taken up by roots and leaves and transported to different compartments of trees. It seems that NPs move faster from the leaves through the phloem to the xylem and further are disperded throughout the plant system.

https://youtu.be/Z0zobGx_eXs

Eat the Trees - How non-native trees could diversify our food and beyond

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KEYWORDS: trees, food, eating, foraging, flavor, wild food, food products, forest, wood, cuisine, sustainable, aroma, diversity, bio-based industry, bio-based

Already today many of us are eating trees on a daily basis, often without realizing it. From smoked food products, black & green tea and cinnamon to barrel aged wines & spirits, maple syrup and even cellulose used extensively by the food industry. Yet reading or hearing about trees themselves being mentioned in the context of food is a rare event in the public discourse. Despite the fact that they could become the very basis of a highly sustainable and resilient food system of the future. From agroforestry and silvopasture to the foraging of wild food and bio-based industry, in every case trees are not only valuable providers of ecosystem services as well as fuel, raw- and building material but can be also used as food. The leaves, fruits, bark, sap, roots, and even the wood of many tree species can be eaten raw or processed and are the engine for numerous regional, often rural, economies worldwide. This is also true in Europe, ranging from orchard meadows and pinecone schnaps production in alpine regions to mastic and pine resin collection in the Mediterranean as well as birch sap production in the Baltics. New biotechnical processes that e.g. allow the production of human digestible protein from wood waste produced by the sawmilling industry furthermore add to the countless possibilities trees offer in the food sector. The inclusion of an array of non-native tree species in this context can be seen as a way to broaden the resource base for food production as each species introduces a range of new use cases and flavors. It is also a hedge against the many known & unknown effects of climate change threatening our very food security. Finally does the concept of “eat the weeds” offer an interesting solution to plants with invasive tendencies. By creating a food economy that intentionally seeks to overuse certain invasive plants, they are not only kept in check but can even provide numerous business opportunities, particularly in economically underdeveloped regions.

https://youtu.be/PZMNIpyaSH4