

19.—22. September 2017 Freiburg/Germany

List of Sessions:

General Congress Theme 4—
"Biodiversity, Ecosystem Services and Biological Invasions"

# General Congress Theme 4

No# Title	2 Co-existence of human and wildlife in changing landscapes and climate
Main Organizer	Chabi Djagoun Laboratory of Applied Ecology, Cotonou/Benin dchabi@gmail.com
Co-Organizer(s)	Hugues Akpona, National Forest Office, Benin, African Wildlife Foundation, DRC Edward D. Wiafe, Presbyterian University College • Environmental and Natural Resources Management, Ghana
Session description	Changes in land use management such as farming, forestry, water management and many other land uses are likely to be impacted by climate change. These activities are all-important for wildlife, and the way they adapt may offer both opportunities and threats to biodiversity. A key question to be addressed is under what conditions coexistence between humans and wildlife is still possible in the twenty-first century, as population and resource pressures, economic growth and globalization become ever more intense. This technical session seeks to understand the dynamics of wildlife and human interactions in Africa and mechanisms of coexistence in a multi-use landscapes. The section will further look at the efforts to reduce human wildlife conflict (HWC) but harmonize peaceful co-existence between human and wildlife as well as policy implications. The experience and knowledge will be gathered worldwide through the oral and poster presentations and answering the following key questions: (i) how can local rural communities benefit more from sustainable use and conservation of wildlife, in order to enable coexistence and offset the costs of living with wildlife? (ii) Given that most countries do not have the resources to manage their protected areas effectively, under what conditions can they be expected to also effectively manage wildlife living in inhabited areas? (iii) How do we design effective context-specific interventions and what role should local communities and conservation interests play in these processes? (iv) and finally how can the voices of rural communities affected by HWC, as well as those of the scientific communities, be effectively heard among policymakers and donors, to ensure that interventions address needs and interests and promote wildlife as assets rather than liabilities?  As expected outputs from this technical session we hope to use some successful case studies to support the key messages to be formulated on how to manage wildlife in changing landscapes and climate and facilitate co-existen

#### No# Title

9 IUFRO Task Force on Biological Invasions in Forests

## Main Organizer

#### **Andrew Liebhold**

US Forest Service Northern Research Station, Morgantown/USA aliebhold@fs.fed.us

# Co-Organizer(s)

#### Session description

Globalization has many benefits, but a harmful consequence of this trend is the movement of organisms among the world's regions. When species become established in alien environments, they often exhibit explosive population growth resulting in severe impacts on native communities. Forests are currently experiencing invasions by non-native insects, pathogens, plants and other organisms, many of which profoundly alter forest ecosystem properties and sometimes cause massive economic impacts on forest resources. This is a problem that is being experienced worldwide, both in economically developed nations, as well as in developing countries. Given the global nature of the problem, it is unlikely that any single government alone can implement effective solutions. As such, the problem of biological invasions demands international cooperation among researchers, and thus IUFRO represents an ideal instrument organization for addressing the problem.

There is an urgent need to understand the drivers of biological invasions, characterize their effects on forests and develop strategies for minimizing future invasions and their impacts. Current work on invasions has generally focused within individual disciplines; the lack of synthesis among fields focusing on specific invasive taxa has hindered the development of integrative knowledge and comprehensive management policies. In particular, there is a strong social component to the invasion problem that has largely been neglected. Globalization is inherently driven by social processes and the mechanisms operating that translate globalization into invasions requires elucidation. Information is also lacking on how societies perceive biological invasions in forests.

This session will report on some of the work being carried out by the IUFRO Task Force on Biological Invasions to synthesize the current state of science on this topic. We will include speakers presenting on invasions of various taxa of organisms but also presentations on the social aspects and policy aspects of the problem.

No# Title	11 Progress in tropical forest management: Assuring sustainability, avoiding degradation and assisting restoration
Main Organizer	Stephan A. Pietsch IIASA and IUFRO (WG1.02.02), Laxenburg/Austria pietsch@iiasa.ac.at
Co-Organizer(s)	Plinio Sist, CIRAD Robert Nasi, CIFOR
Session description	Tropical forests play a multitude of important roles at the local, regional and global scales. Besides their delivery of ecosystem services regarding timber and NTFPs they play a key role in the global carbon cycle. Yet, tropical silviculture has long been seen as if harvest and exploitation of timber and NTFPs cannot endanger their vast resources. Since fifty years, however, this perception has changed and the concern for sustainable management of tropical forests has never been greater than today. Nevertheless, a large part of the research focus is still on conservation of natural forests, on avoiding their deforestation and the impact of silviculture and other extractive industries on tropical land degradation. This session will therefore deal with studies reporting on impacts of forest management on tropical ecosystem regarding the sustainable production of timber and NTFPs and its impacts on the global carbon cycle, on biodiversity issues and local livelihoods of forest dependent people. Field studies as well as modelling exercises from local to global scale are welcome that report on progress in sustainable tropical silviculture, forest restoration and avoidance of land degradation. This includes selective logging, progress in plantation forestry, forest restoration after mining, the impacts of shifting cultivation and its intensification and the effects mixed land use forms like agro-forestry.

No# Title	16 Joint management of large herbivores and forests for resilient ecosystems
Main Organizer	Thomas Rooney Wright State University, Dayton/USA thomas.rooney@wright.edu
Co-Organizer(s)	Nobuhiro Akashi, Forestry Research Institute, Hokkaido Research Organization
Session description	Large herbivores are major drivers of forest dynamics worldwide. Wild herbivores and livestock alter species composition, soil properties, nutrient cycling, wildfire susceptibility, and other forest ecosystem properties and processes. Large herbivores have been both agents of sound forest landscape management, and of habitat degradation.
	Management of forests and large herbivores has often been presented as an either/or dilemma. Either we can have healthy, resilient forests, or we can have abundant populations of large herbivores. However, it is possible to have both, if we broaden our perspective.
	This session explores the joint management of large herbivores and forests, highlighting successes, failures, and new approaches in the spirit of adaptive management.

No# Title

23 Tree biodiversity at the genetic level: vital to confront environmental and livelihood challenges

Main Organizer

**Judy Loo** 

Bioversity International, Maccarese, Rome/Italy *j.loo@cgiar.org* 

## Co-Organizer(s)

#### Session description

The session will focus on research that addresses the vital role played by tree genetic resources in confronting global problems. People need trees for many purposes including food and nutrition security, poverty reduction, restoration of degraded landscapes and climate change adaptation and mitigation; and meeting these needs depends on the availability and effective use of the rich diversity among and within tree species. There is broad recognition of the importance of genetic resources to equip populations of trees to survive abiotic and biotic challenges and adapt to changing environmental conditions, as well as providing the basis for domestication and tree improvement. Combining genetic analyses with emerging knowledge of societal pressures on tree populations and the particular needs for sustainable flows of goods and services from those populations enhances our understanding of the status and threats to and value of tree genetic diversity. Such knowledge can be used to address broader environmental and socio-economic problems and to achieve production, conservation and restoration goals; at the same time, providing a basis for implementing global commitments. The Global Plan of Action for Conservation, Sustainable Use and Development of Forest Genetic Resources (FAO 2014) prioritizes actions and knowledge needed for enhancing the contribution of these invaluable resources to addressing environmental and socio-economic problems and opportunities. This session highlights recent forest tree genetic diversity research that supports the implementation of the Global Plan of Action and other global commitments such as the UN Conventions and the Sustainable Development Goals. In doing so, the session bridges the Congress themes on livelihoods, climate change mitigation and biodiversity conservation.

No# Title	24 Growth and Dynamics of Pine in Mixed Forests
Main Organizer	Mark Ducey University of New Hampshire, Durham/USA mjducey@unh.edu
Co-Organizer(s)	Aaron Weiskittel, University of Maine Felipe Bravo, Universidad de Valladolid-INIA Andres Bravo-Oviedo, INIA-CIFOR
Session description	The genus Pinus is diverse and well-represented in Asia, Europe, and North and Central America. Although it is one of the premier genera for plantation forestry, it also occurs widely in mixed-species stands in natural and semi-natural forests. Its growth and yield, as well as its contributions to structure, function, and biodiversity in such forests, have not been fully characterized or compared across ecosystems. Mixed forests are often hypothesized to provide enhanced resistance and resilience to disturbance, greater biodiversity and carbon storage, greater adaptability to climate change, and higher productivity for a variety of ecosystem services. Pines, as a widespread and diverse genus, should be important contributors to these potential advantages of mixtures. In this session, we will explore quantitative results on the behavior of pines within species mixtures, with the goal of facilitating a shared understanding of the varied roles pines play in stand development and ecology including pine decline in drought stressed environments.  This session will highlight recent work conducted in association with the European Union CoST Action FP 1206 EuMIXFOR – European Network on Mixed Forests, as well as related work in North America. We also hope for contributions from researchers conducting similar work in Asia and wherever pines grow or are grown as part of mixed forests.

# No# Title 45 Forest policy and biodiversity strategy: The relevance of forest genetic resources Main Organizer Hojka Kraigher Slovenian Forestry Institute, Ljubljana/Slovenia hojka.kraigher@gozdis.si Co-Organizer(s) Saša Orlović, University Novi Sad, ILFE, Novi Sad, Serbia Session description Sustainable forest management is based on the long-term adaptability of forest ecosystems and starts at the lowest, namely the gene level. Forest genetic monitoring (FGM) is therefore a crucial component of any sustainable forest management as it gives a possibility to detect potentially harmful changes of forest adaptability before they are seen on higher levels. By introducing genetic monitoring into conservation programmes and sustainable forest management one has the tool in hand to assess information on relevant changes of a species and/or populations' adaptive and neutral genetic variation through time. Based on indicators and their verifiers it can serve as an early warning system to aid the assessment of a species response to environmental change at a long- term temporal scale. Only if future forests will include populations of a high genetic diversity, the adaptability potential

The key questions to address are:

areas.

1. how to contribute to the identification of the national / regional / EU and global-wide genetic monitoring objectives and strategies, and how to address obstacles to meet the objectives for development and implementation of FGM

will be conserved and future landscapes might remain similar to their present situation, with forest stands growing and fulfilling ecosystem services in their present distribution

- 2.how to contribute to the identification of communication systems with key stakeholders and policy makers regarding FGM
- 3. how to contribute to the formation of a future action plan on the procedures needed to obtain a discussion line with policy makers on development and implementation of the system for FGM

Selected case studies from the ADRION (Adriatic-Ionian) region shall be presented to facilitate discussion at different scales.

#### No# Title

58 Managing forests for Biodiversity and Resilience

## Main Organizer

## **Anne Oxbrough**

Edge Hill University, Ormskirk/UK anne.oxbrough@edgehill.ac.uk

## Co-Organizer(s)

#### Session description

This session will explore the relationship between forest biodiversity, ecosystem functioning and resilience in the context of supporting forest management for silviculture and conservation. The world is faced with an unprecedented loss of biodiversity, mainly due to human activities. Natural and planted offer a wide array of habitats for plants, animals and micro-organisms, collectively representing the majority of terrestrial biodiversity. However, this biodiversity is rapidly being lost due to deforestation, fragmentation and degradation of forests. While the dramatic extinction rate of forest species is undoubtedly an important conservation concern, there is a potentially equally dramatic degradation of forest ecosystem properties and functioning. To date, most scientific evidence for relationships between biodiversity and ecosystem function have been provided by observations and experiments on grasslands communities whereas few relevant studies have examined complex forest ecosystems. The session will discuss current research on the response of forest biodiversity under changing environmental conditions (e.g. management, climate) which may influence ecosystem resilience. It will bring together researchers from across Europe and beyond to explore challenges for policy makers and practitioners for managing forest biodiversity. This session directly aligns with the objectives of working party 8.02.02 but also has relevance to a number of other working parties within Division 8. There are currently four speakers who are proposed to present in this two hour session. We intend that the remaining four slots be filled by the general open abstract call, and, if sufficient abstracts are submitted, a poster session will accompany this session.

No# Title	72 Oak forests and management for different ecosystem services
Main Organizer	Magnus Löf Swedish University of Agricultural Sciences, Alnarp/Sweden magnus.lof@slu.se
Co-Organizer(s)	Daniel C. Dey, Research Forester, Project leader, USDA-FS Teresa, Fonseca, University of Trás-os-Montes e Alto Douro Somidh, Saha, University of Freiburg
Session description	There are nearly 600 species of oaks all over the world in temperate regions of Americas to Eurasia, as well as in hilly terrains of subtropical and tropical areas of Central America to Asia. Oaks are natural components of many temperate broadleaved forests and play an important role for biodiversity and for people's livelihoods. Oaks are valued for economicand cultural reasons. For example, oaks are managed to produce high quality timber, firewood, wine barrel material, cork, for cultivation of truffles and fodder etc. However, oak forests are also under pressure from urbanization, pests and pathogens and a successional replacement of oaks with more shade tolerant tree species is occurring worldwide.
	Identification of the ecosystem services provided by oak-dominated forests in all these regions is a prerequisite for ensuring their conservation and sustainable management. These forests seem well-suited for multiple-use forestry, restoration and adaptation of forest management to climate change, but an overview is lacking regarding how to manage them for these purposes. This session organized by IUFRO unit 1.01.06 "Ecology and Silviculture of Oak" will gather such knowledge from different parts of the world.
	In this session we invite contributions on the following topics:
	<ul> <li>State of knowledge of oak forests worldwide</li> <li>Key challenges for effective establishment and management of oaks</li> <li>Ecosystem services from oak-dominating forests</li> </ul>

No# Title	84 Promoting forest resilience, adaptive capacity, and ecosystem services through diverse
	forest ecosystems
Main Organizer	Juergen Bauhus University of Freiburg, Freiburg/Germany juergen.bauhus@waldbau.uni-freiburg.de
Co-Organizer(s)	Klaus Puettmann, Oregon State University, U.S.A. Frédérik Doyon, Université du Québec en Outaouais, Canada
Session description	The demands on forests to provide a wide range of ecosystem goods and services appear to be ever increasing. These demands are partially conflicting and the capacity of forests to provide these goods and services into the future is uncertain against the background of risks posed by a changing climate and global spread of pests and pathogens. In this session we will address two major questions: a) to what extent the provision of goods and services and ecosystem resilience may be enhanced by more structurally diverse and species rich forests, and b) how silvicultural management may actually increase the adaptive capacity of forests. In the first part of the session, individual contributions will cover aspects of productivity, carbon and nutrient cycling, resistance to pests and diseases and abiotic stress and disturbances such as droughts or fire. These contributions will also provide a mechanistic understanding of the functioning of the diversity in tree species and stand structure and thus point out how ecosystem functioning may be further improved. In the second part of the session, we seek to compare approaches and examples from different regions around the globe that demonstrate how the above principles derived from functional ecology and from stand analysis can then be used to develop silvicultural approaches to promote the adaptive capacity of forests.

No# Title	92 Concepts and assessments of forest ecosystem services and benefits
Main Organizer	Markus A. Meyer Bavarian State Institute of Forestry, Freising/Germany markus.meyer@lwf.bayern.de
Co-Organizer(s)	Christoph Schulz, FOR, Bavarian State Institute of Forestry

## Session description

The increasing use and production of biomass from forests for the bio-economy creates

questions about synergies and trade-offs with other forest benefits. From a producer's perspective, multifunctional forestry aims at balancing biomass and other forest benefits. From a societal perspective, the question is how to conceptualize and to assess how forest management balances biomass and other forest benefits. Here, ecosystem services are a prominent concept. However, many applications of this concept do not consistently assess aspects of social and environmental sustainability of forest management. For example, the focus of ecosystem service assessments is on the supply of forest benefits often disregarding the demand for further societally relevant ecosystem services. Equally, not only different ecosystem services occur at different scales but also demand and supply of one ecosystem service. However, existing approaches weakly align the assessment of supply and demand. As a consequence, an evaluation of a bio-economy's sustainability requires improved assessment concepts. This session invites contributions assessing forest benefits with an emphasis on studies dealing with the ecosystem service or comparable concepts.

Therefore, contributions to this session should explore:

- How do different approaches and concepts suit to conceptualize synergies and trade-offs between forest benefits in the frame of a growing bio-economy?
- How can we consider links between forest benefits arising at different temporal and spatial scales?
- How should the supply of and demand for forest benefits be linked to ensure a sustainable bio-economy?
- How can we evaluate uncertainty in assessments of forest benefits?

# General Congress Theme 4

No# Title	96 The role of plant tissue culture technology in biodiversity conservation
Main Organizer	<b>Tae Dong Kim</b> National Institute of Forest Science, Suwon/Republic of Korea ktd747@korea.kr
Co-Organizer(s)	Young-Wook, Kim., National Institute of Forest Science
Session description	The biodiversity conservation is a global concern because biodiversity has declined by more than a quarter in the last 35 years. So, all member states of the Convention on Biological Diversity (CBD) took measure to preserve both agricultural and forest biodiversity. The biotechnological methods such as plant tissue culture, somatic embryogenesis, cryopreservation etc. are quite applicable and useful techniques for ex situ plant conservation and sustainable resource utilization. So, plant tissue culture technology offers new means of improving biodiversity conservation in rare and endangered plant species.

No# Title	109 Promoting forest biodiversity through structural complexity? New advances in the assessment and restoration of habitat structures in forests
Main Organizer	Veronika Braunisch Forest Research Institute of Baden-Württemberg (FVA), Freiburg/Germany Veronika.Braunisch@forst.bwl.de
Co-Organizer(s)	Kurt Bollmann, Swiss Federal Institute for Forest, Snow and Landscape Research WSL Jörg Müller, Bavarian Forest National Park and University of Würzburg
Session description	Forest biodiversity conservation and restoration has gained increasing attention in multifunctional forestry. Conventions and directives at national and international levels have resulted in a large variety of instruments and programmes to promote biodiversity in forests.  As commercially managed forests often show very low abundance of early and late development stages and the associated structures and resources (e.g. microhabitat structures, habitat trees, dead wood, vertical heterogeneity), many conservation instruments are directed towards promoting or actively creating these components so as to increase overall structural complexity.  The instruments applied in this context vary in scale and level of integration (from the protection of single trees to the designation of large protected forests), in conservation effort (from total cessation to intensive restoration management) and in the target components of biodiversity they address (from single species to communities or ecological functions).  Although various studies show a positive relationship between structural complexity and biodiversity, the measures used to quantify both aspects are highly heterogeneous, which makes it difficult to translate the results into quantitative targets for conservation programmes. Moreover, due to economic considerations and constraints, target values for these programmes often result rather from political negotiation as from scientific evidence, and they are rarely evaluated.  The aims of this session are to present methodological advances for assessing structural complexity at various scales, to discuss their relationship to biological diversity and to elucidate their significance for target values of conservation measures. Further, we want to evaluate the effectiveness of structural target values with regard to ongoing conservation projects. By bringing together ecologists and forest scientists from different nations we intend to stipulate the process of identifying common targets for structure-related biodiversity mea

No# Title	144 Forest Genetic Resources of ecological hotspots: Conserving and managing for the trees of the future'
Main Organizer	Fulvio Ducci Consiglio per la ricerca in agricoltura e l'analisi dell'economia agraria (CREA), Arezzo/Italy fulvio.ducci@crea.gov.it
Co-Organizer(s)	Alizoti, Paraskevi, Aristotle University of Thessaloniki - Thessaloniki - Greece Bruno, Fady, INRA - Avignon - France
Session description	The value of peripheral populations is starting to be recognized as global climate change is now being placed at the forefront of many habitat management plans and included in emerging national and international forest adaptation strategies. For example, genetic resources found at low latitude in Europe, around the Mediterranean and in other world regions are currently receiving renewed interest as planting material (forest reproductive material, FRM) for higher latitudes.  The fate of peripheral populations is indeed of particular interest in the context of climate change.  These populations may (i) be where the most significant evolutionary changes will occur within the distribution range, (ii) face increasing extinction risk, or (iii) be the source of migrants for the colonization of new areas at leading edges or (iv) of genetic novelty for reinforcing standing genetic variation throughout the distribution range. Deciding which strategy to implement for conserving and sustainably using the genetic resources of peripheral populations is a challenge with substantial future consequences.  Additionally, conservation, on the one hand, and, on the other, sustainable use of forest tree species and of their genetic resources are often driven by different societal goals. Both approaches need to be reconciled and harmonized for managing peripheral populations.  This approach was widely discussed and elaborated in the framework of IUFRO WP 2013, FAO Silva Mediterranea and Cost Action FP1202 MaP FGR.

No# Title	206 Operational methods for monitoring and assessment of forested landscapes
Main Organizer	Peter Vogt European Commission, Ispra/Italy peter.vogt@jrc.ec.europa.eu
Co-Organizer(s)	Sandra Luque, IRSTEA - National Research Institute of Science and Technology for Environment and Agriculture, France. Kurt Riitters, United States Forest Service, Southern Research Station, Eastern Forest Environmental Threat Assessment Center. USA.
Session description	During the past decades, human activities have imposed increasing pressure on our environment, specifically on forested landscapes. Urbanization, conversion to agriculture and large-scale monocultures, deforestation, and the increased amount of forest fires and pest outbreaks are just a few examples highlighting the urgent need for a systematic land-scape monitoring scheme to support efficient mitigation measures. Current free and open data policy will have a dramatic impact on our ability to understand how biodiversity and other ecological attributes and processes are being affected by anthropogenic pressures. Space-borne observations are now widely available, providing essential and harmonized information for different thematic questions, across political boundaries, and at multiple

scales. They are the most cost-efficient and consistent data source and suitable for mapping and analysis of forest composition, structure, pattern, connectivity, degradation, fragmentation, heterogeneity, phenology, forest dynamics and green infrastructure. In order to address this complex task, new developments in remote sensing image analysis focus on generic and scale-independent assessment schemes. The provision of operational methods and tools for monitoring and quantifying the impact of human activities on forest landscapes facilitates the design of efficient and assessable forest resource policies and risk assessment studies to allow a sustainable multifunctional forest management. This session will focus on innovative and interdisciplinary research in generic analysis schemes to demonstrate their potential as valuable operational techniques, leading to an integrative and solid reference framework, and capable to transfer scientific expertise on critical global forest-related challenges to national and international political agendas. These tools constitute an essential requirement for the adequate assessment of forest restoration, bio-economy, the impacts of climate change and biodiversity loss and their implications to environmental and human health. This session will focus on innovative and interdisciplinary research in generic analysis schemes to demonstrate their potential as valuable operational techniques, leading to an integrative and solid reference framework, and capable to transfer scientific expertise on critical global forest-related challenges to national and international political agendas. These tools constitute an essential requirement for the adequate assessment of forest restoration, bio-economy, the impacts of climate change and biodiversity loss and their implications to environmental and human health.

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