



Faculty of Forestry
and Wood Sciences

SCIENCE & RESEARCH

FFWS CZU Prague





SILVICULTURE

- Close-to-Nature Silviculture
- Natural and artificial regeneration of forest stands
- Silvicultural strategies for adapting forests to climate change
- Assisted migration of tree species
- Woody plant seed management and forest nursery management
- Silviculture of mixed forests, conversion of monocultures
- Forest ecosystem dynamics in relation to game damage
- Silviculture of introduced tree species, potential use and ecological consequences
- Dynamics of forest soils and biodiversity following silvicultural treatments



FOREST ECOLOGY

- Climate modelling
- Analysis of soil properties and their effects on plant growth
- Monitoring and quantification of the effects of climate
- Disturbances and their influence on the structure of natural and near-natural forests (with data from permanent plots in primary forests in Central Europe)
- Dynamics of stands and natural regeneration
- Dendrochronology and its application in the evaluation of both the development of individuals and the development of whole forest stands
- Natural and artificial regeneration of stands, introduction of deciduous trees into stand structure and establishment of stands with the addition of valuable deciduous trees
- Cultivation and ecological consequences of cultivation of introduced treespecies
- Insect, chemical and vertebrate ecology



FOREST MANAGEMENT AND PLANNING

- Decision Support Systems in Forestry – optimizing toll harvesting and developing decision support systems in forestry
- Research in forest production (forest management)
- UAV and its usage in monitoring forests
- Processing of aerial laser scanning data for forestry purposes, especially by determining dendrometric characteristics of height and canopy
- Modelling of forest growth and development
- Logging technology and its impact on forest ecosystems, specializing in harvester technology and cableway systems



FOREST GENETICS AND PHYSIOLOGY

- Population genetics and genomics of forest tree species
- Quantitative genetics, development of gene resource management strategies
- Pedigree reconstruction, statistical methodology
- Statistical evaluation integrating genetics with additional data (physiology, climate models, high-throughput optical data, etc.)
- Spatial layouts of seed orchards
- Optimum selection and deployment algorithms
- Ecophysiology of photosynthesis
- Chlorophyll fluorescence
- Tree-level transpiration
- Biomass allocation
- Stress biology

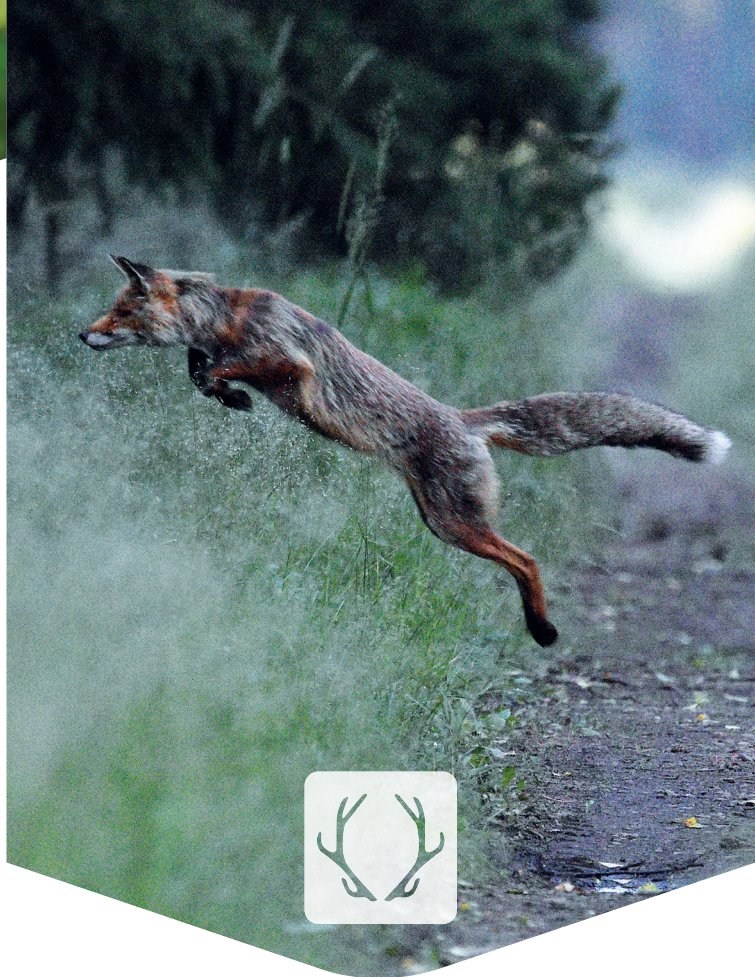



High-tech pavilion



FOREST PROTECTION AND ENTOMOLOGY

- Modelling of disturbance damage of forest stands by wind and snow, including mechanical stress of trees
- Integrated pest control
- Forest fire spread model, forest fire prevention, forest fire threat
- Ecology and taxonomy of insects
- Phylogenesis of important herbivores worldwide
- Biodiversity of forest stands
- Study of recently important and spreading fungal pathogens
- Development of insect repellent and pesticide products
- Impact of climate change on the spread of forest pests
- Forecasts and models predicting the occurrence of pests
- Bark beetle issue – from genetic, tree, and land perspectives
- Complex studies of termite life
- Modern chemical ecology laboratory with research expertise on forest pest and tree samples
- State-of-the-art “Forentomics” (Forest Entomology using Omics) laboratory delineating molecular underpinnings behind forest pest adaptation to host
- RNA interference (RNAi) based next-generation forest pest management



GAME MANAGEMENT AND WILDLIFE BIOLOGY

- Magnetoreception and its influence on animals behaviour
- Spatial activity of game, monitoring and behaviour of wild animals (through sensors)
- Ecological consequences of animal personality
- Individual and interspecies variability in animal acoustic communication
- Relationship between car accidents and animals



WOOD SCIENCES

- Monitoring of wood and wood based composites properties in the machining process in terms of technical and technological factors in relation to energy intensity and the quality of the machined surface
- Optimization of machining process parameters with prediction of adequate timing of timber into timber technologies and products
- Physico-mechanical properties of wood from atypical habitats (North Bohemian brown-angled dumps)
- Physical-mechanical properties of wood for structural and non-structural purposes
- Properties and machining parameters of developed thermowood
- New types of wood-based composite materials and non-wood-based materials with specific properties for the intended use
- Mathematical models aimed at creating materials with specific properties for the intended use



FOREST ECONOMICS AND POLICY

- Socio-economic valuation of forest ecosystem services
- Socio-economic situation of forest owners
- Analysis of stakeholders in forestry policy
- Analysis of the processing capacity, flow and consumer chain of timber and wood products
- Non-wood forest products and their socio-economic impacts
- Forest policy
- Communication in forestry and the wood industry



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