

# Research Topics ESG - Centre for Ecosystem Studies

## Environmental Sciences Department

### Forest ecology and management

Certification of forest management  
Forest fires in forest ecosystem dynamics in Europe  
Global climate change & carbon, water and nutrient cycles  
Regeneration of semiarid plant communities  
Vegetation - atmosphere interactions  
Vegetation - herbivore interactions

### Nature conservation and plant ecology

Climate change and thermophilic invasive species  
Effectiveness of agro-environment schemes  
Global climate change & carbon, water and nutrient cycles  
Plant-soil interactions  
Regulation and functions of biodiversity  
Vegetation - atmosphere interactions  
Vegetation - herbivore interactions

### Resource ecology

Conservation of small populations of threatened species  
Effects of human interference on biodiversity in tropical ecosystems  
Fire and nutrient dynamics in savannah ecosystems  
Global climate change & ecosystem functioning  
Management of natural areas with agricultural/pastoral use  
Natural resource management options for tropical land use  
Soil - vegetation - climate - (large) herbivore interactions  
Wetland ecology and sustainable use in arid zones  
Wildlife conservation by sustainable use

## Alterra

### Ecotoxicology

Accumulation of persistent pollutants in terrestrial food chains (metals, PCBs, dioxins, etc.)  
Ecological risk assessment of pollutant effects on higher organisms (mammals, birds, amphibians, fish)  
Soil biodiversity and ecosystem functioning in polluted soils  
Ecological risk assessment of pollutant effects on soil invertebrate biodiversity (earthworms, mites, springtails, nematodes)  
Agro-biodiversity and emerging pollutants (endocrine disruptors, veterinary pharmaceuticals etc.)

### Forest Ecosystems

Monitoring of forest reserves  
Modelling (forested) landscape processes  
Historical ecology  
Ground layer vegetation in relation to overstorey  
Natural disturbances  
Improving ecological management of forests

### Freshwater Ecosystems

Studies on population dynamics in natural freshwater ecosystems  
Assessment and monitoring of freshwater ecosystems  
The effects of restoration measures in freshwater ecosystems on fish, macrophytes, phytoplankton and macro-invertebrate communities  
Habitat change, climate change and species diversity  
The relation between dispersion capacity of species and the success of restoration measures  
The effects of invasive aquatic species on the functioning of existing communities

### Functional biodiversity

Monitoring of terrestrial invertebrates (networks and evaluation)  
Management of biodiversity (ecological function, species under conservation and pest species)  
Change in soil use from agriculture to nature (life-support function soil)  
Indicators for habitat quality  
Ecology of pest species (e.g. Lyme and pests in trees)  
Effects of pollution on population viability of species (food-chain earthworm-vertebrate earthworm predator e.g. godwit)  
Effects of climate change and invasive species on population viability of species under conservation

### Genetic biodiversity and population ecology

Application and development of non-intrusive DNA sampling techniques for use in nature conservation  
Gene dispersal in European Oak species  
Genetic diversity in relation to forest management in European Beech populations  
Phylo-geography, genetic monitoring and management of endangered species (Red Grouse, Hamster, Otter)  
Conservation of genetic resources of tree species

### International nature management

Flyways of migratory waterbirds  
Co-ordination of Goose specialist group  
Development of Biorights principle  
Management of National Parks and Nature Reserves  
Development of guidelines for wise use of tropical forests

### Vegetation and wildlife ecology

Nature conservation and restoration strategies in natural and semi-natural landscapes  
Grazing management, ecosystem processes and species diversity  
Habitat change, climate change and species diversity  
'Farming for nature', and the restoration of species diversity in agricultural landscapes  
Eco-information tools (SynBioSys, Turboveg) for national and international (EU-Habitat directive) applications  
Population dynamics of re-introduced species (beaver, otter, hamster)  
Ecological networks for large herbivores and carnivores on a national and pan-European level

