Overall theme | Description (exemplary) | Methods | Contact
---|---|---|---
**Mechanisms driving biodiversity** | How does land use and habitat heterogeneity affect diversity of plant communities? | field and common garden experiments and observations | Katja Tielbörger

**Decision making and learning in plants** | Can plants choose between different plastic responses when facing different environmental conditions? Can plants learn? | greenhouse experiments, monitoring plant developmental-plasticity | Katja Tielbörger

**Global Change Ecology** | How will climate and land use change as well as invasive species affect species persistence or ecosystem functioning, particularly in drylands? | field observations and experiments, plant functional traits, remote sensing | Jan Ruppert, Katja Tielbörger

**Functional & ecological morphology** | Study of form and function of morphological key structures of insects and their biological role; also under consideration of miniaturization of body size | micro computer tomography, 3D reconstruction, electron microscopy, histology, experimental morphology, highspeed videography, morphometry | Oliver Betz, Stefan Fischer

**Insect faunistics & ecology** | Collection and interpretation of faunistic data on different groups of insects for conservation or field ecological questions | standard field collection of insects, field ecology, statistics | Oliver Betz

**Bionics** | Bionic research in different fields, e.g. adhesive systems, wing folding, movement principles, bionic theory | | Oliver Betz, Manfred Drack

**Marine visual ecology** | Studies of the visual interactions between fish and their prey or predators in the field and in the lab to test whether they can use light emitted from their eyes by e.g. fluorescence for detection. Predator detection. Camouflage. Light in the sea. | lab observations, eye anatomy, spectrometry, visual modelling, fish training, SCUBA diving, controlled light environments, microscopy, optics, digital imaging and analysis, field experiments, ... | Nico Michiels, Matteo Santon

**Bird conservation ecology** | Field studies at the interface between applied species conservation and management and the ecology of endangered species. Current studies focus on farmland birds (Corn Bunting, Partridge, Lapwing) | Standardized field surveys of birds and their habitats, bird banding, analysis of habitat use using GIS and statistics | Nils Anthes

**Plant conservation ecology** | Field studies at the interface between applied species conservation and management and the ecology of endangered species. Current studies focus on dry grassland restoration and on rare plant species | Standardized field surveys of plants and their habitats, reseeding experiments, population viability analyses | Katja Tielbörger, Michael Koltzenburg

**Invasive plants** | What makes invasive plants successful? What are the roles of different environmental factors and biotic interactions? | Multifactorial experiments in greenhouse, garden or field. Mesocosms (experimental communities), | Madalin Parepa, Oliver Bossdorf, Katja Tielbörger

**Plant evolution & adaptation** | How much genetic and phenotypic variation is there in natural plant populations? How do plants respond to environmental change through plasticity and evolution? | Controlled experiments in growth chamber, greenhouse and garden. Phenotype measurements. Molecular analyses. Quantitative genetics. | Niek Scheepens, Oliver Bossdorf

**Ecological restoration** | Genetic and ecological differences among the different seed materials used for plant community restoration. Ecological consequences of different restoration strategies. | Common garden studies of different seed provenances. Community-level tests of ecological restoration. Biotic interactions (pollination, herbivory) experiments and observation. | Oliver Bossdorf

**Ecotoxicology** | Field and lab studies on the effects of environmental pollutants on fish and invertebrate animals | Field and climate chamber experiments, biochemistry, histo(path)ology, embryology, physiology, quantitative analysis of behaviour | Rita Triebskorn, Heinz Köhler
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<td>Physiological stress ecology</td>
<td>How do individuals arrange themselves with natural stressors, e.g. heat? Aspects of physiological variation and selection pressure</td>
<td>Field and climate chamber experiments, thermography, thermal imaging, biochemistry, morphometry, respirometry</td>
<td>Heinz Köhler, Rita Triebskorn</td>
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<td>Body plan changes</td>
<td>Developmental transition of body plans in molluscs as a model for macroevolution</td>
<td>Lab experiments, embryology, microscopy</td>
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