

Possible and proven effects of global climate change on the biodiversity in Hesse

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Weather phenomena connected with global climate change show large variation on a regional scale. Therefore regional monitoring programmes of ecosystems, especially those providing long term-data are needed to detect the direction and extent of ecological change and provide information on the vulnerability of rare and protected species.

Besides increasing regional ecological research several conservation measures should be taken. Creating a net of habitat corridors between conservation areas as envisioned by the European NATURA2000 programme has become even more vital to nature conservation in the light of global climate change since it forces organisms to move to meet their ecological requirements. Moreover, small isolated populations with low genetic diversity are especially vulnerable to fast ecological changes. In addition to connecting habitats of isolated populations, genetic diversity can also be saved by protecting as many local populations of rare and endangered species as possible, for each of them holds its own potential for adapting to ecological change.

Large stable ecosystems show more resistance against invasive species (neobiota) than small disturbed habitats. This should be considered when choosing sites for new nature conservation areas. Early measures to eliminate certain invasive species should be taken if they prove to be a threat to highly endangered species, rare habitats or human health.

The ecological evaluation of grassland sites has to include additional animal taxa to take changes in species distribution into account. For instance moths and butterflies as well as grasshoppers show higher abundance and diversity in many sites today than years ago.

Grassland management schedules have to be adjusted to the advanced growth and flowering of many species. A general ban of grassland use and management activities before 15th June is no longer sensible.

Since global climate change is an enormous challenge for ecosystems as well as single species, increased efforts have to be made in order to reduce additional threats such as habitat destruction, pollution and acid rain, over-fertilisation, wetland drainage and lowering of the water table. This can be achieved by enforcing resource protection and sustainable management strategies.

Planting fast growing exotic trees to balance greenhouse gas emissions does not prove to be successful or sensible ecologically. Instead, converting forest monocultures into near natural mixed forests can help to make forests more resistant to the threats of climate change including extreme weather events.

Effects of global climate change on ecosystems are already noticeable in Hesse and will increase. A possible massive loss of biodiversity can still be prevented if fast measures are taken.