

Plants and animals under greater threat due to climate change

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Plant and animal species can lose their ability to adapt as a result of climate change. This is shown by research performed by Marleen Cobben with which she hopes to obtain her doctorate at Wageningen University on April 17, 2012. Cobben used computer calculations to illustrate how the genetic base of plants and animals is seriously deteriorating due to climate change. The smaller genetic base makes species more vulnerable to problems such as diseases. Moreover, the fragmentation of landscapes and the loss of wildlife areas is accelerating this decline.

Cobben has demonstrated that climate change is causing the populations on the northern side of the species' living area to migrate further north. However, these populations have less [genetic variation](#) than the populations that live in the centre of the species' range. As a result the populations that establish further north are genetically poor.

The populations in the centre of the living area have more genetic variation. Cobben's research shows that the large genetic variation in these populations cannot migrate north quickly enough when temperatures rise. If these populations become extinct, this genetic variation is therefore lost. And this loss is definite: Gene varieties will disappear permanently from the species, causing an overall genetic impoverishment.

A reduced genetic base makes plant and [animal species](#) more vulnerable to threats such as diseases: when fewer gene varieties exist there is a

smaller chance that a gene variety is present when a plant or animal [population](#) is threatened by a disease. The species therefore loses part of its ability to adapt.

Cobben's [computer calculations](#) shed a new light on the effects of [climate change](#) on plants and animals. People often think that species with slow shifting ranges will manage by adapting to the new climate conditions: adaptation as an alternative survival strategy. However, if the right gene varieties cannot migrate to the right place fast enough, [plants and animals](#) will be less 'climate-proof' than expected.

Cobben believes that her findings underline the importance of preserving or creating large wildlife areas and connections between these areas. "This gives us more time," she says. "Preserving genetic diversity for a species is linked to the survival of populations in the centre of the species' range. The longer these survive, the larger the chance that those gene varieties can migrate north. If this migration is blocked by barriers in the landscape, the genetic variation will decline more quickly, making the species even more vulnerable to new threats such as diseases."

Cobben's research was carried out on the middle spotted woodpecker, a species which has increased in numbers in the Netherlands over recent years. The woodpecker is a so-called 'model species', meaning that it is very suitable for this type of ecological research.

Woodpeckers are most easily found at this time of year, in early spring. They are very active, and pecking. Since the trees have yet to develop full foliage, they are relatively easy to spot.

Provided by Wageningen University

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