

Calculating fussiness

November 7 2011, Roelof Kleis

How fussy is a plant? A new measurement method developed by Alterra, part of Wageningen UR, gives the answer in a simple number.

Some plants are not so choosy; they grow pretty much everywhere. Take daisies or the grass growing between paving stones. Or dandelions, if you ignore the many dozens of micro-species. But a lot of plants are much fussier and are only to be found in certain niches in the environment. Wageningen UR researcher Albert Corporaal thought up a simple measurement for a plant's fussiness. Fussiness expressed as a number between zero and one hundred.

Stenoecity

The concept this is based on is stenoecity, a term thought up by Corporaal himself. 'Steno means short or abbreviated and oekos refers to ecology. So the number is an abbreviated notation for the ecological fussiness. Ecological knowledge about a plant summarized in a number between zero and one hundred. The smaller the number, the fussier the plant.'

Measuring fussiness is not new as such, says Corporaal. Site managers talk of ecologically fussy species. These are mainly choosy species requiring protection and appearing on lists such as the well-known Red List. 'But I can't do sums with a Red List. My number is an alternative, a way of quantifying the ecological fussiness.'

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The fussiness score incorporates the values of seven environmental variables for the sites where the plant grows in a simple and systematic manner. These are the soil's acidity, fertility, [salt content](#), [moisture content](#), soil texture (graininess), soil dynamics and the amount of daylight available. The final score is the plant's stenoecity, or fussiness. Corporaal has calculated the stenoecity for all 1,750 plants that grow wild in the Netherlands. This gives scores ranging from 17 (awlwort/slender bedstraw) to 77 (common chickweed/perennial rye grass). The vast majority of these species (more than 1,200) are reasonably to very fussy. These are species that are only found in a limited ecological range. A minority are not very fussy or not at all fussy and are found all over the place.

Extinction

This new concept allows Corporaal to determine precisely when a plant risks extinction in the Netherlands, for example. That is the case if the stenoecity drops below 26.5. The effects of climate change on the plants (e.g. temperature or rainfall) can be calculated directly. The same is the case for conservation measures. The ecological significance of areas can be captured in a few numbers using stenoecity. These are some of the many possible applications.

GDP

Furthermore, stenoecity is not just applicable to plant life. Corporaal: 'The method can be used for all flora and fauna, including birds, butterflies and other creatures. What is more, this lets me compare these groups with each other. In fact, I can compare apples and oranges.' Dandelions are the great tits of the plant world: both lead the field in lack of fussiness. Or what about a Gross Domestic Ecological Product, analogous to the well-known concept of GDP? Corporaal says it's

possible.

Corporaal has described his idea in detail together with colleagues at Alterra in a report for the Ministry of Agriculture. He is working on a scientific paper. These are the first steps towards general acceptance. 'The idea is that ultimately the figures should be a permanent component of the Dutch flora reports.'

Provided by Wageningen University

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