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Restoration, succession and climatic change

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Abstract
Two outstanding papers on restoration and succession are briefly discussed as model papers for the type of research papers *Appl. Veg. Sci.* should publish. The paper on restoration concentrates on the introduction of hay to a site in order to speed up the introduction of target species. The paper on succession discusses the importance of plant colonization 'windows' opened by extreme weather events for succession and for offering optimum periods for intervention in restoration practice.

Some remarks are also made on the electronic availability of ecology papers.

Keywords: Colonization; Electronic availability; Hay introduction; Restoration; Succession.

Restoration through introduction of hay

The paper that receives the Editors' Award for Vol. 6 is that by Hölzel & Otte (2003). It was chosen by the Chief Editors as the paper that most impressed them, and that best exemplifies the type of paper they would like to see in the journal. This paper is linked to the study by Donath et al. (2003) on site conditions and seed dispersal in the same meadows.

Jan Bakker writes of Hölzel & Otte (2003): "As a result of agricultural intensification, characteristic Central European flood-plain communities such as *Cnidion* and *Molinion* are currently much endangered. The question is how restoration can be brought about by: (1) changing the abiotic conditions, e.g. reduction of nutrient availability, and (2) re-establishing target plant species, i.e. those typical of the endangered plant communities. Although some species are known to have a long-term persistent seed bank, the majority of the target species cannot rely on the seed bank when it comes to restoration. Re-establishment from elsewhere by river water entering the flood plain is marginal. The aforementioned ideas were tested in a large-scale field experiment by the introduction of hay, including seeds, from reference sites harbouring the target communities. A comparison was made with control sites, and with others in which the top soil had been removed down 50 cm. The latter treatment was very effective in reducing nutrient availability to the same level as in the reference sites. It also reduced the viable seed bank of non-target species such as arable weeds and resident grassland species. The re-establishment of target species from hay was very successful, especially in sites that were regularly flooded, thus creating favourable moisture conditions for seedling emergence. This hay-spreading experiment should become a classic paper for restoration of endangered plant communities."

Plant colonization during secondary succession

The editors were also impressed by Bartha et al. (2003). Bastow Wilson writes of it: "It is difficult to investigate succession. One problem is that succession usually occurs over decades. In high-stress environment such as arctic and metalliferous ones, it occurs over centuries. PhDs don't last for centuries (though it sometimes seems like that), nor do research grants. The real answer is to start long-term permanent plots, and we hope that the American LTER research programme will eventually yield long-term records. Space-for-time substitution involves assumptions that may not be warranted. Neither is space-for-time substitution always necessary: there are genuine long-term records already in existence. Bartha et al. use one of the most impressive of these – the Buell-Small oldfield plots that were started in New Brunswick in 1958. This is real deductive science, in that the plots were set up to test Egler's Initial Floristic Composition theory, and the authors find considerable support for one variant of the theory. However, they found effects that were not envisaged when

the plots were set up: that there were particular years when vegetation change was much faster. 'Windows' they called them, and related them to the resource fluctuation theory of invasibility. The 'applied' aspect is obvious from the title of the special feature the paper was in: 'Restoring plant communities' (van Diggelen & Marrs 2003)."

The paper by Bruelheide (2003) was concerned with the impact of climatic change, also listed as a core topic for *Appl. Veg. Sci.* Bastow Wilson writes: "They studied this by translocating a whole sod of montane meadow (vegetation plus soil) to a site 430 m lower in elevation. The sod was 2m wide × 2m long × 2m deep, so it had to be moved with a bulldozer and lorry (who says only physiologists can have high-tech equipment?). There was also a control plot, moved to just a few metres from its original position. The aim was find the responses of the montane species to the higher temperatures found at the lower elevation, and to find these responses in the context of the whole community. The results showed that all the species … … …, well, they didn't all do anything. Four of the eight basically-montane species decreased in cover, but the other four did not change. So far as they could tell, the abundance of different species changed for quite different reasons: one declined because it didn't like the higher temperature at lower elevations and two because they didn't like the drier air. The most abundant species (*Festuca rubra*) increased in cover, probably because of increased nutrient mineralisation, and several species appeared to decline because of increased competition from it. One species apparently died out from increased slug herbivory. This is often the way in Vegetation Science: when we find the truth, there are individualistic responses rather than general trends. To adapt J.B.S. Haldane: the Universe is not only more complicated than we imagine, it is more complicated than we can imagine."

Electronic availability

Electronic access is taking over from the printed word. Our research students don't think of going to the library: they access journals online, or they don't bother. One way of accessing *Appl. Veg. Sci.* has always been to take out an electronic subscription with the publishers (see www.opuluspress.se). However, librarians love buying packages of online journals ("never mind the quality, feel the number"). They can now buy a package including *Appl. Veg. Sci.* (getting both quality and number), because *Appl. Veg. Sci.* is now a part of the BioOne (www.bioone.org) package, from Vol. 5 onwards.

BioOne comprises ca. 70 society-owned journals, and the list is growing. It includes *American Zoologist; Arctic, Antarctic and Alpine Research; BioScience, Biotropica; Bryologist; Evolution; Journal of Palaeontology; Mountain Research and Development; Paleobiology; Proceedings of the Academy of Natural Sciences of Philadelphia; Systematic Botany; Weed Science*; and *Wetlands*.

Older issues of *Appl. Veg. Sci.* will shortly be available in the JSTOR archive.

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