

The right amount of grazing builds diverse forest ecosystems

July 28 2014, by Thomas Deane

Botanists from Trinity College Dublin have provided surprising evidence to show that preventing hungry deer from munching on plants actually decreases floral biodiversity in globally important woodland ecosystems.

When large herbivores, such as Red, Sika, and Red-Sika hybrid [deer](#), are excluded from semi-natural oak woodland ecosystems in Ireland, the composition and abundance of forest-floor plants is greatly changed; plant communities become significantly less diverse over time as some species begin to dominate, with Bambi and co no longer a threat.

The botanists, from the School of Natural Sciences in Trinity, used an existing network of seven long-term experimental deer 'exclosures' to monitor [biodiversity](#) changes over time. The sites were located within EU-level protected oak woodlands in the Wicklow Mountains National Park, Co. Wicklow, Killarney National Park, Co. Kerry, and Glenveagh National Park, Co. Donegal, and were surveyed periodically for up to 41 years. The botanists have just published their findings in the international peer-reviewed journal *Forest Ecology and Management*.

Researcher Dr Miles Newman, who is lead author of the journal article, said: "This research indicates that deer grazing, at the correct level, is highly important for the conservation of our native oak woodlands."

Semi-natural woodlands are a globally important relict ecosystem for biodiversity. This is especially the case in Ireland where woodland is the natural vegetation cover, but where this habitat type has been reduced to

less than 2% of the overall land cover. These relict woodlands are threatened by a range of human-induced actions and changes, such as land-use and climate change, as well as by deer overgrazing.

"Grazing is a natural factor within woodland ecosystems but when levels get too high tree regeneration and biodiversity become threatened," added Professor in Quaternary Ecology at Trinity, Fraser Mitchell. Consequently, fencing to conserve biodiversity is increasingly used as a management tool and so this prompted the investigation of the long-term impacts of deer removal.

Another management tool is deer culling, but this is an emotive issue and is also beset with practical difficulties. When appropriate culling is not achievable, the botanists suggest that fencing remains a viable alternative – but only on a short-term basis (e.g. for less than 12 years). This is because the results of their study have shown that, over time, ungrazed woodland plant communities lose their biodiversity value due to a small number of species taking over.

"Our results certainly have implications for the management of these woodlands as future policy should focus on managing deer – rather than simply excluding them – as part of the overall biodiversity objective. We are now working on the next step to identify what the 'optimal' level of deer grazing may be, added Dr Newman.

Woodland ecology, it seems, is a little like life – it's often best to do things in moderation. If there is too much or too little grazing, these important habitats may lose valuable species for good.

More information: *Forest Ecology and Management* 321 (2014) 136–144.

The complete article is available online:

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Provided by Trinity College Dublin

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