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New Natura 2000 sites can be located using indicator species method

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A new method for identifying forest sites to protect under the Natura 2000 network — as well as reviewing existing sites — is presented in a recent study. The modelling approach predicts the location of certain types of high nature value habitats using existing data on the distribution of key indicator species. The study demonstrates the method using the case of a German federal state, Lower Saxony.

It is likely that more sites will need to be protected by Natura 2000[1] under the EU's Biodiversity Strategy to 2020[2] as part of efforts to stop increasing biodiversity loss. However, identifying which sites are most important to include can be challenging due to a lack of existing data on wildlife, and the time and expense of surveying habitats.

Therefore, the authors of this study developed a method which uses computer modelling to predict where high nature value sites are likely to be — these sites include any habitat that is of interest for nature conservation on the national and/or European level — and may encompass several different criteria, such as habitat type, rareness, or biodiversity hotspots. In this particular study, 'high nature value' refers to those forest habitats that are important at the European level and therefore protected under Natura 2000. It can also be used to assess the suitability of existing sites for protection.

The study focuses on forest habitats in Lower Saxony as a case study of how the method could be used. The researchers gathered data on plant species in the state from a monitoring programme that has been in place since 1982. Over 1500 volunteers and professionals have submitted data to the programme on sightings of vascular plants (land plants which have tissue for conducting water and minerals within the plant), including herbs, grasses, shrubs and ferns.

They also gathered information from existing habitat surveys on the known location of the region's 'forest communities', i.e. tree species growing together in the same location. These were assigned corresponding Natura 2000 habitat types, where appropriate, as listed in the Interpretation Manual of European Union Habitats.

Key indicator vascular plant species, or 'diagnostic species' were identified using a computer algorithm. This considers which plants are likely to occur together, and not occur with other groups of species. It also considers which plants are strongly associated with certain forest habitat types.

The researchers then produced maps of the diagnostic species and habitat distribution. Information about where these plant species occurred (indicator plant species), was used to predict the location of different forest types. These allowed the researchers to develop computer models that predict where researchers would be most likely to find habitat locations with a high nature value.

The model had poor predictive ability for some forest types, such as beech, oak and hornbeam forests on weakly to strongly acid soils, because there were not enough plant species that were strongly associated with these habitats. However, a number of upland forest types were successfully predicted. These included broad-leaved forest communities on dry limestone soils, *Carici-Fagetum* and *Galio-Carpinetum* forests.

Generally speaking, habitat types could be predicted more successfully if they had a higher number of indicator species, or if the species were strictly forest dwelling. The researchers say their indicator species method could be easily adapted to other European countries using data from national vascular plant monitoring programmes and by identifying locally relevant species.

1. http://ec.europa.eu/environment/nature/natura2000/index_en.htm
2. http://ec.europa.eu/environment/nature/biodiversity/comm2006/2020.htm