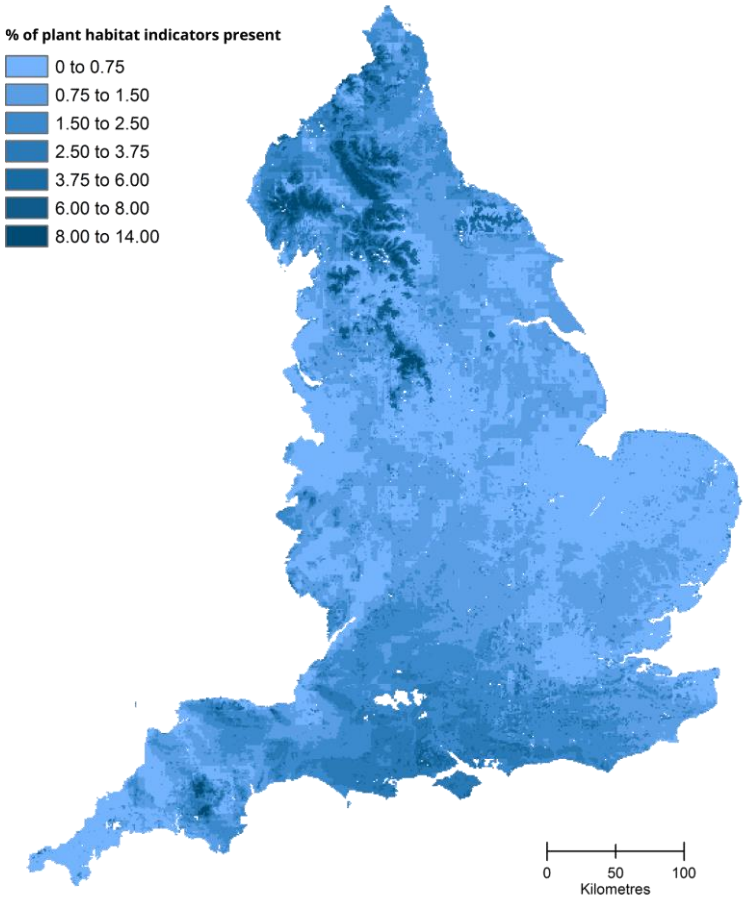
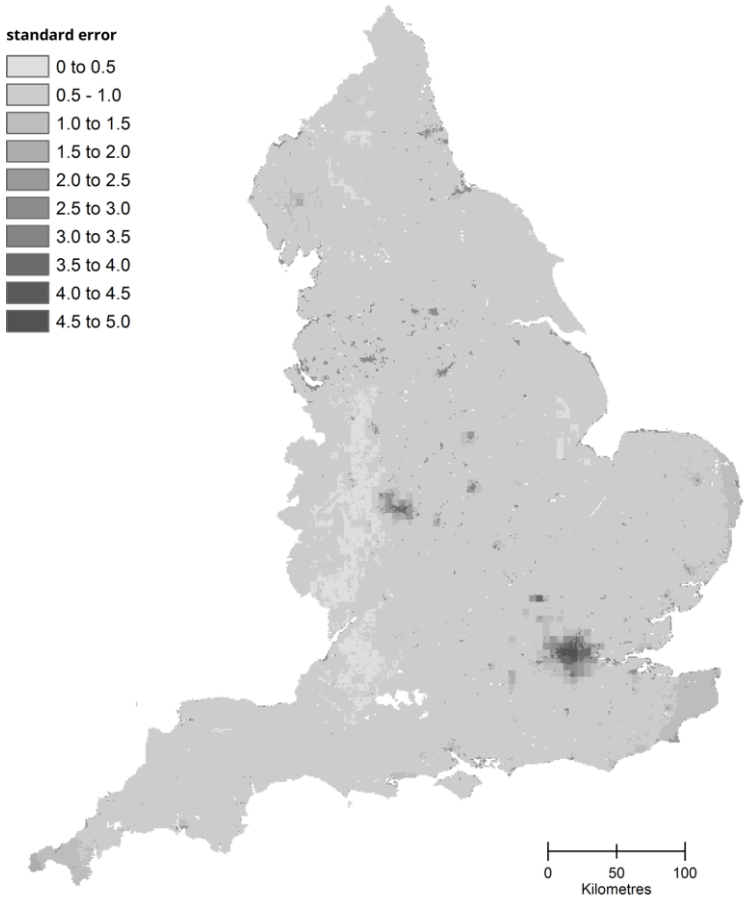
Plant indicators for habitats in good condition

Mean estimates of expected plant habitat indicators (% of plant habitat indicators present)



Uncertainty: Standard error from the mean estimates



Plant indicators for habitats in good condition

Mean estimates of expected plant habitat indicators measured as percentage of plant habitat indicators present.

What does this map show?

The expected plant indicators for habitats in good condition map is based on the occurrence of plant species that are positive indicators for different habitats. The indicator species are taken from the Common Standards Monitoring guidance for Sites of Special Scientific Interest [1], so are based on habitats of high conservation value. They represent species that are characteristic of habitats which are in good condition. Total plant species richness can be deceptive as a measure of biodiversity, higher species numbers may be an indicator of nutrient enrichment or disturbance. Additional species may be out of place and indicate poor condition. By using species that are agreed positive indicators, or 'characteristic' species, and calculating a proportion between the observed plant diversity and the potential indicators within that habitat type, a better understanding is gained of habitat condition and the nature of the plant diversity. Positive habitat indicators are useful in providing information on ecosystem health and the capacity to maintain supporting or regulatory ecosystem services. They are also a cultural service measure, as a number of the species are 'desirable', aesthetic, culturally important species associated with particular habitat types.

The map shows that there are higher proportions of positive indicator species in northern England and upland areas. Upland areas contain habitats such as bog, heathland, acid grassland which are less intensively managed, still retain significant numbers of indicator species and can cover large areas. Areas of higher richness in the south of England may reflect the distribution of other priority habitat types such as calcareous grassland.

How was this map produced?

This map was produced by using the proportion of positive habitat indicators for each 2m × 2m plot in the Centre for Ecology & Hydrology Countryside Survey (2007). There were 8278 sample locations, across GB within 591 1km squares. Measurements were extrapolated up to a national level using statistical analysis. This extrapolation was based on relationships between the proportion of positive habitat indicators and environmental variables which affect their distribution: broad habitat type, geology, temperature, precipitation and nitrogen and sulphur deposition. The relationship between habitat indicators and the presence of a Site of Special Scientific Interest designation was also used in the extrapolation.

What are the limitations of this map?

1. Areas such as urban and littoral rock are not sampled by Countryside Survey and therefore have no associated data. These areas are shown in white on the map.

2. The map shows mean values at a 1 km square resolution. The standard error attributed to the mean estimates is only valid at 1km square resolution. The standard error at different resolutions is unknown.

3. The values for each 1 km square are generated from a statistical model of samples from approximately 591 1 km squares. Hence the map does not show direct measurements at all locations.

Further detail on the steps for creating this map

1. A list of positive habitat indicators [10] was compiled based on the Common Standards Monitoring guidance in association with the Botanical Society of the British Isles [2,3].

2. Data is taken from Countryside Survey 2007 which surveyed 591 1km squares as part of a stratified random sample across Great Britain. This was stratified by land class based on topography, geology, soils and climate [4]). A series of 2m × 2m vegetation plots was located within each 1 km square [5]. Each vegetation plot was assigned to a broad and priority habitat type [6,7]. Within each vegetation plot all vascular plants were recorded (nomenclature followed [8,9]). For this analysis only area plots were used, rather than plots from linear features, such as hedges.

3. The number of positive indicator species in each vegetation plot was calculated using the list mentioned above. The habitat classification of each plot was used to choose the indicators, so that, for example, heathland indicator species were used for heathland plots. The proportion of positive indicator species was calculated by dividing the count by the total number of positive indicator species that could have been recorded for that habitat.

4. Using a statistical model (a generalized additive model), a mean estimate of the proportion of positive indicator species for each habitat, was extrapolated across the whole of England. This extrapolation was based on the proportion of positive indicators associated with a number of variables: broad habitat type (the dominant broad habitat in each 1km square was used for the model), geology, temperature, precipitation and nitrogen and sulphur deposition, as well as the presence or absence of a Site of Special Scientific Interest designation.

5. The statistical model was also used to produce an associated standard error map. High values reflect high variability and hence greater uncertainty in the mean estimates.

How to obtain the data

Data can be downloaded from https://eip.ceh.ac.uk/naturalengland-ncmaps.

You must cite:

> Maskell, L.; Henrys, P.; Norton, L.; Smart, S. (2016). Model estimates of expected diversity of positive plant habitat condition indicators. NERC Environmental Information Data Centre. http://doi.org/10.5285/cc5ae9b1-43a0-475e-9157-a9b7fccb24e7

References

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10. Species indicator list *(derived from Hill, M.O.; Preston, C.D.; Roy, D.B. (2004). PLANTATT - Attributes of British and Irish Plants - Spreadsheet. Centre for Ecology & Hydrology)*. http://eip.ceh.ac.uk/naturalengland-ncmaps/reports/plantindicators_spplist.

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