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16   A Provisional Empirical Nitrogen Critical Load Map for Terrestrial Ecosystems in Wales

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Ecosystem data were taken from a version of the ITE digital land cover map which records twenty five land cover types, derived from satellite data, giving the dominant land cover type for each twenty five metre cell of the British National Grid. For the purposes of this initial study, modal data at one kilometre resolution were used. The nitrogen critical loads for selected terrestrial ecosystems were taken from the classification developed at the Lokeberg workshop (Hettlingh *et al.* 1992). Nitrogen critical loads were assigned to ITE land cover types based on the nearest match between ITE land cover type and ecosystem descriptions. Because the land cover types are essentially broad structural categories and the ecosystem types for which critical loads have been derived are relatively narrow functional classes, the cross matching is fairly subjective. Alternative solutions could be considered, but, as a first attempt, critical loads were assigned as a mean of the reported range for each ecosystem in kgN ha^{-1} yr^{-1}, as shown in Table 1. The resulting map is shown in Figure 1.

Table 1   Land cover types and nitrogen critical loads.

Land cover value	Land cover description	Critical load	Ecosystem
5	Grass heath	13.5	Species-rich lowland heaths, acid grassland
7	Meadow/verge/semi-natural grassland	22.5	Calcareous species-rich grassland. Neutral-acid species-rich grassland
8	Marsh / rough grass	27.5	Mesotrophic fens
9	Moorland grass	12.5	Montane-sub alpine grassland
13	Dense shrub heath	18.5	Lowland wet & dry heath
15	Deciduous woodland	17.5	Acidic (managed) deciduous forest
16	Coniferous woodland	17.5	Acidic (managed) coniferous forest
25	Open shrub heath	18.5	Lowland dry & wet heath

Deposition data (wet + dry) for oxidised nitrogen (NO$_x$) and reduced nitrogen (NH$_y$) were imported as separate grid coverages, at twenty kilometre resolution. In order to produce the exceedance maps at the same resolution as the nitrogen critical load grid coverage, the deposition grid coverages were resampled to a one kilometre resolution. This meant that each component one kilometre cell was ascribed the same value as the original full twenty kilometre square and leads to the curious appearance of the exceedance maps (eg Figure 2). A total inorganic nitrogen deposition grid coverage was also produced by summing the NO$_x$ and NH$_y$ deposition grid coverages.
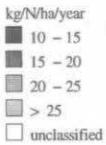
kg/N/ha/year
■ 10 – 15
■ 15 – 20
▨ 20 – 25
☐ > 25
☐ unclassified

kg/N/ha/yea
■ >14
■ 7 – 14
▨ 1.4 – 7
☐ 0 – 1.4
☐ unexceeded
☐ unclassified

Figure 1 **Provisional Empirical Critical loads for nitrogen for terrestrial ecosystems**
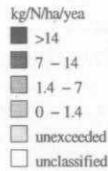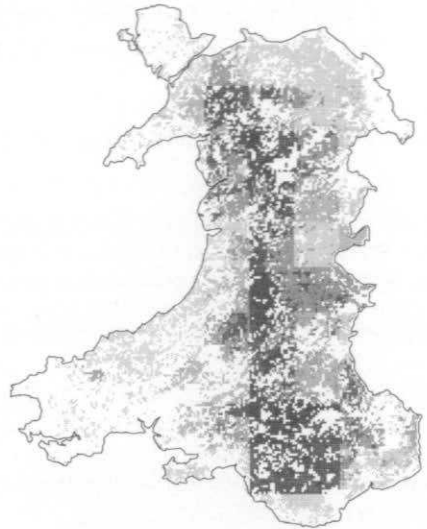
Figure 2 **Exceedance of Provisional Critical Loads for Nitrogen Total N deposition for terrestrial ecosystems**

Reference

Hettelingh, J-P, Posch, M., de Vries, W., Bull, K. and Sverdrup, H.U. (1992) Guidelines for the computation and mapping of nitrogen critical loads and exceedances in Europe. In: Critical Loads for Nitrogen - A workshop report, Eds. P Grennfelt & E Thornelof, Nord 1992:41, Nordic Council of Ministers, Copenhagen.