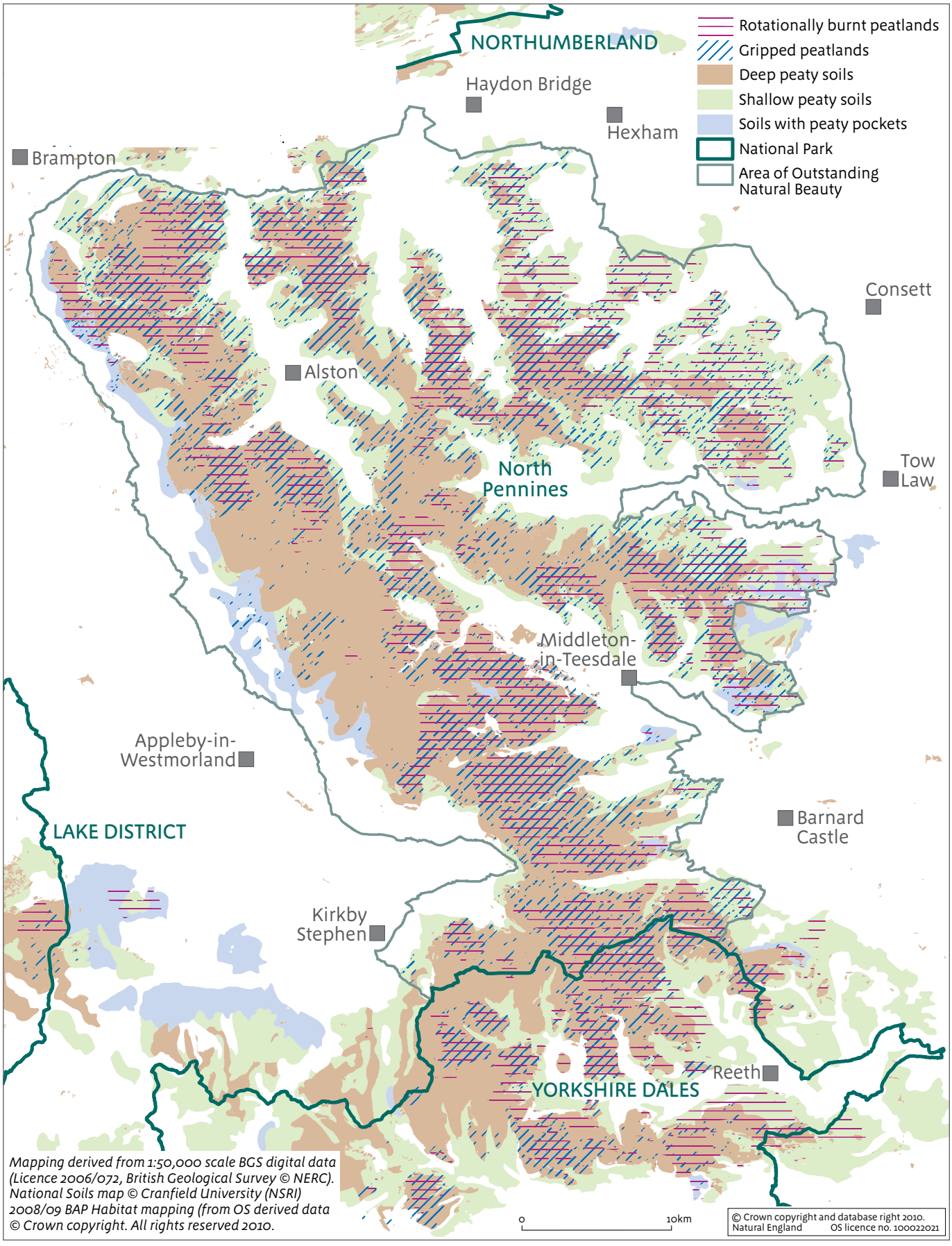
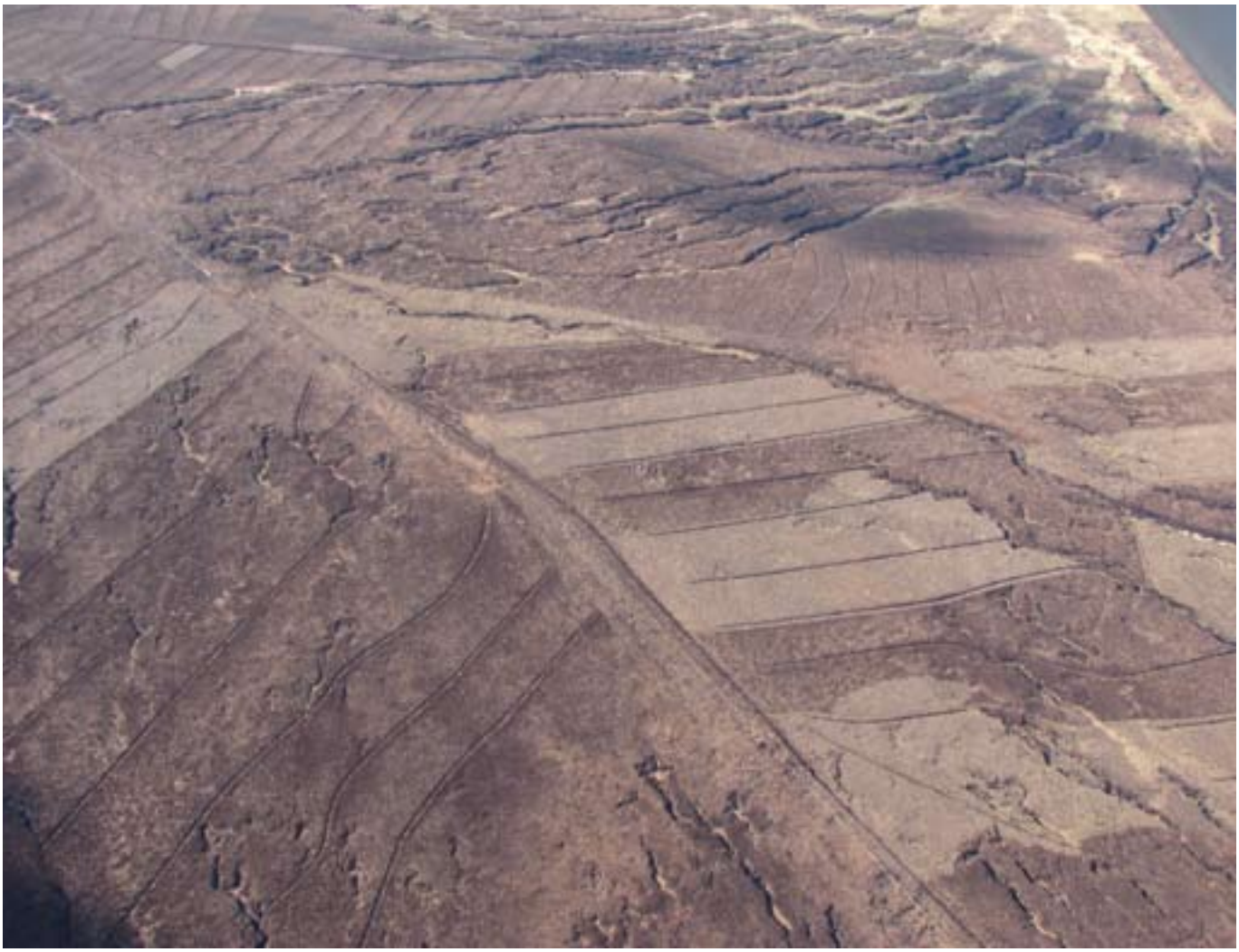
Map 5: The blanket peatlands of the North Pennines AONB and Yorkshire Dales National Park are among the most intensively gripped (drained) in the country, and are also subject to widespread rotational burning for grouse moor management.



Erosion at the sides of haggs and gullies can eventually undermine the remaining vegetation and leave a landscape of **bare peat**. This can also occur as the result of severe wildfires which burn into the peat. Bare peat presents inhospitable conditions for life, being acidic and constantly eroding by rain splash, frost heave and wind as well as becoming very hot and dry in warm weather. Once dried, the peat does not absorb water easily and it shrinks, cracks and is eroded away. Eroded peat can be deposited in flatter areas in gully bottoms, but much is carried into rivers, reservoirs and water bodies downstream. Where peat is loosened or undermined by erosion, large blocks of peat can be lost, and entire peat masses can be lost in catastrophic 'peat slides'. Just over 4,000 ha of blanket bog peatland is bare (mostly in the Peak District); this makes up 1% of all deep peat.

To supply the nation's demand for timber, the early and mid-20th century saw a concerted programme of **afforestation**, mostly using fast-growing conifer species. Land that was of marginal use for agriculture was targeted for plantations, and this often meant areas both of shallow and deeper upland peat. To enable tree growth large areas of peatland were deep ploughed, damaging the soil structure and draining the peat. Approximately 5% of English deep peat has been afforested, mainly on blanket bog (7%) and raised bog (17%) habitats. Our largest area of afforested peatland, at Kielder and Wark Forests, is shown in Map 6.

Peat is **extracted** for use as a growing medium in gardening and professional horticulture. The water-retaining properties of bog moss peat made it an ideal ingredient for composts. Peat extraction for gardening use has affected many of our remaining raised bogs, and continues in several sites in England. Efforts over the last 12 years to reduce peat use have resulted in a expansion of peat alternatives, which now constitute the majority (54%) of this rapidly



Moorland grips, such as these at Weardale in the North Pennines, have been dug across 750km2 of our upland deep peatland

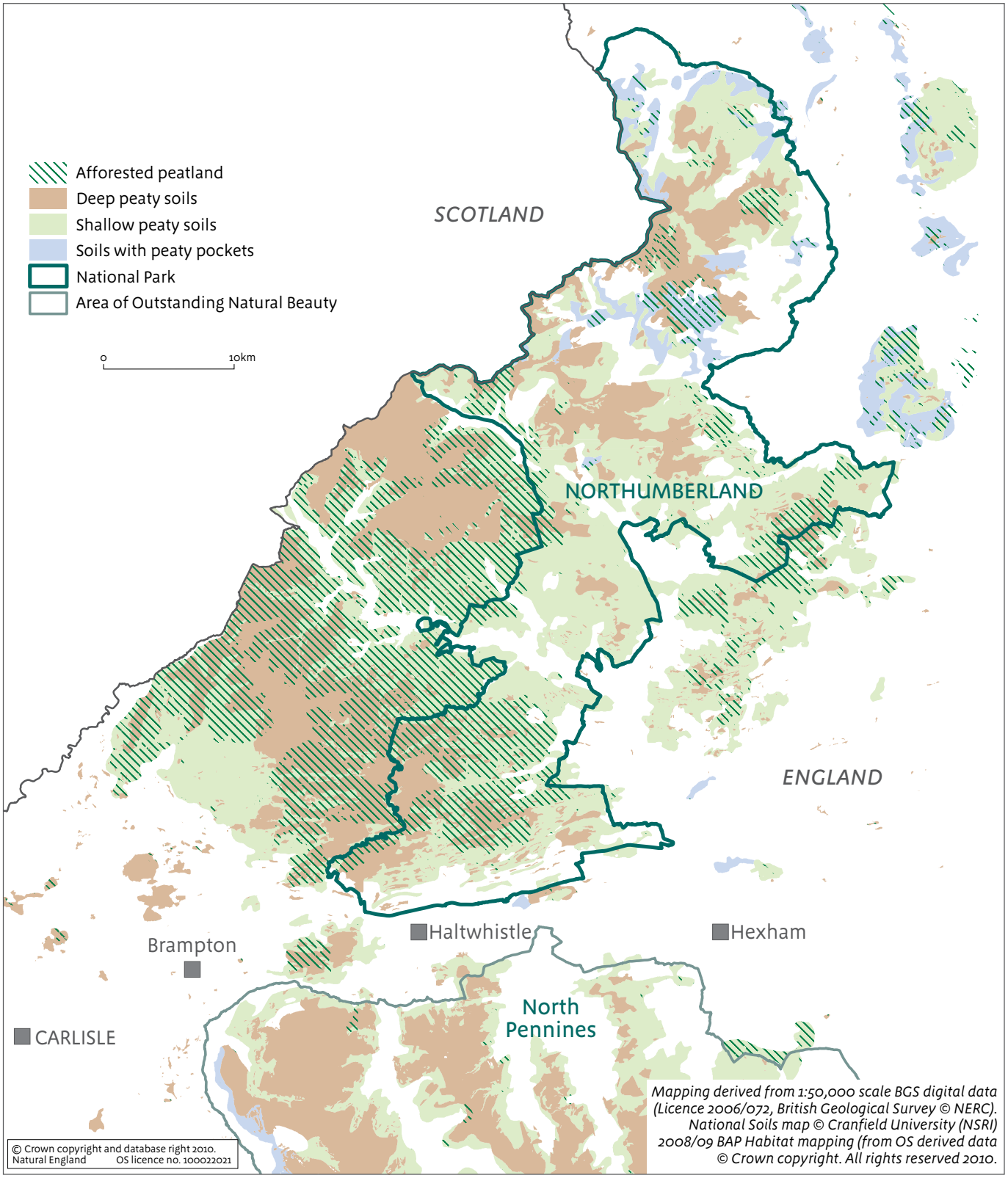
growing market but only a small reduction in total peat use. Extraction is still damaging 1% of deep peats, and 16% of our raised bogs remain affected.

Our expanding population has increased demand for housing, transport and other infrastructure, and peatlands have been affected by being **removed or developed**. These developments also demand more raw materials and peatlands have been affected by mineral extraction to supply this demand. Furthermore, our need for waste disposal has increased even faster than our population and some peat extraction sites have now been converted to landfill sites, effectively ending any possibility of them being restored to active peat bogs. Many developments can also have adverse impacts on deep peat; ironically, this includes wind farms. Here impacts can arise from the development of access roads, the construction of turbine bases, drainage works associated with the construction process and the removal of turbine bases at decommissioning. Around 2% of deep peats have been removed or damaged by development.

Approximately 14% of our blanket bog peat is eroded into haggs and gullies

Wildfire, erosion, drainage and grazing can lead to areas of bare peat and mineral soil

Map 6: The border moorlands of Northumbria and Cumbria support our largest area of coniferous plantations, covering large areas of shallow and some deeper peaty soils.



Peat milling at Thorne Moors, Yorkshire. This site has now been largely restored, but peat extraction for horticulture continues to affect 16% of our raised bog peatlands.

Industrial activities during the last 200 years also increased airborne pollution, depositing soot and heavy metals on our upland peatlands. Sulphur dioxide from coal-fired power stations caused acid rain which put additional pressure on the vegetation of the already acidic upland peatlands. This acidification has now been reduced by cleaner power generation but bog peats remain sensitive even to low deposition levels and are extremely slow to recover from acidification. In addition, peatlands continue to receive damaging deposition of ammonia pollution (much of which comes from intensive agriculture) and oxidised nitrogen pollution (primarily from fossil fuel burning). These both acidify the peat and raise nutrient levels which cause the delicate bog vegetation to be replaced by invasive, nutrient-demanding species such as grasses. Nutrient and other pollution is also carried from farmland into the water supplying lowland peatlands, and can damage these habitats too. Almost all our upland blanket bog and lowland raised bogs are subject to damaging levels of nitrogen pollution.

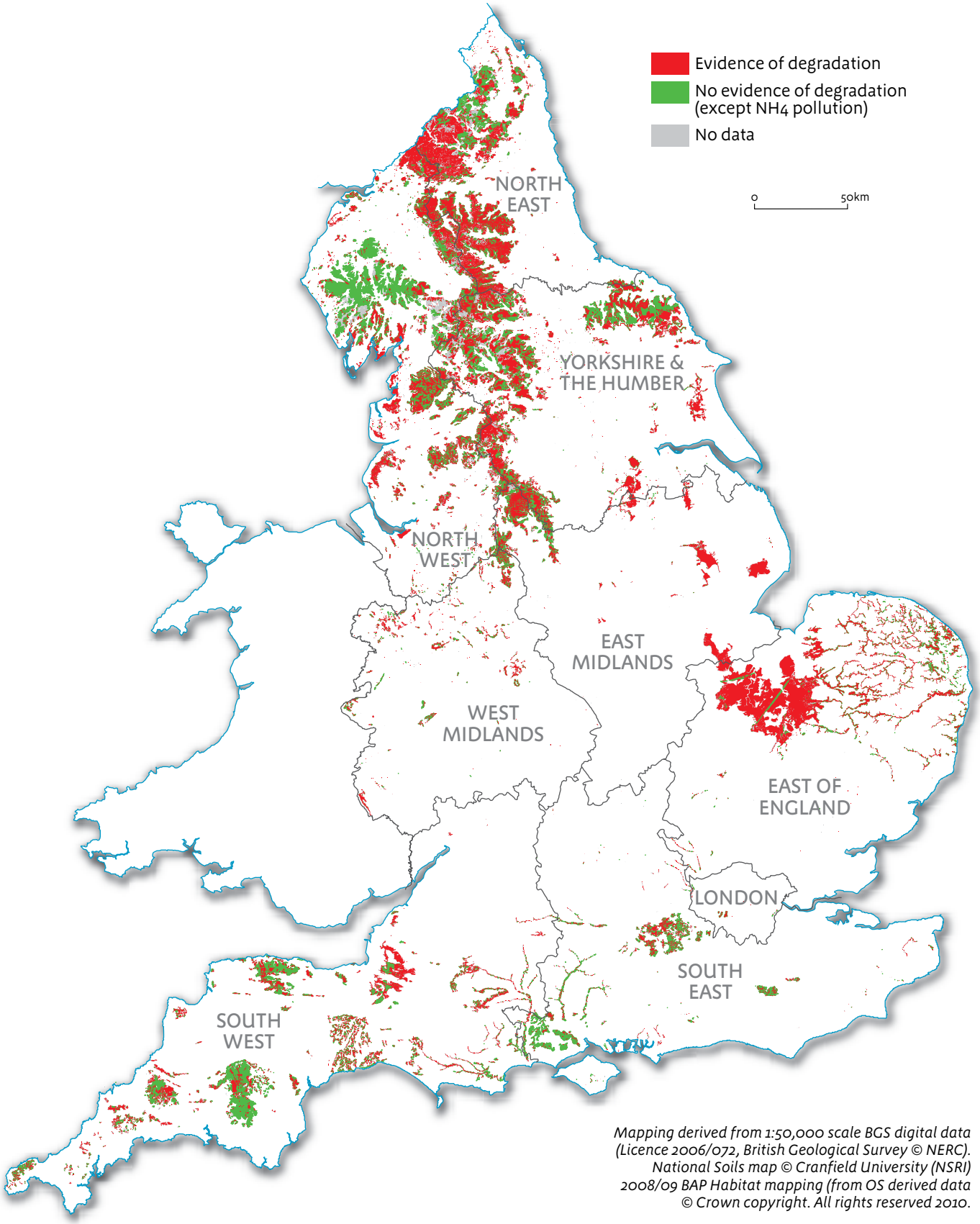
Finally, in recent years efforts have been made to begin the process of **restoration** of degraded peatlands. A re-wetted peatland will start to deliver again some of the benefits that were lost with the destruction or damage of the natural peatland. We estimate that around 2% of the deep peat resource has been – or is currently – undergoing hydrological restoration, with lowland raised bogs (5%) showing the highest proportion restored. Other types of restoration management, such as developing appropriate grazing or burning regimes, have been applied over a much wider area.

Overall, around 74% of our deep peatlands show visible peat degradation* or are subject to damaging land management practices**, as shown in Map 7. Including damage from pollution brings this figure to almost 96%. The majority of our deep peat resource is therefore degraded to some extent. This has implications for the amount of carbon our peats can store and, as importantly, for the flow of CO_2 and other greenhouse gases between peatlands and the atmosphere.

* Includes hagging and gullying, bare peat and peat wastage.

** Includes cultivation, agricultural improvement, moorland gripping, rotational burning, overgrazing, afforestation, peat extraction and old peat cuttings.

Map 7: The balance between degraded peatlands and those with no on-the-ground degradation shows most of our peatlands have suffered damage. Remaining areas are subject to widespread ammonia pollution.



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