

Current environmental baseline and trends for soil - SCOTLAND

Sub-topic	Current environmental baseline	Trends
Soil quality	<ul style="list-style-type: none"> Scotland has a large variety of soils reflecting geological and climatic diversity which is marginally different to the rest of the UK. Soils in the midland valley tend to be more mineral than in the highlands and southern uplands. Based on existing information, Scottish soils are generally of good quality. There is little evidence to suggest that serious soil erosion, compaction or other problems related to land management are occurring widely. Many soils in Scotland are sensitive to acid deposition, and exceedances of critical load were significant in the Galloway Hills and West Central Highlands. Overall they were exceeded across 86% of the Scottish land area between 1995 and 1997. Many of the existing national datasets are around 20-30 years old. A systematic resampling of Scottish soils started in 2007 and will be completed in 2009. 	<ul style="list-style-type: none"> There is no routine monitoring of soil and limited information on trends. There is some evidence that soils are becoming slightly less acidic in some areas due reduced acid deposition, but recovery from acidification does not match the rate of acidification reduction. In 2000, a study showed a decrease in acidity since 1978, with the only increase under coniferous woodland. Modelled results for 2010 show that expected reduction in areas where the critical load for acidity is exceeded will be by about 40%. Progress is being made towards a more consistent set of indicators with which to assess and monitor soil condition.
Soil contamination	<ul style="list-style-type: none"> Only a few soils have high levels of contamination, and levels in the remainder are generally low. The main threats to land include the use or disposal of chemicals, oil or waste. Organic waste, including sewage sludge, is one of the main sources of heavy metal contamination of soils from human activities. Information on pesticide concentrations in soil is limited. The legacy left by hazardous chemicals remains in some parts of Scotland's soils. New pressures include products like cosmetics and detergents. 	<ul style="list-style-type: none"> Ecological damage to soils caused by run-off from roads and urban areas is likely to increase. Sewage sludge and other organic waste recycling to land are projected to continue. There is some emerging evidence that sewage sludge application (which can be high in zinc) may be having a long term affect on the long-term fertility of some soils.
Soil sealing/ loss	<ul style="list-style-type: none"> Soil sealing caused by impermeable surfaces such as roads, car parks and buildings and soil removal for mining and quarrying developments is an ongoing concern. 	<ul style="list-style-type: none"> Agricultural land is being developed at twice the rate as in the 1990s. This development is likely to have occurred on some of Scotland's versatile and productive soils.

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Soil erosion	<ul style="list-style-type: none"> • An estimated 900,000 tonnes of soil were lost by erosion to freshwater during 2004, of which 88% was from agricultural land. • Construction sites, road and rail building schemes have been identified as sources of soil erosion (e.g. as a result of de-vegetation and from soil storage bunds). • Erosion and plough damage can cause damage to cultural remains and degrade the layers of soil for artefacts. Soil erosion on cultivated mineral soil is generally a localised event confined to a small area. 	<ul style="list-style-type: none"> • Various policies are explicitly directed at minimising soil erosion e.g. Good Agricultural and Environmental Condition. • Best management practices have been implemented for forestry to mitigate the effects of land management through the Forests & Soils Guidelines 1998. • There are increasing opportunities to create woodland on farms to reduce soil erosion through the Scottish Rural Development Programme. • Future trends in soil erosion linked to climate change are difficult to predict, but research has been commissioned to address the issues (e.g. SNIFFER project on organic soil, Macaulay Land Use Research Institute project on land capability). • It is unclear whether landslide and debris flows are becoming more frequent across Scotland. • In upland Scotland peat erosion covers the largest area and this may increase under climate change, but the factors controlling peat erosion and implications of peat erosion need further research. • Monument loss has been greatest in lowland arable areas.
Soil structural degradation & compaction	<ul style="list-style-type: none"> • There are anecdotal reports of compaction and structural degradation by grazing animals and trafficking by farm machinery, but this tends to be localised. • Other factors associated with this issue are loss of soil organic matter in arable soils, construction and other activities leading to soil storage and reinstatement. 	<ul style="list-style-type: none"> • There are large variations in the structural quality of soils and there is no routine monitoring of soil structure/compaction, therefore little evidence of trends in structural degradation is available. • Predicted trends of increased winter rainfall suggests that monitoring of structural degradation and compaction will be necessary.

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Soil organic matter	<ul style="list-style-type: none"> • Scotland contains a much higher proportion of organic soils than the rest of the UK. Scottish soil contains over half of the total carbon in UK soil. • Soil biodiversity remains largely unknown in the UK. • Organic matter content of soils varies across Scotland. Wet and acidic soils are generally rich in organic matter and dominate the North and West of Scotland. • Loss of soil organic matter can impact the cultural significance of soil, through loss of past land management activities and reduced stabilising effects which protect archaeological remains. • Soil organic matter is being lost through soil erosion (inc. peat). 	<ul style="list-style-type: none"> • New policies are encouraging good practice in conserving soil organic matter. • Loss of organic matter has been identified as a significant threat. There is some evidence that levels of organic matter may be declining. • Indirect evidence from two decades of monitoring indicate a significant increase in dissolved organic carbon levels in rivers, which imply a possible increase in losses of organic matter from soils.

Sources:

SEPA (2007) Scotland SOER.

Scottish Government (2006) Scotland's Soil Resource – current state and threats.