

# The state of Scotland's raised bogs in 2012

Interim findings from a survey of 58 Scottish raised bogs and analysis of change since 1994-95



## Aims

- Determine the current state of Scottish lowland raised bogs by surveying a sample of 58 sites
- Analyse change in condition by comparison with surveys carried out during the 1990s
- Estimate costs associated with site restoration to bring sites into favourable condition
- Identify landowners supportive of restoration measures



**Scottish  
Wildlife  
Trust**

## Overview

- 58 Scottish lowland raised bogs were surveyed<sup>1</sup> covering 4,060 ha (all Scottish sites cover 27,892 ha)
- Median site size is 34 ha with 67% of sites less than 50 ha
- 68% of the survey area is restorable deep peat<sup>2</sup> and includes near natural and degraded open mire, deep peat with woodland cover and commercially worked bare peat
- 32% of the survey area is considered non-restorable, mainly archaic peat that is agriculturally improved or urbanised, and areas of non-peat where peat has been removed
- Of the restorable peatland area, 38% is uncut primary mire and 62% is cutover secondary mire

## Survey results 2011-12 – current state of the resource

### Major forms of damage

#### Site drainage

- 97% of sites are affected by artificial drainage ditches across the mire expanse
- All sites are affected by perimeter drainage ditches causing drying of the bog surface, loss of peat forming Sphagnum mosses and oxidation of surface peat (carbon loss)

#### Woodland and scrub

- 45% of the restorable peatland area is covered by open and closed-canopy woodland or scrub
- 74% of sites are affected by significant areas of woodland or scrub causing the surface of the bog to dry and loss of bog vegetation through shading

#### Peat cutting

- 9% of sites are subject to active peat cutting on a semi-commercial or commercial scale
- Of these, 3 sites are severely affected with greater than 50% of the mire expanse maintained as bare peat
- No sites have evidence of recent small-scale domestic peat cutting

### Carbon storage and peat accumulation

#### Carbon storage

- Average primary mire (uncut) peat depth is 4.7m at the centre of the site
- Average secondary mire (cutover) peat depth is 2.2m
- Based on site depth measurements, the total carbon stored across the survey area (excluding archaic peat) is estimated to be 10,109,000 tonnes of carbon<sup>3</sup>
- An extrapolation from the carbon stored in the surveyed sites gives an indicative carbon storage figure for all Scottish lowland raised bogs of 59,413,000 tonnes of carbon

#### Peat accumulation

- 11% of the restorable peatland area is classed as 'Sphagnum dominated' and it is within this area that peat (and carbon) accumulation is likely to be taking place
- Of the remaining 89% of the restorable peatland area, a high proportion is likely to be suffering from carbon loss as a result of drying and oxidation processes

# Comparison between the 1994-95 and 2010-11 surveys

## Condition of the resource

### Assessment of condition on a site by site basis

- An assessment of site condition was based on the following criteria: plant indicator species, drainage, presence of woodland and burning / grazing damage
- 48% of sites show deterioration in condition, 36% show an improvement in condition and 16% show no change in condition
- Of the 11 sites managed for conservation<sup>4</sup>, 64% show an improvement in condition

### Change in condition across the restorable peatland area

- Overall improvement in condition is evidenced by an increase in sites with infilling drains, a decrease in sites affected by burning and a decrease in sites affected by severe grazing and trampling
- Overall deterioration in condition is evidenced by a decrease in area of peatland classed as wet, deterioration in the quality of raised mire vegetation and an increase in woodland cover
- This mixed picture may be partly the result of 'benign neglect' – sites becoming less intensively managed – leading to both positive effects (e.g. less livestock trampling damage) and negative effects (e.g. greater area of woodland cover)
- A clearer trend of deterioration in site condition becomes apparent if the sites managed for conservation are excluded

## Site restoration

### Attitudes to restoration by private landowners

- Private landowners were asked about their attitudes to site restoration<sup>5</sup>
- 39 out of 41 private landowners questioned (95%) were either very supportive or broadly supportive of grant-aided restoration measures being carried out on their sites

### Restoration costs

- Restoration costs are based on the restorable peatland area and include capital costs (e.g. removal of tree cover and installation of dams) and annual management costs (e.g. grazing and maintenance of dams)
- Capital costs are estimated to be £1,280 / ha and annual management costs are estimated to be £40 / ha / year
- The cost of restoring 50 sites of typical size (34ha) is calculated. The total capital cost is £1,481,000 with an ongoing annual management cost of £46,000

1) Four sites are excluded from the original sample of 62 - two that are entirely archaic peat (Ingraston Moss and Gretna Flow) and two unrepresentative sites that are large and highly managed (Flanders Moss and Longbridge Muir). 2) Deep peat is 30cm in depth or greater. 3) For assumption on peat volume, bulk density and carbon content see main report. 4) 5 Sites of Special Scientific Interest, 4 sites receiving environmental grants and 2 sites restored by the Scottish Wildlife Trust. 5) Publicly owned sites, commercially operated sites and sites designated as SSSIs were excluded from the survey.

## Summary of key findings

- Scottish lowland raised bog sites show a high level of degradation and damage and unmanaged sites show a net deterioration in condition over the last 15 years
- Some improvement in condition as a result of less intensive use of sites ('benign neglect') is not sufficient to reverse the damaged condition of the Scottish lowland raised bog resource
- Only a small proportion of the restorable peatland area is peat forming and therefore sequestering carbon – the majority of the area is likely to be emitting carbon through drying and peat oxidation processes
- A programme of site restoration will have clear wildlife benefits whilst reducing carbon emissions and increasing the long-term storage of peat
- Active restoration management is required to:
  - restore sites to a favourable condition
  - increase their potential for peat accumulation
  - enhance their ability to adapt to climate change
- Restoration effort should focus on:
  - removal of woodland and scrub
  - installation of dams
  - use of livestock grazing to inhibit regeneration of scrub and woodland
  - creation of buffer zones at the peatland margin

