

Peter Matthews<sup>1</sup>, Jonathan Hughes<sup>2</sup> and Gill Dowse<sup>2</sup> 2012. *The State of Scotland's Raised Bogs in 2012*. Scottish Wildlife Trust, Edinburgh. <sup>1</sup>Ecological consultant. <sup>2</sup>Scottish Wildlife Trust. For a copy of the report or any other queries please contact Eric Coull, Scottish Wildlife Trust e: ecoull@swt.org.uk t: 0131 312 7765 Acknowledgement: Christine Oines of the Scottish Wildlife Trust for producing the graphics.

#### Introduction

The main aims of the study were to determine the current state of Scotland's lowland raised bogs and to analyse change in condition by comparison with surveys carried out during the 1990s.

These aims were achieved by surveying a sample of 58 Scottish lowland raised bogs covering over 4,000 ha during 2010/11 (a repeat of surveys carried out during 1994/5).



Bog rosemary, Andromeda polifolia at Cadgill Flow, Dumfries and Galloway

## 2 Method

The survey method had two main components – the aerial photograph interpretation (API) methodology and the field survey methodology.

The API method involved the use of ArcGIS and aerial photographs to determine compartment boundaries based on vegetation change and a desk-based assessment of site compartment condition criteria (with field validation).

The field survey method assessed the sites on a whole site basis and also included point data. Whole site data included, for example, an assessment of burning and grazing damage, and point location based data included, for example, vegetation quadrats.

## **3 Results – Sites overview**

Median site size is 34ha with 67% of sites less than 50ha.

The survey area has 68% restorable deep peat (e.g. degraded open mire and deep peat with woodland cover) and 32% is non-restorable deep peat (e.g. archaic peat). Of the restorable peatland area, 38% is uncut primary mire and 62% is cutover secondary mire.





#### 4 Results – Major forms of damage

Site drainage – 97% of sites are affected by drainage ditches across the mire expanse and all sites have perimeter ditches.

Woodland and scrub – 74% of sites are affected by significant areas of woodland and scrub. Peat cutting – 9% of sites are subject to active cutting on a commercial or semi-commercial scale.





Commercial peat cutting at Letham Moss, Falkirk

#### **5** Results – Peat accumulation

Likelihood of peat/carbon accumulation across the restorable peatland area



Only 11% of the restorable peatland area is classed as 'Sphagnum dominated' and it is here that peat (and carbon) accumulation is likely to occur. 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.

Based on site peat depth measurements, the total carbon stored across the survey area (excluding archaic peat) is estimated to be 10,109,000 tonnes of carbon.

# 6 Results – **Comparison with 1994-95**

On a site by site basis, based on an overall assessment of condition, 48% of sites show a deterioration in condition, 36% show an improvement in condition and 16% show no change. Of the 11 sites managed for conservation, 64% show an improvement in condition.

Analysis of individual damage criteria shows a mixed picture. This 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).

Site condition comparison between the 1994/95 and 2010/11 surveys





# costs

7 Results – Restoration

Restoration costs are based on the restorable peatland area and include capital costs (e.g. removal of tree cover and annual installation management grazing and costs (e.q. 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 and the annual management cost is £46,000.

questioned about attitudes to When restoration, 39 out of 41 private landowners (95%) were either very supportive or broadly supportive of grant-aided restoration measures being carried out on their sites.

# 8 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 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 favourable condition
- Increase the potential for peat and carbon accumulation
- •Enhance their ability to adapt to climate change
- •Maximise their wildlife biodiversity value

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Common Lizard Lacerta vivipara on Sphagnum moss