Review of the Impacts of Peatland Restoration (rewetting, revegetation and vegetation management)

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Presented by Dr Paul Lunt
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   Phase 2 – Restoration of active peatland
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4) Key Challenges for Peatland Restoration
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Typical Degradation Following the Drainage of a Peatland

Effects of a lowering water table on vegetation. Pool and hummock structure of an intact active peat bog. Drawn down of water with loss of pool. Increase in dwarf shrubs and grasses. Loss of *Sphagnum* and functioning acrotelm layer.
Intensity and Causes of Peatland Degradation
Phase 1 - Restoration of Damaged Hydrology

Upland peatlands – grip blocking

Reproduced with permission of Richard Lindsay (Lindsay 2010)
Cross Section of a Degraded Peatland - illustrating an eroding drainage channel or gully

Reproduced with permission of Richard Lindsay
Restoration of Damaged Hydrology - Grip Blocking
Restoration of Gully Erosion

Upland peatlands – gully blocking
Restoration of Bare and Eroding Peat

• Seed with lime, fertilizer grasses and heather

• Stabilisation with geo-jute and heather brash
Phase 2- Peatland Vegetation Restoration

Carrier out following or in association with hydrological restoration

• Sustainable grazing

• Cessation of burning

• Removal of scrub and woodland

• Restoration of a *sphagnum* rich surface layer

Grazing exclusion

1991

1999
The Importance of *Sphagnum* – ‘the engineer of peat growth’

Restoration of a *Sphagnum* rich surface layer

Requirements:

- High, stable water table
- Structured substrate for *Sphagnum* growth (straw mulch, heather brash, cotton grass transplants)
- Inoculation with *Sphagnum* diasporos (lime, fertiliser?)
<table>
<thead>
<tr>
<th>Restoration</th>
<th>Stability and Height of Water Table</th>
<th>Peat Stabilisation / Carbon Storage</th>
<th>Biodiversity (Common Standards Monitoring Assessment Targets)</th>
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<td></td>
<td>1 Year</td>
<td>1-5 years</td>
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**Water Management**

- Grip blocking and gully blocking
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**Restoration of Bare Peat**

- Seed with lime, fertilizer grasses and heather
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  - 1-5 years
  - 5-20 years
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- Stabilisation with geo-jute and heather brash
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  - 1-5 years
  - 5-20 years
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**Vegetation Management**

- Introduction of Sphagnum
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- Removal of grazing
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- Cessation of burning
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- Removal of scrub and woodland
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Knowledge Gaps

• How to restore active peatlands
• The success of restoration given future climate change predictions
• Requirements for management of active peatlands
• Constraints posed by atmospheric deposition of N
• How to match monitoring to restoration objectives
Key Summary Points

What we know?
• Grip blocking is an effective first measure in peatland restoration
• Peatland restoration is an effective means of reducing carbon loss on degraded sites

What we need?
• On severely damaged /modified peatlands funding needs to be available for phased restoration
• Methods for restoration of Sphagna rich surface layers require further development
• Research is required on the impacts of grazing, burning and trampling on active peatland.
• Funding is required for an organisation to act as a trainer and communicator of best practice
• Best practice guidance is required on the monitoring of peatland restoration

Recommendations
• Require greater protection from development on non designated deep peats
• Government targets need to be agreed for the restoration of peatlands for carbon storage and carbon sequestration
• Where carbon sequestration is a principal aim a Sphagna rich surface cover should be the ultimate objective