PEATSCAPES

Adaptation to Climate Change in a UK Protected Area: A Case Study for Peatlands
Objectives:

- **Restoration**: Supporting restoration and management work;
- **Research**: Supporting and disseminating new and existing research;
- **Celebration**: Raising appreciation and understanding of blanket bog;
- **Promoting best practice**: Provision of management advice.
• Partnership project
• 2006-2012
• 3 staff
• £2.2 million
• AONB wide remit
• AONBs largest climate change project
• Networking nationally via IUCN UK Peat Programme
Why is Peat Important?

1) Biodiversity
2) Carbon Store/Sink
3) Water Colour
4) Sediment Load
5) Flooding
6) Historical Record
7) Economy

Local – National – International Benefits
The Global Situation

How much peat is there? 2.7 million km²

Global Peat Resource

<table>
<thead>
<tr>
<th>Region</th>
<th>Km²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>58,410</td>
</tr>
<tr>
<td>Asia</td>
<td>920,730</td>
</tr>
<tr>
<td>North America</td>
<td>1,354,220</td>
</tr>
<tr>
<td>South America</td>
<td>62,400</td>
</tr>
<tr>
<td>Europe</td>
<td>308,510</td>
</tr>
<tr>
<td>Oceania</td>
<td>9,640</td>
</tr>
</tbody>
</table>
European Peat Resource

308,510 km²

Km²

68,000
64,000
60,000
56,000
52,000
48,000
44,000
40,000
36,000
32,000
28,000
24,000
20,000
16,000
12,000
8,000
4,000
0

Germany
Greece
Hungary
Iceland
Ireland
Italy
Lithuania
Netherlands
Norway
Poland
Portugal
Romania
Slovakia
Slovenia
Spain
Sweden
Switzerland
Ukraine
United Kingdom
UK has 19,500 km$^2$ of peat

North Pennines AONB has 900 km$^2$ of peat 5% of UK total
Climate Change Adaptation and Mitigation

- **Adaptation** - initiatives and measures to reduce the vulnerability of natural and human systems against actual or expected climate change effects. ie resilience

- **Mitigation** - taking actions to reduce greenhouse gas emissions and to enhance sinks aimed at reducing the extent of global warming.*

*Source Tyndall Centre*
What do peatlands do for Climate Change?

- Store carbon - mitigation
- Sink new carbon - mitigation
- Flood control – mitigation/adaptation
- Water provision/quality – adaptation
- Restoration of peatlands - resilience
Managing for Resilience

- Habitat/species responses to climate change are unique
- Management needs to consider uniqueness
  - i.e. one size does not fit all

- Prioritise by
  - Highly vulnerable habitats
  - High profile habitats
  - Data-rich species
  - Keystone species
  - Economics (funding)
  - Access
  - Other?
Peatlands are Quick and Cost-Effective Measure to reduce 10% of greenhouse emissions

International community calls for urgent action to protect and restore peatlands - the world's most important carbon store.

Bali, 11 December 2007 - Clearing, draining and setting fire to peatlands emits more than 3 billion tonnes of carbon dioxide every year - equivalent to 10% of global emissions from fossil fuels, according to Assessment on Peatlands, Biodiversity and Climate Change, the first comprehensive global assessment of the link between peatland degradation and climate change.

"Just like a global phase out of old, energy guzzling light bulbs or a switch to hybrid cars, protecting and restoring peatlands is perhaps another key "low hanging fruit" and among the most cost-effective options for climate change mitigation," said Achim Steiner, UN Under-Secretary General and Executive Director UN Environment Programme (UNEP).

Peatlands are wetland ecosystems that accumulate plant material under saturated conditions to form layers of peat soil up to 20m thick - storing on average 10 times more carbon per hectare than other ecosystems. Peatlands occur in 180 countries and cover 400 million hectares or 3% of the world's surface.

Steiner said, "the new Assessment, funded by the Global Environment Facility (GEF), shows that peatlands are a critical part of the global warming mix in nature. They are an important part of the carbon cycle and their degradation needs urgently to be acknowledged."

A Global Mandate?
How much carbon is in North Pennines peat?

<table>
<thead>
<tr>
<th>Peat (ha)</th>
<th>T/ha</th>
<th>Carbon tonnes</th>
<th>CO$^2$ tonnes</th>
</tr>
</thead>
<tbody>
<tr>
<td>90,000*</td>
<td>2,000</td>
<td>180,000,000</td>
<td>658,800,000</td>
</tr>
<tr>
<td>1,926,000**</td>
<td>2,000</td>
<td>3,852,000,000</td>
<td>14,098,320,000</td>
</tr>
</tbody>
</table>

UK 2006 CO$^2$ emissions 560,000,000 (DEFRA)
*AONB Peat = 1.2 years of UK equivalent CO$^2$
**UK Peat = 25.2 years of UK equivalent CO$^2$
Drains cut for agriculture and shooting reasons. (9,400 km in AONB)
Left a legacy or degraded biodiversity, eroding peat, carbon release, increased water colouration and sediment loading.
Paradigm and cultural conflicts exist, i.e. what is peatland for?
Peat (moorlands) are there to be shot
Cultural view that moorlands have always been and always will be treeless and ecologically static
Should peatlands being managed for climate change reasons? (carbon farmers)
Burning - Shooting

• Burning is undertaken for shooting reasons
• Provides a mosaic of vegetation ages for birds
• Concerns about hot burns are frequent burns exist
• Is there damage to moss layer and peat?
• Science in emerging
• How will climate change effect burning.
• Paradigm and cultural conflicts exist, i.e. what is peatland for?
• Peat (moorlands) are there to be shoot
• Cultural view that moorlands have always been and always will be treeless ecologically static
Grazing - Agriculture

- Many areas are overgrazed
- Impacts on peatland stability
- Impacts of vegetation
- Impacts of restoration and ability to recover
- Hill farming is on the decline, is it sustainable?
Wind farms – Economy?

Peatlands tend to be windy and high places
Pressure to build on peat
Need to balance one carbon system for another?
What is the role of protected areas and wind farms?
Climate Change?

Peatlands will be affected by climate change and can affect climate change.

Can we restore degraded peatlands to mitigate their carbon loss to avoid pristine peatlands being impacted by climate change causing their carbon release and causing runaway climate change?

Peat scores high on the priority list due to multiple benefits and high concentrations of carbon.
Temperature Trends from 1931

(Locally weighted regression lines)

°C

Central England

Durham (altitude 60 metres)

Moor House (altitude 550 metres)


www.ecn.ac.uk

9,420 km of grips
(60,000) (Drains)
cut since 1950’s

900 km² peat in AONB
Grips
Grip Blocking

Landscape Scale Problem – Simple, proven, long term, natural solution.

Insert peat dams (blocks) every 7-15 metres.
After
Peat Power?

Strengths

Peatlands deliver a wide range of ecosystem services
Peatlands are a huge carbon store with direct climate change benefits
Peatland restoration can convert bogs from a carbon source to a sink
Peatlands offer climate change adaptation solutions
Peatland restoration is relatively cheap, natural and permanent
The UK has many successful peatland restoration projects
There is professional momentum for peatland restoration
Peat Power?

Weaknesses

Insufficient policy relevant scientific information
No coordinated policy focus on peatlands
The extent of damaged UK peatlands
Impact of greenhouse gas budgets versus a focus on carbon dioxide
Potential conflicts between objectives from different ecosystem services
Limited consideration of whole functioning units beyond designated sites
Lack of public awareness and understanding
Poor communications and campaigning
The Butterfly Effect?
Can a sheep farmer in North Pennines can impact glacier melt in the Arctic
900 km² of peat in AONB to 2.7 million km² of peat around the globe (the carbon connection)

- **Linkages**
  - UK Peatland Network
  - IUCN UK Peatland Programme
  - UK Climate Change Act
  - CAP Reform 2013
  - EU Budget Reform 2013
  - Copenhagen Summit Dec 2009
Adaptation may be habitat specific but thinking needs to be global.

Climate Change Battle is being fought in the wild areas of the world.

The Global protected areas family can speak with one voice and act in a coordinated fashion to mitigate and adapt to climate change.
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www.northpenninesaonb.org.uk