The future of Irish Peatlands: a delicate exercise in balancing scientific knowledge and management options

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What do peatlands mean to different people?
- One of the most ancient, near-natural and important ecosystems on the planet
- A carbon store
- A tool to understand our past
- A unique landscape
- A reservoir of biodiversity
- A source of energy

Threats/disturbances to peatlands (anthropogenic and natural)
- Domestic and industrial peat harvesting
- Grassland reclamation
- Forestry plantation
- Sheep grazing and stock trampling
- Land slide (natural and artificial)
- Fire
- Wind farms
- Landfills
- Recreation (hill walking)
- Military training
- Pollution
- Climate change

Cumulative impacts of disturbances can increase the severity of the effects on a particular peatland function above the sum of individual disturbance alone

Condition of peatlands
- Physical extent (area and depth)
- Carbon balance (peat forming)
- Greenhouse gas balance
- Hydrological status
- Bare peat area, hoof print, trampling
- Peat bulk density
- Biodiversity extent
- Vegetation
- Birds
- Terrestrial/aquatic invertebrates
- Microbial communities

Options chosen to restore as many functions and services of the peatland as possible

Management options
- Remove threats/risk e.g. fence against sheep or low intensity flock
- Restore: rewet, block drains, cut trees, reseed
- Conserve/protect natural/near-natural systems
- Manage whole landscape (in the case of cutaway peatlands where different habitats can be restored, e.g. wet and dry communities)

Different end-users so manage peatlands for multiple end-benefits

Ecosystem status direction
- Poor: degraded peatlands where most of the ecosystem services are seriously damaged, e.g. industrial cutaway peatlands
- Good: natural peatlands resulting from long-continued disturbances. Functioning of some ecosystem services, e.g. most Irish blanket bogs

High quality: Active peatland with the capacity to form peat. Functioning of all ecosystem services

Policy and Socio-economic conditions
- Private interest: turbary, recreation
- Environmental legislation:
- Conservation policy, Biodiversity Convention, Agenda 21, ELA, Water Framework Directive, Landscape Convention
- Energy policy: Peat represents 5% of primary energy requirement in Ireland and is the main indigenous source of energy. Peat consumption increased by 35% in 2005.

Examples of restoration work in Ireland:
- a) drains blocked with corrugated plastic sheets in Atlantic blanket bog
- b) drains blocked with excavated peat in a raised bog
- c) drains filled to allow rewetting of an industrial cutaway peatland

Problems:
Little is known about the processes of peatland degradation. Different disturbances can have different effects on different peatland functions (e.g. blanket bog vegetation was found to adapt to water table drawdown but carbon sink function was reduced for that period). We need to understand these processes before defining specific desired objectives for management. Success of management options (e.g. restoration) should not be assessed against a single reference system (e.g. intact active bog accumulating peat) but against an ‘ecological status direction’.

Solutions:
Scientific research into peatland environments is needed as peatlands occur in a range of alternative stable states or references. Peatlands are dynamic systems in a changing environment, thus requiring constant research into the ecosystem services they provide. In addition, we should learn from managed peatlands which are, in effect, large scale manipulation of the ecosystem and which can provide valuable information about system behaviour.

The BOGLAND project is a multi-disciplinary, nation-wide research project which aims to assess the current condition of peatlands in Ireland and the effects of threats and disturbances on these ecosystems and to monitor a range of management options in order to provide strategies for the future of Irish peatlands.

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