



# Costs and benefits of peatland restoration in Scotland & public perceptions of peatlands



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8<sup>th</sup> IUCN UK Peatland Programme conference: *'Peatland Connections: Building Prosperity'*



*Leading the way in Agriculture and Rural Research, Education and Consulting*

- Provide an overview of a long term research project
- Focus on
  - What is the (extent of) public support for peatland restoration?
  - What are the general public perceptions on peatlands?
  - What are the values and motivations to engage in restoration?

# Quantitative social research

# Public support and benefits of restoration

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- An online survey with members of the public (n=1,795)
- Views on peatlands and their restoration
- Preferences for peatland restoration (“willingness to pay”)
  - Choice Experiment
- Development of materials to communicate about peatlands and their restoration in a way that is easily understandable by the public and scientifically rigorous

# Ecological condition descriptions



**Good ecological condition**



**Intermediate ecological condition**






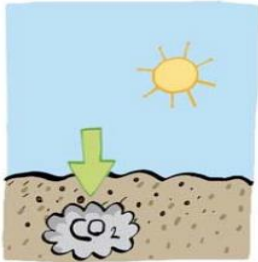
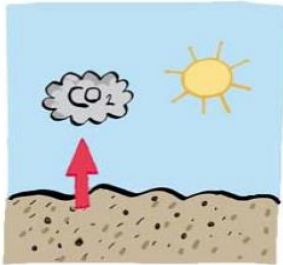
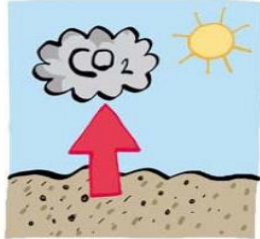






**Bad ecological condition**

**Degradation**



**Restoration**

# Ecosystem service provision

	Good ecological condition	Intermediate ecological condition	Bad ecological condition
			
Carbon emissions			
Water quality			
Wildlife			



# Communication tools for ecosystem restoration processes and benefits



- We have developed a short communication web tool, also now found on the SNH Peatland Action website
- For land managers:  
[www.see.leeds.ac.uk/peatland-modules/?type=assess](http://www.see.leeds.ac.uk/peatland-modules/?type=assess)
- For general public:  
[www.see.leeds.ac.uk/peatland-modules/?type=learning](http://www.see.leeds.ac.uk/peatland-modules/?type=learning)



## RESEARCH ARTICLE

### How to make complexity look simple? Conveying ecosystems restoration complexity for socio-economic research and public engagement

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## Abstract

Ecosystems degradation represents one of the major global challenges at the present time, threatening people's livelihoods and well-being worldwide. Ecosystem restoration therefore seems no longer an option, but an imperative. Restoration challenges are such that a dialogue has begun on the need to re-shape restoration as a science. A critical aspect of that reshaping process is the acceptance that restoration science and practice needs to be coupled with socio-economic research and public engagement. This inescapably means conveying complex ecosystem's information in a way that is accessible to the wider public. In this paper we take up this challenge with the ultimate aim of contributing to making a step change in science's contribution to ecosystems restoration practice. Using peatlands as a paradigmatically complex ecosystem, we put in place a transdisciplinary process to articulate a description of the processes and outcomes of restoration that can be understood widely by the public. We provide evidence of the usefulness of the process and tools in addressing four key challenges relevant to restoration of any complex ecosystem: (1) how to represent restoration outcomes; (2) how to establish a restoration reference; (3) how to cope with varying restoration time-lags and (4) how to define spatial units for restoration. This evidence includes the way the process resulted in the creation of materials that are now being used by restoration practitioners for communication with the public and in other research contexts. Our main contribution is of an epistemological nature: while ecosystem services-based approaches have enhanced the integration of academic disciplines and non-specialist knowledge, this has so far only followed one direction (from the biophysical underpinning to the description of ecosystem services and their appreciation by the public). We propose that it is the mix of approaches and epistemological directions (including from the public to the biophysical parameters) that will make a definitive contribution to restoration practice.

## OPEN ACCESS

**Citation:** Martin-Ortega J, Glenk K, Byg A (2017) How to make complexity look simple? Conveying ecosystems restoration complexity for socio-economic research and public engagement. *PLoS ONE* 12(7): e0181686. <https://doi.org/10.1371/journal.pone.0181686>

**Editor:** Asim Zia, University of Vermont, UNITED STATES

**Received:** January 31, 2017

**Accepted:** July 4, 2017

**Published:** July 28, 2017

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**Data Availability Statement:** All relevant data are within the paper and its Supporting Information files.

**Funding:** This research was mainly funded by the Scottish Government Strategic Research Programme (2011–2016). Part of the work reported here was also partially funded by the Valuing Nature Network project "Valuing Peatlands: Assessing and valuing peatland ecosystem services for sustainable management" funded by the Natural Environment Research Council (UK).

# Survey results



## PUBLIC VIEWS AND VALUES OF PEATLAND RESTORATION IN SCOTLAND RESULTS OF A QUANTITATIVE STUDY

Julia Martin-Ortega, Klaus Glenk, Anja Byg and Murat Okumah  
April 2017

JOURNAL OF ENVIRONMENTAL ECONOMICS AND POLICY, 2018  
<https://doi.org/10.1080/21606544.2018.1434562>

UKNEE

Routledge  
Taylor & Francis Group

OPEN ACCESS Check for updates

### The economics of peatland restoration

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#### ABSTRACT

Restoration offers opportunities for securing and enhancing critical ecosystem services provided by peatlands, such as carbon storage, water retention and water quality, and support for biodiversity and wildlife. A comprehensive valuation encompassing the relevant public benefits of restoration and how these compare with it is lacking to date, leaving policy makers with little guidance with respect to the economic efficiency of restoring this climate-critical ecosystem. Using Scotland as a case study, this paper quantifies the non-market benefits of changes in peatland ecological condition associated with changes in ecosystem service provision and depending on the location of restoration efforts. Benefits on a per hectare basis are compared to varying capital and recurrent cost in a net present value space, providing a benchmark to be used in decision making on investments into peatland restoration. The findings suggest that peatland restoration is likely to be welfare enhancing. Benefits also exceed cost in appraisals of previous and future public investments into peatland restoration. The results thus strengthen the economic rationale for climate change mitigation through improved peatland management.

#### ARTICLE HISTORY

Received 11 September 2017  
Accepted 22 January 2018

#### KEYWORDS

Climate change mitigation;  
ecosystem restoration;  
peatlands; choice  
experiment; benefit-cost  
assessment; net present  
value

- Majority supportive of restoration
- Main reasons:
  - Opportunity to do something about climate change
  - Improved water quality
  - Cultural identity, recreational benefits (e.g. enjoy wildlife on restored peatlands)
  - Improving income generation in rural economies
- Main reasons for not supporting restoration: other priorities



# Monetary valuation

- How much to restore?
- Shown as percentage of Scottish peatlands in
  - Good ecological condition
  - (Intermediate ecological condition)
  - Bad ecological condition
- Shifts from 'bad' and 'intermediate' to 'good'



**Good ecological condition**



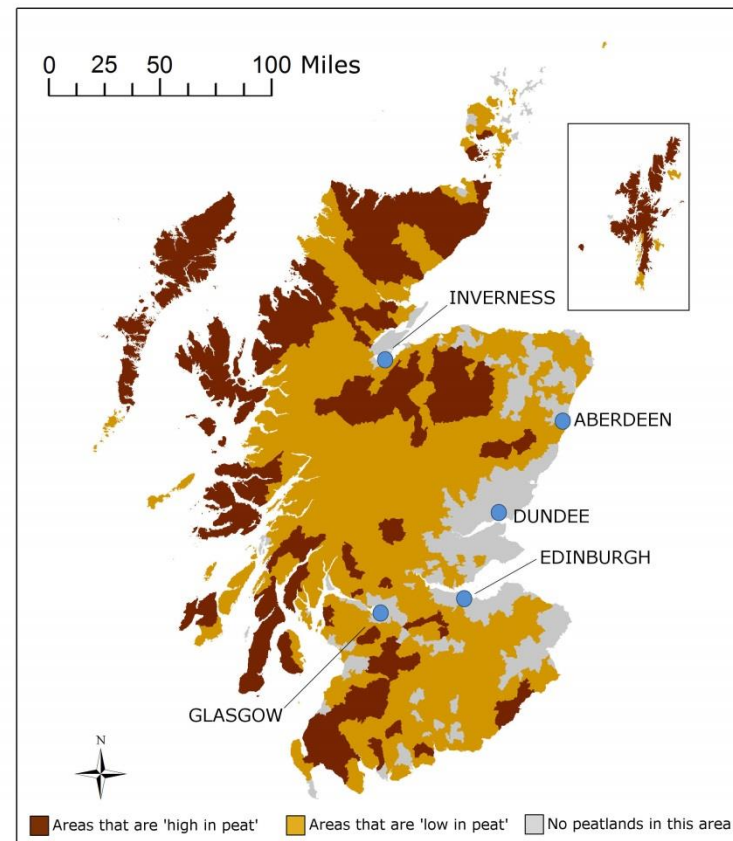
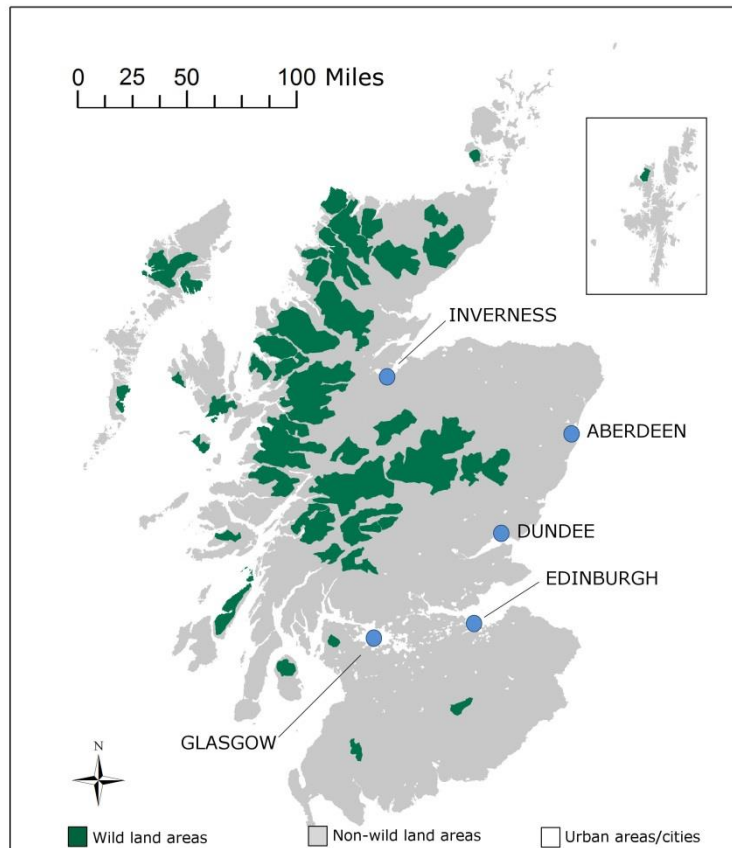
**Intermediate ecological  
condition**



**Bad ecological condition**

# Monetary valuation

- “Spatial” aspects: where to restore?
  - Wild land area/no wild land area
  - Areas with greater/lesser share of peatlands in land cover



# Monetary valuation

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- How much does it cost the taxpayer?
  - Payment towards a hypothetical Peatland Trust fund
  - Trust fund delivers the proposed improvements and would be in place over a period of 15 years

# Example choice card

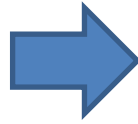


	Business as usual no additional restoration	Restoration Option A	Restoration Option B
Share in <b>GOOD</b> condition			
	20%	70%	50%
Share in <b>BAD</b> condition			
	40%	10%	30%
Focus in wild land areas	-	no	yes
Focus in areas that are	-	high in peat	low in peat
Cost per year	£0	£250	£150
Tick your preferred option here	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

# Monetary valuation



Bad ecological condition



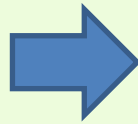
Intermediate ecological condition

Ø Value per  
hectare and year

£190



Bad ecological condition



Good ecological condition

£273

- Little spatial differentiation for changes from 'bad' to 'good'
- For 'intermediate' to 'good': highest value in remote areas with lots of peatlands (£400 per hectare and year)



# Peatland Action 1<sup>st</sup> phase, example BCA



- 10,000 ha restored
- £230/ha/yr benefits
- £833/ha average upfront costs
- £0 - £100/ha/yr recurrent costs
- Discount rate: 3.5%, 15 years

	NPV	B/C ratio
RC £0	£ 20 million	3.49
RC £100	£ 8 million	1.39

- Similar B/C ratios to other studies
- Comparison to other uses of public funding?
- Sensitive to assumptions

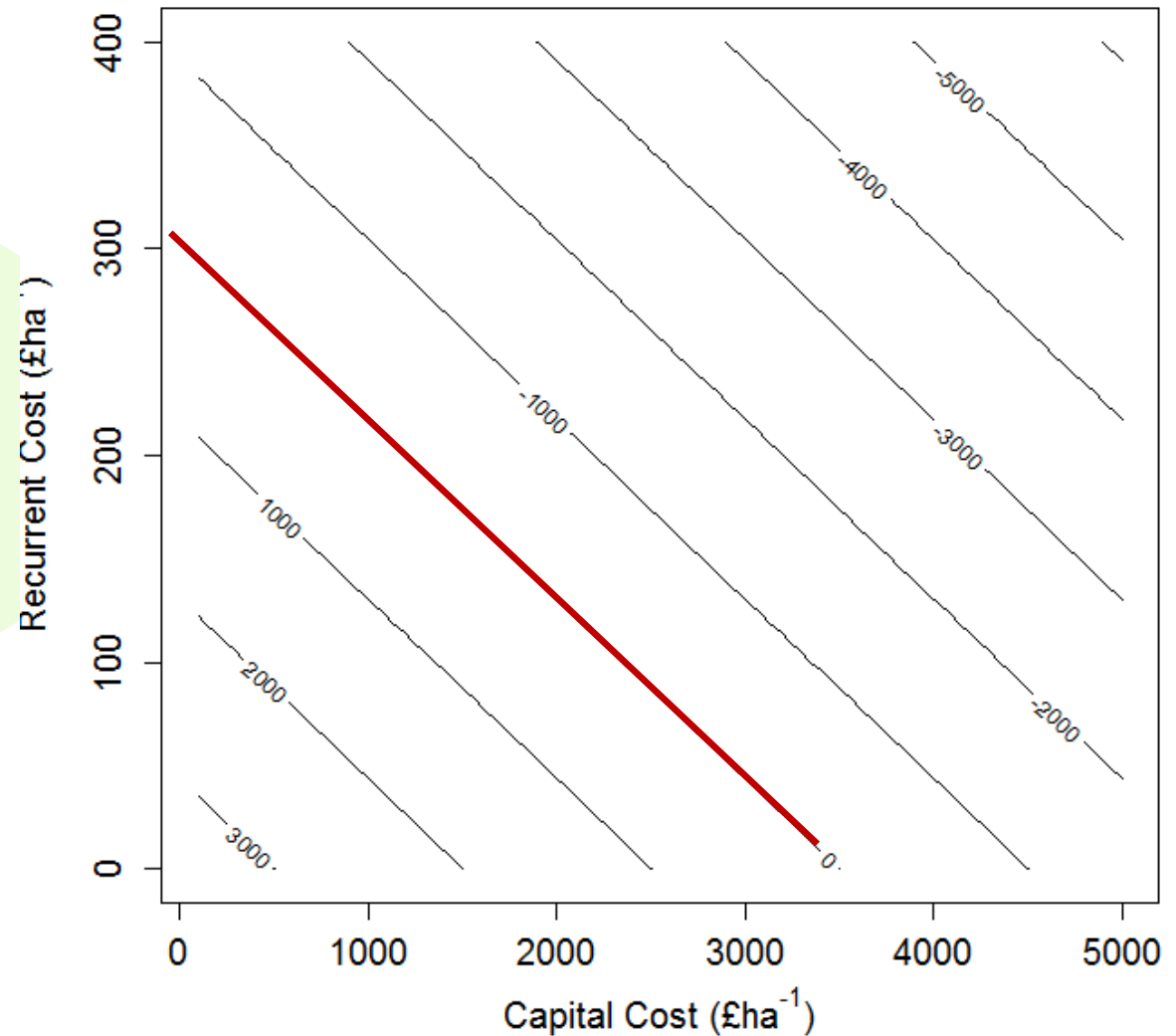




# Sensitivity to cost



**a) Poor to Good Condition/Low Concentration/Not in Wild Land Area**



# What's next?

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- Better understanding of the conditions under which restoration is beneficial
  - Especially important as restoration increases in scale!
  - Better data on implementation and maintenance costs
  - What are opportunity costs of restoration and how do they vary by land use and type of land ownership?
  - What evidence emerges about the effectiveness of restoration and what factors does it depend on?
  - Evidence of 'wider' benefits (e.g. employment etc.)?
- Future funding for peatland restoration
  - Role of potential private (PES) funding and Peatland Code?
  - Funding post Brexit

# Qualitative social research

# Previous research

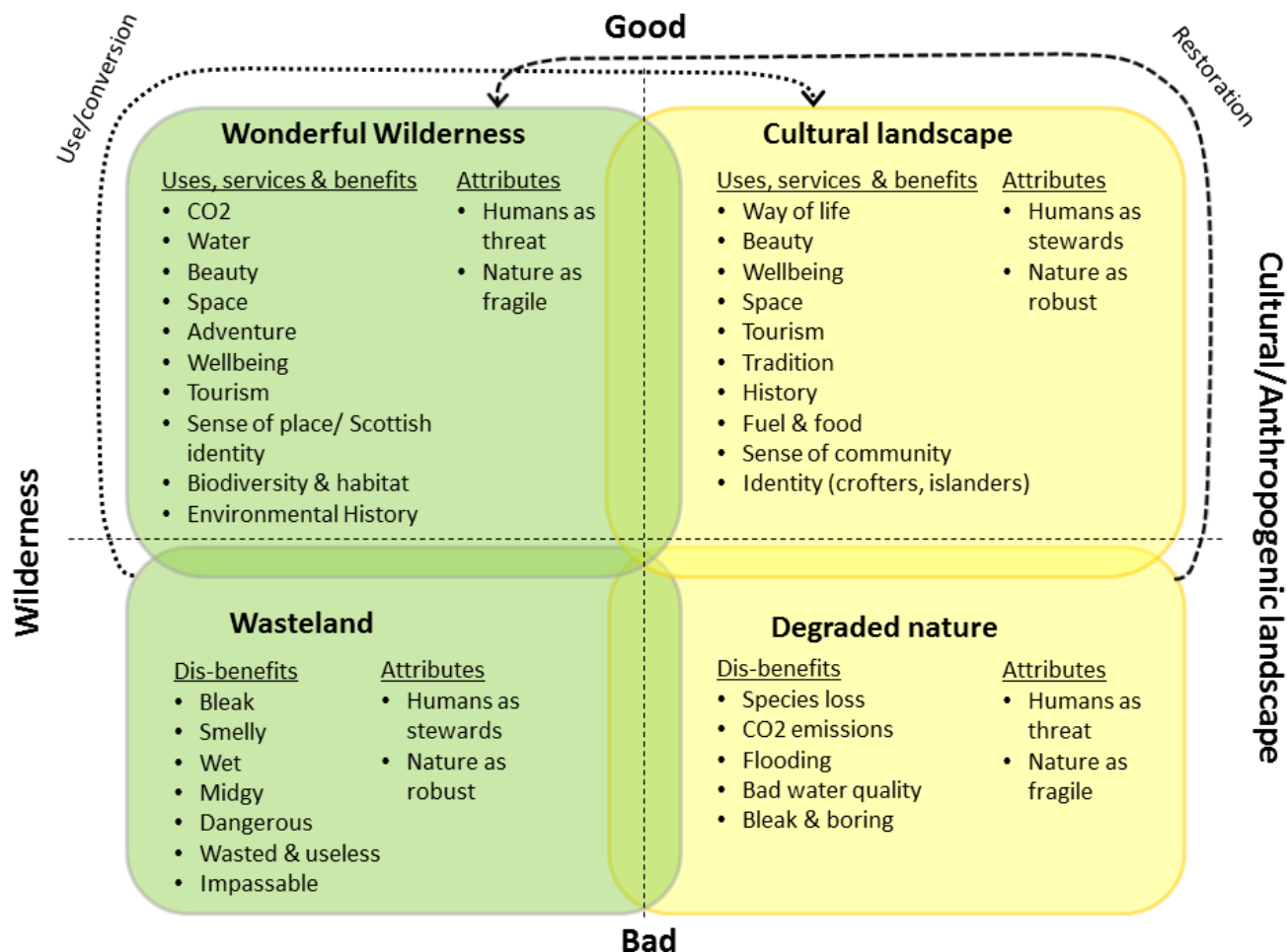


Workshops on people's perceptions in general:

- Uses, benefits and disbenefits
- Consequences of degradation, restoration
- Importance & preferences
- Uniqueness and distribution of uses/benefits
- Preferences in relation to restoration (location, time scale, states & proportions)



# General public perceptions



Source: Byg et al. (2017)

- The different views are often held by the same persons

# Some results

Example: Individual preferences for peatlands in different states



Participant 1	30%	20%	50%
Participant 2	20%	30%	50%
Participant 3	30%	30%	40%
Participant 4	40%	30%	30%
...	50%	30%	20%
...	60%	30%	10%
	50%	40%	10%
	60%	40%	0%
	50%	50%	0%
	20%	60%	20%
	30%	60%	10%
	20%	70%	10%
	30%	70%	0%
	20%	80%	0%



# Current work



- More explicit focus on restoration
- Values & motivations
- Methods:
  - Interviews (managers, volunteers, local residents)
  - Participant observation (Portlethen, Lenzie Moss, Easter Inch Moss & Fallin Moss)
  - Workshops (Portlethen & Shetland)



# Results

- The usual constraints (funding, time, people,...)
- Relational & moral values: “give something back” (consumptive & non-consumptive uses)
- World views
  - The nature of nature: fragile or resilient
  - The role of humans: people as a threat or farmers as stewards
  - Notions of balance
- Experienced trade-offs (recreation, biodiversity, other land uses,...)
- Personal interactions with peatbogs & expert knowledge → meaning, values & further interactions (e.g. beech tree removal)
- Ecological values vs. social values: the importance of small remnant sites to enable personal relationships
- Peatbog perceptions enmeshed in the wider socio-economic context of local communities & places (marginality, rural-urban divide, urban sprawl,...)

Walkers anger at Moss  
'massacre'



<https://www.kirkintilloch-herald.co.uk/news/walkers-anger-at-moss-massacre-1-3675284>



# Results

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- Potential for multiple benefits (private, public, intangible)
  - Ambivalence and ambiguity have not acted as barriers to restoration (so far), partly linked to:
    - Flexibility of Peatland Action Programme → can encompass a variety of approaches & interests
    - The 'experimental' status of peatland restoration
  - This might be challenged in the future (e.g. more targeted approaches, concerns about economic efficiency, etc.)
- ⇒ Necessary to consider how to deal with ambivalence and ambiguity in the future

# Related work from the research team

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Work funded by



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