

# Participatory land use planning in the Pentland Hills Regional Park: using ecosystem service values to inform decision-making

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# Overview of presentation

## ■ Introduction

- The ecosystem approach and ecosystem service values
- Opportunities in the Pentlands?
- OPERAs project – exploring socio-cultural values of ecosystem services

## ■ Method

- Objectives and overall approach
- Stakeholder workshop
- Participatory mapping of ecosystem services
- Ecosystem service valuation using a socio-cultural values framework

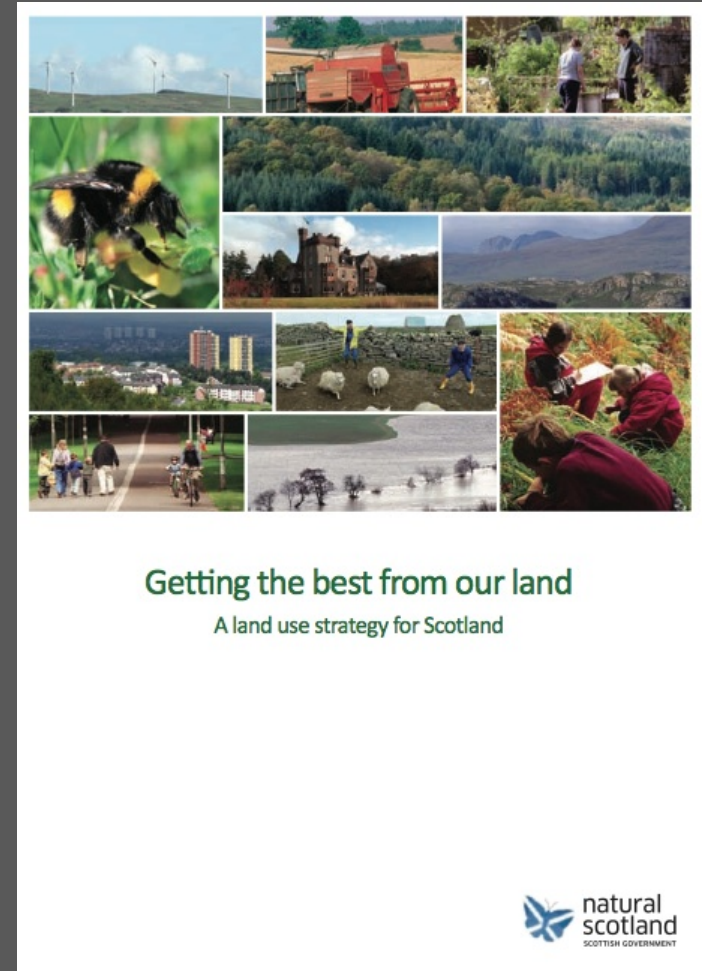
## ■ Results

- Mapping ecosystem services
- Valuing ecosystem services

## ■ Conclusions

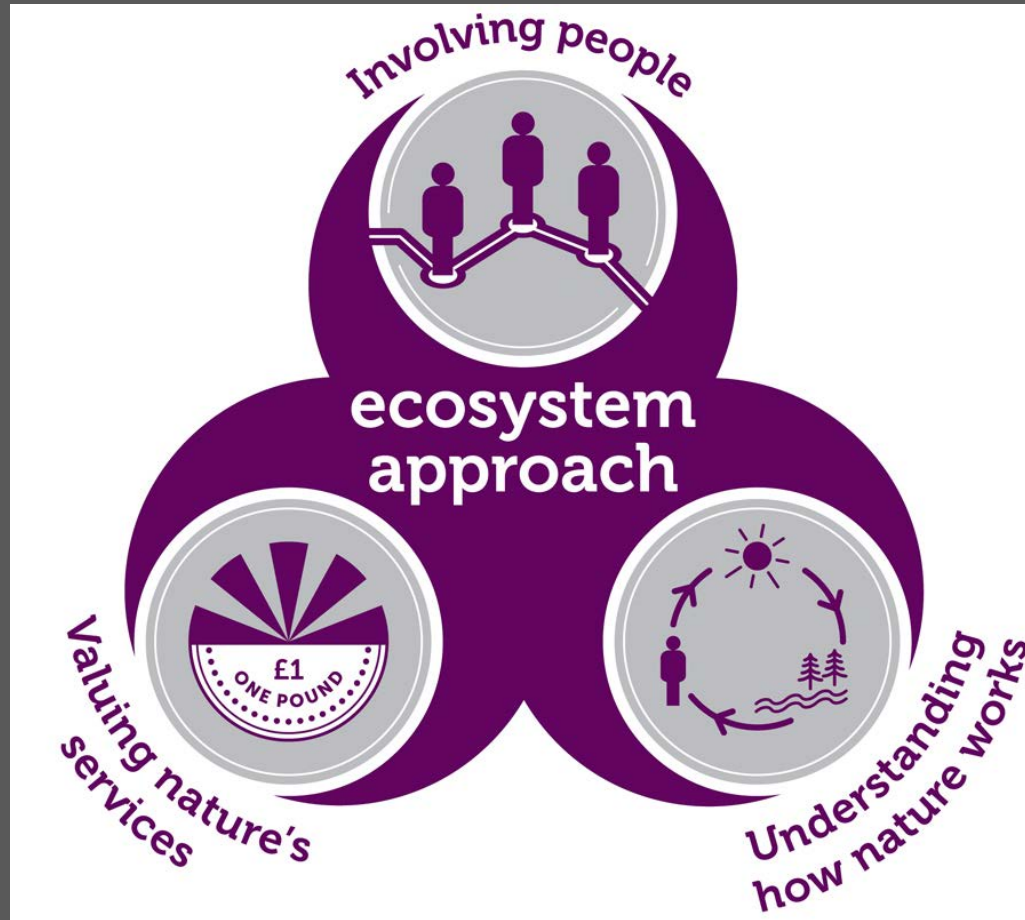
# Introduction

# The ecosystem approach and ecosystem service values (1)





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# The ecosystem approach and ecosystem service values (2)

## 1. Understanding how nature works



# The ecosystem approach and ecosystem service values (2)

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# The ecosystem approach and ecosystem service values (3)

## 2. Involving people in decisions affecting nature



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# The ecosystem approach and ecosystem service values (3)

## 2. Involving people in decisions affecting nature





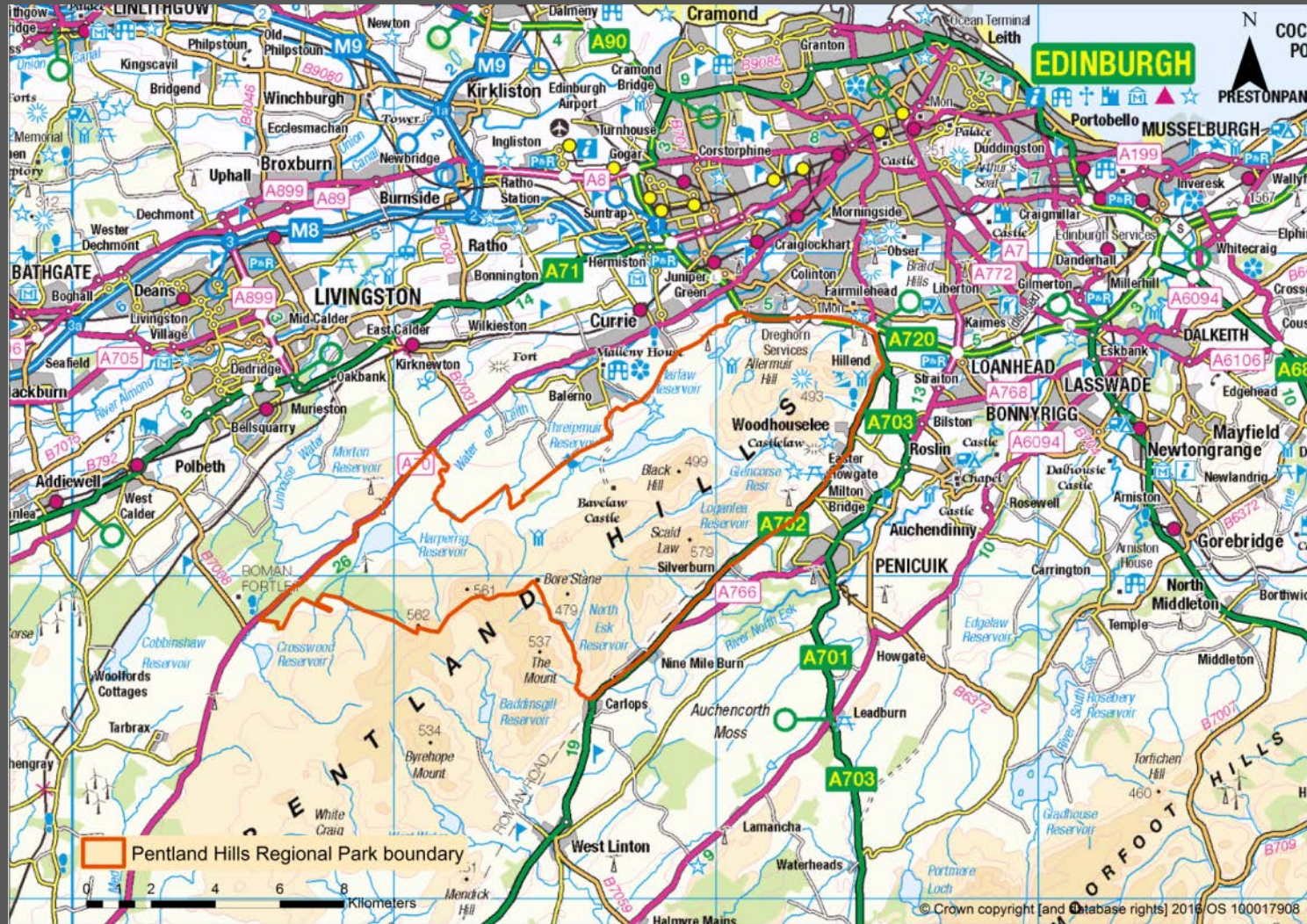
# The ecosystem approach and ecosystem service values (4)

## 3. Valuing the services that nature provides





# Opportunities in the Pentland Hills?





# Opportunities in the Pentland Hills?



**Pentland Hills  
Regional Park  
Plan 2007 - 2017**



**pentland hills  
regional park**

**Pentland Hills  
Regional Park  
Consultative  
Forum**



OPERAs (1):

# Exploring socio-cultural values of ecosystem services

Scoping Workshop  
December 2013

Bilateral discussions with  
Consultative Forum members

Presentation of project and  
agreement of list of relevant  
ecosystem services  
at Consultative Forum  
February 2014

Pre-test of survey on site  
February 2014

On-site survey June/July 2014

Online survey July-October 2014



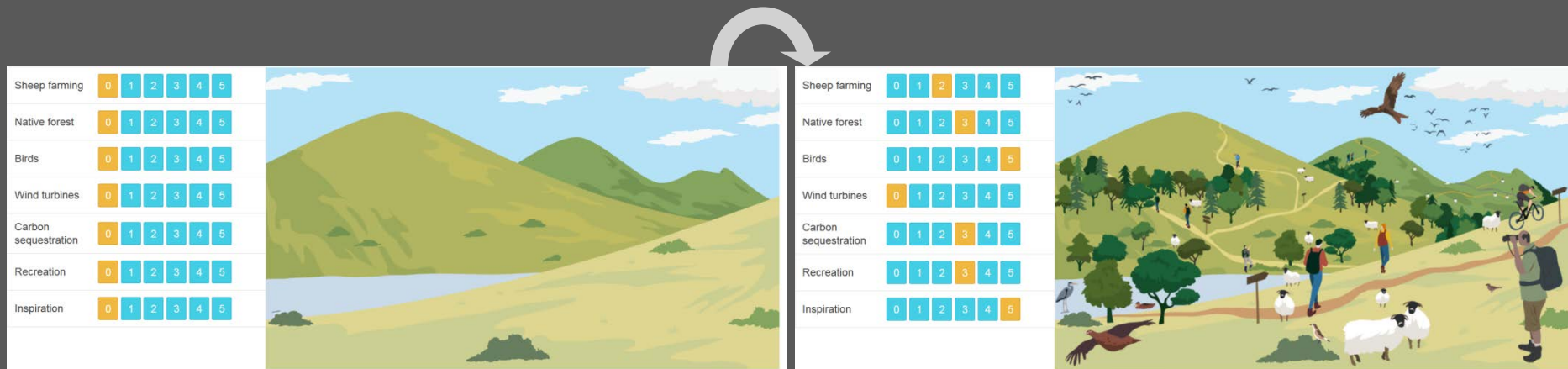
OPERAs



## OPERAs (2):

# Exploring the link between socio-cultural valuation of ecosystem services and landscape preferences

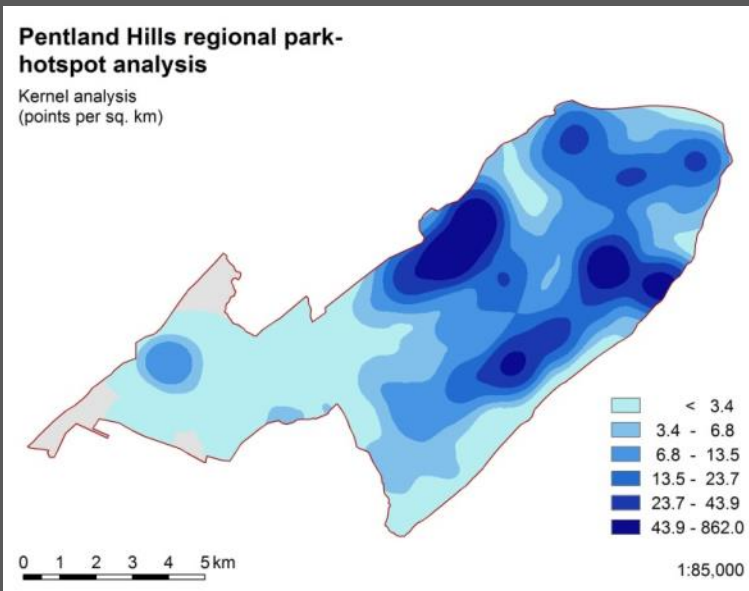
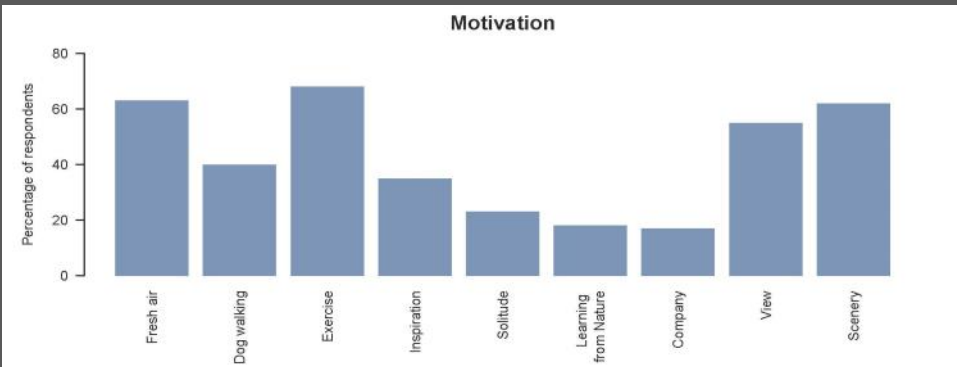
- Update visitor information
- Socio-cultural valuation of relevant ecosystem services
- Use of visualisation tool LANDPREF to assess land use visions



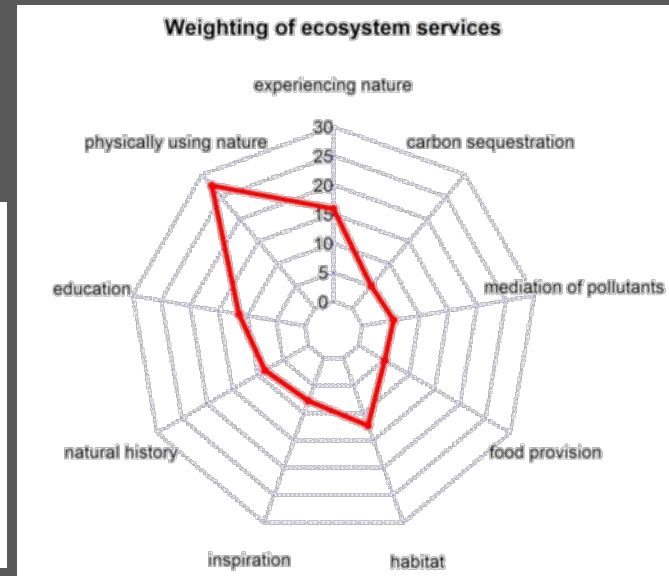
## OPERAs (3):

# Results of the survey

## 1. Update visitor information



## 2. Valuation of ecosystem services



## 3. Assessment of land use visions





# Method

# Method (1) objectives and overall approach

- **Timescales**

- February – December 2016
- May 2016 workshop with members of the Consultative Forum

- **Key project objectives**

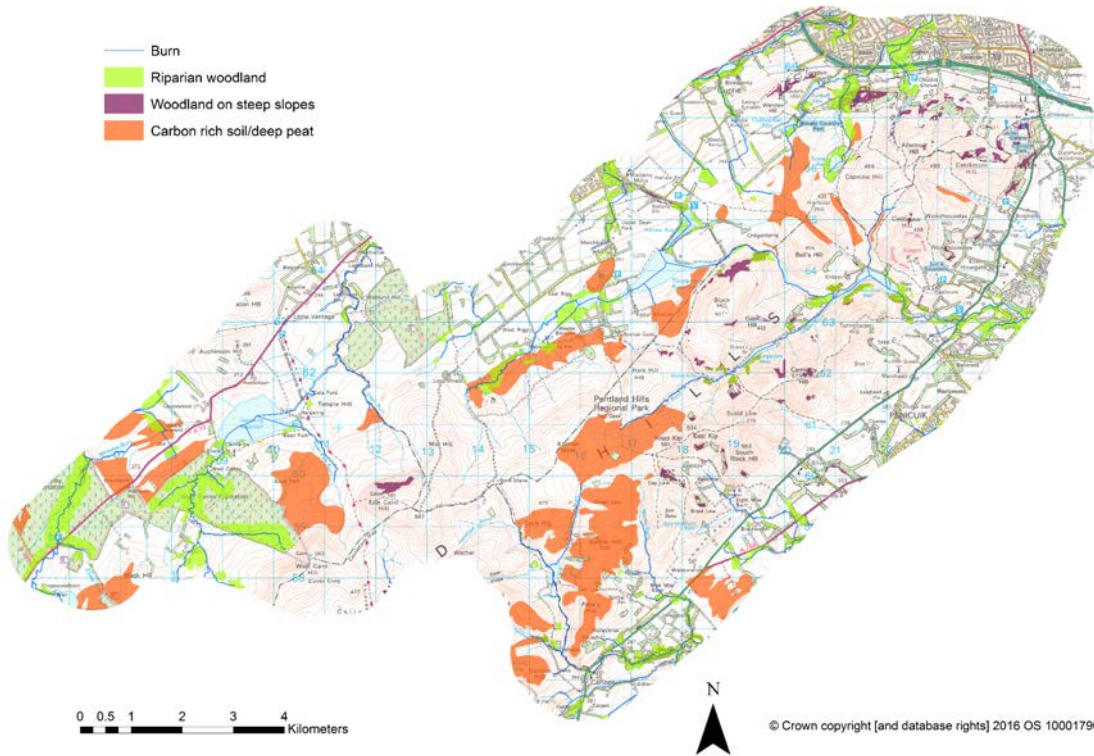
- Support the Consultative Forum to identify and assess the benefits they receive from the Park
- Support the Consultative Forum to identify, discuss and as far as possible agree land use management opportunities that aim to sustain key benefits in an equitable way over the long-term



# Method (2) stakeholder workshop

- Approx. 20 self-selecting members of the Consultative Forum
- Workshop sessions:
  - Identifying and mapping ecosystem services provided by the Park
  - Valuing ecosystem services provided by the Park
  - Prioritising criteria for determining value
  - Identifying land use change and possible implications for the Park
- Focus of this talk is on the mapping and valuation sessions:
  - Mapping ES: quantitative – *how many, what type, where?*
  - Valuing ES: qualitative – *why are mapped ES important?*
- Mapping and valuation combined describes the range of ES in the Park and why they are important / valued

# Method (3) participatory mapping of ES

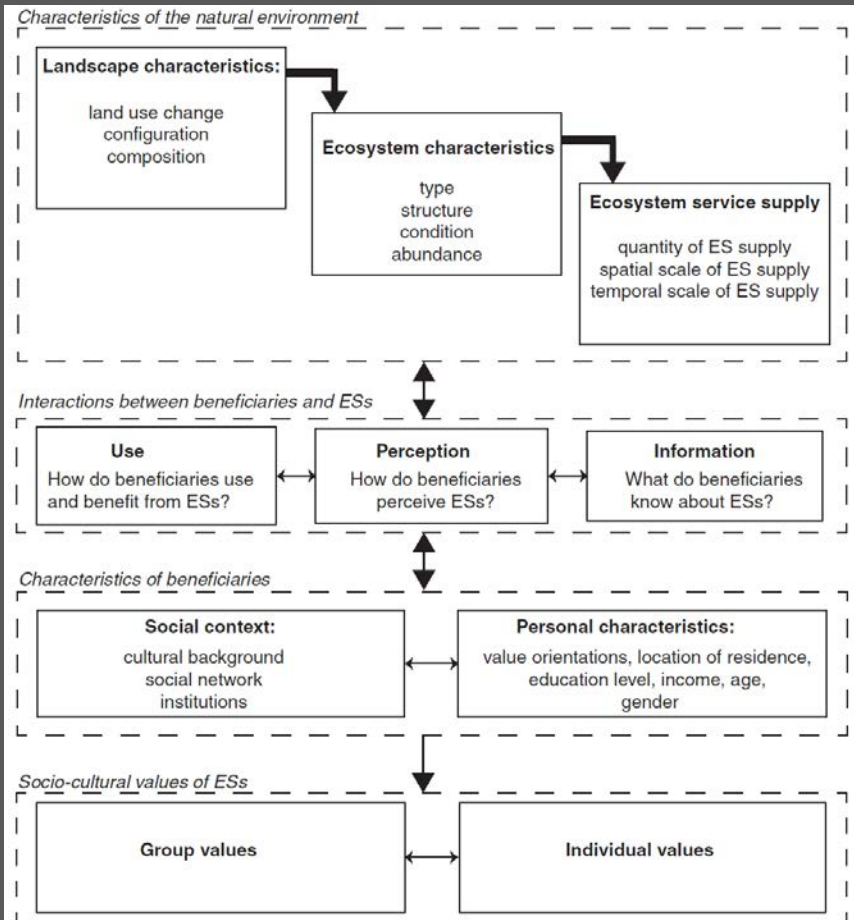


- Widely used technique (Brown, 2005; Raymond *et al.*, 2009; Sheate *et al.*, 2012; Plieninger *et al.*, 2013)
- Various materials: A0 paper map; 1:50k OS base map; ES proxies; ES info sheet; colour coded “sticky dots”
- Facilitator explained info on the map and ES discussed

- Use of “easily understood” question framing (after Plieninger *et al.*, 2009) to elicit response and identification of ES on the map using sticky dots – e.g. “*where in the Pentlands do you know of sites that help to store flood water?*”



# Method (4) ES valuation using a socio-cultural values framework



- Defined as: *“the importance people, as individuals or as a group, assign to ES”* (Scholte *et al.*, 2015 p.68)
- Relate to material and immaterial wellbeing therefore can be used to understand the importance of all ES
- Different determinants of value: understanding how stakeholders relate the ES provided in an area to these factors can help to tease out a qualitative understanding of value

Source: Scholte *et al.* (2015)

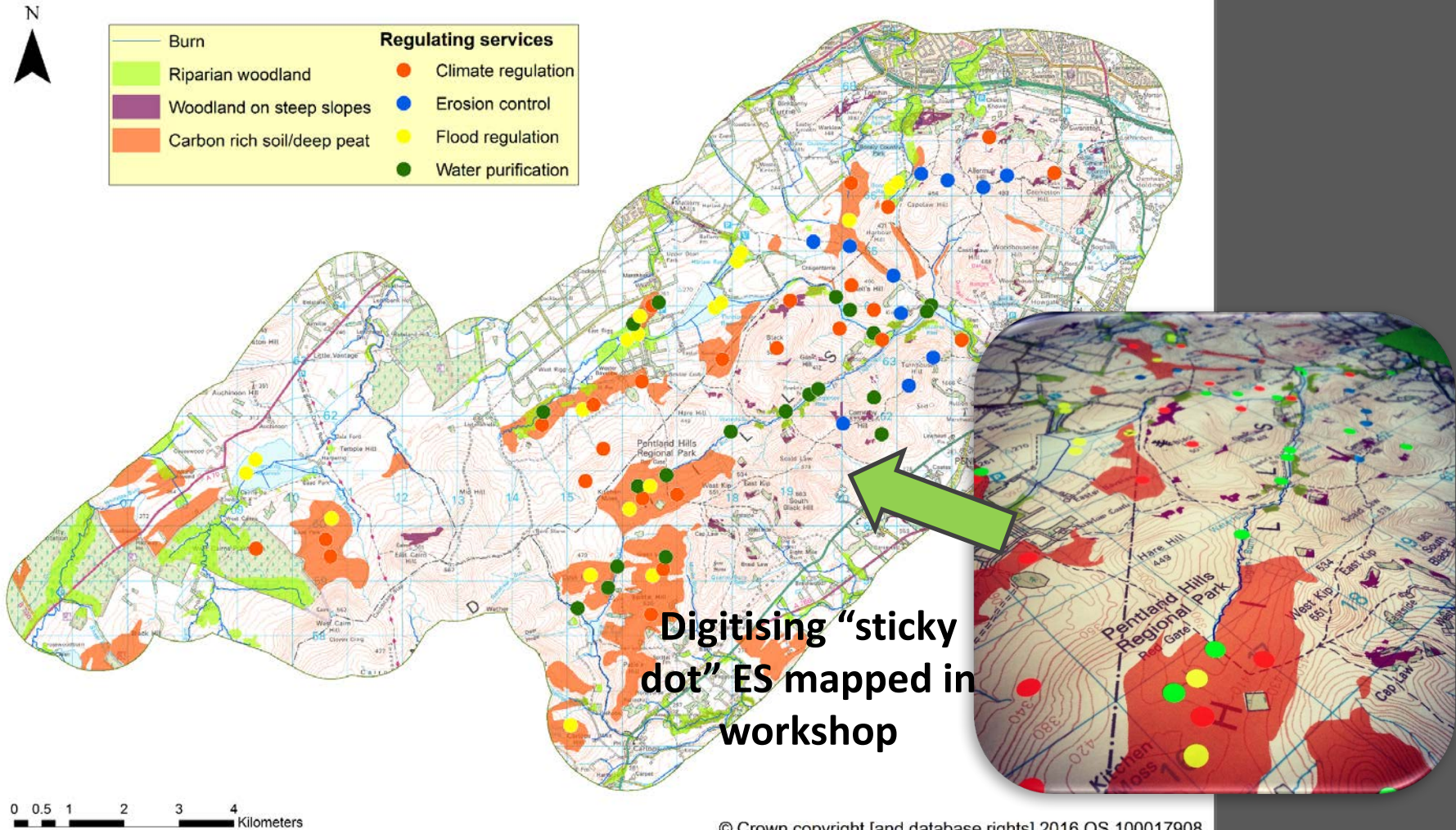
# Method (4) ES valuation using a socio-cultural values framework

- Determinants of socio-cultural value considered:
  - Landscape characteristics
  - Who the beneficiaries are
  - How benefits are used
- Use of questioning and prompts to elicit responses, such as:
  - Landscape characteristics: *which landscape characteristics contribute to the delivery of the benefit? Which features are most important and why?*
  - Beneficiaries: *who will benefit? Where are these beneficiaries located?*
  - Use: *what is it that makes a given use particularly important?*
- Relating valuation questions back to the ES map



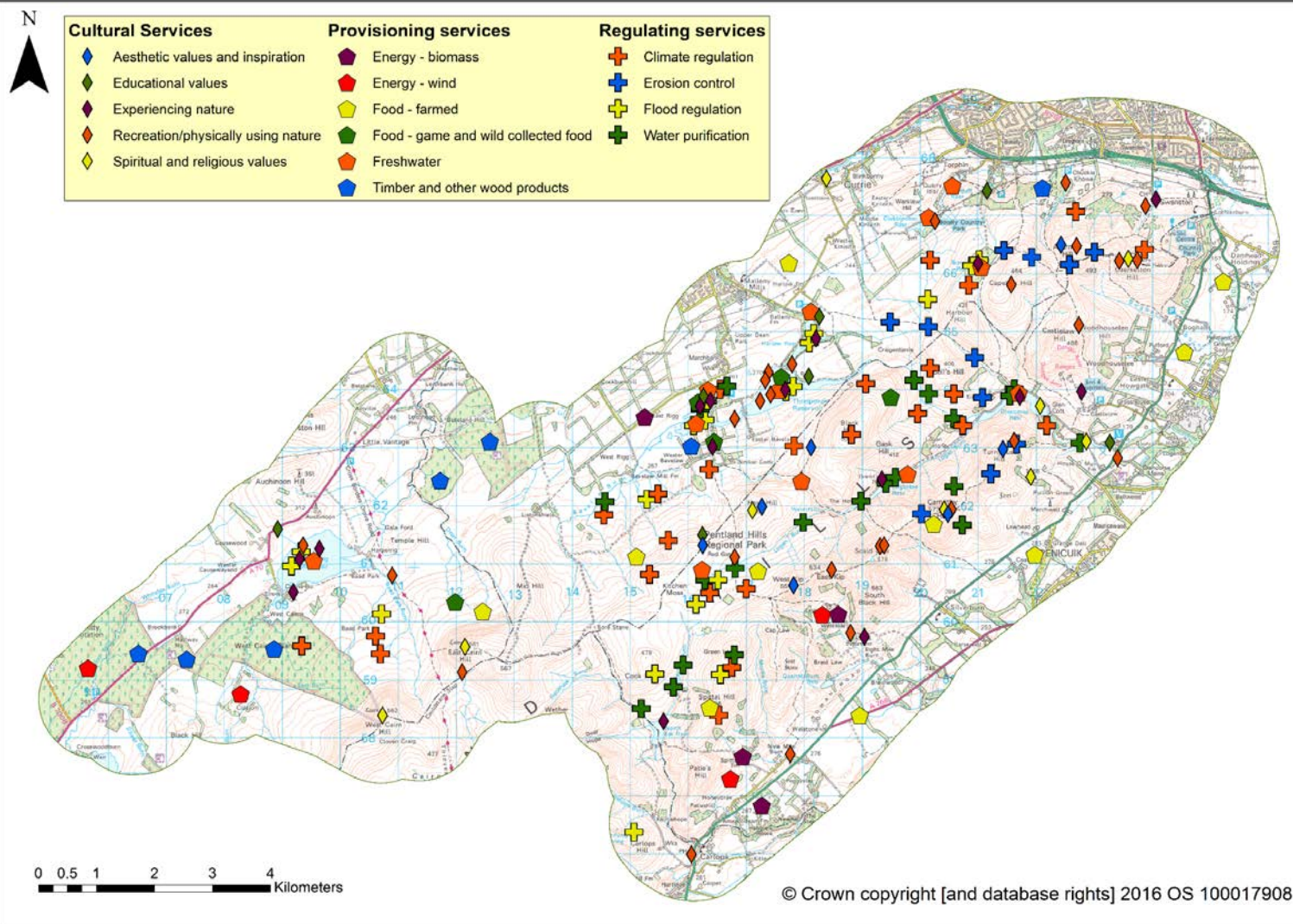
# Results

# Results (1) mapping ES

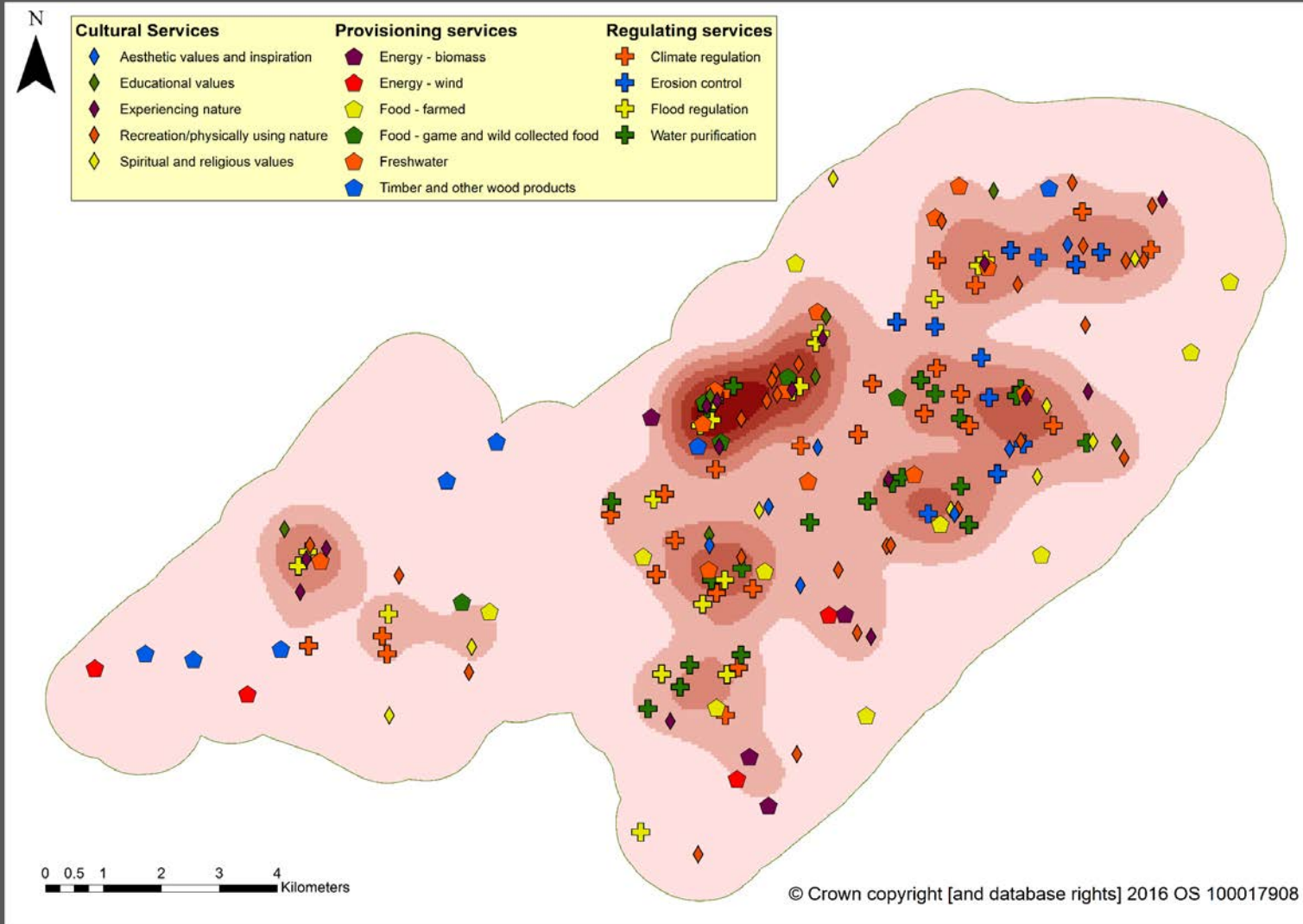




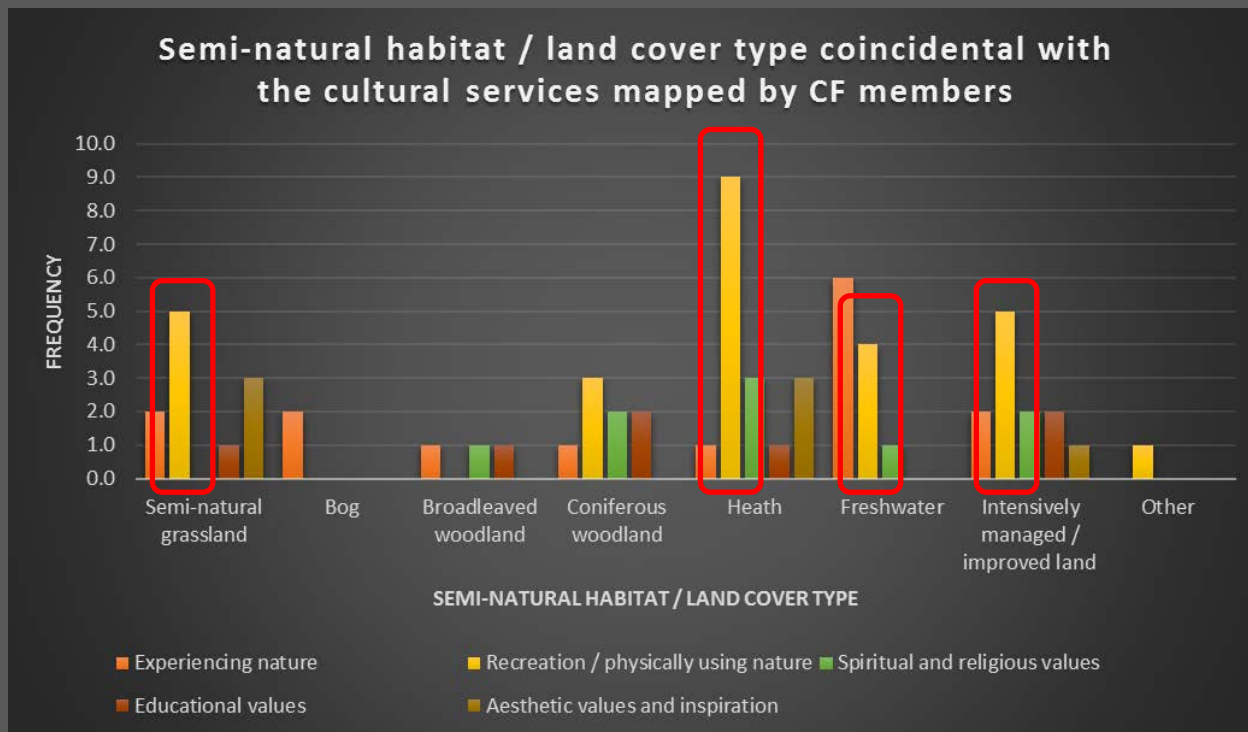
# Results (1) mapping ES



# Results (1) mapping ES



# Results (2) valuing ES – landscape characteristics



Qualitative aspects:  
discussion around  
important features – e.g.  
for recreation:

*“sites and paths that  
provide the opportunity  
of great views and  
scenery whilst being  
active”*

Quantitative aspects: ‘point in polygon’ analysis of mapped ES with land cover data identifies habitats / land covers that may be important for provision of particular ES – e.g. heath and freshwater for recreation.



# Results (2) valuing ES – beneficiaries

- **Who will benefit and where are they located – e.g. recreation:**
  - Members of the public – from within the locality (e.g. Edinburgh)
  - Tourists – people from abroad visiting Edinburgh, people from elsewhere in Scotland visiting the Pentlands
  - Schools – school groups doing activities in the Park
- **Distributional effects and conflicts – beneficiaries of recreation:**
  - Recreational benefits may be valued more by disabled users due to limited access provision – management implications?
  - Recreational users are generally more urban (e.g. Edinburgh based) and there can be conflicts between recreationalists and local residents / landowners
- **Benefits enjoyed by some can create dis-benefits for others**

# Conclusions

# Conclusions (1) methodological

- Participatory mapping of ES
  - Worked well – participants really engaged, lots of useful data
  - Issues with size / representativeness of sample
  - Some ES harder for participants to grapple with (esp. regulating)
- ES valuation using socio-cultural values
  - Valuation did not attempt to rank or prioritise ES – *held* value focus
  - Valuation exercise elicited some useful conversations – rich data helping us understand *why* ES provided in the Park are important
  - Less tangible concept to grasp in short time
  - Questions require some tweaking
  - Presentation to introduce concepts before getting ‘stuck-in’



# Conclusions (2) impact and legacy

- **Developing management objectives and recommendations**
  - Identification of pressures
  - Mapping pressures to Ecosystem Services
- **Follow on work**
  - Use of OPERAs data
  - Updates to Park Management Plan
  - Heritage Lottery Fund
- **Novel aspects**
  - Combining participatory mapping and valuation
  - Planning at different scales
  - Replicable tools for use by non-experts

# Acknowledgements

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- Participants: Members of the PHRP Consultative Forum
- Project Steering Group: Jenny Hargreaves (City of Edinburgh Council), Chris Alcorn (West Lothian Council) and Charlie Cumming (Edinburgh and Lothian Greenspace Trust)
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# References

Brown, G. (2005). Mapping spatial attributes in survey research for natural resource management: methods and applications. *Society & Natural Resources*, 18, pp.17-39.

Plieninger, T., Dijks, S., Oteros-Rozas, E., and Bieling, C. (2013). Assessing, mapping and quantifying cultural ecosystem service at community level. *Land Use Policy*, 33, 118-129.

Raymond, C.M., Bryan, B.A., MacDonald, D.H., Cast, A., Strathearn, S., Grandgirard, A., and Kalivas, T. (2009). Mapping community values for natural capital and ecosystem services. *Ecological Economics*, 68, pp.1301-1315.

Scholte, S.S.K., van Teeffelen, A.J.A., and Verburg, P.H. (2015). Integrating socio-cultural perspectives into ecosystem service valuation: A review of concepts and methods. *Ecological Economics*, 114, pp.67-78.

Sheate, W.R., Eales, R.P., Daly, E., Baker, J., Murdoch, A., Hill, C., Ojike, U. and Karpouzoglou, T. (2012). Spatial representation and specification of ecosystem services: a methodology using land use/land cover data and stakeholder engagement. *Journal of Environmental Assessment Policy and Management*, 14(1), pp.1-36.