SEFARI LEADING IDEAS FOR BETTER LIVES

Scottish Government
Riaghaltas na h-Alba

Ecosystems and Land Use Stakeholders Engagement Group (ELSEG)
Land use – notes and presentations

Monday 21st January 2019, Victoria Quay, Edinburgh

Land Use

Antonia Eastwood presented on People and Adaptive Management of Woodland (or putting the social into AM), Paula Novo on Biodiversity Governance; Values and Perceptions and Klaus Glenk on Economic Benefits of Woodland Recreation.

Antonia was asked whether she thought the attitudes toward woodland management in the Cairngorms and whether they would be representative of other locations. She replied that they were hoping to expand the work to Cumbernauld which would help answer this question. The role of peer pressure was then questioned. Antonia suggested that the role of peer pressure was important, land owners are very keen to know what their neighbours are doing and then go one better. In general, there is a large element of competition. A question was then asked about the relationship between public goods and adaptive management? It was Antonia's view that the move to delivering more public goods seems to be reflected by the ability, capacity and resources of land owners, it being more difficult for poorer land owners to make changes and bridge gaps.

In response to the presentation of Biodiversity Governance, Paula was asked whether there was any way to cross check what land owners *think* is driving decision making with reality? Paula's view is that it is difficult to answer at this stage as they have mainly used SG and organisations (e.g. RSPB) but not farmers/land owners. It is something they will consider in the future. It was also queried whether views are dependent on demography or region? This has been mentioned in workshops but at responses too variable to draw any conclusions. In considering how attitudes might change Paula was asked if marketing people/companies had been approached for input; should we be looking to learn something from large companies (e.g. coca cola) about how to change people's perceptions? Paula noted that some work is being done on this in other contexts but not within this piece of work. It does raise ethical concerns.

In considering the Economic Benefits of Woodland Recreation, Klaus was asked whether he could compare perceived and actual naturalness of woodlands? In response, Klaus said that there were strong correlations with some features of naturalness, e.g. forest structure, but in general there is not enough information available for all the forests. The potential of subjects to accurately score naturalness was also discussed, including the influence of the specific context provided by individual forests that were visited and the heterogeneity of that forest.

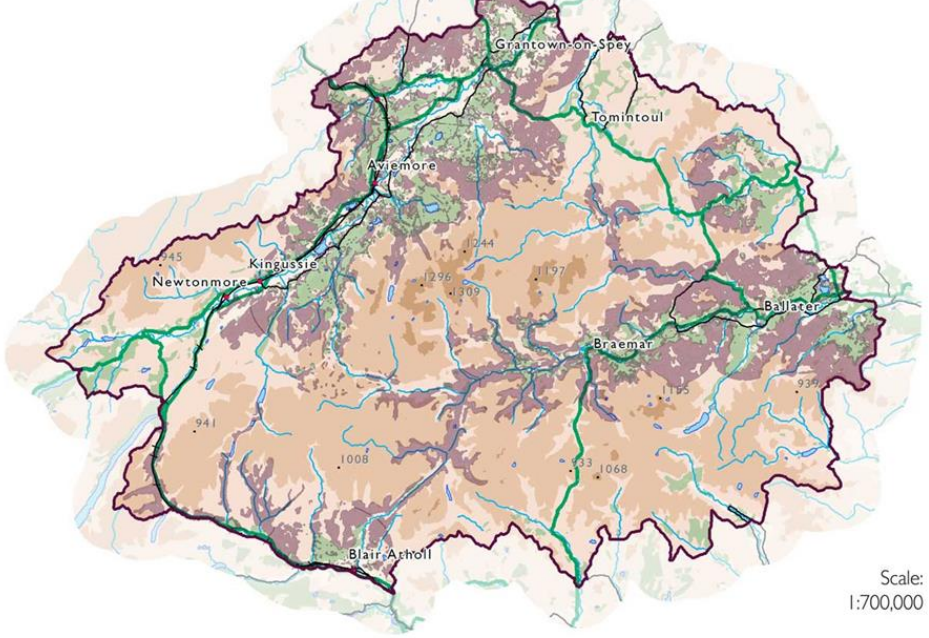
Appendix 1 - Presentations

The following pages show the land use meeting presentation slides

Adaptive management and woodland expansion *(or putting the social into AM)*

Antonia Eastwood, Anke Fischer and Alice Hague

The James Hutton Institute



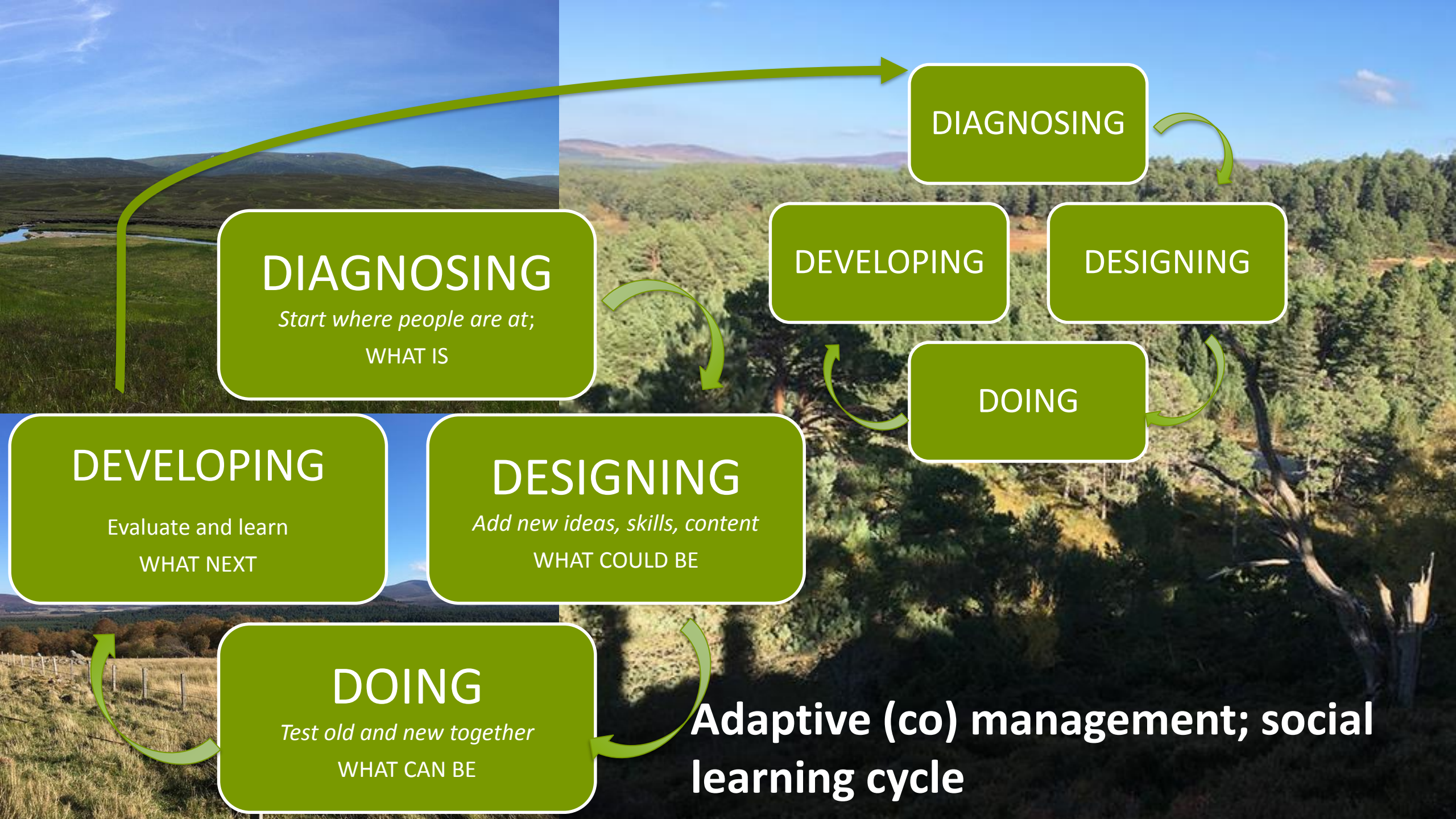
Areas of woodland and potential woodland expansion in the Cairngorms National Park

- Woodland expansion
- Peatland restoration
- Natural Flood Management
- River restoration
- Deer and moorland management

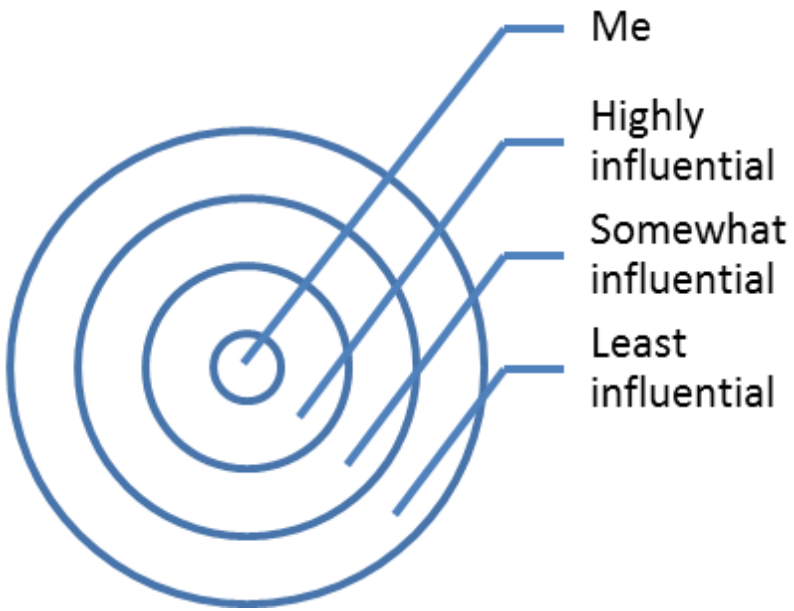
A changing environment …

- Greater importance of managing land for the public interest and public goods
- Delivery of multiple benefits; collaboration of land owners across landscapes

The James Hutton Institute


DIAGNOSING
Start where people are at;
WHAT IS
DESIGNING
Add new ideas, skills, content
WHAT COULD BE
DOING
Test old and new together
WHAT CAN BE
DEVELOPING
Evaluate and learn
WHAT NEXT
DIAGNOSING
DESIGNING
DOING
DEVELOPING
Adaptive (co) management; social learning cycle

Factors that influence my decision making



Qualitative study

- 15 land managers from v. different estates
- Interview
  - management objectives
  - changes in approach to management
  - key influences leading to change
  - role of collaborations in decision-making
- Social network map
- Preliminary findings

The James Hutton Institute

Adaptive Management

The James Hutton Institute

Social learning

- Networks
- Reflection
- Trust
- Influences

Implementation

- Agency
- Capacity
- Incentives
- Disincentives
- Social relations

AM

Social networks are key influences

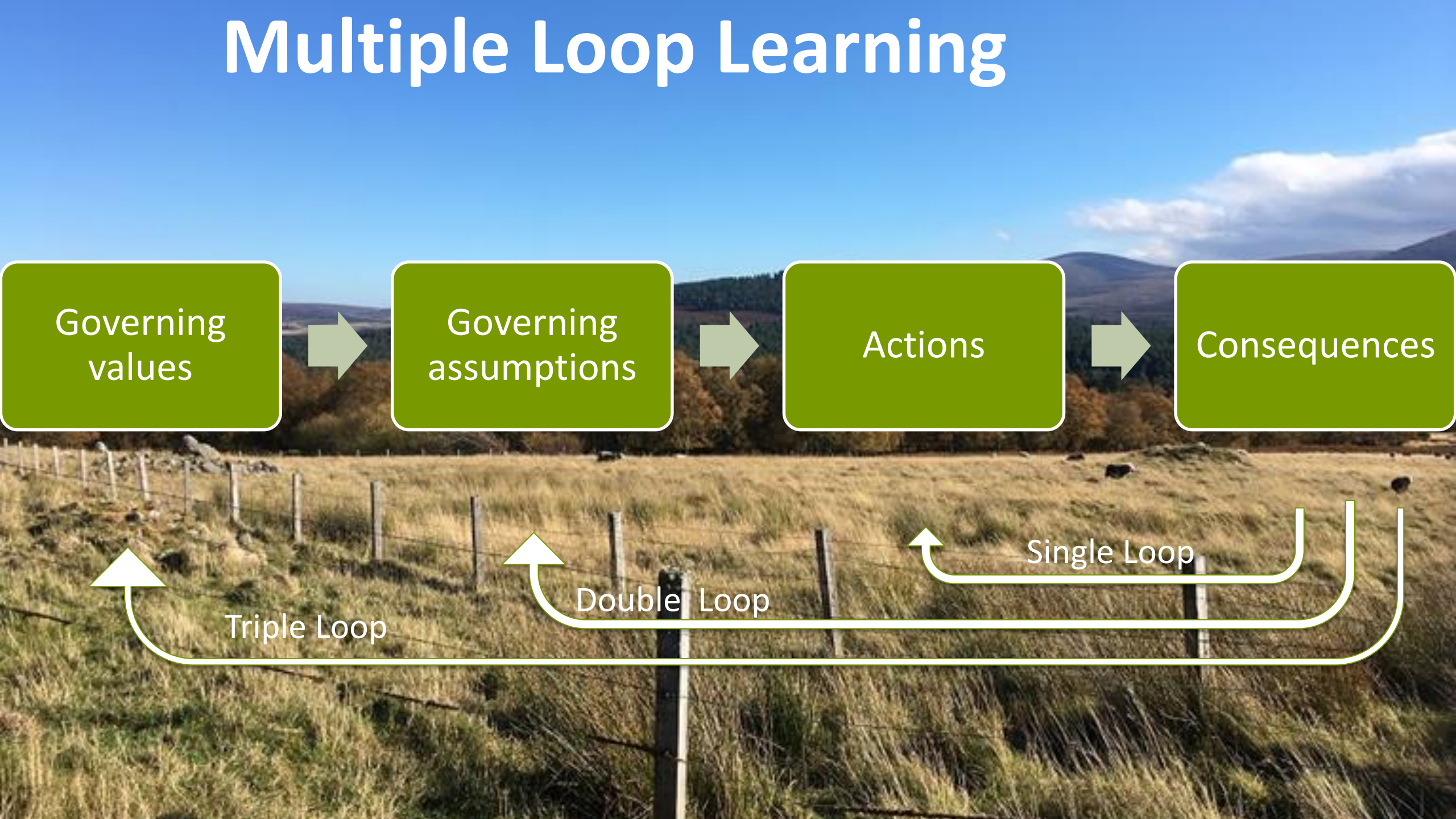
- Decisions strongly influenced by owner or trustees
- Decisions strongly influenced by family, close staff and community
- Social networks/influences vary in size, diversity and influence
- And can support ‘adaptation’
- Lack of trust between some social groups

The James Hutton Institute

Facilitation of learning

- Significant event or memorable experience
  - Stress; change in visitor management approach
  - Fencing contractor - poor condition of hill deer in fenced areas; sustainability of deer populations
  - Section 7 agreement and statutory culling/media attention
  - Independent review; forced dialogue and engagement with communities
- New settings and experiences
  - Norway trip/Trip to Canada
  - Social occasions vs formal meetings (guards are down)
  - The personal touch
- Not being an expert/specialist
  - More open to different perspectives
  - Openness to learn from other (personality?)
- Bridge makers
- Reflection
- Government policy changes

Multiple Loop Learning



Key message and next steps

- Preliminary analysis: Social relations and learning is key to AM
- Analyse further and those factors that may promote or hinder AM implementation
- Research brief

Governing biodiversity: the role of values and perceptions

Paula Novo[1], Scott Herrett[2], Anja Byg[2], Nazli Koseoglu[2]

Ecosystems and Land Use Stakeholder Engagement Group (ELSEG) – 2019 Meeting

1: Scotland's Rural College, 2: The James Hutton Institute
This research was funded by Scottish Government's Strategic Research Programme, 2016 - 2021

Rationale for this research

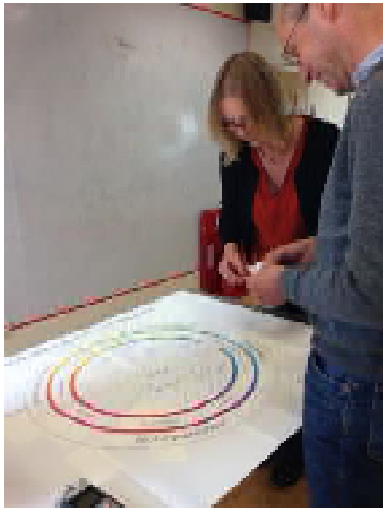
- Large number of governance mechanisms seek to get land managers to adopt 'biodiversity friendly' practices
- Biodiversity continues to decline
- Many studies have looked at barriers to uptake
- But role of values explored to a lesser extent

Values in biodiversity governance

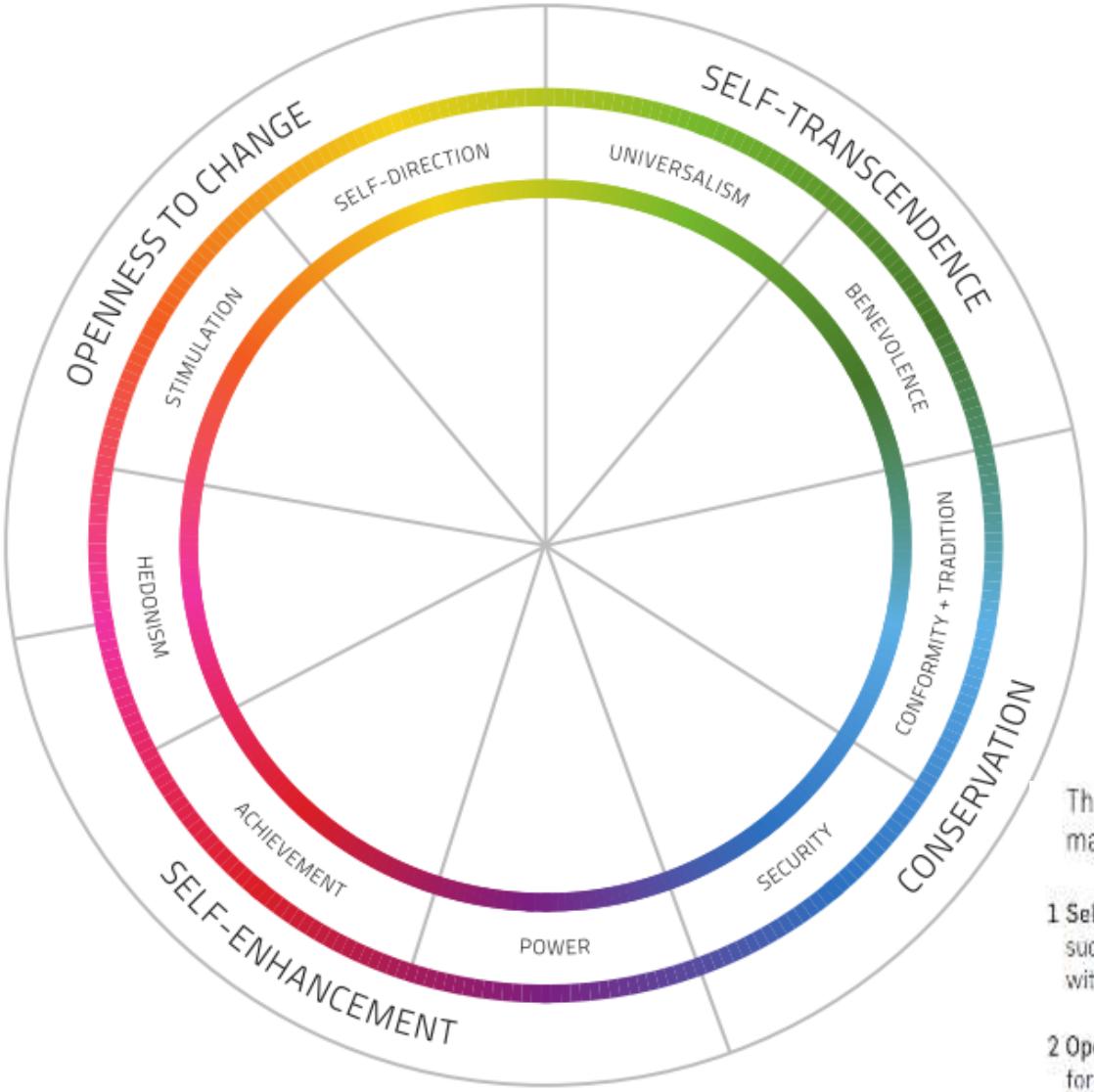
- Values as abstract goals and guiding principles (Schwartz, 2012)
- Values guide decision-making, e.g. what and where to conserve, what to regard as acceptable ways of using and managing the land, what trade-offs to make, who and what is targeted
- What to see as appropriate governance solutions

Research: experiences with biodiversity governance and role of values

- Methods
  - 15 interviews with people involved in biodiversity governance (in Scotland):
    - what works /doesn't work
    - perceptions and values in relation to people and biodiversity
  - 2 workshops:
    - desirable governance characteristics
    - (fundamental) values to influence attitudes and behaviours towards biodiversity
    - implications of appealing to these values



Fundamental values: Schwartz's values wheel



↑ Figure 3. Schwartz's value circumplex.[16]

Image credit: Common Cause Foundation (UK)

The ten groups of values can then be divided along two major axes, as shown above:

1 **Self-enhancement** (based on the pursuit of personal status and success) as opposed to **self-transcendence** (generally concerned with the wellbeing of others);

2 **Openness to change** (centred on independence and readiness for change) as opposed to **conservation** values (not referring to environmental or nature conservation, but to 'order, self-restriction, preservation of the past and resistance to change').

Results: the role of values

- Values are reflected in different governance mechanisms
  - Values feed back into the relationship between humans and nature (human-nature divide)
  - Creation of trade-offs and potential conflicts
- Governance mechanisms appeal to different values to engage stakeholders in particular land management practices
  - Different approaches for different people?
  - Rational language and logical arguments and/or emotive language
  - Normative and relational values
  - Taboo trade-offs
- Values also determine what is seen as good governance

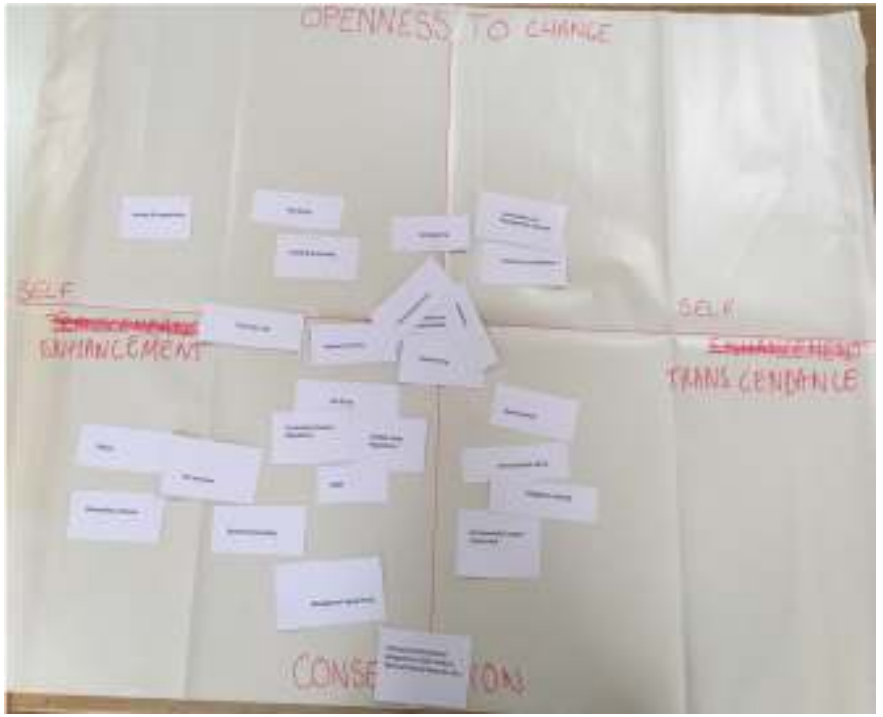
Results: good governance

Characteristics related to…	Detailed governance characteristics
Stakeholders	Engaged land managers, accessible language, inclusive, legitimate and respected
Monitoring and evaluation	Relevant to ecological processes, evidence and outcome based, multiple outcomes, accountable, fairness and compatibility with social welfare measures
Governance structure and processes	Continuous engagement, joined up, integrative approach across policy areas, bottom-up, collaborative, transparent, links to resourcing
Effectiveness and efficiency	Efficient, landscape scale, robust, provides an opportunity for creativity and bespoke solutions, flexible for change, targeted, realistic, allows for uncertainty

Results: fundamental values to influence attitudes and behaviours

- Self-transcendence (universalism and benevolence)
  - Natural fit with motivations for conservation
  - Belief that there is more than our individual selves
  - Sense of stewardship
- Conservation (security and conformity)
  - Comply with the regulations and avoiding threats
  - Responsibility of passing down the land
- Self-enhancement (achievement and power)
  - Making a return on biodiversity
  - Social recognition (tied with universalism)
- Hedonism
  - Stimulation, beauty of nature
- Self-direction
  - Pioneering farming practices
  - Sense of ownership and responsibility over the local environment

Results: to what values different governance mechanisms appeal?



Results: to what values different governance mechanisms appeal?

- Cluster of governance mechanisms appealing to self-enhancement and conservation values
  - Mechanisms dominated by regulations and economic incentives
  - Recognises the economic impact on land managers
  - Compliance-based measures are ‘convenient’ to implement
- Only a few mechanisms appealing to self-transcendence and openness-to-change values
  - Role of larger scale mechanisms (e.g. partnerships and other collective actions) in promoting these values

Conclusions

- Outcome of biodiversity governance is also a question of what and whose values are brought to bear
- Notions of fairness, equity and participation recognised as key characteristics but often fall out of formal governance processes and structures
- Need (opportunity) for re-thinking policies to promote human connections with nature and reconcile different values, uses and needs
- Mismatch between values of those involved and the values expressed by actual governance
- Understanding these complex relationships can provide the basis for governance designs rooted at the value base of the stakeholders involved

Thank you!

paula.novo@sruc.ac.uk

Reports available here:

http://www.hutton.ac.uk/research/srp2016-21/wp134-biodiversity-management/assessment-current-biodiversity-management-measures

Acknowledgements: We are indebted to the interviews and workshop participants for taking the time to share their thoughts and opinions with us. This research was funded by Scottish Government's Strategic Research Programme 2016-2021.

Benefits of woodland recreation

Klaus Glenk, Alistair McVittie (SRUC)

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

Background

- Research to inform part of Natural Capital Accounting work in WP1.4

- Two main aims
  - Generate updated welfare estimates for Scotland
    - Comprehensive approach to allow for flexibility e.g. to distinguish by forest patch size or recreational activity
  - Improve understanding of heterogeneity in forest use
    - What explains differences in intensity and type of recreational forest use?

Survey of forest and woodland recreation in Scotland

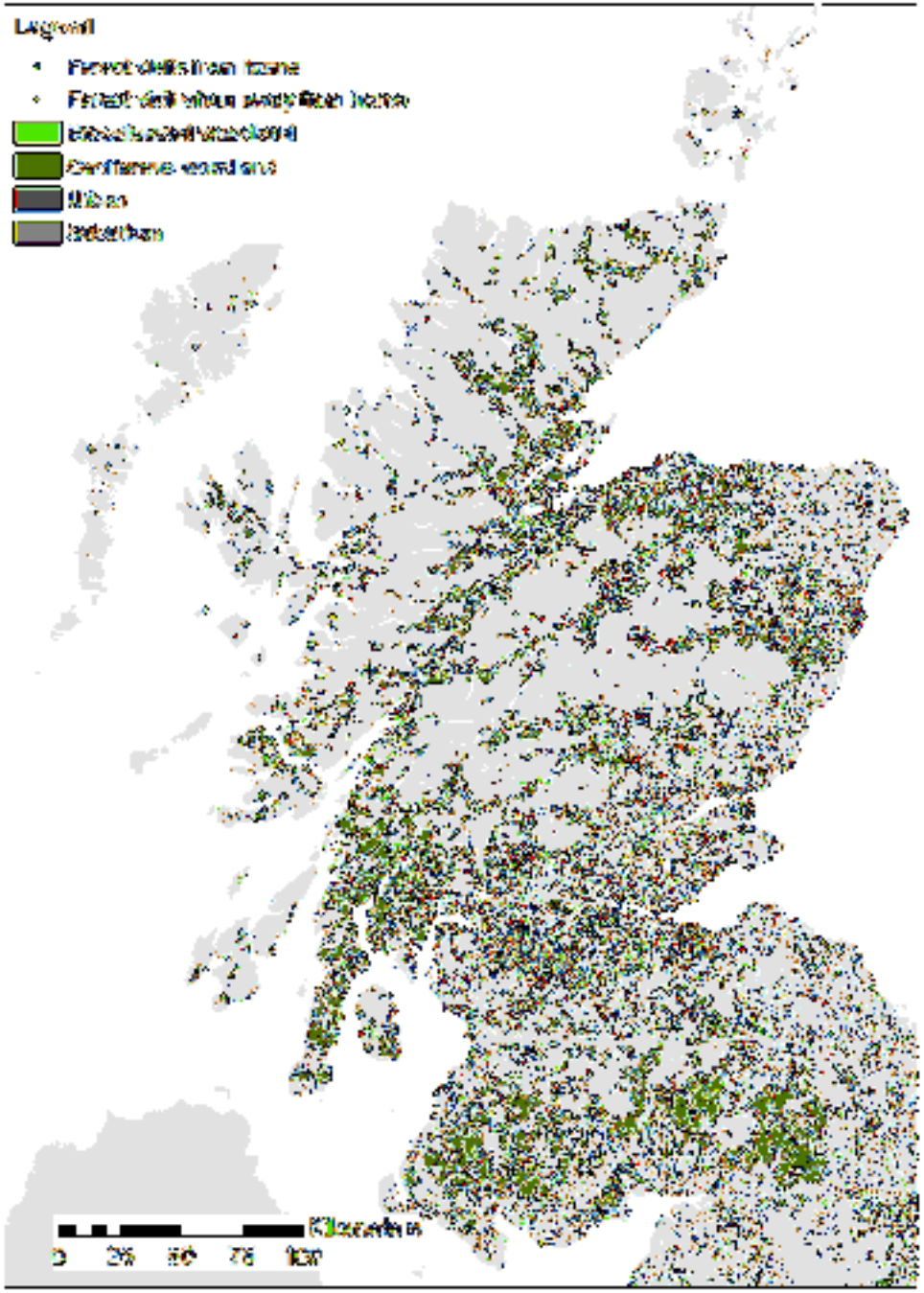
- Part of wider European research effort – countries: AT, BY, CH, CZ, DE, DK, FR, PL, SK, UK
- Spring (April/May 2017) – potential seasonality effects; explored in French sample
- Online panel
- 1,001 usable responses in Scotland

- Revealed preference part
  - forest(s) recently visited
- Stated preference part
  - Preferences for and perceptions of forest characteristics

Forest recreation data: characteristics (Scottish sample)

- Screening question – 'have you visited a forest or woodland for recreation in the past 12 months?'
  - 71% Yes
  - Comparable to 78% reported to have visited forest/woodland at least once in past 12 months (SNH Scotland's People and Nature Survey 2013/14)
- Forest/woodland visited last:
  - Visiting forest was single purpose of trip: 70%; …was part of other activity (e.g. family visit, holidays, business trip etc.): 30%
  - Weekend/holiday: 57%; weekday: 43%

Forests (last) visited



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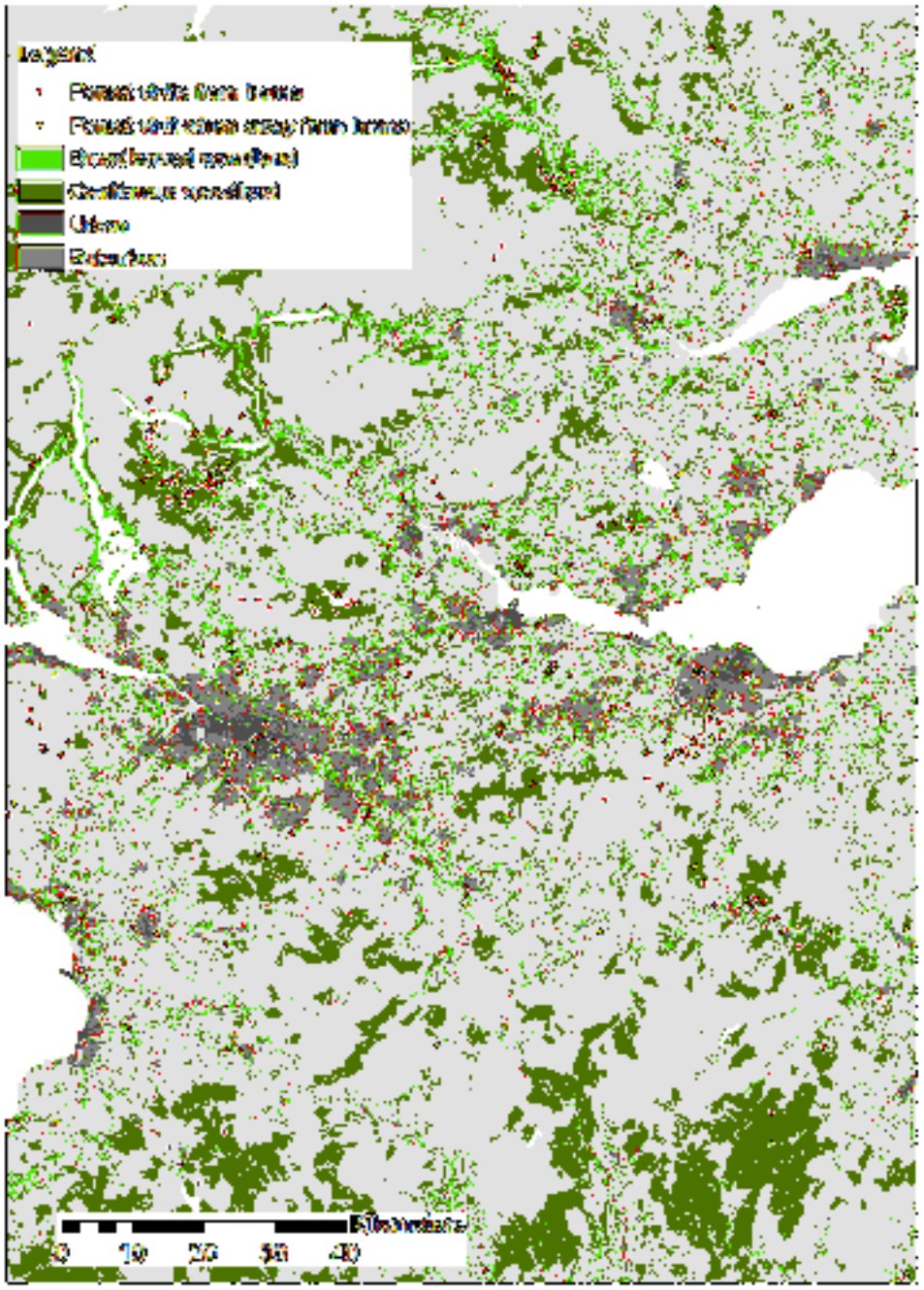
Forests (last) visited (Central belt)



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RP: Consumer surplus estimation

- Consumer surplus per trip based on incurred cost
- Recreationists are WTP at least as much to access site as they incurred in travel costs
- Assumption: data on last visited forest is across sample representative of general forest recreation behaviour

- Data:
  - Frequency of visiting this forest over past year
  - Travel cost estimated from survey data

- Count data model

RP results – consumer surplus/trip

- Only travel cost (weekday)

	DE	DK	FR	PL	SCOT
CS	**0.8**	**1.0**	**1.4**	**1.5**	**1.0**
s.e.	0.1	0.2	0.3	0.5	0.1
N	167	289	189	163	223

- Only travel cost (weekends/holiday)

	DE	DK	FR	PL	SCOT
CS	**4.9**	**7.2**	**8.5**	**4.9**	**5.8**
s.e.	0.8	0.6	0.9	0.5	1
N	423	351	437	419	335

RP results – consumer surplus/trip

- Travel cost and time cost (weekday)

	DE	DK	FR	PL	SCOT
CS	**3.7**	**6**	**5.7**	**2.7**	**4.4**
s.e.	0.5	0.9	1	1.0	0.4
N	167	289	189	163	223

- Travel cost and time cost (weekends/holiday)

	DE	DK	FR	PL	SCOT
CS	**23.0**	**43.7**	**35**	**9.1**	**25.5**
s.e.	3.6	3.9	3.6	1.0	4.4
N	423	351	437	419	335

RP summary

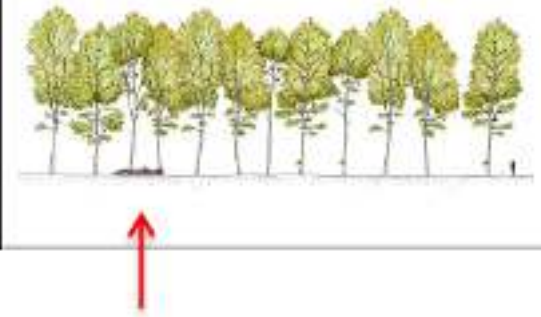
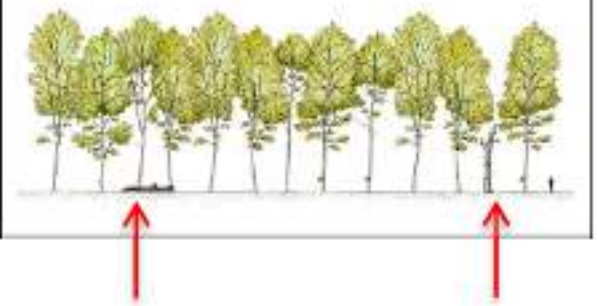
- Comparison of consumer surplus estimates with some previous UK studies
  - Christie et al (2006) £9.8 - £19 per trip (TCM) depending on activity
  - Sen et al. (2014) £3.6 (MA)
- Extensions
  - Differentiation by trip type, activity, forest type
  - Refining travel cost assumptions
  - Potential for including forest characteristics (e.g. patch size) and other spatial variables (e.g. availability of substitute sites)

SP: Preferences for forest attributes

- Respondents choose between going to one of two hypothetical forests and the forest last visited
- Choice experiment format: 12 choices
- Attributes:
  - Forest type (coniferous, broadleaved, mixed)
  - Tree height (8m, 18m, 24m)
  - Number of tree types by habitus (1, 2, 3, 4)
  - Age variation (single aged; two-aged, multi-aged)
  - Trees left for natural decay 'deadwood' (none, low, medium)
  - Facilities (none; picnic facilities/benches; marked trails)
  - One-way distance to forest (miles)

Example: deadwood

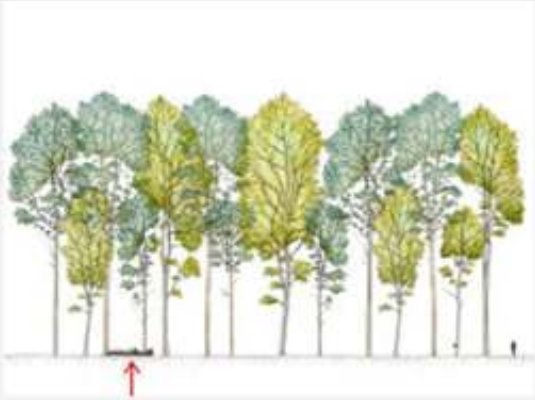
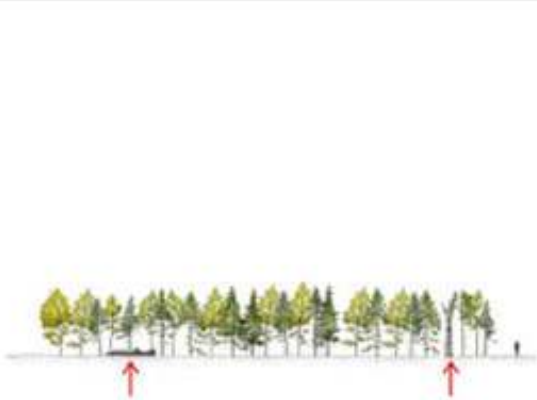
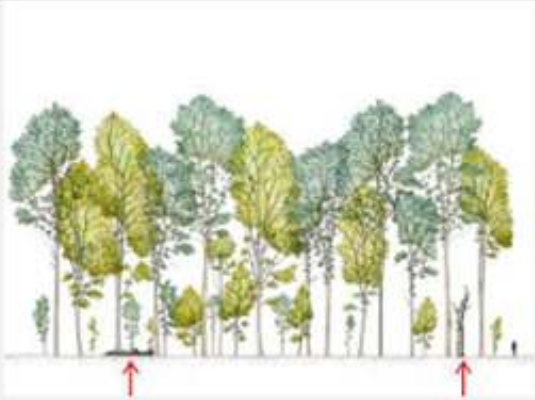
Dying or dead trees can be left in the forest for natural death and decay. They provide good living conditions for numerous rare species of animals, plants and fungi. Trees left for natural decay can be lying or standing. Only near natural forests have a high volume of dead and dying trees.

None	Low	Medium
No trees left for natural decay	Few trees left for natural decay; you find on average every 50 m wood left for decay	Several trees left for natural decay; you find on average every 25 m wood left for decay lying or stand upright
		

Choice card

As defined by respondents

Which of these three forests would you visit?

Forest A	Forest B	Last visited forest
Mix of 2 broadleaved tree species, tallest trees 24 m, two-aged, low amount of trees left for natural decay	Mix of 2 coniferous and broadleaved tree species (1 coniferous and 1 broadleaved), tallest trees 8 m, single-aged, medium amount of trees left for natural decay	Mix of 2 broadleaved tree species, tallest trees 24 m, multi-aged, medium amount of trees left for natural decay
		
Picnic facilities  Marked trails 	None 	Marked trails 
One way distance 2 miles	One way distance 8 miles	One way distance 0-2 miles
○	○	○

SP: results – Monetary value (£/trip)

Attribute	WTP (£/trip)	lower bound [2.5%]	upper bound [97.5%]
#trees: increase	0.94	0.55	1.32
#trees: decrease	-1.50	-1.96	-1.04
Tree height (m)	0.19	0.13	0.25
Two aged	0.15	-0.59	0.88
Multi aged	1.68	0.92	2.43
Deadwood: low	0.54	-0.01	1.09
Deadwood: medium	1.63	1.05	2.21
Picnic facilities	0.78	0.05	1.50
Marked trails	3.24	2.39	4.09
Picnic & trails	5.18	4.24	6.11

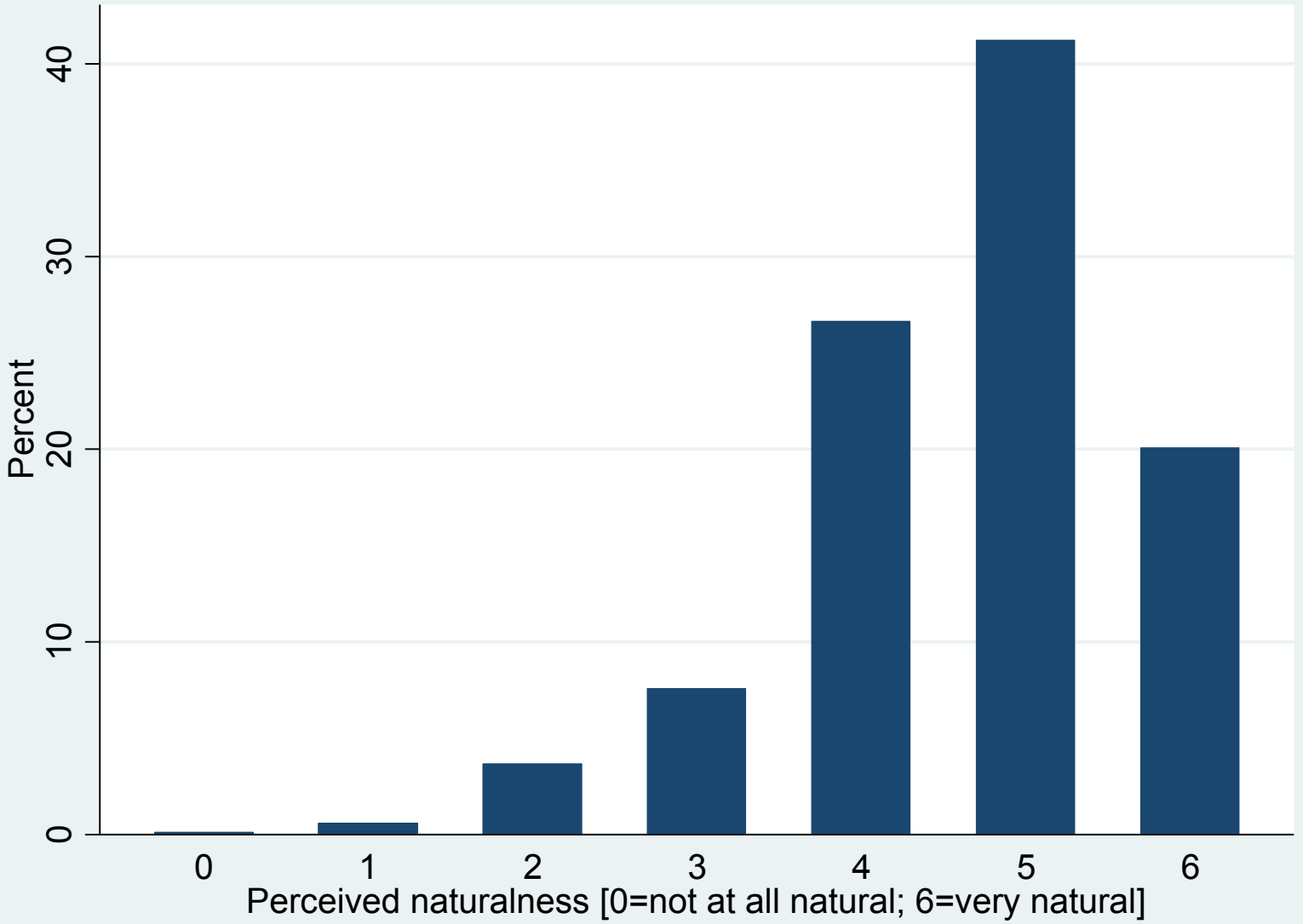
SP: summary

- Recreationists value structural forest attributes and facilities
- Preferences may – to a degree – help explain why some forest areas receive lower visitation

- Some structural forest attributes related to biodiversity and directly relevant for forest management
  - Variation in tree types
  - Age variation
  - Deadwood

- Extensions
  - Accounting for preference heterogeneity – also by activity etc.
  - Matching perceptions with objective data on forest characteristics (if possible)

Perceived naturalness



Perceived naturalness - findings

- Perceived naturalness found to have direct and indirect influence on emotional well-being associated with recreational experience (Marselle et al. 2016)

- We find positive association of perceived naturalness with:
  - Increased age variation of trees
  - Increased amount of trees left for decay (deadwood)

- Perceived naturalness is positively correlated with perceived restorativeness (Qualities: ‘Fascination’ and ‘Being Away’)

Summary

- Results (thus far) look promising and make intuitive sense
- More work on both RP and SP data needed
  - More refined estimates also considering what is most useful for natural capital accounts
- Links to mental well-being work interesting and could be expanded in future studies

RP: Assumptions

- Only single purpose trips considered (for now)
- Geodesic distance not network distance
- Car transport only (70%) – 'average' car/2 people
- High sensitivity to low number of very long trips
- Travel cost
  - Round trip distance – shortest distance x 'wiggle factor' (1.2)
  - Fuel cost (based on 7l/100km)
  - Travel time cost: assuming travel speed of 50 km/h; 1/3 of wage rate
- Truncated negative binomial count data regression

Table 5.1 Recreation values from the existing evidence base.

Source	Value per visit (converted to 2014 GBP)	Values for	Method/notes
Scarpa (2003)	2.23–3.69	Forests and woodlands only	Contingent valuation (open-ended and dichotomous choice willingness to pay surveys).
Christie *et al.* (2006b)	9.75–18.50	Forests and woodlands only	Travel cost method to estimate the value of improvements to recreational facilities in forests. Range depends on type of recreation activity (e.g. cycling, hiking).
Eftec (2010)	2.69	Forests and woodlands only	Low facility sites; constant value applied per trip. Does not vary with size of woodland, distance from populations, household incomes, availability of substitutes and so on.
Eftec (2010)	13.45	Forests and woodlands only	High facility sites; constant value applied per trip. Does not vary with size of woodland, distance from populations, household incomes, availability of substitutes and so on.
Sen *et al.* (2012)	3.35*	All outdoor recreation types across Great Britain, including forests and woodlands	Meta-analysis of over 100 studies, combining revealed and stated preference valuation techniques. Develops detailed Trip Generation Function (TGF**). Expressly models travel time and cost from each potential outset area to each recreation site, availability of substitute sites and household characteristics (e.g. income).
Sen *et al.* (2014)	3.59	Forests and woodlands only	Combines TGF with meta-analysis of 297 values from 98 studies to estimate per visit values. Expressly models travel time and cost from each potential outset area to each recreation site, availability of substitute sites and household characteristics (e.g. income).

Notes: Conversions to 2014 GBP using HM Treasury GDP Quarterly Deflators 30 September 2015 Update, available from: https://www.gov.uk/government/statistics/gdp-deflators-at-market-prices-and-money-gdp-september-2015-quarterly-national-accounts. * Based on Sen *et al.* (2012) base case scenario with 3231 000 visits totalling GBP 10 040 000 in value. ** The TGF developed in Sen *et al.* (2011) relates the number of trips observed to a variety of predictor variables including site type (e.g. mountain, lake, grassland); study details (sample size, treatment of substitutes, valuation methods); demographic details (population density). Some studies excluded due to age.

Example: age variation

Forests can also differ with respect to how different trees in the same place vary with respect to their age. The forests in our study can be:

Single-aged composed of trees are of the same age and similar size	**Two-aged** composed of trees that are of two age and size classes	**Multi-aged** composed of trees of varying age and size classes
		

SP: results – recently visited forest

Variable	Mean	SD	Min	Max
Distance (km)	37.61	45.22	0.5	150
Number of tree types by habitus	2.48	1.04	1	4
Tree height	21.94	3.79	8	24
Single aged	0.35	0.48	0	1
Two aged	0.12	0.32	0	1
Multi aged	0.54	0.50	0	1
No deadwood	0.08	0.27	0	1
Low deadwood	0.50	0.50	0	1
Medium deadwood	0.43	0.49	0	1
No facilities	0.21	0.40	0	1
Picnic facilities/benches	0.07	0.26	0	1
Marked trails	0.25	0.43	0	1
Both picnic facilities and marked trails	0.47	0.50	0	1

SP: results – choice model

Variable	Coefficient
Constant	0.504
Distance (8.6p/km)	-0.191
#trees: increase	0.148
#trees: decrease	-0.257
Tree height (m)	0.0402
Two aged	-0.01 (n.s.)
Multi aged	0.178
Deadwood: low	0.114
Deadwood: medium	0.241
Picnic facilities	0.212
Marked trails	0.620
Picnic & trails	0.913

N=832 respondents

Ordered logit – perceived naturalness

Ordered logistic regression — Number of obs = 1001
LR chi2(10) = 46.82
Prob > chi2 = 0.0000
Log likelihood = -1373.3211 — Pseudo R2 = 0.0168

X1	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
sum_tree	.0542775	.0574937	0.94	0.345	-.0584081	.1669632
tree18m	.3433222	.3494442	0.98	0.326	-.3415758	1.02822
tree24m	.1537995	.4013531	0.38	0.702	-.6328381	.9404371
two_age	.472852	.2847414	1.66	0.097	-.0852308	1.030935
mult_age	.7494592	.2483512	3.02	0.003	.2626998	1.236219
dead_med	.5237683	.2276781	2.30	0.021	.0775273	.9700093
dead_hig	.6438924	.2325197	2.77	0.006	.1881622	1.099623
infra2	.232173	.2529252	0.92	0.359	-.2635514	.7278973
infra3	-.0232317	.1721764	-0.13	0.893	-.3606912	.3142278
infra4	.2127885	.1531308	1.39	0.165	-.0873423	.5129194
/cut1	-5.566779	1.069618			-7.663192	-3.470366
/cut2	-3.611936	.5365522			-4.663559	-2.560313
/cut3	-1.721917	.4119279			-2.529281	-.9145536
/cut4	-.6149209	.3980955			-1.395174	.1653319
/cut5	.96529	.3986738			.1839038	1.746676
/cut6	2.863903	.4063092			2.067552	3.660255

SP: results – recently visited forest

Variable	Mean	SD	Min	Max
Distance (km)	37.61	45.22	0.5	150
Number of tree types by habitus	2.48	1.04	1	4
Tree height	21.94	3.79	8	24
Single aged	0.35	0.48	0	1
Two aged	0.12	0.32	0	1
Multi aged	0.54	0.50	0	1
No deadwood	0.08	0.27	0	1
Low deadwood	0.50	0.50	0	1
Medium deadwood	0.43	0.49	0	1
No facilities	0.21	0.40	0	1
Picnic facilities/benches	0.07	0.26	0	1
Marked trails	0.25	0.43	0	1
Both picnic facilities and marked trails	0.47	0.50	0	1
Perceived naturalness [not at all natural=0; very natural=6]	4.64	1.05	0	6