The diversity of people's relationships with biodiversity should inform forest restoration and creation

Supplementary Information

Appendix 1 Participants

Participants were selected by a social research agency (Qa Research Ltd, York, UK) using both face-to-face and telephone invitations, following the recruitment criteria for each workshop (see subsection 2.2 in the main manuscript). In total, 194 individuals were recruited (winter, *n*=50; spring, *n*=46; summer, *n*=50; autumn, *n*=48) (Table S1).

Table S1. Social characteristics of participants (*N*=194). Social grades are defined as: AB, higher & intermediate managerial, administrative, professional occupations; C1, supervisory, clerical & junior managerial, administrative, professional occupations; C2, skilled manual occupations; DE, semi-skilled & unskilled manual occupations, unemployed.

	Winter		Spring		Summer		Autumn	
Variable	***n***	**%**	***n***	**%**	***n***	**%**	***n***	**%**
Gender								
Female	27	54.0	23	50.0	27	54.0	25	52.1
Male	23	46.0	23	50.0	23	46.0	23	47.9
Age range								
18-29	16	32.0	14	30.4	16	32.0	14	29.2
30-59	17	32.0	16	34.8	18	36.0	17	35.4
60+	17	34.0	16	34.8	16	32.0	17	35.4
Ethnicity								
White British	40	80.0	34	73.9	39	78.0	33	68.8
Other	10	20.0	12	26.1	11	22.0	15	31.2
Country								
England	46	92.0	40	87.0	42	84.0	45	93.8
Scotland	2	4.0	2	4.3	4	8.0	3	6.3
Wales	2	4.0	4	8.7	4	8.0	-	-
Urban/Rural								
Urban	40	80.0	36	78.3	37	74.0	40	83.3
Rural	10	20.0	10	21.7	13	26.0	8	16.7
Social grade								
AB	14	28.0	13	26.0	15	30.0	14	28.0
C1	14	28.0	15	30.0	13	26.0	16	32.0
C2	11	22.0	9	18.0	12	24.0	10	20.0
DE	11	22.0	9	18.0	10	20.0	8	16.0

Appendix 2 Q-methodology

While Q-sets usually consist of statements on a particular subject, they may comprise anything that can be ranked and discussed by participants (Watts & Stenner, 2012). When using statements, participants can react to each one (i.e. agree, disagree or neutral), and then discuss how the statement does, or does not, align with their personal viewpoint. In this study, we used images as

our Q-set stimuli (Fig. S1), allowing participants to focus on whichever attributes were important to them when ranking and discussing the items. Images create opportunities for participants to articulate what is salient, as an image may be ranked the same/inversely by participants based on different attributes (Van Auken et al., 2010). Images can also access participant's tacit, sometimes unconscious, use of characterizations and metaphors (Van Auken et al., 2010). Moreover, images have the potential to cross literacy and language barriers, helping to produce richer and more participant-led data (Milcu et al., 2014; Sherren et al., 2010). Image Q-sets have been used successfully in previous research using Q-methodology, focusing on issues such as the creation of recreational trails (Hawthorne et al., 2008), public views on windfarms (Beckham Hooff et al., 2017), land-use change (Lu et al., 2018; Swaffield & Fairweather, 1996) and landscape preferences (Milcu et al., 2014).

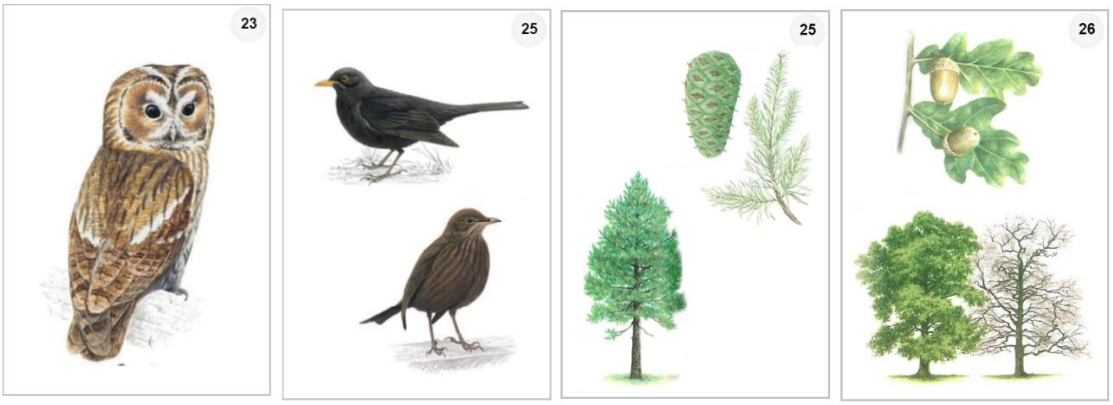

Figure S1. Example Q-set images used to explore how the public interact with, respond to and talk about biodiversity attributes associated with British forest species. Examples of images, left to right: tawny owl (*Strix aluco*), blackbird (*Turdus merula*), lodgepole pine (*Pinus contorta var. latifolia*) and English oak (*Quercus robur*) (bird images courtesy of Mike Langman via rspb-images.com and tree images courtesy of John Kilbracken).

We selected images to embody a diverse mixture of attributes associated with forest biodiversity, informed by the literature (e.g. Larsen et al., 2017; Smith et al., 2012; Sumner et al., 2018; Zhao et al., 2017). Due to the high levels of biodiversity in forests, we created four broad Q-sets: vertebrates (*n*=32 images), invertebrates (*n*=43), trees (*n*=32), and understory plants and fungi (*n*=32). The invertebrate Q-set was larger to account for the greater diversity of species. The Q-set images were all illustrations from identification guides, presented against a white background to minimize the influence of context and artistic style (Fig. S1). They were presented on A5 cards, each having a unique number within the Q-set (i.e. 1 to 32, or 1 to 43). Throughout the study, the researchers referred to image numbers rather than species names. Participants could then discuss images without needing to identify or name the species.

Appendix 3 Data collection

For each Q-sort, participants were given ten minutes to rank the Q-set images, guided by the following instructions: "*We ask that you choose the pictures that represent what you would most want to encounter or come across in woodlands in England, Scotland or Wales, and what you would least want to encounter. Take your time to look at the pictures carefully. There are no right or wrong answers, as this is entirely based on your personal views, thoughts and reactions. Do not worry about the artistic composition or quality of the pictures but think about the characteristics and attributes of what you see. Please do not worry about naming it correctly or identifying it*." We used the phrase 'want to encounter', and the term 'woodlands' (rather than forests), following extensive testing in focus groups and pilot data collection exercises. These elicited the widest variety of responses from our participants, covering different types of human-nature interaction (e.g. direct, indirect, incidental, thereness; Kaplan & Kaplan, 1989; Keniger et al., 2013), and resulted in participants discussing both tangible (e.g. visual, olfactory, auditory, tactile) and intangible (e.g. symbolic, culturally significant, personal associations) perceptions of biodiversity attributes.

Participants recorded their preference rankings on an answer sheet (Fig. S2; Brown, 1980). The image number of the species that the participant would most prefer to encounter was written in the top square box of the grid, through to least prefer to encounter in the bottom square box. Participants were told that each image number should only appear once throughout the grid, and that only a single image number should be placed in each of the square boxes (known as a forced-choice distribution). The single rectangular box in the middle of the distribution is therefore for the images where preferences are weakest (Watts & Stenner, 2012). We used a single rectangular box at the center of our forced-choice quasi-normal distribution, rather than many individual square boxes, as participants found it easier to comprehend during the pilot data collection exercises. Once the grid is complete, the central rectangular box contained 23 image numbers for invertebrates and 12 for the other three Q-sets.

After the sorting task was complete, participants were asked to talk through their rankings, guided by the following instructions: "*I'm now going to ask you to tell us why you chose to place the various pictures at the top and bottom of your sort, representing what you would most prefer to encounter and would least prefer to encounter. There are no right or wrong answers and we are interested in your personal views, thoughts and reactions to the pictures. When you are talking to us about the pictures, please think about the characteristics or attributes that might help us to understand why you placed it where you did*".

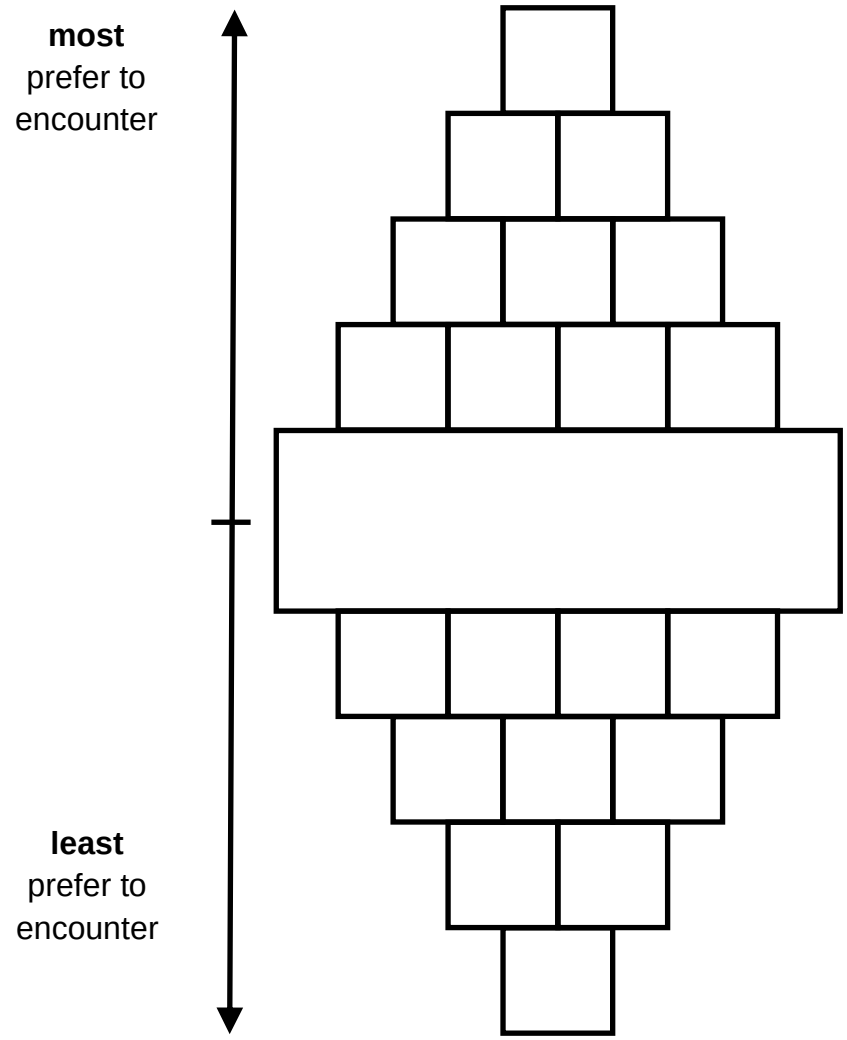

Figure S2. The Q-sort answer sheet grid used by participants. The answer sheet represents a quasi-normal distribution, from most prefer to encounter through to least prefer to encounter. Participants were informed that each image number should only appear once throughout the grid and that a single image number should be placed in each of the square boxes. The central rectangular box remained as one large box of equal preference for ease of use. Once completed, it contained 23 image numbers for the invertebrates Q-sort, and 12 for the vertebrate, tree and understory plants and fungi Q-sorts.

Appendix 4 Data analysis

For each Q-sort, we used principal component analysis (PCA) and varimax rotation (Ramlo, 2016) to determine the factors (Watts & Stenner, 2012). We applied the criteria that factors needed to have an eigenvalue greater than 1, and that two or more participants must load onto a factor to represent a shared perspective (Sandbrook et al., 2013). Some participants did not load on any factor, and no participant loaded on more than one factor, signifying that the views captured by each factor were distinct from those captured by other factors (Watts & Stenner, 2012).

Factor arrays (Tables S1-S4) are the array of possible values from the original distribution (+4 to -4 in this study) ranking images according to their z-score (the number of standard deviations from the mean; Zabala & Pascual, 2016). The size of the z-scores indicate the influence of an image within a factor, both positively (prefer to encounter) and negatively (not prefer to encounter) (Zabala & Pascual, 2016). Factors are interpreted by studying quantitative factor arrays (a hypothetical Q-sort for each factor, formed by calculating scores for each image; Zabala 2014) in conjunction with the qualitative transcriptions for participants loading onto that factor. We then conducted an iterative process of factor reduction, using the image scores and inductive thematic analysis of the transcriptions (Braun & Clarke, 2006), to identify the shared perspectives for each factor that can be considered qualitatively different from one another. Defining factors in a purely statistical way can result in multiple factors that are very similar in terms of participant perspectives that underpin them. Too many factors means that similar perspectives appear on more than one factor, while too few mean that nuances are lost. While strength of preference is reflected by those images placed in boxes at the extreme ends of the forced-choice distribution, the ranking of all images is used to interpret factor arrays (Watts & Stenner, 2012). Quantitative analysis provides factors that group participants who ranked images in a similar way, while qualitative analysis allowed us to determine the shared perspectives on biodiversity attributes rather than species *per se*. As well as elucidating which attributes participants focused on, we explored how participants related to those attributes, which could be positively or negatively.

Our approach to coding and qualitative analysis follows the logic of Interpretative Phenomenological Analysis (IPA). In this context, it assumes that encounters with nature are a shared phenomenological experience that can be understood in analytical terms through the building up of codes inductively, while recognizing that the data collected nonetheless reflects and follows a general schedule of questions and stimuli created by the researchers. Factors were named according to the shared participant perspectives associated with the factors, in an analogous way to Q-sorts that use statements (e.g. Guenat et al., 2019; Nijnik et al., 2018; Sandbrook et al., 2013).

Table S2. Factor arrays for the vertebrate Q-sorts across the four seasons. Factor scores (bold) represent the ranking of that image in the factor array (from +4 for most prefer to encounter, to -4 for least prefer to encounter). The number below the factor score is the z-score, which shows the number of standard deviations from the mean.

Table S2a. Winter vertebrates

Image	Appearance and behavior	Encounters	Characteristic of forest	Familiarity	Captivating
Barbastella barbastellus	**-1** -0.66	**-3** -1.76	**0** 0.50	**1** 0.66	**2** 1.31
Plecotus auritus	**-1** -0.37	**-4** -1.92	**0** -0.11	**2** 0.76	**0** 0.00
Nyctalus noctula	**0** -0.34	**-2** -1.26	**-1** -0.72	**0** 0.11	**0** 0.33
Natrix helvetica	**-3** -1.94	**-3** -1.42	**-3** -1.32	**-2** -1.02	**0** 0.00
Lacerta vivipara	**-1** -0.65	**-1** -0.94	**0** -0.02	**-3** -1.74	**-1** -0.33
Anguis fragilis	**-4** -2.16	**-1** -0.88	**-2** -0.83	**-1** -0.85	**0** 0.32
Rana temporaria	**0** -0.18	**-2** -1.15	**0** -0.16	**-2** -0.95	**0** -0.33
Bufo bufo	**0** 0.02	**-2** -0.99	**0** -0.36	**0** -0.27	**0** -0.33
Muscardinus avellanarius	**-2** -0.85	**0** -0.04	**-2** -0.88	**1** 0.48	**1** 0.65
Apodemus sylvaticus	**-2** -0.68	**0** 0.03	**3** 1.43	**1** 0.50	**0** 0.33
Rattus norvegicus	**-3** -1.85	**-1** -0.90	**-3** -2.08	**-4** -1.85	**0** 0.00
Sorex araneus	**-2** -1.25	**-1** -0.85	**0** 0.31	**2** 1.13	**0** -0.33
Sciurus carolinensis	**2** 1.30	**0** 0.13	**-4** -2.61	**3** 1.18	**0** 0.33
Erinaceus europaeus	**2** 1.18	**3** 1.59	**1** 0.90	**2** 1.16	**3** 1.31
Capreolus capreolus	**3** 1.87	**4** 1.80	**-1** -0.45	**-3** -1.61	**2** 0.98
Muntiacus reevesi	**3** 1.31	**0** -0.05	**-2** -1.25	**-2** -1.46	**1** 0.33
Meles meles	**1** 0.73	**2** 1.44	**2** 1.34	**4** 2.58	**2** 0.98
Vulpes vulpes	**0** -0.27	**2** 1.24	**-1** -0.49	**3** 1.93	**3** 1.96
Martes martes	**0** 0.14	**2** 1.40	**4** 1.51	**-1** -0.50	**4** 2.29
Dendrocopos major	**1** 0.68	**1** 1.51	**2** 1.19	**0** 0.00	**-2** -1.31
Accipter gentilis	**1** 0.77	**1** 0.47	**0** -0.03	**0** 0.29	**0** 0.32
Garrulus glandarius	**0** 0.14	**0** -0.07	**0** 0.11	**0** -0.16	**-2** -1.31
Strix aluco	**4** 2.00	**3** 1.54	**3** 1.35	**1** 0.68	**1** 0.65
Phylloscopus collybita	**0** 0.20	**0** 0.00	**-1** -0.57	**0** 0.00	**-3** -1.31
Turdus merula	**-1** -0.41	**0** 0.15	**0** 0.01	**-1** -0.34	**-2** -0.98

Fringilla coelebs	**0** 0.17	**0** 0.19	**1** 0.75	**0** -0.14	**0** 0.00
Regulus regulus	**1** 0.29	**0** 0.33	**1** 0.95	**0** -0.14	**-1** -0.33
Luscinia megarhynchos	**0** -0.11	**0** 0.14	**0** -0.24	**-1** -0.43	**-3** -1.64
Sitta europaea	**0** 0.29	**1** 0.70	**2** 0.96	**0** 0.00	**-1** -0.98
Ficedula hypoleuca	**0** -0.35	**0** -0.02	**0** -0.24	**0** -0.14	**-1** -1.96
Certhia familiaris	**0** 0.11	**0** 0.15	**1** 0.75	**0** 0.00	**-4** -1.96
Cyanistes caeruleus	**2** 0.88	**1** 0.44	**0** 0.29	**0** 0.18	**0** 0.00

Table S2b. Spring vertebrates

Image	Morphology	Familiarity	Encounters
Barbastella barbastellus	**-3** -1.76	**0** -0.1	**3** 1.81
Plecotus auritus	**-3** -1.61	**1** 0.71	**0** -0.46
Nyctalus noctula	**-2** -1.59	**0** -0.13	**0** 0.13
Natrix helvetica	**-4** -1.91	**-3** -1.88	**-4** -1.92
Lacerta vivipara	**-2** -1.23	**-1** -0.71	**-2** -1.26
Anguis fragilis	**-2** -1.48	**-2** -1.04	**-2** -1.24
Rana temporaria	**0** 0.24	**0** -0.15	**-3** -1.38
Bufo bufo	**0** -0.06	**-2** -1.29	**-2** -1.03
Muscardinus avellanarius	**0** 0.06	**1** 0.67	**-1** -0.76
Apodemus sylvaticus	**-1** -0.19	**3** 1.20	**0** -0.39
Rattus norvegicus	**-1** -1.12	**-4** -2.28	**-3** -1.71
Sorex araneus	**-1** -0.57	**0** 0.24	**-1** -0.51
Sciurus carolinensis	**3** 1.73	**-3** -2.19	**2** 1.68
Erinaceus europaeus	**3** 1.42	**2** 1.16	**1** 0.47
Capreolus capreolus	**2** 1.20	**3** 1.72	**2** 0.71
Muntiacus reevesi	**1** 0.55	**-1** -0.42	**-1** -0.82
Meles meles	**1** 0.73	**1** 0.69	**0** 0.25
Vulpes vulpes	**0** -0.05	**-2** -0.87	**3** 1.92
Martes martes	**0** 0.41	**0** -0.04	**-1** -0.59
Dendrocopos major	**0** 0.28	**2** 0.99	**0** 0.33
Accipter gentilis	**1** 0.73	**0** 0.47	**0** 0.00

Garrulus glandarius	**0** -0.02	**0** -0.12	**0** 0.12
Strix aluco	**4** 1.96	**4** 1.88	**4** 1.94
Phylloscopus collybita	**0** 0.09	**-1** -0.25	**1** 0.41
Turdus merula	**0** -0.10	**0** 0.14	**0** -0.05
Fringilla coelebs	**1** 0.49	**2** 0.73	**1** 0.47
Regulus regulus	**2** 0.82	**1** 0.54	**2** 0.80
Luscinia megarhynchos	**0** 0.00	**0** -0.05	**0** 0.15
Sitta europaea	**0** 0.32	**0** 0.37	**1** 0.68
Ficedula hypoleuca	**-1** -0.22	**-1** -0.42	**0** -0.12
Certhia familiaris	**0** 0.02	**0** 0.20	**0** 0.11
Cyanistes caeruleus	**2** 0.87	**0** 0.23	**0** 0.26

Table S2c. Summer vertebrates

Image	Morphology	Behavior	Perceived danger	The unusual and the mundane
Barbastella barbastellus	**-1** -0.74	**0** 0.26	**-2** -1.56	**-2** -1.03
Plecotus auritus	**-2** -1.25	**-1** -0.4	**-3** -1.61	**-2** -1.06
Nyctalus noctula	**-1** -0.56	**-1** -0.29	**-2** -1.38	**-2** -1.30
Natrix helvetica	**-4** -2.16	**-2** -1.07	**-4** -2.37	**4** 1.86
Lacerta vivipara	**-2** -1.04	**0** -0.28	**0** -0.13	**1** 0.48
Anguis fragilis	**-3** -1.92	**0** -0.07	**-3** -1.84	**1** 0.90
Rana temporaria	**-1** -0.8	**0** -0.16	**0** 0.42	**0** -0.30
Bufo bufo	**-2** -1.05	**-2** -0.69	**0** 0.39	**0** -0.33
Muscardinus avellanarius	**1** 0.52	**0** -0.24	**0** 0.31	**-3** -1.69
Apodemus sylvaticus	**2** 0.68	**2** 0.47	**0** -0.13	**-1** -0.58
Rattus norvegicus	**-3** -1.63	**-4** -2.64	**-2** -0.73	**-4** -2.09
Sorex araneus	**0** -0.03	**-1** -0.41	**-1** -0.57	**-3** -1.42
Sciurus carolinensis	**2** 1.12	**-3** -2.38	**2** 1.05	**2** 1.20
Erinaceus europaeus	**3** 1.94	**2** 1.02	**1** 0.56	**3** 1.49
Capreolus capreolus	**4** 2.08	**0** -0.26	**1** 1.04	**3** 1.83
Muntiacus reevesi	**1** 0.50	**-3** -1.43	**-1** -0.67	**2** 1.34
Meles meles	**2** 1.05	**2** 1.12	**0** 0.20	**0** 0.29

Vulpes vulpes	**1** 0.36	**1** 0.45	**-1** -0.33	**-1** -0.84
Martes martes	**0** 0.04	**1** 0.40	**0** -0.03	**0** -0.36
Dendrocopos major	**0** 0.10	**3** 1.70	**3** 1.28	**0** 0.32
Accipter gentilis	**0** 0.28	**3** 1.58	**2** 1.20	**1** 0.83
Garrulus glandarius	**0** 0.07	**-2** -0.60	**0** -0.13	**0** 0.17
Strix aluco	**3** 1.61	**4** 2.13	**-1** -0.71	**2** 1.19
Phylloscopus collybita	**0** 0.02	**-1** -0.36	**0** 0.00	**0** 0.01
Turdus merula	**-1** -0.32	**1** 0.40	**0** 0.09	**-1** -0.54
Fringilla coelebs	**0** 0.19	**0** 0.13	**2** 1.26	**0** 0.00
Regulus regulus	**0** 0.16	**0** 0.35	**3** 1.28	**0** 0.08
Luscinia megarhynchos	**0** -0.06	**0** 0.12	**0** 0.00	**1** 0.36
Sitta europaea	**0** 0.21	**0** 0.33	**1** 1.03	**0** -0.09
Ficedula hypoleuca	**0** 0.01	**0** 0.36	**1** 0.53	**-1** -0.66
Certhia familiaris	**0** -0.01	**0** 0.07	**0** 0.00	**0** 0.00
Cyanistes caeruleus	**1** 0.60	**1** 0.40	**4** 1.57	**0** -0.03

Table S2d. Autumn vertebrates

Image	Morphology and behavior	Behavior	Intrigue
Barbastella barbastellus	**-2** -1.43	**-1** -0.38	**0** 0.37
Plecotus auritus	**-2** -1.22	**0** 0.16	**2** 1.06
Nyctalus noctula	**-2** -1.20	**-2** -0.53	**0** 0.00
Natrix helvetica	**-4** -2.17	**1** 0.50	**1** 0.90
Lacerta vivipara	**-1** -0.83	**0** 0.36	**0** 0.41
Anguis fragilis	**-3** -1.57	**0** 0.39	**3** 1.43
Rana temporaria	**-1** -0.31	**0** -0.15	**-4** -2.06
Bufo bufo	**-1** -0.87	**-2** -0.78	**0** -0.02
Muscardinus avellanarius	**0** -0.26	**0** -0.36	**0** -0.43
Apodemus sylvaticus	**0** 0.39	**0** 0.00	**1** 0.57
Rattus norvegicus	**-3** -1.46	**-4** -3.13	**0** 0.14
Sorex araneus	**-1** -0.68	**-1** -0.46	**0** -0.08
Sciurus carolinensis	**2** 1.15	**-3** -2.26	**0** 0.22

Erinaceus europaeus	**3** 1.74	**3** 1.05	**3** 1.37
Capreolus capreolus	**4** 1.87	**2** 1.03	**4** 1.98
Muntiacus reevesi	**0** 0.44	**0** 0.08	**1** 0.61
Meles meles	**1** 0.70	**-1** -0.42	**0** 0.35
Vulpes vulpes	**0** -0.05	**-1** -0.37	**2** 0.96
Martes martes	**0** 0.18	**0** 0.04	**2** 1.33
Dendrocopos major	**1** 0.49	**2** 0.79	**-1** -0.67
Accipter gentilis	**2** 0.86	**3** 1.50	**0** -0.27
Garrulus glandarius	**0** 0.03	**2** 0.70	**-2** -1.14
Strix aluco	**3** 1.86	**4** 2.53	**1** 0.86
Phylloscopus collybita	**0** 0.17	**0** -0.35	**-1** -0.84
Turdus merula	**0** -0.20	**-3** -0.80	**-3** -1.84
Fringilla coelebs	**1** 0.48	**0** 0.10	**-3** -1.72
Regulus regulus	**0** 0.33	**0** 0.18	**-1** -0.86
Luscinia megarhynchos	**0** 0.00	**-2** -0.48	**-2** -1.08
Sitta europaea	**1** 0.53	**1** 0.55	**-1** -0.61
Ficedula hypoleuca	**0** 0.11	**0** -0.36	**0** 0.20
Certhia familiaris	**0** 0.02	**1** 0.48	**0** -0.16
Cyanistes caeruleus	**2** 0.90	**1** 0.39	**-2** -0.98

Table S3. Factor arrays for the invertebrate Q-sorts across the four seasons. Factor scores (bold) represent the ranking of that image in the factor array (from +4 for most prefer to encounter, to -4 for least prefer to encounter). The number below the factor score is the z-score, which shows the number of standard deviations from the mean.

Table S3a. Winter invertebrates

Image	Purpose	Harmless	Encounters of spiders	Curiosity
Lumbricus terrestris	**2** 1.19	**0** -0.36	**0** -0.14	**-4** -2.92
Forficula auricularia	**-1** -0.84	**0** -0.48	**0** -0.19	**-1** -0.66
Orchesella cincta	**0** -0.36	**-3** -0.94	**0** -0.09	**0** 0.00
Arianta arbustorum	**-1** -0.48	**0** -0.66	**0** -0.17	**-2** -1.09
Limax cinereo-niger	**-2** -1.08	**-2** -0.89	**0** -0.15	**-1** -0.68
Helix pomatia	**0** -0.45	**0** -0.27	**0** -0.13	**-1** -0.95
Armadillium sp.)	**0** -0.04	**0** -0.56	**0** -0.34	**1** 0.79
Ophyiulus pilosus	**0** -0.18	**-1** -0.83	**-1** -0.49	**2** 0.89
Lithobius forficatus	**0** -0.31	**-3** -1.11	**-2** -0.88	**3** 1.58
Tettigonia viridissima	**1** 0.96	**0** 0.12	**1** 0.67	**0** 0.03
Chorhippus brunneus	**0** 0.41	**0** -0.07	**0** 0.26	**0** 0.30
Formica rufus	**0** -0.47	**-2** -0.88	**0** 0.03	**0** -0.15
Palomena prasina	**0** 0.10	**0** -0.42	**1** 0.65	**4** 2.04
Xysticus cristatus	**0** 0.31	**0** -0.71	**-4** -2.82	**0** 0.00
Meta segmentata	**1** 0.78	**0** -0.39	**-3** -2.14	**0** -0.28
Araniella cucurbitina	**0** 0.56	**0** -0.27	**-2** -0.93	**1** 0.88
Micrommata virescens	**0** -0.14	**0** 0.00	**-3** -1.76	**0** 0.00
Leiobunum rotundum	**0** -0.10	**0** 0.06	**-2** -0.96	**0** 0.42
Tipula maxima	**-1** -0.62	**0** 0.08	**0** -0.33	**-2** -1.44
Coccinella septempunctata	**2** 1.19	**2** 2.27	**3** 1.45	**0** -0.14
Myzia oblogoguttata	**0** -0.24	**1** 0.72	**0** 0.26	**0** 0.00
Aglais urticae	**3** 1.52	**3** 2.49	**3** 2.52	**1** 0.82
Argynnis paphia	**2** 1.13	**3** 2.47	**2** 1.42	**0** 0.15
Apatura iris	**1** 1.02	**4** 2.59	**2** 1.18	**0** 0.15
Hyloicus pinastri	**0** -0.03	**1** 0.57	**0** 0.22	**3** 1.66

Catocala nupta	**0** 0.04	**2** 1.52	**1** 0.45	**0** -0.15
Geometra papilionaria	**0** -0.10	**1** 1.11	**0** 0.09	**0** 0.15
Ennomos alniaria	**0** 0.07	**2** 1.18	**2** 0.92	**0** 0.15
Bombus terrestris	**4** 3.11	**1** 0.43	**4** 2.56	**0** -0.55
Andrena sp.	**-2** -0.86	**-2** -0.91	**0** 0.00	**0** 0.42
Rhyssa persuasoria	**-3** -2.37	**0** -0.07	**-1** -0.87	**2** 1.53
Dasysrphus venustus	**-2** -1.17	**-1** -0.81	**0** 0.28	**-2** -1.02
Lucilia caesar	**-3** -1.71	**-1** -0.84	**0** -0.20	**-3** -2.14
Ceroxys urticae	**-1** -0.50	**0** -0.71	**-1** -0.68	**-3** -1.99
Ocypus olens	**0** -0.26	**0** -0.27	**0** -0.09	**1** 0.65
Vespa crabo	**-4** -2.54	**0** -0.19	**0** -0.46	**-2** -1.02
Geotrupes stercorosus	**3** 1.26	**-4** -1.18	**0** 0.00	**0** 0.14
Potosia cuprea	**1** 0.64	**0** -0.04	**1** 0.75	**0** -0.14
Cicindela campestris	**0** 0.06	**0** -0.09	**0** 0.19	**0** 0.46
Saperda carcharias	**0** 0.32	**-1** -0.82	**0** 0.13	**0** 0.14
Hylobius abietis	**0** 0.11	**0** -0.23	**-1** -0.59	**2** 1.02
Agelastica alni	**0** 0.06	**0** -0.69	**0** 0.37	**0** 0.51
Phyllobius argentatus	**0** -0.03	**0** 0.10	**0** 0.00	**0** 0.46

Table S3b. Spring invertebrates

Image	Purpose	Attraction and repulsion	Perceptions of harm
Lumbricus terrestris	**1** 0.80	**-4** -2.80	**0** -0.33
Forficula auricularia	**-3** -1.65	**-1** -0.54	**-1** -0.81
Orchesella cincta	**0** -0.43	**0** -0.15	**0** -0.13
Arianta arbustorum	**0** -0.38	**0** 0.14	**1** 0.60
Limax cinereo-niger	**-2** -1.61	**-3** -1.45	**-1** -0.91
Helix pomatia	**0** -0.36	**-1** -0.56	**0** 0.40
Armadillium sp.)	**1** 0.47	**-2** -1.12	**0** 0.20
Ophyiulus pilosus	**0** -0.14	**-3** -1.72	**0** -0.43
Lithobius forficatus	**-1** -0.72	**-2** -1.43	**0** 0.01
Tettigonia viridissima	**2** 1.00	**1** 0.79	**2** 1.01
Chorhippus brunneus	**0**	**0**	**0**

	0.37	0.28	-0.19
Formica rufus	**-2** -1.05	**0** -0.03	**0** -0.26
Palomena prasina	**0** 0.41	**0** 0.29	**0** 0.00
Xysticus cristatus	**0** -0.17	**0** -0.05	**-3** -1.41
Meta segmentata	**1** 0.54	**0** 0.08	**-2** -1.19
Araniella cucurbitina	**0** 0.20	**0** 0.49	**-1** -1.04
Micrommata virescens	**0** 0.21	**2** 0.80	**-4** -2.09
Leiobunum rotundum	**0** -0.07	**1** 0.61	**-2** -1.04
Tipula maxima	**-1** -0.85	**0** -0.17	**0** -0.41
Coccinella septempunctata	**2** 1.15	**2** 1.54	**4** 2.43
Myzia oblogoguttata	**0** -0.02	**1** 0.73	**0** 0.15
Aglais urticae	**3** 2.02	**3** 2.07	**2** 1.65
Argynnis paphia	**1** 0.83	**3** 2.04	**2** 1.41
Apatura iris	**3** 1.84	**4** 2.63	**3** 2.11
Hyloicus pinastri	**0** -0.20	**0** 0.51	**0** 0.47
Catocala nupta	**0** 0.23	**0** 0.25	**1** 0.83
Geometra papilionaria	**0** 0.19	**0** 0.11	**1** 0.53
Ennomos alniaria	**0** 0.31	**1** 0.71	**1** 0.54
Bombus terrestris	**4** 2.80	**2** 0.79	**3** 2.35
Andrena sp.	**0** -0.21	**0** -0.16	**0** 0.19
Rhyssa persuasoria	**-1** -0.47	**0** 0.23	**-3** -1.91
Dasysrphus venustus	**-1** -0.48	**0** 0.02	**0** -0.06
Lucilia caesar	**-3** -2.22	**-2** -1.01	**0** -0.11
Ceroxys urticae	**-2** -0.96	**0** -0.27	**0** -0.09
Ocypus olens	**0** -0.28	**-1** -0.85	**-1** -0.92
Vespa crabo	**-4** -2.51	**0** -0.34	**-2** -1.31
Geotrupes stercorosus	**2** 0.90	**-1** -0.89	**0** -0.29
Potosia cuprea	**0** 0.32	**0** -0.50	**0** 0.21
Cicindela campestris	**0** 0.36	**0** -0.05	**0** 0.06
Saperda carcharias	**0** 0.00	**0** -0.18	**0** -0.13
Hylobius abietis	**0** 0.00	**0** -0.31	**0** -0.09

Agelastica alni	**0** 0.03	**0** -0.16	**0** 0.00
Phyllobius argentatus	**0** -0.21	**0** -0.39	**0** 0.00

Table S3c. Summer invertebrates

Image	Purpose	Perceptions of harm	Lepidoptera
Lumbricus terrestris	**1** 0.56	**0** -0.09	**-4** -1.64
Forficula auricularia	**-2** -1.49	**0** -0.49	**0** -0.58
Orchesella cincta	**-1** -0.58	**0** -0.17	**0** -0.10
Arianta arbustorum	**0** -0.46	**0** 0.41	**0** -0.34
Limax cinereo-niger	**-3** -1.90	**0** 0.17	**-1** -0.90
Helix pomatia	**-2** -1.12	**0** 0.38	**0** -0.22
Armadillium sp.)	**0** -0.01	**0** 0.09	**-2** -1.05
Ophyiulus pilosus	**0** -0.15	**0** -0.22	**-1** -0.95
Lithobius forficatus	**0** -0.28	**0** -0.47	**-2** -0.96
Tettigonia viridissima	**2** 0.99	**2** 0.78	**0** 0.16
Chorhippus brunneus	**1** 0.28	**1** 0.75	**0** 0.16
Formica rufus	**-1** -0.54	**0** -0.29	**0** -0.52
Palomena prasina	**0** 0.19	**0** 0.20	**0** 0.30
Xysticus cristatus	**0** -0.09	**-4** -2.4	**0** -0.08
Meta segmentata	**1** 0.39	**-3** -1.79	**0** 0.11
Araniella cucurbitina	**0** 0.10	**-1** -0.85	**1** 0.57
Micrommata virescens	**0** -0.1	**-2** -1.38	**0** -0.04
Leiobunum rotundum	**0** -0.09	**-2** -1.18	**0** -0.11
Tipula maxima	**0** 0.02	**-1** -0.53	**0** -0.43
Coccinella septempunctata	**3** 2.10	**2** 1.82	**1** 0.88
Myzia oblogoguttata	**0** 0.11	**0** 0.36	**0** 0.00
Aglais urticae	**3** 1.88	**4** 2.49	**3** 1.63
Argynnis paphia	**2** 1.21	**2** 1.26	**3** 2.72
Apatura iris	**2** 1.30	**3** 1.97	**4** 2.89
Hyloicus pinastri	**0** 0.03	**0** 0.08	**2** 1.42
Catocala nupta	**0** 0.09	**0** 0.28	**2** 1.17

Geometra papilionaria	**0** 0.14	**1** 0.62	**1** 1.17
Ennomos alniaria	**0** 0.15	**1** 0.60	**2** 1.42
Bombus terrestris	**4** 3.42	**3** 1.83	**1** 0.73
Andrena sp.	**1** 0.51	**-2** -1.42	**0** 0.38
Rhyssa persuasoria	**-2** -0.89	**0** -0.13	**-1** -0.74
Dasysrphus venustus	**-1** -0.57	**-1** -0.96	**0** 0.04
Lucilia caesar	**-4** -2.16	**-1** -0.68	**0** -0.74
Ceroxys urticae	**-3** -1.52	**0** -0.21	**-1** -0.74
Ocypus olens	**0** -0.53	**0** -0.17	**-3** -1.21
Vespa crabo	**-1** -0.75	**-3** -1.76	**-3** -1.45
Geotrupes stercorosus	**0** -0.01	**0** -0.02	**-2** -1.08
Potosia cuprea	**0** 0.12	**1** 0.57	**0** -0.66
Cicindela campestris	**0** 0.13	**0** 0.28	**0** 0.00
Saperda carcharias	**0** -0.37	**0** -0.09	**0** -0.44
Hylobius abietis	**0** -0.31	**0** -0.08	**0** -0.17
Agelastica alni	**0** 0.28	**0** 0.36	**0** -0.65
Phyllobius argentatus	**0** -0.09	**0** 0.07	**0** 0.01

Table S3d. Autumn invertebrates

Image	Purpose	Attraction and repulsion
Lumbricus terrestris	**2** 0.63	**0** -0.60
Forficula auricularia	**-1** -0.62	**0** -0.04
Orchesella cincta	**-1** -0.49	**0** -0.47
Arianta arbustorum	**0** 0.05	**0** 0.07
Limax cinereo-niger	**-2** -0.75	**0** -0.39
Helix pomatia	**0** -0.17	**0** 0.16
Armadillium sp.)	**0** -0.12	**-3** -1.21
Ophyiulus pilosus	**0** 0.01	**-1** -0.73
Lithobius forficatus	**0** -0.47	**-2** -0.95
Tettigonia viridissima	**1** 0.61	**1** 0.81
Chorhippus brunneus	**0** 0.30	**0** 0.43

Formica rufus	**-2** -0.72	**0** -0.49
Palomena prasina	**1** 0.42	**0** -0.14
Xysticus cristatus	**0** -0.41	**-3** -1.22
Meta segmentata	**0** 0.31	**-4** -1.24
Araniella cucurbitina	**0** 0.05	**-1** -0.76
Micrommata virescens	**0** -0.28	**-1** -0.86
Leiobunum rotundum	**-1** -0.53	**0** -0.50
Tipula maxima	**0** -0.39	**0** -0.40
Coccinella septempunctata	**3** 1.63	**3** 2.12
Myzia oblogoguttata	**0** 0.20	**0** 0.59
Aglais urticae	**3** 1.90	**3** 2.45
Argynnis paphia	**2** 1.19	**2** 2.00
Apatura iris	**2** 1.47	**4** 2.58
Hyloicus pinastri	**0** -0.11	**1** 0.76
Catocala nupta	**0** 0.29	**2** 1.53
Geometra papilionaria	**0** 0.08	**1** 1.08
Ennomos alniaria	**0** 0.29	**2** 1.43
Bombus terrestris	**4** 3.52	**1** 0.64
Andrena sp.	**0** -0.03	**0** -0.67
Rhyssa persuasoria	**-3** -1.77	**0** -0.52
Dasysrphus venustus	**-1** -0.63	**-1** -0.74
Lucilia caesar	**-4** -2.40	**0** -0.61
Ceroxys urticae	**-2** -1.60	**0** -0.39
Ocypus olens	**0** -0.48	**0** -0.66
Vespa crabo	**-3** -1.75	**-2** -1.02
Geotrupes stercorosus	**1** 0.42	**-2** -0.96
Potosia cuprea	**1** 0.52	**0** 0.04
Cicindela campestris	**0** 0.15	**0** -0.13
Saperda carcharias	**0** -0.24	**0** -0.42
Hylobius abietis	**0** 0.03	**0** -0.31
Agelastica alni	**0** 0.13	**0** -0.14

Phyllobius argentatus	**0** -0.25	**0** -0.09

Table S4. Factor arrays for the tree Q-sorts across the four seasons. Factor scores (bold) represent the ranking of that image in the factor array (from +4 for most prefer to encounter, to -4 for least prefer to encounter). The number below the factor score is the z-score, which shows the number of standard deviations from the mean.

Table S4a. Winter trees

Image	Childhood memories	Maturity	Characteristic of forest	Flowers, berries, leaves & cones	Aesthetic appeal
Alnus glutinosa	**1** 0.73	**0** 0.07	**-1** -0.53	**1** 0.68	**1** 0.43
Fraxinus excelsior	**0** -0.08	**0** 0.10	**-3** -1.95	**-2** -0.89	**0** 0.02
Populus tremula	**1** 0.79	**0** -0.01	**-1** -0.53	**0** -0.41	**0** -0.02
Larix decidua	**1** 0.60	**-4** -2.09	**2** 1.04	**1** 0.45	**-3** -1.37
Picea sitchensis	**-1** -0.34	**-2** -1.37	**0** -0.02	**2** 0.94	**0** -0.43
Crataegus monogyna	**0** -0.15	**1** 0.69	**-3** -1.39	**0** 0.19	**-1** -0.53
Ilex aquifolium	**-4** -2.19	**0** 0.24	**3** 1.58	**4** 2.66	**2** 1.10
Aesculus hippocastanum	**3** 1.86	**2** 0.71	**3** 1.65	**0** 0.15	**3** 2.23
Taxus baccata	**0** -0.02	**3** 1.81	**0** -0.22	**3** 1.62	**-4** -2.29
Ulmus procera	**0** -0.03	**0** -0.15	**-1** -0.54	**0** -0.15	**-2** -0.95
Pinus sylvestris	**0** -0.29	**-3** -1.45	**0** -0.04	**1** 0.63	**-3** -1.17
Populus nigra	**0** 0.00	**0** 0.22	**0** -0.51	**-1** -0.68	**-1** -0.50
Prunus spinose	**0** -0.09	**1** 0.32	**0** 0.52	**0** 0.00	**1** 0.48
Fagus sylvatica	**2** 0.90	**2** 0.72	**1** 0.84	**2** 1.01	**0** -0.42
Malus sylvestris	**0** 0.11	**2** 0.78	**1** 0.70	**-1** -0.67	**0** -0.24
Salix fragilis	**0** -0.03	**0** 0.20	**-1** -0.56	**-1** -0.62	**-1** -0.76
Pseudotsuga menziesii	**-2** -1.10	**-2** -1.11	**1** 0.53	**0** 0.08	**-2** -1.07
Sambucus nigra	**0** 0.12	**1** 0.32	**0** -0.37	**-2** -0.91	**0** -0.28
Tsuga heterophylla	**-2** -1.41	**-1** -0.95	**2** 1.21	**0** -0.08	**0** -0.32
Corylus avellana	**-2** -0.84	**0** -0.09	**-4** -2.21	**0** -0.24	**2** 0.68
Carpinus betulus	**0**	**0**	**0**	**-3**	**-2**

	-0.07	-0.20	-0.44	-1.47	-0.88
Juniperus communis	**-3** -1.65	**-1** -0.21	**0** 0.26	**-3** -1.40	**1** 0.40
Chamaecyparis lawsoniana	**-3** -1.43	**-2** -0.98	**0** 0.23	**-4** -1.87	**0** 0.12
Tilia cordata	**-1** -0.29	**0** 0.10	**-2** -1.04	**-2** -1.32	**0** -0.23
Pinus contorta var. latifolia	**-1** -0.38	**-3** -1.37	**-2** -0.59	**0** -0.39	**0** 0.23
Quercus robur	**4** 2.45	**4** 2.84	**4** 1.91	**0** -0.29	**2** 0.89
Sorbus aucuparia	**-1** -0.72	**-1** -0.25	**-2** -1.00	**3** 1.71	**0** 0.38
Betula pendula	**1** 0.22	**0** -0.13	**0** -0.46	**-1** -0.63	**-1** -0.48
Acer pseudoplatanus	**3** 1.52	**0** 0.15	**1** 0.53	**1** 0.24	**1** 0.43
Sorbus aria	**0** -0.29	**1** 0.27	**0** -0.09	**0** 0.15	**0** 0.35
Castanea sativa	**2** 1.22	**3** 1.66	**2** 1.54	**0** 0.04	**3** 1.71
Rhododendron ponticum	**2** 0.87	**-1** -0.83	**0** -0.07	**2** 1.47	**4** 2.50

Table S4b. Spring trees

Image	Importance of mature, deciduous forest	Blossom, nuts, seeds and berries	Nostalgia	Feelings associated with season symbolized by tree
Alnus glutinosa	**0** 0.21	**0** -0.05	**0** 0.22	**-1** -0.6
Fraxinus excelsior	**0** 0.29	**-2** -1.23	**-3** -1.5	**-2** -1.03
Populus tremula	**2** 0.91	**-1** -0.61	**2** 0.76	**-1** -0.6
Larix decidua	**-2** -1.34	**0** 0.24	**2** 1.01	**2** 1.10
Picea sitchensis	**-1** -1.13	**-1** -0.59	**-2** -0.85	**0** -0.18
Crataegus monogyna	**0** 0.08	**2** 1.31	**0** 0.08	**0** 0.34
Ilex aquifolium	**0** 0.16	**4** 1.89	**1** 0.32	**3** 1.37
Aesculus hippocastanum	**3** 1.56	**2** 1.35	**4** 2.53	**0** -0.38
Taxus baccata	**1** 0.66	**1** 0.92	**-4** -1.92	**4** 1.81
Ulmus procera	**1** 0.55	**-2** -1.05	**-2** -0.88	**-2** -1.08
Pinus sylvestris	**0** -0.26	**-1** -0.67	**1** 0.53	**0** -0.01
Populus nigra	**0**	**-2**	**-3**	**0**

	0.11	-0.91	-1.60	0.01
Prunus spinose	**0** 0.16	**3** 1.55	**0** -0.28	**0** -0.33
Fagus sylvatica	**3** 1.32	**0** 0.46	**2** 1.09	**2** 1.05
Malus sylvestris	**0** 0.37	**3** 1.36	**0** -0.03	**3** 1.53
Salix fragilis	**0** 0.12	**0** 0.05	**-1** -0.7	**0** -0.17
Pseudotsuga menziesii	**-3** -1.51	**0** -0.54	**1** 0.28	**0** 0.54
Sambucus nigra	**1** 0.45	**0** -0.50	**-2** -1.30	**0** 0.04
Tsuga heterophylla	**-2** -1.33	**-1** -0.64	**0** -0.26	**1** 0.72
Corylus avellana	**-1** -0.3	**0** -0.43	**-1** -0.63	**-1** -0.54
Carpinus betulus	**0** 0.27	**-3** -1.55	**0** -0.33	**1** 0.73
Juniperus communis	**-3** -1.45	**1** 0.76	**-1** -0.74	**0** 0.11
Chamaecyparis lawsoniana	**-1** -1.20	**-4** -1.84	**0** 0.27	**-2** -0.75
Tilia cordata	**1** 0.46	**0** -0.15	**0** -0.14	**0** 0.00
Pinus contorta var. latifolia	**-2** -1.33	**-3** -1.63	**-1** -0.53	**0** -0.14
Quercus robur	**4** 2.50	**0** 0.18	**3** 1.92	**-1** -0.39
Sorbus aucuparia	**-1** -0.38	**1** 0.59	**0** 0.27	**1** 0.88
Betula pendula	**0** -0.06	**0** -0.54	**0** 0.08	**-3** -1.63
Acer pseudoplatanus	**2** 0.67	**0** -0.42	**3** 1.87	**2** 1.13
Sorbus aria	**0** 0.04	**0** 0.32	**0** -0.21	**-3** -1.29
Castanea sativa	**2** 1.25	**1** 1.09	**1** 0.37	**1** 0.69
Rhododendron ponticum	**-4** -1.85	**2** 1.28	**0** 0.27	**-4** -2.93

Table S4c. Summer trees

Image	Variety and symbolism in deciduous forest	Blossom, berries, nuts, seeds and catkins	Expectations of forest
Alnus glutinosa	**1** 0.68	**1** 0.50	**0** -0.07
Fraxinus excelsior	**0** 0.58	**-4** -1.73	**0** 0.23
Populus tremula	**0** 0.44	**-2** -0.86	**0** -0.34

Larix decidua	**-2** -1.34	**0** 0.02	**0** 0.14
Picea sitchensis	**-3** -1.55	**0** 0.02	**0** -0.12
Crataegus monogyna	**1** 0.62	**0** -0.09	**-1** -0.94
Ilex aquifolium	**0** -0.41	**4** 1.97	**-4** -2.14
Aesculus hippocastanum	**3** 1.29	**2** 1.46	**2** 1.50
Taxus baccata	**-1** -0.75	**0** -0.57	**1** 0.47
Ulmus procera	**0** 0.56	**-3** -1.42	**1** 0.53
Pinus sylvestris	**-1** -0.48	**0** -0.19	**2** 0.84
Populus nigra	**0** -0.08	**-2** -1.07	**0** 0.04
Prunus spinose	**1** 0.65	**0** 0.27	**-2** -1.17
Fagus sylvatica	**3** 1.10	**3** 1.49	**4** 2.32
Malus sylvestris	**0** 0.24	**2** 1.34	**0** 0.36
Salix fragilis	**0** -0.09	**-1** -0.78	**0** -0.25
Pseudotsuga menziesii	**-3** -1.56	**0** 0.18	**1** 0.39
Sambucus nigra	**0** -0.32	**0** -0.36	**0** -0.24
Tsuga heterophylla	**-2** -1.29	**0** -0.12	**2** 0.80
Corylus avellana	**1** 0.82	**-2** -1.07	**-3** -1.18
Carpinus betulus	**0** 0.06	**0** -0.62	**0** 0.10
Juniperus communis	**-2** -1.32	**0** -0.19	**-3** -1.31
Chamaecyparis lawsoniana	**-4** -1.73	**-3** -1.44	**-1** -0.57
Tilia cordata	**0** 0.10	**-1** -0.63	**0** -0.30
Pinus contorta var. latifolia	**-1** -0.83	**-1** -0.67	**0** -0.42
Quercus robur	**4** 2.54	**2** 1.37	**3** 2.07
Sorbus aucuparia	**2** 0.86	**0** -0.22	**-1** -0.49
Betula pendula	**0** 0.45	**-1** -0.86	**-1** -0.59
Acer pseudoplatanus	**2** 0.86	**1** 1.13	**-2** -0.97
Sorbus aria	**0** 0.33	**1** 0.49	**-2** -1.07

Castanea sativa	**2** 0.83	**3** 1.77	**1** 0.65
Rhododendron ponticum	**-1** -1.25	**1** 0.88	**3** 1.73

Table S4d. Autumn trees

Image	Color and morphology	Time	Morphology
Alnus glutinosa	**0** 0.02	**0** 0.07	**0** -0.10
Fraxinus excelsior	**0** -0.46	**-4** -1.46	**0** 0.34
Populus tremula	**0** -0.36	**-2** -0.97	**0** 0.34
Larix decidua	**-1** -0.52	**2** 1.39	**-2** -0.91
Picea sitchensis	**-3** -1.3	**1** 0.77	**-2** -1.04
Crataegus monogyna	**2** 1.19	**0** 0.15	**0** 0.19
Ilex aquifolium	**4** 2.22	**2** 1.35	**-1** -0.75
Aesculus hippocastanum	**2** 1.28	**3** 2.16	**3** 1.77
Taxus baccata	**2** 1.33	**-2** -0.96	**3** 1.63
Ulmus procera	**0** 0.11	**-3** -0.97	**1** 0.44
Pinus sylvestris	**-1** -0.51	**1** 0.29	**1** 0.42
Populus nigra	**-2** -0.79	**-1** -0.79	**2** 0.84
Prunus spinosa	**0** 0.23	**-1** -0.90	**0** 0.22
Fagus sylvatica	**3** 1.46	**1** 0.93	**2** 1.14
Malus sylvestris	**0** 0.35	**0** 0.26	**0** 0.21
Salix fragilis	**0** -0.09	**-1** -0.8	**1** 0.43
Pseudotsuga menziesii	**-2** -0.89	**1** 0.28	**-1** -0.6
Sambucus nigra	**0** 0.14	**0** -0.23	**0** -0.03
Tsuga heterophylla	**0** 0.04	**0** -0.18	**-2** -0.95
Corylus avellana	**-1** -0.78	**-3** -1.07	**-1** -0.58
Carpinus betulus	**0** -0.45	**-1** -0.91	**0** 0.29
Juniperus communis	**-2** -1.11	**0** -0.78	**-4** -2.41

Chamaecyparis lawsoniana	**-4** -2.14	**0** -0.46	**-3** -1.74
Tilia cordata	**0** -0.47	**-2** -0.94	**0** 0.08
Pinus contorta var. latifolia	**-3** -1.73	**0** -0.24	**-1** -0.63
Quercus robur	**1** 0.37	**4** 2.19	**4** 1.94
Sorbus aucuparia	**1** 0.97	**0** -0.67	**0** -0.11
Betula pendula	**-1** -0.60	**0** -0.58	**0** 0.22
Acer pseudoplatanus	**0** -0.20	**2** 1.45	**2** 0.82
Sorbus aria	**1** 0.42	**0** 0.15	**0** 0.00
Castanea sativa	**1** 0.48	**3** 1.54	**1** 0.56
Rhododendron ponticum	**3** 1.80	**0** -0.05	**-3** -2.02

Table S5. Factor arrays for the understory plants and fungi Q-sorts across the four seasons. Factor scores (bold) represent the ranking of that image in the factor array (from +4 for most prefer to encounter, to -4 for least prefer to encounter). The number below the factor score is the z-score, which shows the number of standard deviations from the mean.

Table S5a. Winter understory plants and fungi

Image	Color	Colorful and complexity	Appealing to the senses
Ajuga reptans	**2** 0.79	**0** 0.55	**0** 0.05
Arum maculatum	**1** 0.62	**2** 1.08	**-3** 1.48
Hyacinthoides non-scripta	**4** 1.78	**3** 1.71	**3** 1.53
Digitalis purpurea	**2** 1.45	**4** 1.76	**-1** -0.47
Silene dioica	**3** 1.71	**1** 0.80	**0** 0.05
Viola reichenbachiana	**2** 1.52	**1** 0.78	**0** 0.32
Anemone nemorosa	**1** 0.57	**0** -0.06	**0** -0.08
Rubus fruticosus	**1** 0.77	**2** 1.25	**4** 1.58
Conopodium majus	**0** 0.05	**0** -0.64	**0** -0.08
Allium ursinum	**0** 0.23	**0** -0.29	**1** 0.57
Lamiastrum galeobdolon	**0** 0.19	**0** 0.38	**-4** -2.09
Ranunculus auricomus	**1** 0.30	**0** 0.03	**0** 0.15
Primula vulgaris	**3** 1.60	**0** 0.06	**2** 1.39
Chrysosplenium oppositifolium	**0** -0.24	**-1** -0.66	**-2** -1.34
Mercurialis perennis	**0** -0.27	**0** -0.47	**-2** -1.16
Bromopsis ramosa	**-1** -0.40	**-2** -1.06	**0** -0.35
Schedonorus giganteus	**0** -0.21	**-4** -1.62	**0** -0.20
Carex pendula	**-1** -0.30	**-2** -1.34	**1** 0.38
Milium effusum	**0** -0.27	**-1** -0.96	**0** -0.35
Equisetum sylvaticum	**-1** -0.48	**-3** -1.54	**-3** -1.39
Luzula sylvatica	**0** -0.10	**-1** -0.88	**0** -0.14
Pteridium aquilinum	**0** 0.22	**-3** -1.37	**2** 1.39
Blechnum spicant	**-1** -0.34	**-2** -1.14	**3** 1.47
Asplenium scolopendrium	**0** -0.25	**-1** -0.84	**-1** -0.82
Adiantum sp.	**0** 0.07	**0** -0.44	**0** -0.22

Trametes versicolor	**-3** -1.56	**0** -0.25	**-2** -1.12
Piptoporus betulinus	**-2** -1.44	**0** 0.09	**-1** -0.60
Cantharellus cibarius	**-3** -1.64	**2** 0.99	**0** 0.32
Amanita muscaria	**0** 0.26	**3** 1.61	**1** 1.24
Lactarius sp.	**-2** -1.10	**1** 0.90	**2** 1.37
Oudemansiella mucida	**-2** -1.40	**1** 0.95	**1** 0.95
Lycoperdon perlatum	**-4** -2.12	**0** 0.63	**-1** -0.75

Table S5b. Spring understory plants and fungi

Image	Expectations of forest	Color and danger	Indicators
Ajuga reptans	**0** -0.02	**0** 0.48	**0** -0.47
Arum maculatum	**1** 0.80	**2** 1.13	**-3** -1.73
Hyacinthoides non-scripta	**3** 1.87	**3** 1.53	**4** 2.57
Digitalis purpurea	**2** 1.09	**3** 1.78	**3** 1.88
Silene dioica	**2** 0.87	**4** 2.02	**2** 0.70
Viola reichenbachiana	**0** 0.36	**1** 0.55	**1** 0.65
Anemone nemorosa	**0** 0.20	**0** 0.29	**0** -0.34
Rubus fruticosus	**3** 1.71	**2** 0.96	**-2** -0.83
Conopodium majus	**0** -0.36	**0** -0.07	**-1** -0.58
Allium ursinum	**2** 1.14	**1** 0.66	**0** 0.33
Lamiastrum galeobdolon	**-1** -0.95	**0** 0.23	**-1** -0.63
Ranunculus auricomus	**-1** -0.66	**1** 0.71	**0** -0.37
Primula vulgaris	**1** 0.49	**2** 0.97	**3** 1.93
Chrysosplenium oppositifolium	**-2** -1.00	**0** 0.03	**0** 0.16
Mercurialis perennis	**-2** -0.95	**0** -0.03	**0** -0.38
Bromopsis ramosa	**-2** -1.43	**-1** -0.18	**-3** -0.84
Schedonorus giganteus	**-4** -1.71	**0** -0.07	**-2** -0.81
Carex pendula	**-3** -1.53	**-1** -0.53	**0** 0.00
Milium effusum	**-3** -1.59	**0** 0.00	**-1** -0.59
Equisetum sylvaticum	**-1** -0.83	**-1** -0.28	**-2** -0.81
Luzula sylvatica	**-1** -0.64	**0** -0.12	**0** 0.14

Pteridium aquilinum	**0** -0.16	**0** -0.10	**0** -0.22
Blechnum spicant	**0** 0.39	**0** -0.01	**1** 0.69
Asplenium scolopendrium	**0** -0.45	**0** -0.08	**0** -0.18
Adiantum sp.	**0** -0.13	**1** 0.52	**1** 0.36
Trametes versicolor	**0** -0.29	**-3** -1.70	**2** 1.15
Piptoporus betulinus	**0** 0.08	**-2** -1.23	**1** 0.33
Cantharellus cibarius	**1** 0.72	**-3** -1.73	**-1** -0.66
Amanita muscaria	**4** 2.08	**-1** -1.16	**-4** -2.29
Lactarius sp.	**1** 0.64	**-2** -1.42	**0** 0.23
Oudemansiella mucida	**0** 0.44	**-2** -1.20	**2** 0.87
Lycoperdon perlatum	**0** -0.19	**-4** -1.94	**0** -0.29

Table S5c. Summer understory plants and fungi

Image	Color	Color and structure	Expectation and familiarity
Ajuga reptans	**1** 0.64	**0** -0.14	**0** 0.03
Arum maculatum	**2** 1.15	**0** 0.53	**0** -0.15
Hyacinthoides non-scripta	**2** 1.38	**3** 1.52	**4** 2.47
Digitalis purpurea	**4** 1.95	**2** 1.12	**3** 1.77
Silene dioica	**2** 1.00	**2** 0.90	**2** 1.61
Viola reichenbachiana	**1** 0.82	**2** 0.93	**2** 1.24
Anemone nemorosa	**1** 0.56	**0** -0.31	**2** 0.84
Rubus fruticosus	**3** 1.92	**3** 1.32	**-4** -1.86
Conopodium majus	**0** 0.00	**0** -0.18	**0** -0.24
Allium ursinum	**0** 0.12	**0** 0.37	**0** -0.10
Lamiastrum galeobdolon	**1** 0.52	**-1** -0.86	**-3** -1.29
Ranunculus auricomus	**0** 0.19	**0** 0.50	**1** 0.30
Primula vulgaris	**3** 1.39	**1** 0.72	**3** 1.83
Chrysosplenium oppositifolium	**-1** -0.35	**-2** -1.22	**0** -0.04
Mercurialis perennis	**-1** -0.43	**-4** -1.99	**-2** -0.71
Bromopsis ramosa	**0** -0.31	**-3** -1.35	**-2** -0.73
Schedonorus giganteus	**-1** -0.32	**-3** -1.44	**0** -0.37

Carex pendula	**0** -0.06	**-2** -1.29	**-1** -0.65
Milium effusum	**0** -0.20	**-1** -0.92	**-1** -0.63
Equisetum sylvaticum	**0** -0.20	**-1** -0.83	**-2** -1.24
Luzula sylvatica	**0** -0.23	**-1** -0.84	**-1** -0.69
Pteridium aquilinum	**0** -0.09	**0** 0.27	**1** 0.24
Blechnum spicant	**0** -0.21	**0** -0.23	**0** 0.07
Asplenium scolopendrium	**-2** -0.48	**-2** -0.97	**0** -0.06
Adiantum sp.	**0** -0.28	**0** -0.43	**1** 0.62
Trametes versicolor	**-3** -2.02	**0** -0.24	**0** -0.54
Piptoporus betulinus	**-2** -1.33	**0** 0.45	**0** 0.18
Cantharellus cibarius	**-3** -1.81	**1** 0.56	**0** -0.52
Amanita muscaria	**0** 0.17	**4** 2.40	**-3** -1.54
Lactarius sp.	**-1** -0.39	**1** 0.58	**0** 0.19
Oudemansiella mucida	**-2** -0.99	**1** 0.84	**1** 0.63
Lycoperdon perlatum	**-4** -2.10	**0** 0.20	**-1** -0.65

Table S5d. Autumn understory plants and fungi

Image	Color and structure	Color and danger	Texture
Ajuga reptans	**0** 0.48	**0** 0.41	**-2** -0.87
Arum maculatum	**1** 0.70	**1** 0.56	**2** 1.12
Hyacinthoides non-scripta	**3** 1.47	**3** 1.57	**2** 1.00
Digitalis purpurea	**2** 1.32	**2** 0.94	**3** 1.18
Silene dioica	**2** 1.03	**4** 1.94	**1** 0.78
Viola reichenbachiana	**1** 0.60	**3** 1.44	**0** 0.15
Anemone nemorosa	**0** -0.14	**2** 0.88	**0** -0.15
Rubus fruticosus	**4** 2.17	**2** 1.14	**-4** -2.71
Conopodium majus	**-1** -0.82	**1** 0.57	**0** 0.00
Allium ursinum	**0** -0.01	**0** 0.47	**0** 0.27
Lamiastrum galeobdolon	**-1** -0.42	**0** 0.08	**0** 0.00
Ranunculus auricomus	**0** -0.03	**1** 0.55	**-1** -0.75
Primula vulgaris	2 1.38	1 0.52	0 0.41
Chrysosplenium oppositifolium	**-1**	**0**	**-2**

	-0.68	-0.08	-0.77
Mercurialis perennis	**-2** -1.12	**0** -0.12	**-3** -1.87
Bromopsis ramosa	**-4** -2.00	**0** -0.16	**0** 0.04
Schedonorus giganteus	**-3** -1.79	**0** 0.23	**-1** -0.44
Carex pendula	**-2** -1.17	**0** -0.24	**-2** -1.22
Milium effusum	**-3** -1.49	**0** 0.01	**0** -0.04
Equisetum sylvaticum	**0** -0.18	**0** 0.33	**0** -0.30
Luzula sylvatica	**-1** -0.55	**0** 0.15	**-1** -0.70
Pteridium aquilinum	**0** 0.24	**0** -0.01	**1** 0.71
Blechnum spicant	**0** -0.09	**-1** -0.25	**3** 1.28
Asplenium scolopendrium	**-2** -0.83	**-1** -0.41	**1** 0.58
Adiantum sp.	**0** -0.41	**-1** -0.28	**0** 0.06
Trametes versicolor	**0** -0.38	**-2** -1.49	**0** 0.39
Piptoporus betulinus	**0** 0.08	**-3** -1.58	**0** 0.54
Cantharellus cibarius	**1** 0.62	**-3** -1.97	**-1** -0.57
Amanita muscaria	**3** 1.64	**-2** -0.80	**4** 2.14
Lactarius sp.	**1** 0.49	**-2** -1.10	**2** 0.79
Oudemansiella mucida	**0** 0.29	**-1** -0.79	**1** 0.59
Lycoperdon perlatum	**0** -0.37	**-4** -2.53	**-3** -1.63

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