

Appendix

Appendix 1. Factor analysis with rotated factor loadings of motives for visiting forest

Original item in questionnaire	Resulting factors with factor loadings		
	Freedom	Social reasons	Contemplative reasons
Smoke and drink	0.838	0.227	-0.151
Consume drugs	0.805	0.157	-0.147
Be unobserved	0.745	0.253	-0.066
Have sex	0.682	0.191	-0.025
Loud music/make noise	0.621	0.455	-0.140
Meet friends	0.419	0.813	0.030
Girl-/boyfriend	0.324	0.803	0.066
Family	0.003	0.661	0.176
Have fun	0.123	0.645	0.321
Tranquility	-0.072	0.108	0.808
Enjoy nature	-0.166	0.210	0.748
Health reasons	-0.034	0.149	0.733
Eigenvalues	3.39	2.27	1.28
% variance explained	28.25	18.91	10.65

Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy: 0.79

Bartlett's test of sphericity: χ^2 (66) = 2610.03, p<0.001

Appendix 2. Factor analysis with rotated factor loadings of reasons for not visiting forest

Original item in questionnaire	Resulting factors with factor loadings		
	Health risks	Fear	Forest uninteresting
Diseases	0.843	0.594	0.231
Poisonous plants	0.840	0.623	0.248
Mosquitoes/insects	0.769	0.368	0.495
Ticks	0.765	0.409	0.400
Hay fever	0.514	0.265	0.375
Fear of being assaulted	0.478	0.848	0.287
Fear of getting lost	0.505	0.802	0.351
Fear of dogs	0.407	0.784	0.202
Fear of having an accident	0.706	0.710	0.295
Fear of weird people	0.601	0.692	0.355
Fear of being alone	0.633	0.589	0.514
Leisure time outside forest	0.329	0.228	0.805
Boredom	0.529	0.331	0.742
Friends don't visit forest	0.319	0.239	0.719
Too far away	0.316	0.356	0.686
Eigenvalues	6.28	1.62	1.07
% variance explained	41.87	10.81	7.10

Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy: 0.90

Bartlett's test of sphericity: $\chi^2 (105) = 5497.01$, p<0.001

Appendix 3. Factor analysis with rotated factor loadings of forest preferences

Original item in questionnaire	Resulting factors with factor loadings				
	... wilder- ness	... high vegetation cover	... diverse forest	... ad- venturous forest	... mono- culture
Lying dead trees	0.796	0.172	0.174	0.044	-0.060
Woody debris	0.794	0.372	0.221	0.069	0.105
Standing dead trees	0.696	0.149	0.001	0.230	0.086
Rocks and rocky terrain	0.620	0.249	0.289	0.484	-0.064
Dark and dense forest	0.558	0.416	0.032	-0.057	0.421
Presence of moss	0.307	0.837	0.260	0.251	0.158
Presence of ivy	0.165	0.788	0.246	0.291	0.136
High ground vegetation cover	0.300	0.736	0.447	0.141	0.015
High diversity of tree species	0.121	0.328	0.824	0.256	0.087
Mixed forest	0.132	0.265	0.762	0.175	0.302
A lot of shrubs and young trees	0.314	0.430	0.599	0.105	0.121
Forest clearings	0.027	0.155	0.596	0.374	0.072
Mixture of large and thin trunks	0.129	0.566	0.539	0.510	-0.004
Informal trails	0.051	0.270	0.299	0.777	0.091
Trees suitable for climbing	0.352	0.209	0.207	0.680	0.065
Big trees with large trunks	0.012	0.462	0.131	0.531	0.390
Only coniferous trees	0.029	0.129	0.095	0.051	0.851
Only deciduous trees	0.063	0.146	0.282	0.187	0.767
Eigenvalues	4.61	2.07	1.51	1.31	1.24
% variance explained	25.60	11.50	8.39	7.30	6.88

Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy: 0.82

Bartlett's test of sphericity: χ^2 (153) = 4966.32, p<0.001

Appendix 4. Factor analysis with rotated factor loadings of preferences concerning recreational infrastructure

Original item in questionnaire	Resulting factors with factor loadings		
	Infrastructure for social experiences	Infrastructure for sports	Infrastructure for cleanliness
Benches	0.825	0.209	0.499
Huts and shelters	0.793	0.307	0.390
Tree trunks to sit	0.756	0.101	0.344
BBQ-sites	0.716	0.356	0.390
Playgrounds	0.657	0.425	0.400
Running trails	0.216	0.807	0.164
Fitness trails	0.376	0.801	0.273
Mountain bike trails	0.227	0.788	0.167
Bins for dog's faeces	0.402	0.159	0.816
Rubbish bins	0.602	0.121	0.801
Toilets	0.365	0.286	0.800
Eigenvalues	4.245	1.620	1.029
% variance explained	38.590	14.730	9.353

Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy: 0.854

Bartlett's test of sphericity: $\chi^2 (55) = 3634.724$, p<0.001

Appendix 5. Factor analysis with rotated factor loadings of cultural ecosystem services expected of urban forests

Original item in questionnaire	Resulting factors with factor loadings	
	Spiritual and cultural interactions	Physical and experiential interactions
Inspiration	0.779	0.148
Cultural identity	0.760	0.270
Education and research	0.726	0.350
Cultural heritage	0.712	0.486
Spiritual service	0.690	0.355
Aesthetics	0.353	0.889
Recreation	0.342	0.883
Eigenvalues	3.178	45.398
% variance explained	1.182	16.880

Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy: 0.786

Bartlett's test of sphericity: χ^2 (21) = 2015.099, p<0.001

Appendix 6

Ordered logit model examining the influence of forest-related and person-related factors on the perception of cultural ecosystem services on 50 forest photographs. Results from n = 199 teenagers are shown.

	Spiritual/cultural interactions		Physical/experiential interactions	
	Estimate	Robust SE	Estimate	Robust SE
Constant	2.55	1.45	2.67*	1.28
<i>Forest-related factors</i>				
Foliage	0.57*	0.20	0.80*	0.30
Sun	0.35*	0.17	0.67*	0.21
Pure coniferous forest	0.00	NA	0.00	NA
Mixed coniferous forest	-0.40	0.35	-0.71	0.43
Mixed deciduous forest	-0.27	0.29	-0.38	0.36
Pure deciduous forest	0.17	0.26	0.04	0.35
Single-layered stand structure	0.00	NA	0.00	NA
Multi-layered stand structure	0.07	0.16	0.00	0.23
Stand structure all-aged/all-sized	-0.26	0.19	-0.18	0.27
Stand structure clustered	-0.16	0.63	0.04	0.84
Stage of stand development: young growth or pole timber	0.00	NA	0.00	NA
Stage of stand development: young, medium or old timber	-0.02	0.17	0.22	0.22
Stage of stand development: mixed	-0.09	0.15	0.09	0.20
Ground vegetation cover	-0.00	0.04	0.07	0.05
Shrub layer cover	-0.02	0.06	-0.20*	0.08
Cover of berry bushes	-0.02	0.04	-0.02	0.06
Geomorphological objects: none	0.00	NA	0.00	NA
Geomorphological objects: scree	-0.62	0.40	-1.13*	0.51
Geomorphological objects: Block debris	-0.23	0.28	-0.73*	0.36
Geomorphological objects: Boulder	-0.17	0.36	-0.71	0.41
Geomorphological objects: Rock	-0.20	0.58	-0.43	0.69
Stumps	0.47	0.47	0.35	0.59
Lying dead trees	0.27	0.23	0.21	0.26
Standing dead trees	-1.38*	0.43	-3.01*	0.48
Heaps of branches	-0.02	0.12	-0.14	0.16
Root plates	0.05	0.25	0.06	0.27
Signs of logging	-0.98*	0.46	-1.38*	0.61
Tree trunks at edge of road	0.29	0.48	-0.75	0.60
Moss on trees and stones	0.01	0.16	0.39*	0.20
Ivy on trees	-0.53*	0.23	-0.78*	0.28
Presence of ferns	-0.26	0.21	-0.72*	0.32
Bench	0.44	0.42	-0.05	0.53

High-voltage line	-0.40	0.47	-0.12	0.53
Fence	-0.20	0.24	-0.82*	0.30
Footpath	0.20	0.34	0.24	0.39
Asphalt path or road	-0.49	0.34	-0.94*	0.40
Gravel road	-0.21	0.21	-0.51	0.30
Concrete road	0.42	0.24	0.53	0.28
<i>Person-related factors</i>				
Preference for high vegetation cover	0.27*	0.10	0.20*	0.08
Preference for monoculture	0.08	0.10	0.13	0.09
Preference for wilderness	0.05	0.10	0.09	0.08
Preference for diverse forest	-0.13	0.09	0.10	0.07
Contemplative reasons for forest visit	0.15	0.10	0.05	0.06
Social reasons for forest visit	0.21*	0.08	0.11	0.07
Fear of forest	0.07	0.09	-0.12	0.07
Preference for infrastructure for social experiences	-0.22*	0.09	-0.10	0.07
Preference for infrastructure for sports	0.21*	0.09	0.29*	0.08
Preference for infrastructure for cleanliness	0.22*	0.09	0.07	0.07
Female	0.21	0.16	-0.08	0.14
Age	-0.06	0.08	0.01	0.07
Member environmental organisation	0.09	0.18	-0.02	0.17
Forest in childhood not important	0.00	NA	0.00	NA
Forest in childhood neutral	0.06	0.35	0.11	0.27
Forest in childhood important	0.36	0.31	0.50*	0.20
Forest ownership (in family)	0.33*	0.15	0.17	0.14
Chronic illness/disabilities	0.54*	0.25	0.56*	0.28
Language region German-speaking	0.00	NA	0.00	NA
Language region French-speaking	0.08	0.22	0.44*	0.19
Language region Italian-speaking	0.60	1.14	-0.28	0.62
τ_1 _recreation	--	--	0.00	NA
τ_2 _recreation	--	--	1.46*	0.13
τ_3 _recreation	--	--	2.34*	0.16
τ_4 _recreation	--	--	4.09*	0.20
τ_1 _aesthetics	--	--	0.00	NA
τ_2 _aesthetics	--	--	1.44*	0.13
τ_3 _aesthetics	--	--	2.59*	0.17
τ_4 _aesthetics	--	--	4.22*	0.20
τ_1 _spiritual services	0.00	NA	--	--
τ_2 _spiritual services	0.98*	0.10	--	--
τ_3 _spiritual services	2.82*	0.15	--	--

τ_4 _spiritual services	3.94*	0.17	--	--
τ_1 _cultural heritage	0.00	NA	--	--
τ_2 _cultural heritage	0.85*	0.09	--	--
τ_3 _cultural heritage	2.30*	0.14	--	--
τ_4 _cultural heritage	3.95*	0.17	--	--
τ_1 _education	0.00	NA	--	--
τ_2 _education	0.89*	0.09	--	--
τ_3 _education	2.51*	0.15	--	--
τ_4 _education	3.96*	0.18	--	--
τ_1 _inspiration	0.00	NA	--	--
τ_2 _inspiration	1.06*	0.10	--	--
τ_3 _inspiration	2.59*	0.14	--	--
τ_4 _inspiration	3.99*	0.17	--	--
τ_1 _sense of place	0.00	NA	--	--
τ_2 _sense of place	1.13*	0.10	--	--
τ_3 _sense of place	2.51*	0.14	--	--
τ_4 _sense of place	3.84*	0.17	--	--

Number of observations	1194	1194
LL (final, whole model)	-8659.24	-3137.37
AIC	17456.48	6394.74
BIC	17807.35	6699.84
Estimated parameters	60	60

τ_{-1-4} : Threshold estimates. These values represent the cut points in the distribution of the underlying continuous latent variable behind the discrete options of each dependent variable. They show where the latent variable is cut to make the 5 groups ("do not agree" to "fully agree") that we see in our data. In general, they are not used in the interpretation of the results.

Appendix 7

Ordered logit model examining the influence of forest-related and person-related factors on the perception of cultural ecosystem services on 50 forest photographs. Results from n = 802 adults are shown.

	Spiritual/cultural interactions		Physical/experiential interactions	
	Estimate	Robust SE	Estimate	Robust SE
Constant	2.45*	0.30	3.82*	0.34
<i>Forest-related factors</i>				
Foliage	0.71*	0.11	1.20*	0.14
Sun	0.31*	0.08	0.38*	0.10
Pure coniferous forest	0.00	NA	0.00	NA
Mixed coniferous forest	-0.60*	0.17	-0.52*	0.21
Mixed deciduous forest	-0.67*	0.16	-0.51*	0.20
Pure deciduous forest	-0.19	0.14	-0.05	0.19
Single-layered stand structure	0.00	NA	0.00	NA
Multi-layered stand structure	-0.10	0.10	-0.35*	0.12
Stand structure all-aged/all-sized	-0.39*	0.10	-0.31*	0.13
Stand structure clustered	-0.43	0.31	-0.68	0.41
Stage of stand development: young growth or pole timber	0.00	NA	0.00	NA
Stage of stand development: young, medium or old timber	-0.26*	0.09	-0.07	0.11
Stage of stand development: mixed	0.08	0.09	0.31*	0.11
Ground vegetation cover	-0.03	0.02	-0.02	0.03
Shrub layer cover	0.05	0.03	-0.03	0.04
Cover of berry bushes	-0.08*	0.02	-0.18*	0.03
Geomorphological objects: none	0.00	NA	0.00	NA
Geomorphological objects: scree	-0.17	0.18	-0.40	0.23
Geomorphological objects: Block debris	-0.70*	0.15	-0.86*	0.20
Geomorphological objects: Boulder	-0.17	0.16	0.08	0.21
Geomorphological objects: Rock	-0.45	0.26	-0.78*	0.32
Stumps	0.71*	0.22	1.11*	0.28
Lying dead trees	-0.17	0.11	-0.61*	0.13
Standing dead trees	-1.17*	0.22	-2.16*	0.28
Heaps of branches	-0.12	0.07	-0.14	0.08
Root plates	0.45*	0.13	0.62*	0.16
Signs of logging	-1.05*	0.22	-1.78*	0.28
Tree trunks at edge of road	0.73*	0.23	0.80*	0.29
Moss on trees and stones	0.00	0.08	0.06	0.10
Ivy on trees	-0.35*	0.10	-0.53*	0.13
Presence of ferns	-0.46*	0.11	-1.14*	0.14
Bench	0.06	0.20	-0.07	0.25

High-voltage line	-0.10	0.20	-0.27	0.26
Fence	-0.19	0.13	-0.30	0.17
Footpath	0.29	0.16	0.32	0.20
Asphalt path or road	-0.04	0.17	-0.42	0.22
Gravel road	-0.55*	0.12	-0.60*	0.16
Concrete road	0.35*	0.11	0.27	0.14
<i>Person-related factors</i>				
Preference for high vegetation cover	0.19*	0.06	0.19*	0.05
Preference for monoculture	0.17*	0.05	0.12*	0.04
Preference for wilderness	0.20*	0.05	0.28*	0.05
Preference for diverse forest	0.00	0.05	0.14*	0.05
Contemplative reasons for forest visit	0.24*	0.05	0.22*	0.04
Social reasons for forest visit	0.26*	0.04	0.11*	0.04
Fear of forest	0.01	0.04	-0.16*	0.04
Preference for infrastructure for social experiences	-0.02	0.05	0.11*	0.05
Preference for infrastructure for sports	0.09*	0.04	-0.08	0.05
Preference for infrastructure for cleanliness	0.09	0.05	0.02	0.05
Female	0.23*	0.08	0.17*	0.08
Age	0.01*	0.00	0.00	0.00
Member environmental organisation	0.23*	0.10	-0.04	0.11
Forest in childhood not important	0.00	NA	0.00	NA
Forest in childhood neutral	-0.11	0.19	-0.01	0.19
Forest in childhood important	0.11	0.15	0.24	0.16
Forest ownership (in family)	0.07	0.09	-0.12	0.09
Chronic illness/disabilities	0.26	0.14	-0.02	0.14
Language region German-speaking	0.00	NA	0.00	NA
Language region French-speaking	-0.04	0.09	0.24*	0.09
Language region Italian-speaking	0.39*	0.18	0.62*	0.16
τ_1 _recreation	--	--	0.00	NA
τ_2 _recreation	--	--	1.84*	0.09
τ_3 _recreation	--	--	2.99*	0.10
τ_4 _recreation	--	--	4.81*	0.12
τ_1 _aesthetics	--	--	0.00	NA
τ_2 _aesthetics	--	--	1.64*	0.09
τ_3 _aesthetics	--	--	3.01*	0.10
τ_4 _aesthetics	--	--	4.86*	0.12
τ_1 _spiritual services	0.00	NA	--	--
τ_2 _spiritual services	1.66*	0.07	--	--
τ_3 _spiritual services	3.31*	0.09	--	--

$\tau_{-4_spiritual\ services}$	4.67*	0.10	--	--
$\tau_{-1_cultural\ heritage}$	0.00	NA	--	--
$\tau_{-2_cultural\ heritage}$	0.97*	0.06	--	--
$\tau_{-3_cultural\ heritage}$	2.44*	0.08	--	--
$\tau_{-4_cultural\ heritage}$	4.18*	0.10	--	--
$\tau_{-1_education}$	0.00	NA	--	--
$\tau_{-2_education}$	1.12*	0.07	--	--
$\tau_{-3_education}$	2.80*	0.09	--	--
$\tau_{-4_education}$	4.68*	0.10	--	--
$\tau_{-1_inspiration}$	0.00	NA	--	--
$\tau_{-2_inspiration}$	1.61*	0.07	--	--
$\tau_{-3_inspiration}$	3.39*	0.08	--	--
$\tau_{-4_inspiration}$	4.98*	0.10	--	--
$\tau_{-1_sense\ of\ place}$	0.00	NA	--	--
$\tau_{-2_sense\ of\ place}$	1.26*	0.06	--	--
$\tau_{-3_sense\ of\ place}$	2.84*	0.08	--	--
$\tau_{-4_sense\ of\ place}$	4.37*	0.09	--	--

τ_{1-4} : Threshold estimates. These values represent the cut points in the distribution of the underlying continuous latent variable behind the discrete options of each dependent variable. They show where the latent variable is cut to make the 5 groups ("do not agree" to "fully agree") that we see in our data. In general, they are not used in the interpretation of the results.

* $p < 0.05$