

Supplementary Materials to the Technical note “Forest inventory data provide useful information for ecosystem service potential mapping”

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Table S1. Indicators for evaluating the potential of selected forest ecosystem services in Latvia (ES section, group and class according to CICES version 5.1.)

Section	Group	Class	Code	Indicator	Unit	Description/ data source	Stand attributes used for calculation	Score confidence*
Provisioning (biotic)	Wild plants (terrestrial and aquatic) for nutrition, materials or energy	Wild plants (terrestrial and aquatic, including fungi, algae) used for nutrition	1.1.5.1	Potential bilberry (<i>Vaccinium myrtillus</i>) yield	kg ha ⁻¹ year	Calculated according to forest type group, stand age and density	Site type, stand density, stand age	2
				Potential lingonberry (<i>Vaccinium vitis- idaea</i>) yield				
	Wild animals (terrestrial and aquatic) for nutrition, materials or energy	Wild animals (terrestrial and aquatic) used for nutritional purposes	1.1.6.1	Habitat suitability for game species (Roe deer, <i>Capreolus capreolus</i>)	Suitability class	Calculated according to the habitat suitability class in different site types for specific game species	Land cover, forest site type class, forest age class	1
				Habitat suitability for game species (Red deer, <i>Cervus elaphus</i>)	Suitability class 0- 5	Calculated according to the habitat suitability class in different site types for specific game species	Land cover, forest site type class, forest age class	
				Habitat suitability for game species (moose, <i>Alces alces</i>)				
				Habitat suitability for game species				

Section	Group	Class	Code	Indicator	Unit	Description/ data source	Stand attributes used for calculation	Score confidence*
				(wildboar, <i>Sus scrofa</i>)				
Regulation & Maintenance (biotic)	Mediation of wastes or toxic substances of anthropogenic origin by living processes	Bioremediation by microorganisms, algae, plants and animals	2.1.1.1	Potential phytoremediation by trees and ground vegetation	Phytoremediation potential	Calculated according to the phytoremediation potential of specific trees and plants and their occurrence in specific site types	Forest site type	4
	Mediation of nuisances of anthropogenic origin	Noise attenuation	2.1.2.2	Noise attenuation potential	% from the full density (100%)	Expressed as total stand density by tree species group (conifers/broadleaves)	Dominant tree species, stand density (sum of all layers)	3
	Mediation of waste, toxics and other nuisances by non-living processes	Mediation by other chemical or physical means (e.g. via filtration, sequestration, storage or accumulation)	5.1.1.3	Stabilization potential of toxic heavy metals (Hg, Pb, Cd)	cm	Calculated according to organic layer depth in forest soils in different site types	Forest site type	1
	Mediation of anthropogenic pressure by biotic and abiotic processes	Regulation of ecosystem resilience	2.3.1.1.	Stabilization potential of forest ecosystems to ensure resilience against anthropogenic	Resilience class	Calculated according to stand structure and terrain slope	Forest site type, stand age, dominant tree species	1, 2

Section	Group	Class	Code	Indicator	Unit	Description/ data source	Stand attributes used for calculation	Score confidence*
				(recreational) pressure				
Cultural (biotic)	Physical and experiential interactions with natural environment	Characteristics of living systems that enable activities promoting health, recuperation or enjoyment through active or immersive interactions	3.1.1.1	Suitability of the forest compartment to provide environment for recreation	Recreational suitability class	Calculated according to stand structure, proximity to waterbodies, cities and settlements and pollution level	Dominant tree species, site type, age group	1
		Characteristics of living systems that enable activities promoting health, recuperation or enjoyment through passive or observational interactions	3.1.1.2	Visual attractiveness of forest stands	Visual quality class	Calculated according to stand structure and type of the view (open, closed)	Tree species, stand age	2

*1 – LV focused, peer-reviewed literature; 2 – LV focused, “grey” literature; 3 - foreign literature; 4 - expert opinion (adjusted from Geange et al. [65])

Table S2. Trees and ground vegetation species suitable for phytoremediation. The first number shows possible habitat (1 – oligotrophic sites, 2 – mesotrophic sites, 3 – eutrophic sites), the second – occurrence (1- rarely, 2 – sometimes, 3 – often) (based on Straupe, unpublished data)

Species	Occurrence by site type				
	Forests on dry mineral soils	Forests on wet mineral soils	Forests on wet peat soils	Forests on drained mineral soils	Forests on drained peat soils
<i>Pinus sylvestris</i> L.	1/3, 2/3	1/3, 2/2	1/3, 1/2	1/3, 2/3	1/3, 2/3
<i>Picea abies</i> (L.) H.Karst.	1/1, 2/2, 3/3	1/2,2/3, 3/1	1/2, 2/2, 3/2	1/2, 2/3, 3/3	1/2, 2/3, 3/2
<i>Quercus robur</i> L.	3/2				
<i>Juniperus communis</i> L.	1/2, 2/3	1/1, 2/1	1/1, 2/3	1/2	1/2, 2/3
<i>Festuca ovina</i> L.s.str.	1/3				
<i>Festuca rubra</i> L. s.l.					2/3
<i>Calamagrostis epigeios</i> (L.) Roth	1/3				
<i>Juncus</i> sp.		2/3, 3/2		3/3	
<i>Caltha palustris</i> L.		3/3	2/3, 3/3		
<i>Iris pseudacorus</i> L.			2/2, 3/2		
<i>Scirpus sylvaticus</i> L.			2/3		
<i>Cirsium arvense</i> (L.) Scop.					2/3

Table S3. Area of forests on dry mineral soils in each ES potential class, % by dominant tree species group. 0 – ES not provided, 1 – ES value very low, 2 – ES value low, 3 – ES value average, 4 – ES value high, 5 – ES value very high.

Ecosystem service/ ES potential class by dominant tree species group	Pine						Spruce						Birch						Other					
	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5
Potential bilberry yield	3	75	15	4	2	0	62	38	0	0	0	0	62	38	0	0	0	0	96	4	0	0	0	0
Potential lingonberry yield	45	41	12	2	0	0	99	1	0	0	0	0	99	1	0	0	0	0	100	0	0	0	0	0
Habitat suitability moose	0	34	58	0	0	9	0	0	100	0	0	0	0	0	58	42	1	0	0	19	37	9	15	20
Habitat suitability red deer	0	8	5	2	18	66	0	19	0	58	23	0	0	0	21	0	78	0	0	0	40	8	52	0
Habitat suitability roe deer	0	0	5	2	35	58	0	0	53	24	23	0	0	22	1	42	0	36	0	21	26	17	0	36
Habitat suitability wild boar	0	20	14	66	0	0	0	0	17	19	24	40	0	0	21	0	79	0	0	19	0	21	40	20
Phytoremediation potential	0	0	0	6	94	0	0	0	0	56	44	0	0	0	0	57	43	0	0	0	0	80	20	0
Heavy metal stabilization potential	0	100	0	0	0	0	0	100	0	0	0	0	0	100	0	0	0	0	0	100	0	0	0	0
Noise attenuation potential	0	0	2	12	48	38	0	0	2	16	43	40	0	0	6	31	36	27	19	0	3	18	24	36
Resilience against recreational pressure	0	4	10	12	22	53	0	0	34	19	36	11	0	0	0	0	12	88	0	35	0	0	9	56
Visual quality	0	0	0	40	33	27	0	0	41	59	0	0	0	0	3	57	40	0	0	19	1	57	23	0
Recreational suitability	0	3	27	26	44	0	0	53	47	0	0	0	0	36	31	32	0	0	0	66	33	0	1	0

Table S4. Area of forests on wet mineral soils in each ES potential class, % by dominant tree species group. 0 – ES not provided, 1 – ES value very low, 2 – ES value low, 3 – ES value average, 4 – ES value high, 5 – ES value very high.

Ecosystem service/ ES potential class by dominant tree species group	Pine						Spruce						Birch						Other					
	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5
Potential bilberry yield	54	18	10	7	7	4	98	1	0	0	0	0	99	1	0	0	0	0	100	0	0	0	0	0
Potential lingonberry yield	53	24	17	6	0	0	98	1	0	0	0	0	99	1	0	0	0	0	100	0	0	0	0	0
Habitat suitability moose	0	51	43	0	0	5	0	0	100	0	0	0	0	0	39	55	7	0	0	19	37	20	16	7
Habitat suitability red deer	0	6	3	5	37	49	0	17	0	58	25	0	0	0	16	2	82	0	0	0	41	7	52	0
Habitat suitability roe deer	0	0	3	5	49	43	0	0	34	41	25	0	0	17	7	55	0	22	0	23	29	26	0	21
Habitat suitability wild boar	0	42	9	49	0	0	0	0	8	17	41	33	0	0	16	0	84	0	0	19	0	22	51	7
Phytoremediation potential	0	0	4	43	52	0	0	3	35	2	60	0	0	6	45	1	48	0	0	12	65	1	22	0
Heavy metal stabilization potential	0	4	53	43	0	0	0	0	95	5	0	0	0	0	92	8	0	0	0	0	87	13	0	0
Noise attenuation potential	0	0	2	12	46	41	0	0	1	13	38	48	0	0	6	28	37	28	19	0	5	24	27	24
Resilience against recreational pressure	0	11	10	40	38	0	0	26	43	27	4	0	0	0	5	12	31	52	0	37	2	7	14	40
Visual quality	0	0	0	36	43	21	0	0	25	75	0	0	0	0	2	50	48	0	0	19	1	48	32	0
Recreational suitability	0	57	43	0	0	0	0	100	0	0	0	0	0	100	0	0	0	0	0	100	0	0	0	0

Table S5. Area of forests on wet peat soils in each ES potential class, % by dominant tree species group. 0 – ES not provided, 1 – ES value very low, 2 – ES value low, 3 – ES value average, 4 – ES value high, 5 – ES value very high.

Ecosystem service/ ES potential class by dominant tree species group	Pine						Spruce						Birch						Other					
	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5
Potential bilberry yield	100	0	0	0	0	0	100	0	0	0	0	0	100	0	0	0	0	0	100	0	0	0	0	0
Potential lingonberry yield	100	0	0	0	0	0	100	0	0	0	0	0	100	0	0	0	0	0	100	0	0	0	0	0
Habitat suitability moose	0	50	0	0	49	1	0	0	100	0	0	0	0	0	12	0	88	0	0	20	10	1	68	1
Habitat suitability red deer	0	1	0	4	47	48	0	18	0	43	38	0	0	0	0	15	85	0	0	0	20	13	67	0
Habitat suitability roe deer	0	0	0	4	48	48	0	0	30	31	38	0	0	12	88	0	0	0	0	10	87	2	0	1
Habitat suitability wild boar	0	49	0	50	0	0	0	0	5	18	31	46	0	0	0	0	100	0	0	20	0	0	79	1
Phytoremediation potential	0	0	1	50	50	0	0	2	34	2	63	0	0	2	42	2	54	0	0	8	74	1	17	0
Heavy metal stabilization potential	0	0	0	0	1	99	0	0	0	0	35	65	0	0	0	0	44	56	0	0	0	0	82	18
Noise attenuation potential	0	0	2	15	47	36	0	0	2	14	33	52	0	1	7	27	39	26	20	1	7	26	30	16
Resilience against recreational pressure	0	31	43	26	0	0	0	84	15	0	0	0	0	5	8	63	24	0	0	28	6	46	20	1
Visual quality	0	0	0	29	63	9	0	0	30	70	0	0	0	0	1	53	45	0	0	20	1	43	36	0
Recreational suitability	0	44	56	0	0	0	0	100	0	0	0	0	0	100	0	0	0	0	0	100	0	0	0	0

Table S6. Area of forests on drained mineral soils in each ES potential class, % by dominant tree species group. 0 – ES not provided, 1 – ES value very low, 2 – ES value low, 3 – ES value average, 4 – ES value high, 5 – ES value very high.

Ecosystem service/ ES potential class by dominant tree species group	Pine						Spruce						Birch						Other					
	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5
Potential bilberry yield	97	3	0	0	0	0	100	0	0	0	0	0	100	0	0	0	0	0	100	0	0	0	0	0
Potential lingonberry yield	97	2	1	0	0	0	100	0	0	0	0	0	100	0	0	0	0	0	100	0	0	0	0	0
Habitat suitability moose	0	18	76	0	1	6	0	0	100	0	0	0	0	0	32	28	39	0	0	22	19	7	39	13
Habitat suitability red deer	0	8	6	0	3	82	0	19	0	58	22	0	0	0	8	9	83	0	0	0	26	24	50	0
Habitat suitability roe deer	0	0	6	0	17	77	0	0	42	35	22	0	0	18	39	28	0	14	0	16	55	13	0	16
Habitat suitability wild boar	0	3	14	82	0	0	0	0	12	19	35	34	0	0	8	0	92	0	0	22	0	4	61	13
Phytoremediation potential	0	0	1	64	0	35	0	0	34	65	0	1	0	0	48	51	0	1	0	0	70	29	0	1
Heavy metal stabilization potential	0	62	38	0	0	0	0	99	1	0	0	0	0	99	1	0	0	0	0	99	1	0	0	0
Noise attenuation potential	0	0	2	9	47	43	0	0	1	14	42	43	0	0	6	31	38	25	22	0	4	20	25	28
Resilience against recreational pressure	0	5	12	21	35	27	0	23	20	48	9	0	0	0	0	10	15	75	0	38	0	9	13	40
Visual quality	0	0	0	40	36	24	0	0	30	70	0	0	0	0	3	48	50	0	0	22	1	51	26	0
Recreational suitability	0	21	40	39	0	0	0	57	43	0	0	0	0	31	69	0	0	0	0	82	18	0	0	0

Table S7. Area of forests on drained peat soils in each ES potential class, % by dominant tree species group. 0 – ES not provided, 1 – ES value very low, 2 – ES value low, 3 – ES value average, 4 – ES value high, 5 – ES value very high.

Ecosystem service/ ES potential class by dominant tree species group	Pine						Spruce						Birch						Other					
	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5
Potential bilberry yield	56	27	9	3	3	2	98	1	0	0	0	0	97	3	0	0	0	0	100	0	0	0	0	0
Potential lingonberry yield	55	35	9	1	0	0	98	2	0	0	0	0	97	3	0	0	0	0	100	0	0	0	0	0
Habitat suitability moose	0	22	0	0	75	3	0	0	100	0	0	0	0	0	25	0	75	0	0	32	16	3	41	8
Habitat suitability red deer	0	4	0	4	17	75	0	17	0	49	34	0	0	0	0	15	85	0	0	0	32	11	56	0
Habitat suitability roe deer	0	0	0	4	21	74	0	0	39	27	34	0	0	25	75	0	0	0	0	16	72	4	0	8
Habitat suitability wild boar	0	18	4	78	0	0	0	0	10	17	27	46	0	0	0	0	100	0	0	32	0	0	60	8
Phytoremediation potential	0	1	0	27	18	54	0	35	0	2	0	63	0	44	0	3	1	53	0	70	0	2	1	28
Heavy metal stabilization potential	0	0	0	0	55	45	0	0	0	0	98	2	0	0	0	0	97	3	0	0	0	0	98	2
Noise attenuation potential	0	0	1	11	48	39	0	0	2	16	40	43	0	0	7	31	37	24	32	0	5	22	23	17
Resilience against recreational pressure	0	10	23	40	28	0	0	41	45	14	0	0	0	0	11	16	56	17	0	36	10	13	34	7
Visual quality	0	0	0	35	42	22	0	0	30	70	0	0	0	0	3	49	48	0	0	32	2	43	23	0
Recreational suitability	0	11	36	53	0	0	0	52	48	0	0	0	0	30	70	0	0	0	0	73	27	0	0	0

Figure S1. Potential bilberry (*Vaccinium myrtillus*) yield. Ecosystem service median values, aggregated on a 5x5 km grid.

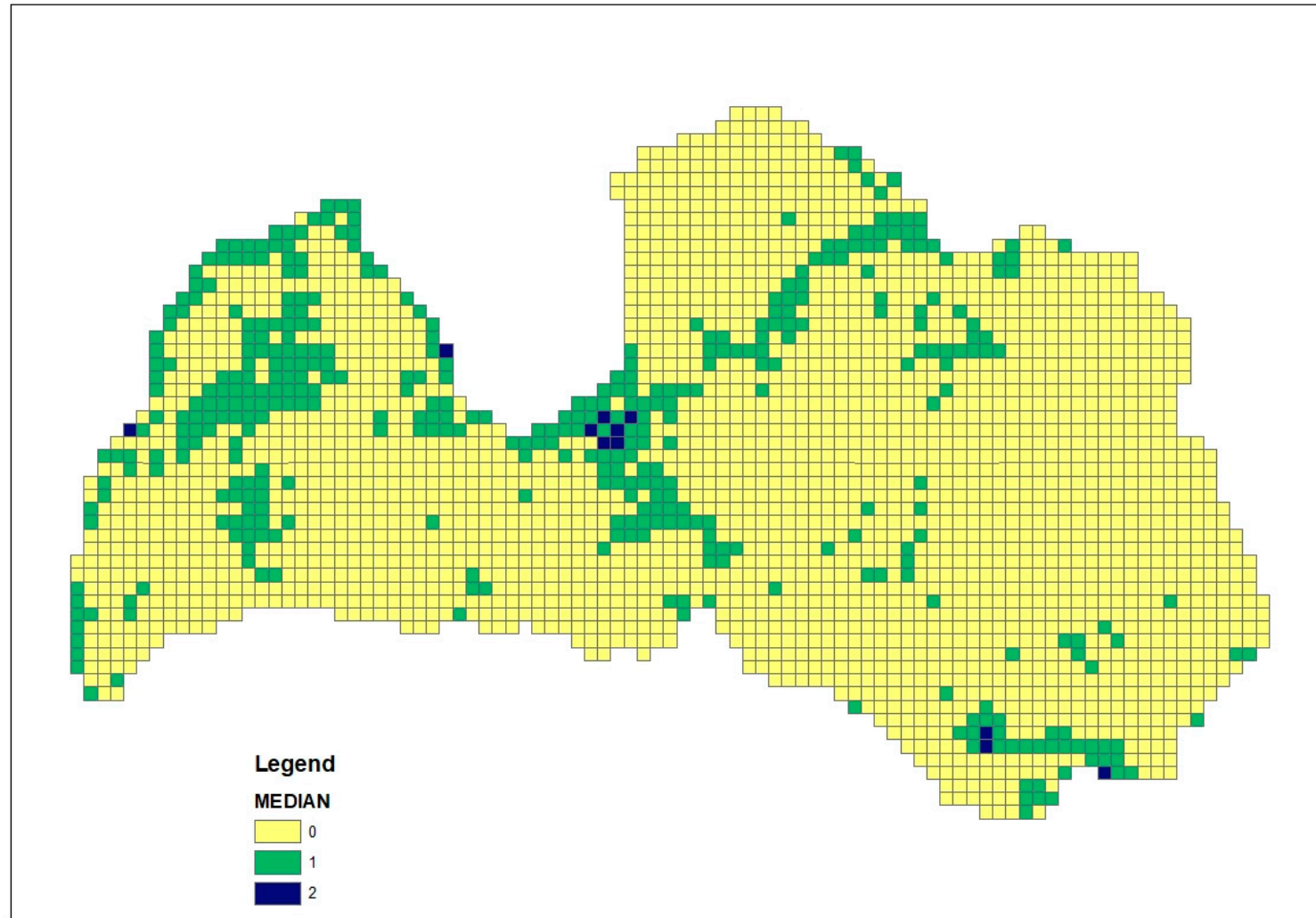


Figure S2. Potential lingonberry (*Vaccinium vitis-idaea*) yield. Ecosystem service median values, aggregated on a 5x5 km grid.

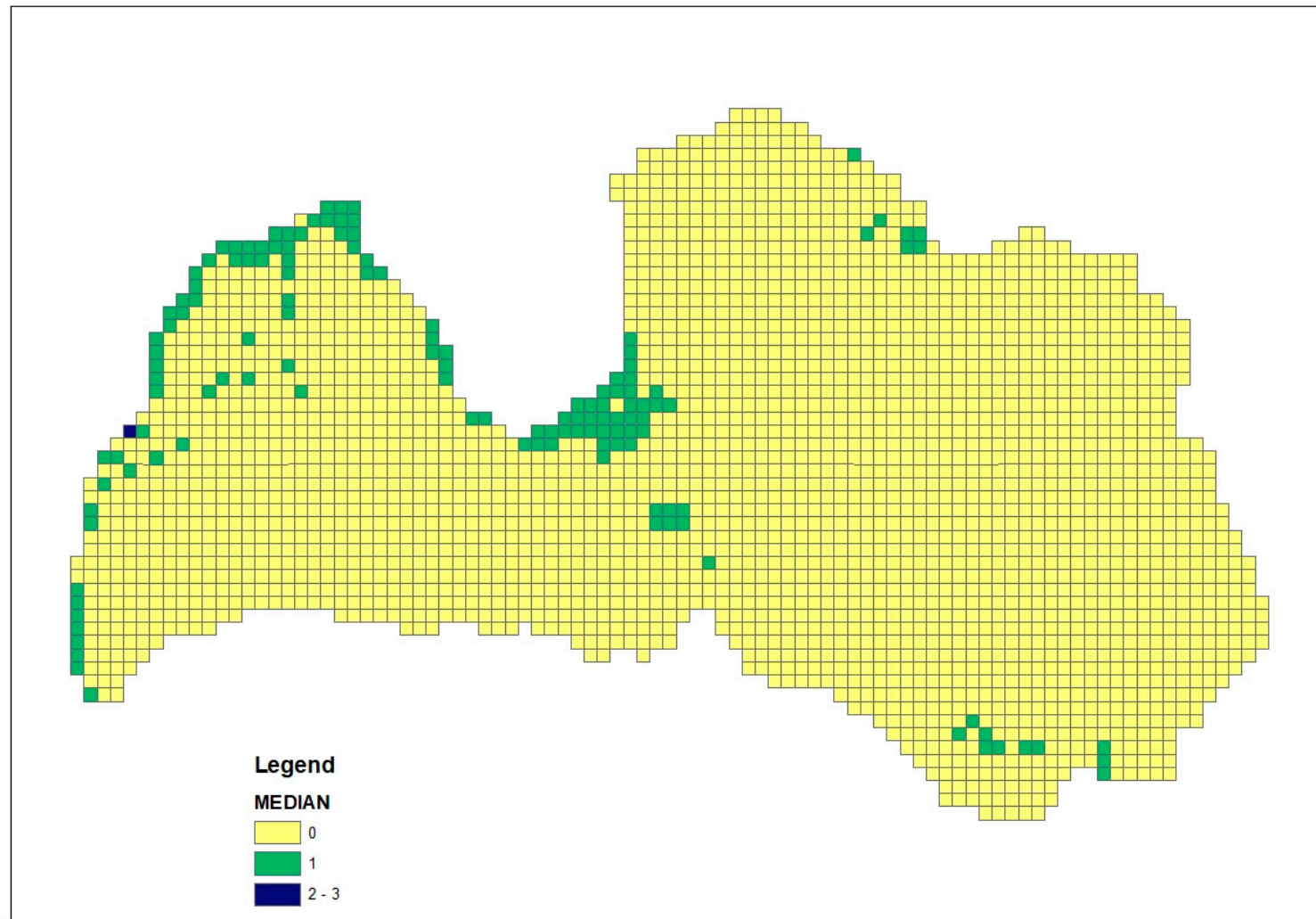


Figure S3. Habitat suitability for moose (*Alces alces*). Ecosystem service median values, aggregated on a 5x5 km grid.

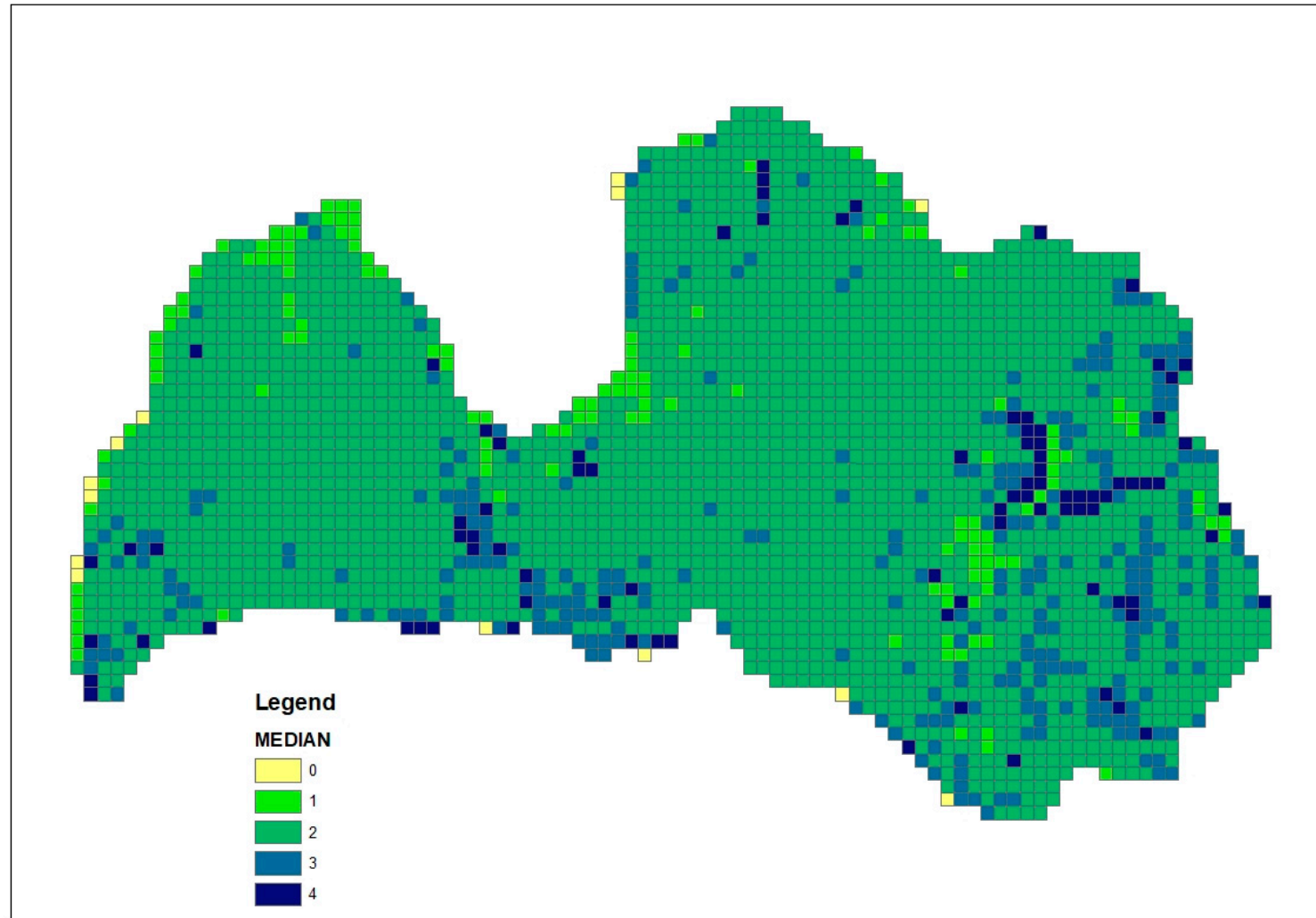


Figure S4. Habitat suitability for red deer (*Cervus elaphus*). Ecosystem service median values, aggregated on a 5x5 km grid.

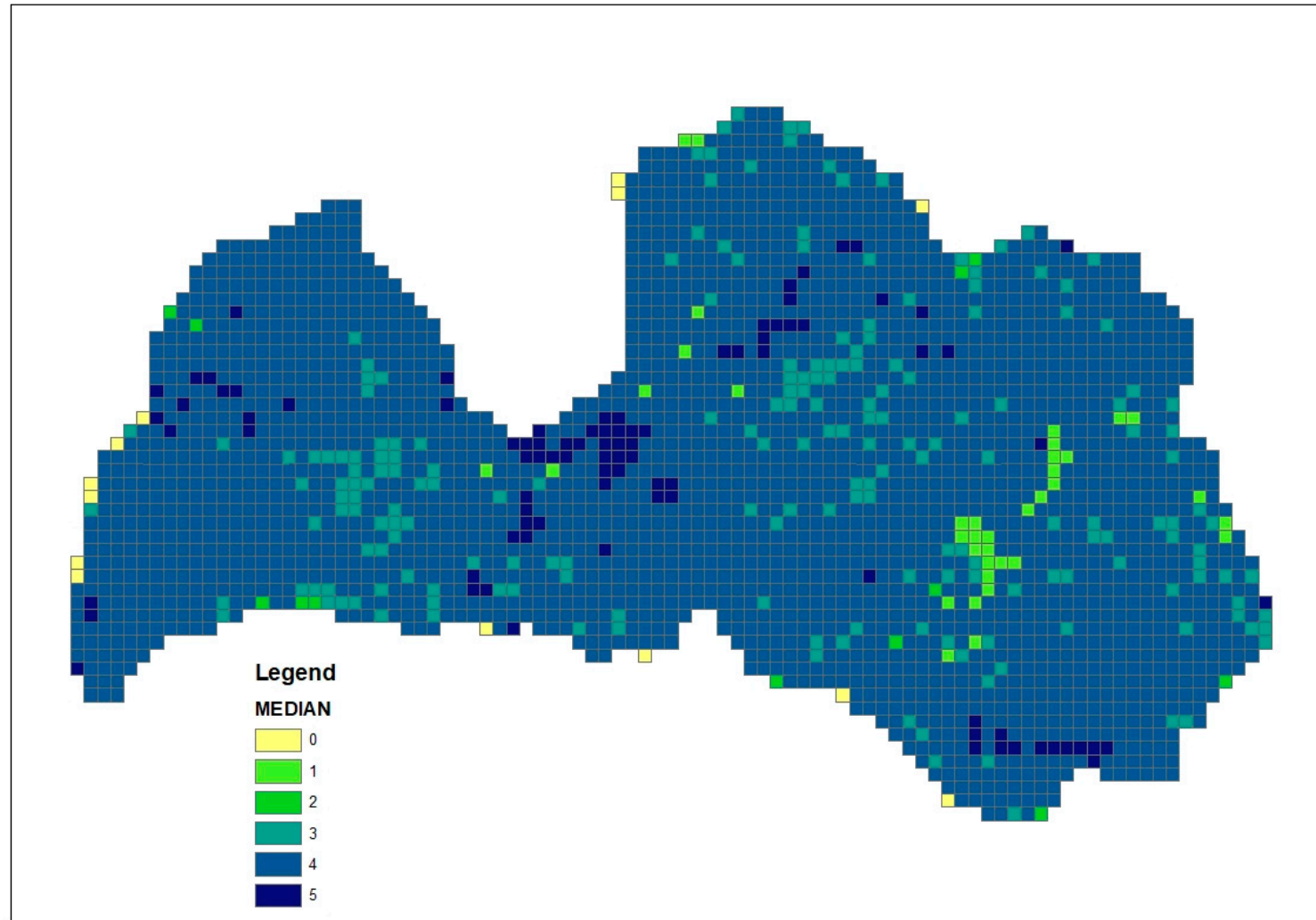


Figure S5. Habitat suitability for roe deer (*Capreolus capreolus*). Ecosystem service median values, aggregated on a 5x5 km grid.

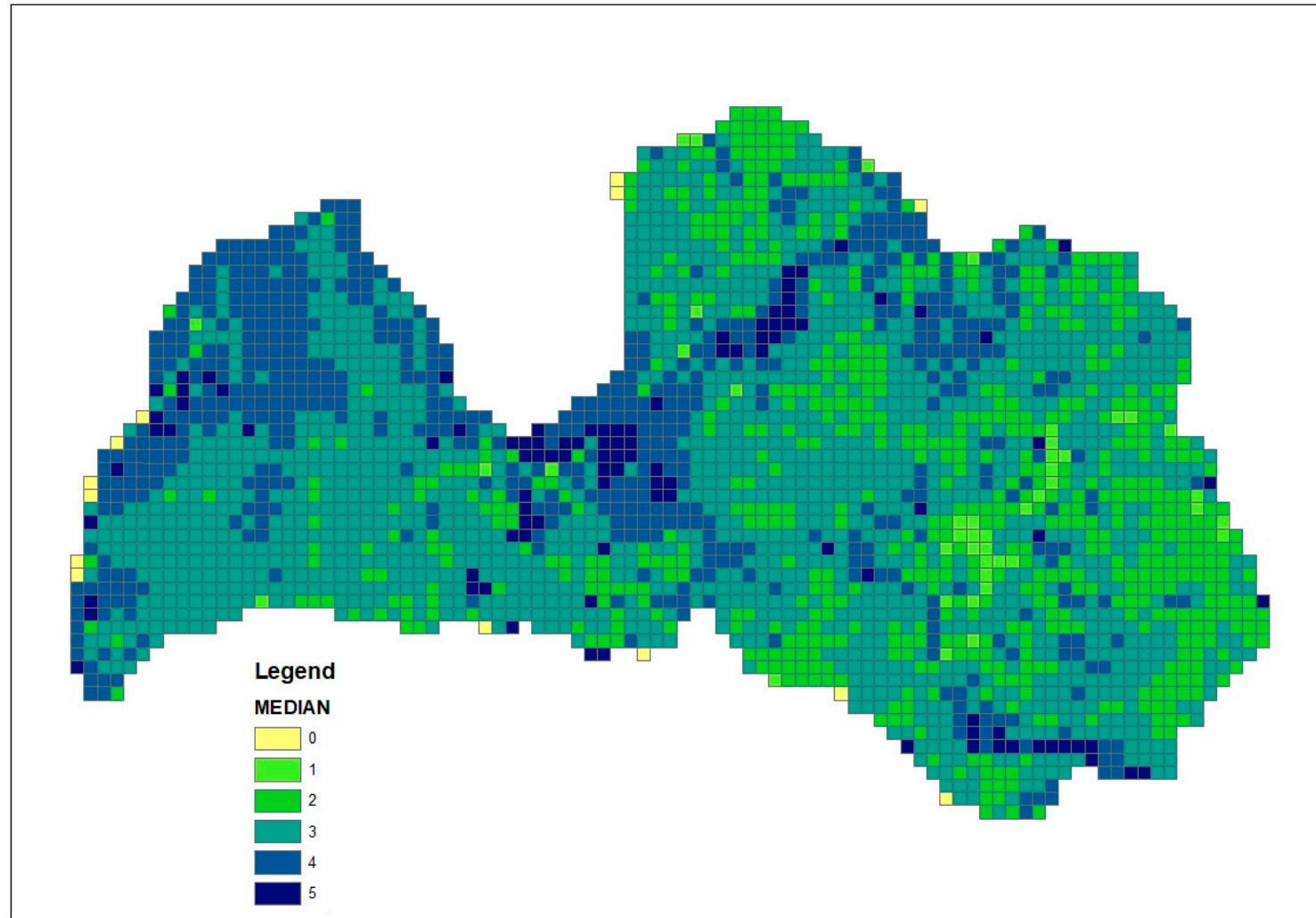


Figure S6. Habitat suitability for wild boar (*Sus scrofa*). Ecosystem service median values, aggregated on a 5x5 km grid.

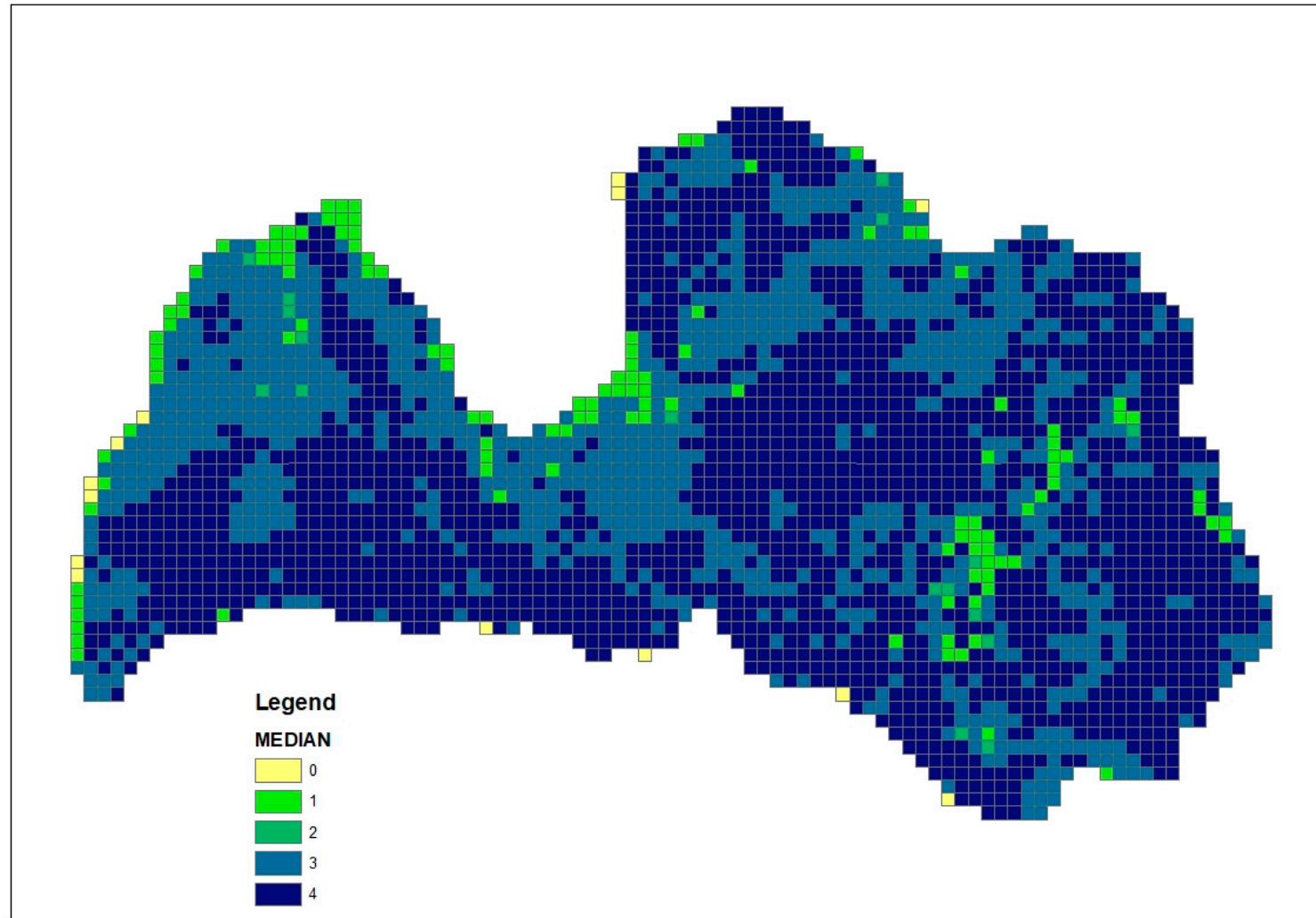


Figure S7. Potential phytoremediation by trees and ground vegetation. Ecosystem service median values, aggregated on a 5x5 km grid.

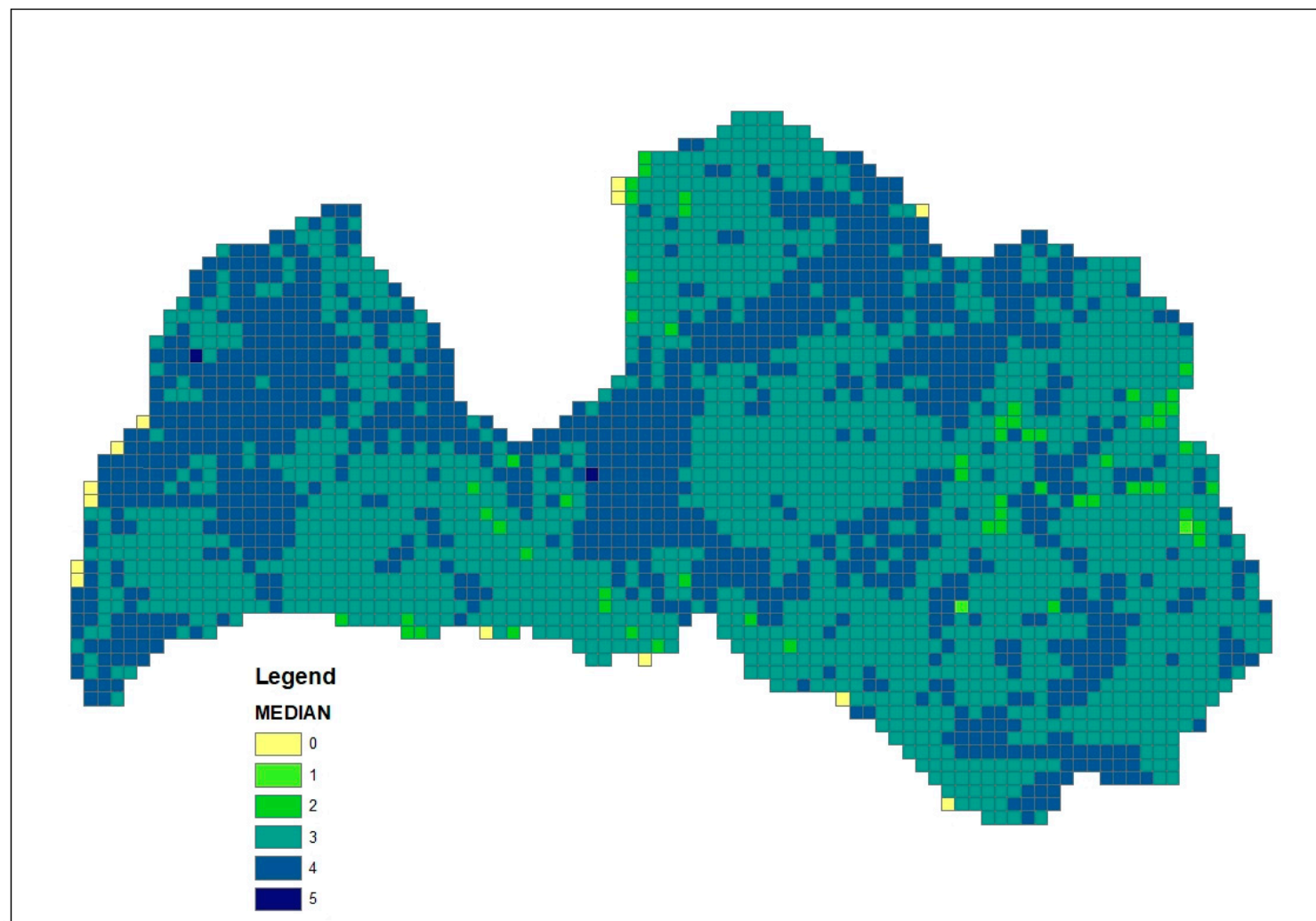


Figure S8. Noise attenuation potential. Ecosystem service median values, aggregated on a 5x5 km grid.

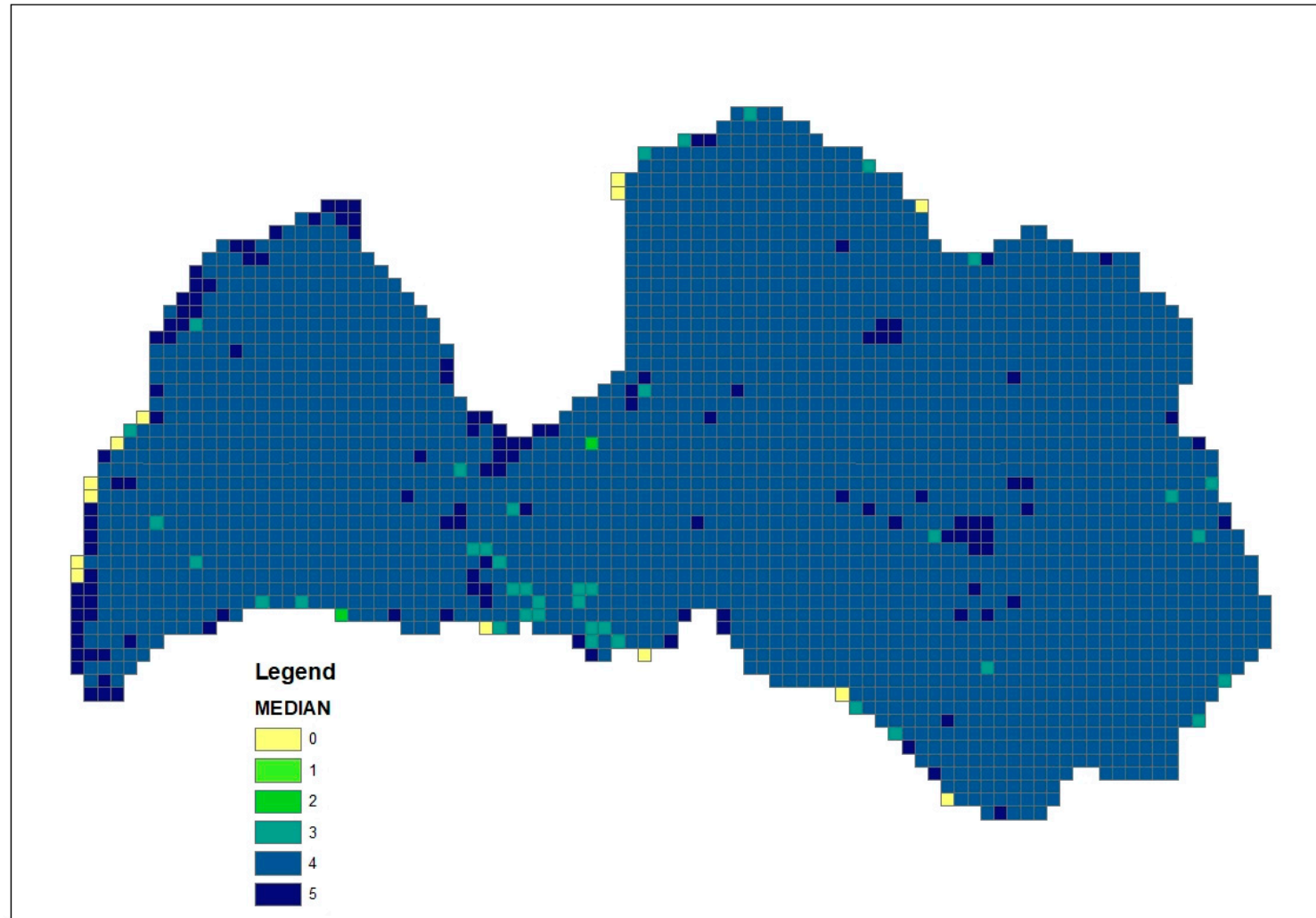


Figure S9. Stabilization potential of toxic heavy metals (Hg, Pb, Cd). Ecosystem service median values, aggregated on a 5x5 km grid.

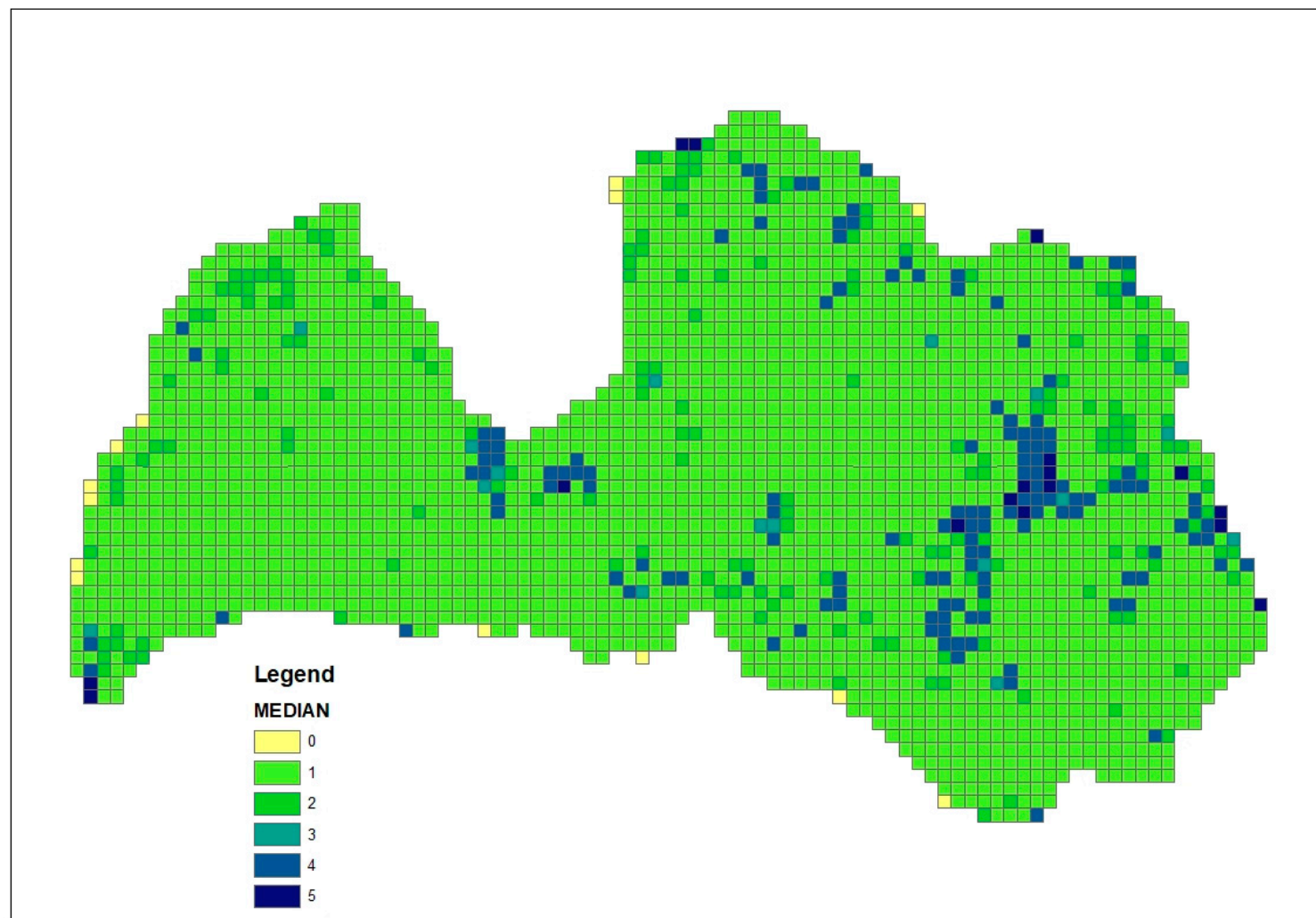


Figure S10. Stabilization potential of forest ecosystems to ensure resilience against anthropogenic (recreational) pressure. Ecosystem service median values, aggregated on a 5x5 km grid.

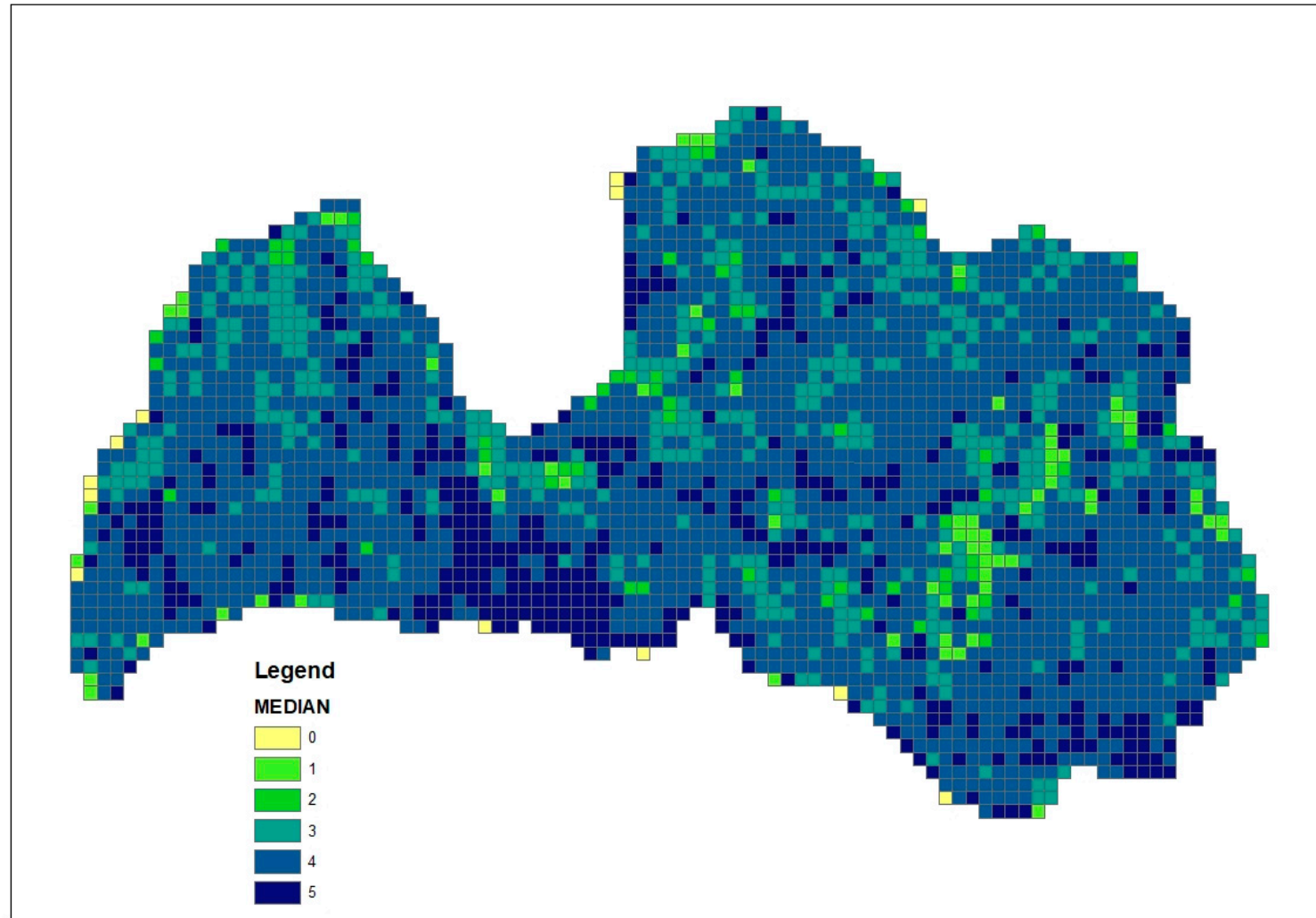


Figure S11. Suitability of the forest compartment to provide environment for recreation. Ecosystem service median values, aggregated on a 5x5 km grid.

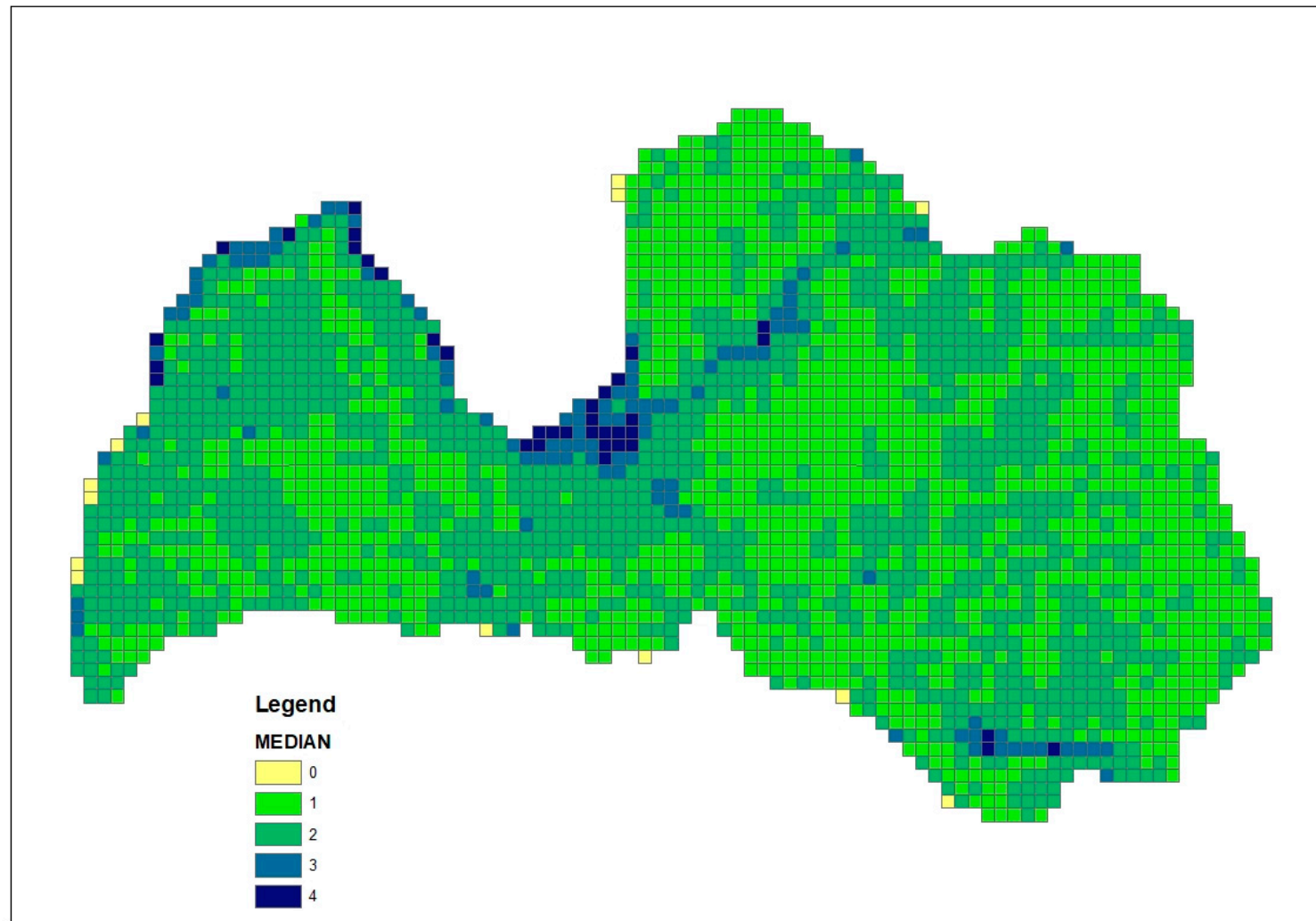


Figure S12. Visual attractiveness of forest stands. Ecosystem service median values, aggregated on a 5x5 km grid.

