

## SUPPLEMENTARY MATERIAL

**Table S1:** Number of papers found in the literature search for the period 2000-2020 according to the keyword strings and the databases used, filtered and selected. Note that no article published before 2000 was retrieved using search strings.

Keyword string	ISI WOK			SCOPUS		
	Search	Filtered	Selected	Search	Filtered	Selected
LiDAR* AND biodiversity*	648	317	62	380	216	48
LiDAR* AND vertebrates*	853	23	18	13	12	12
LiDAR* AND mammals*	592	28	25	25	22	16
LiDAR* AND birds*	229	87	75	122	126	68
LiDAR* AND reptiles*	32	4	3	4	3	2
LiDAR* AND amphibians*	5	4	2	5	3	2
LiDAR* AND invertebrates*	254	9	2	13	11	1
LiDAR* AND insects*	138	43	9	104	86	7
LiDAR* AND fungi*	41	10	1	12	9	3
LiDAR* AND lichens*	9	3	3	7	3	3
LiDAR* AND bryophytes*	15	5	5	16	8	5
Total	2816	533	205	701	499	167

**Table S2:** List of species recorded in each of the 173 articles reviewed. #: more than 20 species recorded; N/A: data not available.

Birds			
Order	Common name	Scientific name	Reference
Charadriiformes	Eastern hooded plover	<i>Thinornis cucullatus cucullatus</i>	Ehmke et al. 2016
Charadriiformes	Marbled murrelet	<i>Brachyramphus marmoratus</i>	Hagar et al. 2014
Galliformes	Capercaillie	<i>Tetrao urogallus</i>	Graf et al. 2009, Milanese et al. 2017, Glad et al. 2020
Galliformes	Capercaillie, hazel grouse	<i>Tetrao urogallus</i> , <i>Tetrastes bonasia</i>	Vauhkonen & Imponen, 2016, Kortmann et al. 2018(a)
Galliformes	Hazel grouse	<i>Tetrastes bonasia</i>	Bae et al.2014, Zellweger et al. 2014
Galliformes	Greater sage-grouse	<i>Centrocercus urophasianus</i>	Zabihi et al. 2019
Passeriformes	Eurasian sky lark	<i>Alauda arvensis</i>	Mason et al. 2003
Passeriformes	Eurasian sky lark, great tit, Eurasian blue tit	<i>Alauda arvensis</i> , <i>Parus major</i> , <i>Cyanistes caeruleus</i>	Bradbury et al. 2005
Passeriformes	Salt-marsh sparrow	<i>Ammodramus caudacutus</i>	Meiman et al. 2012
Passeriformes	Brown creeper	<i>Certhia americana</i>	Vogeler et al. 2013, Vierling et al 2014
Passeriformes	Wood thrush	<i>Hylocichla mustelina</i>	Jirinec et al. 2016
Passeriformes	Red-backed shrike	<i>Lanius collurio</i>	Svendsen et al 2015
Passeriformes	Great tit	<i>Parus major</i>	Hinsley et al. 2006, Hill & Hinsley, 2015
Passeriformes	Great tit, Eurasian blue tit	<i>Parus major</i> , <i>Cyanistes caeruleus</i>	Hinsley et al. 2002, Hinsley et al. 2008, Hinsley et al. 2009(a), Redhead et al 2013
Passeriformes	Siberian jay	<i>Perisoreus infaustus</i>	Klein et al. 2020
Passeriformes	Wood warbler	<i>Phylloscopus sibilatrix</i>	Huber et al 2016, Huber et al. 2017
Passeriformes	Wood warbler	<i>Phylloscopus trochilus</i>	Bellamy et al 2009
Passeriformes	Marsh tit	<i>Poecile palustris</i>	Broughton et al. 2006, Broughton et al. 2012a Broughton et al. 2012b Broughton et al. 2014
Passeriformes	Black-throated blue warbler	<i>Setophaga caerulescens</i>	Goetz et al. 2010
Passeriformes	Cerulean warbler	<i>Setophaga cerulea</i>	Barnes et al. 2006
Passeriformes	Dark-eyed junco, warbling vireo	<i>Junco hyemalis</i> , <i>Vireo gilvus</i>	Clawges et al. 2008
Passeriformes	Eurasian black cap, Common chaffinch	<i>Sylvia atricapilla</i> , <i>Fringilla coelebs</i>	Renner et al. 2016
Passeriformes	Lapland longspur, white-crowned Sparrow	<i>Calcarius lapponicus</i> , <i>Zonotrichia leucophrys</i>	Boelman et al 2016
Passeriformes	Several species	<i>Regulus regulus</i> , <i>Phylloscopus trochilus</i> , <i>Fringilla coelebs</i> , <i>Erithacus rubecula</i> , <i>Parus major</i> ,	Eldegard et al. 2016

		<i>Anthus trivialis</i> , <i>Troglodytes troglodytes</i> , <i>Carduelis spinus</i>	
Passeriformes	Several species	<i>Alauda arvensis</i> , <i>Anthus pratensis</i> , <i>A. trivialis</i> , <i>Saxicola rubicola</i> , <i>Turdus philomelos</i> , <i>Lophophanes cristatus</i> , <i>Certhia brachydactyla</i> , <i>Carduelis cannabina</i> , <i>Emberiza citrinella</i>	Ficetola et al. 2014
Passeriformes	Several species	<i>Setophaga striata</i> , <i>S. caerulescens</i> , <i>S. magnolia</i> , <i>S. coronata</i> , <i>Seiurus aurocapilla</i> , <i>Vireo olivaceus</i> , <i>Junco hyemalis</i> , <i>Empidonax flaviventris</i>	Swatantran et al. 2012
Passeriformes	Several species	<i>Setophaga striata</i> , <i>S. caerulescens</i> , <i>S. magnolia</i> , <i>S. coronata</i> , <i>Seiurus aurocapilla</i> , <i>Vireo olivaceus</i> , <i>Junco hyemalis</i> , <i>Empidonax flaviventris</i>	Seavy et al. 2009
Passeriformes	Several species	<i>Hemignathus virens</i> , <i>Himatione sanguinea</i> , <i>Myadestes obscurus</i> , <i>Zosterops japonicus</i> , <i>Garrulax canorus</i>	Boelman et al. 2007
Passeriformes	Several species	#	Müller et al. 2009, Sasaki et al. 2016
Piciformes	Red-cockaded woodpecker	<i>Leuconotopicus borealis</i>	Smart et al. 2012, Trainor et al. 2013, Garabedian et al. 2014, Garabedian et al 2017, Garabedian et al 2018, Garabedian et al. 2020
Piciformes	Lewis's woodpecker	<i>Melanerpes lewis</i>	Vogeler et al. 2016
Piciformes	Black-backed woodpecker	<i>Picoides arcticus</i>	Casas et al. 2016
Piciformes	Three-toed woodpecker	<i>Picoides tridactylus</i>	Zielewska et al. 2018
Piciformes	Red-naped sapsucker	<i>Sphyrapicus nuchalis</i>	Vierling et al. 2013
Strigiformes	Northern spotted owl	<i>Strix occidentalis caurina</i>	Sovern et al. 2019, Hagar et al. 2020
Strigiformes	Northern spotted owl, barred owl	<i>Strix occidentalis caurina</i> , <i>Strix varia</i>	Jenkins et al 2019, Mangan et al. 2019
Strigiformes	California spotted owl	<i>Strix occidentalis occidentalis</i>	Garcia-Feced et al. 2011, North et al. 2017, Gallagher et al. 2019
Several	Several species	<i>Pavo muticus</i> , <i>Treron phayrei</i> , <i>Psitta culaeupatria</i> , <i>P. ularoseata</i> , <i>Ploceus hypoxanthus</i> , <i>Polihierax insignis</i> , <i>Picus rabieri</i>	Singh et al. 2017
Several	Several species	<i>Catharus ustulatus</i> , <i>Geothlypis tolmiei</i> , <i>Oreothlypis celata</i> , <i>Empidonax oberholseri</i> , <i>Leuconotopicus villosus</i> , <i>Colaptes auratus</i> , <i>Sitta canadensis</i> , <i>Poecile gambeli</i>	Lorenz et al. 2015
Several	Several species	<i>Tetrao urogallus</i> , <i>Tetrastes bonasia</i> , <i>Picoides tridactylus</i> , <i>Glaucidium passerinum</i>	Zellweger et al. 2013

Several	Several species	<i>Parus major, Poecile montanus, P. palustris, Sitta europea, Periparus ater, Cyanistes caeruleus, Garrulus glandarius, Lophophane cristatus, Dendrocopos major, Fringilla coelebs, Pyrrhula pyrrhula</i>	Renner et al. 2012
Several	Several species	<i>Laniu scollurio, Crex crex, Otus scops, Picus viridis</i>	Tattoni et al. 2012
Several	Several species	<i>Anous minutus, A. stolidus, Onychoprion lunatus, Gygis alba, Fregata minor, Sula dactylatra, S. sula, Phaethon rubricauda</i>	Hatfield et al. 2012
Several	Several species	<i>Himatione sanguinea, Chlorodrepanis virens, Myadestes obscurus, Drepanis coccinea, Chasiempis sandwichensis, Zosterops japonicus, Haemorhous mexicanus, Leiothrix lutea, Garrulax canorus, Buteo solitarius, Lophura leucomelanos</i>	Flaspohler et al. 2010
Several	Several species	<i>Empidonax oberholseri, Leuconotopicus villosus, Melanerpes lewis, Dryobates pubescens</i>	Martinuzzi et al. 2009
Several	Several species	<i>Anthus trivialis, Fringilla coelebs, Phylloscopus trochilus, Pluvialis apricaria, Tringa totanus, T. glareola, Vanellus vanellus, Anthus pratensis, Alauda arvensis</i>	Leivits&Leivits, 2009
Several	Several species	#	Goetz et al. 2007 Hinsley et al. 2009(b), Müller et al. 2010, Lesak et al. 2011, Jones et al. 2013, Young et al. 2013, Goetz et al 2014, Vogeler et al. 2014, Weisberg et al. 2014, Vihervaara et al. 2015, Wallis et al. 2016, Swift et al. 2017, Bae et al. 2018, Melin et al. 2018, Mononen et al. 2018, Kellner et al. 2018, Adams & Matthews, 2019, Melin et al. 2019 Khanaposhtani et al. 2019, Taillie et al. 2019
Several	Several species	N/A	Davenport et al. 2000, Coops et al. 2016, Carrasco et al. 2019

Mammals			
Chiroptera	Western barbastelle	<i>Barbastella barbastellus</i>	Carr et al. 2018, Kortmann et al. 2018 (b)
Chiroptera	Several species	N/A	Lacki et al 2017
Chiroptera	Several species	<i>Myotis</i> spp., <i>Plecotus</i> spp., <i>Pipistrellus</i> spp., <i>Hypsugos</i> avii, <i>Eptesicus</i> spp., <i>Nyctalus</i> spp., <i>Vespertilio murinus</i>	Froidevaux et al. 2016
Chiroptera	Several species	<i>Pipistrellus</i> spp., <i>Vespertilio</i> spp., <i>Eptesicus</i> spp., <i>Nyctalus</i> spp., <i>Myotis</i> spp.	Müller et al. 2013
Chiroptera	Several species	<i>Pipistrellus pygmaeus</i> , <i>P. nathusii</i> , <i>P. pipistrellus</i> , <i>Myotis</i> sp., <i>Plecotus</i> sp., <i>Barbastella barbastellus</i> , <i>Nyctalus leisleri</i> , <i>N. noctula</i>	Jung et al. 2012
Artiodactyla	White-tailed deer	<i>Odocoileus virginianus</i>	Kroeger et al. 2020
Artiodactyla	Mule deer	<i>Odocoileus hemionus</i>	Coops et al. 2010
Artiodactyla	Several species	<i>Odocoileus</i> spp., <i>Cervus canadensis</i>	Hull et al. 2019
Artiodactyla	Moose	<i>Alces alces</i>	Melin et al. 2013, Melin et al. 2014, Melin et al. 2016
Artiodactyla	European roe deer	<i>Capreolus capreolus</i>	Ewald et al. 2014, Lone et al. 2014
Artiodactyla	Sable antelope	<i>Hippotragus niger</i>	Asner et al 2015
Artiodactyla	Migratory woodland caribou	<i>Rangifer tarandus caribou</i>	Finnegan et al. 2018
Carnivora	Pacific marten	<i>Martes caurina</i>	Tweedy et al. 2019
Carnivora	Fisher	<i>Pekania pennanti</i>	Zhao et al. 2012, Blomdahl et al. 2019
Carnivora	Jaguar	<i>Panthera onca</i>	de Thoisy et al. 2016
Carnivora	Lion	<i>Panthera leo</i>	Loarie et al. 2013, Davies et al 2016(a)
Carnivora	Several species	<i>Lycalopexculpaes</i> , <i>Lycalopexgriseus</i> , <i>Lycalopexfulvipes</i> , <i>Leopardusguigna</i>	Moreira-Arce et al. 2016
Lagomorpha	Snowshoe hare	<i>Lepusamericanus</i>	Kawaguchi &Desrochers, 2017
Lagomorpha	New England cottontail	<i>Sylvilagustransitionalis</i>	Amaral et al. 2016
Primates	Gray's bald-faced saki	<i>Pithecia irrorata</i>	Palminteri et al. 2012
Primates	Bornean orangutan	<i>Pongo pygmaeus</i>	Davies et al. 2019, Seaman et al. 2019
Primates	Bornean white-bearded gibbon, maroon leaf monkey	<i>Hylobates albibarbis</i> , <i>Presbytis rubicunda</i>	Singh et al. 2018
Primates	Several species	<i>Alouatta palliata</i> , <i>Ateles geoffroyi</i> , <i>Cebus capucinus</i> ,	McLean et al. 2016
Rodentia	Wood mouse	<i>Apodemus sylvaticus</i>	Jaime-Gonzalez et al. 2017
Rodentia	Red tree vole	<i>Arborimus longicaudus</i>	Linnell et al. 2017
Rodentia	Hazel dormouse	<i>Muscardinus avellanarius</i>	Goodwin et al. 2018
Rodentia	Delmarva fox squirrel	<i>Sciurus nigercinereus</i>	Nelson et al. 2005
Rodentia	Red squirrel	<i>Sciurus vulgaris</i>	Flaherty et al. 2014
Rodentia	Douglas squirrel, American red squirrel	<i>Tamiasciurus douglasii</i> , <i>T. hudsonicus</i>	Fotis et al. 2020
Rodentia	American red squirrel	<i>Tamiasciurus hudsonicus</i>	Hatten, 2014

Several	Several species	<i>Blarina brevicauda</i> , <i>Glaucomys</i> sp., <i>Microtus pennsylvanicus</i> , <i>Myodes gapperi</i> , <i>Napaeozapus insignis</i> , <i>Peromyscus leucopus</i> , <i>Peromyscus maniculatus</i> , <i>Sorex arcticus</i> , <i>S. cinereus</i> , <i>S. hoyi</i> , <i>Tamias minimus</i> , <i>T. striatus</i> , <i>T. ciurus hudsonicus</i> , <i>Zapus hudsonius</i>	Schooler et al. 2019
Several	Several species	<i>Panthera leo</i> , <i>Tragelaphus strepsiceros</i> , <i>T. oryx</i> , <i>Syncerus caffer</i> , <i>Equus quagga</i> , <i>Alcelaphus buselaphus</i>	Davies et al. 2016 (b)
<b>Invertebrates</b>			
Blattodea	Termites	<i>Macrotermes</i> spp.	Levick et al 2010, Davies et al. 2014, Davies et al. 2016
Coleoptera	Beetles	<i>Agonum retractum</i> , <i>Calathu singratus</i> , <i>Platynus decentis</i> , <i>Pterostichus adstrictus</i> , <i>P. coracinus</i> , <i>P. pennsylvanicus</i> , <i>Sphaeroderus nitidicollis</i> , <i>Synuchus impunctatus</i>	Work et al. 2011
Coleoptera	Ground beetles	#	Bombi et al. 2019
Coleoptera	Saproxyllic beetles	#	Gossner et al. 2016, Seibold et al. 2017
Coleoptera	Beetles	#	Müller et al. 2009 (b)
Hemiptera	Wēkiu bug	<i>Nysius wekiuicola</i>	Stephenson et al. 2017
Lepidoptera	Several species	<i>Coenonympha tullia</i> , <i>Celastrina ladon</i> , <i>Cupido amyntula</i> , <i>Vanessa cardui</i>	Hess et al. 2013
Lepidoptera	Several species	#	Aguirre-Gutierrez et al. 2017
Araneae	Spiders	#	Vierling et al. 2011
Decapoda	Red swamp crayfish	<i>Procambarus clarkii</i>	Paulson & Martin, 2014
Ostreida	Eastern oyster	<i>Crassostrea virginica</i>	Hogan & Reidenbach, 2019
Several	Several species	N/A	Kerfoot et al. 2019
Several	Arthropods	#	Müller et al. 2018, Müller et al. 2014
Several	Snails	#	Zellweger et al. 2015
<b>Reptiles</b>			
Crocodylia	Saltwater crocodile	<i>Crocodylus porosus</i>	Evans et al. 2017
Squamata	Several species	<i>Lacerta schreiberi</i> , <i>Timon lepidus</i> , <i>Podarcis bocagei</i> , <i>P. hispanica</i>	Sillero & Goncalves-Seco, 2014
Testudines	Kemp's ridley sea turtle	<i>Lepidochelys kempii</i>	Culver et al. 2020
Testudines	Greek tortoise	<i>Testudo graeca</i>	Bernheim et al. 2019
<b>Amphibians</b>			

Several	Several species	N/A	Julian et al. 2009, Wu et al. 2014, Riley et al. 2017
<b>Bryophytes, lichens &amp; fungi</b>			
Several	Bryophytes	<i>Sphagnum</i> spp.	Korpela et al. 2020
Several	Bryophytes	<i>Campylophyllum hispidulum</i> , <i>Chiloscyphus pallescens</i> , <i>Lophocolea heterophylla</i> , <i>Plagiomnium drummondii</i> , <i>Scapani aglaucocephala</i> , <i>Pleurozium schreberi</i> , <i>Hylocomium splendens</i> , <i>Aulacomnium palustre</i> , <i>Thuidium recognitum</i> , <i>Brachythecium campestre</i> , <i>Orthotrichum speciosum</i> , <i>Pylaisia polyantha</i> , <i>Ptilidium pulcherrimum</i> , <i>Dicranum fragilifolium</i>	Bartels et al. 2018
Several	Bryophytes	<i>Sphagnum</i> spp., <i>Pleurozium</i> spp., <i>Hylocomium</i> spp.	Peckham et al. 2009
Several	Bryophytes	<i>Pleurozium schreberi</i> , <i>Hylocomium splendens</i> , <i>Sphagnum girgensohnii</i> , <i>Polytrichum commune</i>	Kristensen et al. 2015
Several	Lichens	<i>Cladonia</i> & <i>Cetraria</i> spp	Keim et al. 2017
Several	Lichens (Biological soil crust)	N/A	Rodriguez-Caballero et al. 2019
Several	Fungi	#	Peura et al. 2016, Thers et al. 2017
Several	Several species	N/A	Langford et al. 2016, Moeslund et al. 2019
<b>Several taxonomic groups</b>			
Birds, bats, mammals, amphibians		Cooper et al. 2020	
Birds, bats, invertebrates, bryophytes, lichens, fungi		Bae et al. 2019	
Birds, mammals (bats)		Renner et al. 2018	
Birds, invertebrates (butterflies)		Zellweger et al. 2017	
Birds, invertebrates (insects)		Zellweger et al. 2016	
Birds, invertebrates (beetles)		Lindberg et al. 2015	
Birds, mammals, amphibians		Roll et al. 2015	

**Annex 2:** List of the reviewed articles included in the systematic review (173).

Note that all these articles have not been cited in the main text.

1. Adams, B.T. & Matthews, S.N. (2019). Diverse temperate forest bird assemblages demonstrate closer correspondence to plant species composition than vegetation structure. *Ecography*, 42(10): 1752-1764. doi: 10.1111/ecog.04487.
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4. Asner, G.P., Owen-Smith, N., Loarie, S.R., Davies, A.B., Le Roux, E. & Levick, S.R. (2015). Habitat differences do not explain population declines of sable antelope in an African savanna. *Journal of Zoology*, 297(3): 225-234. doi: 10.1111/jzo.12269.
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8. Barnes, K.W., Islam, K. & Auer, S.A. (2016). Integrating LIDAR-derived canopy structure into cerulean warbler habitat models. *Journal of Wildlife Management*, 80(1): 101-116. doi: 10.1002/jwmg.995.
9. Bartels, S.F., Caners, R.T., Ogilvie, J., White, B. & Macdonald, S.E. (2018). Relating Bryophyte Assemblages to a Remotely Sensed Depth-to-Water Index in Boreal Forests. *Frontiers in Plant Science*, 9: 858. doi: 10.3389/fpls.2018.00858.
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