

**Supplementary material**

## Appendix 1

Annual average sample sizes and growth rates ( $\pm$  SE) of the 63 study species observed in at least 50 winters during the whole 54-year study period. The main migration strategies are indicated using lower case letters (resident r, irruptive i, partial p, short-distance migratory landbirds sl, short-distance migratory waterbirds sw) and habitats of species using upper case letters (water W, urban U, forest F, intermediate species I). Significantly increasing or decreasing trends are bolded.

Common and scientific name of species	Migration, habitat	Average sample size (min. – max.)	Growth rate $\pm$ SE
Whooper Swan <i>Cygnus cygnus</i>	sw, W	329 (0–4272)	<b>0.0959 <math>\pm</math> 0.0075</b>
Mallard <i>Anas platyrhynchos</i>	sw, W	9515 (5968–13700)	–0.0017 $\pm$ 0.0009
Tufted Duck <i>Aythya fuligula</i>	sw, W	2272 (1–43471)	<b>0.1256 <math>\pm</math> 0.0412</b>
Long-tailed Duck <i>Clangula hyemalis</i>	sw, W	1087 (3–10296)	<b>0.0351 <math>\pm</math> 0.0095</b>
Common Goldeneye <i>Bucephala clangula</i>	sw, W	1210 (16–13552)	<b>0.0837 <math>\pm</math> 0.0062</b>
Common Merganser <i>Mergus merganser</i>	sw, W	1554 (31–5926)	<b>0.0715 <math>\pm</math> 0.0057</b>
Northern Goshawk <i>Accipiter gentilis</i>	r, I	63 (35–110)	<b>0.0097 <math>\pm</math> 0.0021</b>
Eurasian Sparrowhawk <i>Accipiter nisus</i>	sl, U	97 (55–151)	<b>0.0035 <math>\pm</math> 0.0016</b>
Hazel Grouse <i>Tetrastes bonasia</i>	r, F	257 (105–574)	<b>–0.0124 <math>\pm</math> 0.0015</b>
Willow Ptarmigan <i>Lagopus lagopus</i>	r, F	108 (5–317)	<b>–0.0392 <math>\pm</math> 0.0043</b>
Black Grouse <i>Lyrurus tetrix</i>	r, F	1891 (511–5026)	<b>–0.0328 <math>\pm</math> 0.0016</b>
Western Capercaillie <i>Tetrao urogallus</i>	r, F	102 (15–335)	<b>–0.0423 <math>\pm</math> 0.0030</b>
Grey Partridge <i>Perdix perdix</i>	r, I	287 (44–1011)	<b>–0.0255 <math>\pm</math> 0.0040</b>
Black-headed Gull <i>Chroicocephalus ridibundus</i>	sw, W	26 (0–263)	0.0233 $\pm$ 0.0162
Mew Gull <i>Larus canus</i>	sw, W	1063 (8–8229)	<b>0.0358 <math>\pm</math> 0.0035</b>
European Herring Gull <i>Larus argentatus</i>	sw, W	108 (5–317)	<b>0.0295 <math>\pm</math> 0.0028</b>
Great Black-backed Gull <i>Larus marinus</i>	sw, W	256 (8–764)	<b>0.0650 <math>\pm</math> 0.0047</b>
Rock Pigeon <i>Columba livia</i>	r, U	5678 (3847–8168)	0.0005 $\pm$ 0.0011
Northern Hawk Owl <i>Surnia ulula</i>	i, F	6 (0–36)	<b>–0.0255 <math>\pm</math> 0.0088</b>

Eurasian Pygmy Owl <i>Glaucidium passerinum</i>	i, F	18 (2–66)	<b>0.0205 ± 0.0047</b>
Grey-faced Woodpecker <i>Picus canus</i>	r, I	26 (9–62)	<b>0.0090 ± 0.0037</b>
Black Woodpecker <i>Dryocopus martius</i>	r, F	110 (41–268)	<b>0.0133 ± 0.0017</b>
Great Spotted Woodpecker <i>Dendrocopos major</i>	r, I	1564 (250–4159)	<b>0.0231 ± 0.0008</b>
Lesser Spotted Woodpecker <i>Dendrocopos minor</i>	r, I	28 (2–92)	<b>–0.0093 ± 0.0033</b>
Three-toed Woodpecker <i>Picoides tridactylus</i>	r, F	18 (3–60)	<b>–0.0158 ± 0.0042</b>
Bohemian Waxwing <i>Bombycilla garrulus</i>	i, U	10059 (32–120269)	<b>0.0404 ± 0.0056</b>
White-throated Dipper <i>Cinclus cinclus</i>	sw, W	138 (38–223)	0.0002 ± 0.0019
Eurasian Blackbird <i>Turdus merula</i>	p, U	679 (36–2800)	<b>0.0574 ± 0.0015</b>
Fieldfare <i>Turdus pilaris</i>	i, U	14065 (12–140473)	<b>0.0525 ± 0.0084</b>
Goldcrest <i>Regulus regulus</i>	p, F	3120 (1186–7294)	<b>–0.0092 ± 0.0008</b>
Northern Long-tailed Tit <i>Aegithalos caudatus</i>	r, I	500 (25–1539)	<b>0.0089 ± 0.0024</b>
Willow Tit <i>Poecile montanus</i>	r, F	5335 (1953–8672)	<b>–0.0200 ± 0.0006</b>
Siberian Tit <i>Poecile cinctus</i>	r, F	22 (4–73)	–0.0083 ± 0.0070
Crested Tit <i>Lophophanes cristatus</i>	r, F	1302 (732–2193)	<b>–0.0179 ± 0.0007</b>
Coal Tit <i>Parus ater</i>	r, I	767 (218–1497)	0.0006 ± 0.0010
Blue Tit <i>Cyanistes caeruleus</i>	p, U	7664 (411–24083)	<b>0.0681 ± 0.0010</b>
Eurasian Great Tit <i>Parus major</i>	p, U	26673 (14134–41978)	<b>0.0085 ± 0.0004</b>
Eurasian Treecreeper <i>Certhia familiaris</i>	p, F	396 (138–670)	–0.0019 ± 0.0010
Northern Shrike <i>Lanius excubitor</i>	sl, I	31 (8–71)	<b>0.0057 ± 0.0029</b>
Eurasian Jay <i>Garrulus glandarius</i>	r, I	1019 (670–1742)	<b>0.0058 ± 0.0008</b>
Siberian Jay <i>Perisoreus infaustus</i>	r, F	18 (1–64)	0.0011 ± 0.0096
Eurasian Magpie <i>Pica pica</i>	r, U	8591 (4176–12361)	<b>0.0104 ± 0.0005</b>
Spotted Nutcracker <i>Nucifraga caryocatactes</i>	r, I	19 (0–88)	<b>0.0477 ± 0.0096</b>
Eurasian Jackdaw <i>Corvus monedula</i>	p, U	7907 (3164–19824)	<b>0.0028 ± 0.0012</b>
Rook <i>Corvus frugilegus</i>	sl, U	12 (0–102)	<b>–0.0490 ± 0.0162</b>
Carrion Crow <i>Corvus corone</i>	p, U	14903 (8941–27832)	<b>–0.0060 ± 0.0007</b>
Common Raven <i>Corvus corax</i>	r, I	725 (186–1620)	<b>0.0165 ± 0.0016</b>
Common Starling <i>Sturnus vulgaris</i>	sl, U	118 (0–1105)	<b>–0.0287 ± 0.0050</b>
House Sparrow <i>Passer domesticus</i>	r, U	23029 (7860–51638)	<b>–0.0189 ± 0.0007</b>

Eurasian Tree Sparrow <i>Passer montanus</i>	r, U	1407 (0–9856)	<b>0.1248 ± 0.0093</b>
Chaffinch <i>Fringilla coelebs</i>	sl, U	219 (43–853)	–0.0003 ± 0.0020
Brambling <i>Fringilla montifringilla</i>	sl, U	185 (3–1566)	–0.0108 ± 0.0072
European Greenfinch <i>Carduelis chloris</i>	p, U	11274 (293–37717)	<b>0.0778 ± 0.0018</b>
European Goldfinch <i>Carduelis carduelis</i>	sl, U	215 (19–817)	<b>0.0312 ± 0.0032</b>
Eurasian Siskin <i>Carduelis spinus</i>	p, I	2702 (61–17604)	<b>0.0108 ± 0.0023</b>
Eurasian Linnet <i>Carduelis cannabina</i>	sl, I	80 (1–1683)	–0.0274 ± 0.0190
Common Redpoll <i>Carduelis flammea</i>	i, I	12110 (1330–94533)	–0.0012 ± 0.0015
Red Crossbill <i>Loxia curvirostra</i>	i, F	1046 (9–6341)	<b>–0.0259 ± 0.0031</b>
Parrot Crossbill <i>Loxia pytyopsittacus</i>	i, F	53 (0–293)	<b>0.0335 ± 0.0085</b>
Pine Grosbeak <i>Pinicola enucleator</i>	i, F	292 (0–1815)	<b>–0.0273 ± 0.0058</b>
Eurasian Bullfinch <i>Pyrrhula pyrrhula</i>	p, I	7573 (3206–14374)	<b>–0.0023 ± 0.0006</b>
Snow Bunting <i>Plectrophenax nivalis</i>	sl, I	32 (1–211)	<b>–0.0327 ± 0.0119</b>
Yellowhammer <i>Emberiza citrinella</i>	p, U	29029 (13212–44812)	<b>0.0025 ± 0.0007</b>

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## Appendix 2

Relative densities (individuals / 10 km route) of species occurring in forest lands, where trees are at least five metres tall (forest) or less than five (clear-cuts and stands of saplings). Note that detectability of birds in open clear-cuts is higher than in forests, so the absolute differences in densities are probably higher.

Common and scientific name of species	Trees $\geq$ 5m	Trees < 5m
Hazel Grouse <i>Tetrastes bonasia</i>	0.97	0.12
Willow Ptarmigan <i>Lagopus lagopus</i>	0.13	0.16
Black Grouse <i>Lyrurus tetrix</i>	2.84	4.18
Western Capercaillie <i>Tetrao urogallus</i>	0.16	0.06
Northern Hawk Owl <i>Surnia ulula</i>	0.01	0.02
Eurasian Pygmy Owl <i>Glaucidium passerinum</i>	0.04	0.02
Black Woodpecker <i>Dryocopus martius</i>	0.46	0.10
Three-toed Woodpecker <i>Picoides tridactylus</i>	0.07	0.00
Goldcrest <i>Regulus regulus</i>	12.02	0.70
Willow Tit <i>Poecile montanus</i>	11.13	1.95
Siberian Tit <i>Poecile cinctus</i>	0.05	0.00
Crested Tit <i>Lophophanes cristatus</i>	4.09	0.24
Eurasian Treecreeper <i>Certhia familiaris</i>	1.62	0.04
Siberian Jay <i>Perisoreus infaustus</i>	0.03	0.00
Red Crossbill <i>Loxia curvirostra</i>	2.87	0.24
Parrot Crossbill <i>Loxia pytyopsittacus</i>	0.22	0.06
Pine Grosbeak <i>Pinicola enucleator</i>	0.37	0.01
Total	37.08	7.9