

Appendix. The prevalence of delayed development in several avian traits, including plumage, iris, beak and leg coloration, as a function of morphological and ecological traits. The first species of each pair represents the delayed species and the second the non-delayed species. Pairs of species are organized in terms of the degree of overlap between delay and breeding activity and in terms of breeding system. Passerine species are listed first.

Species	Family	Male body mass	Female body mass	Migration 1	Breeding density <sup>2</sup>	Nesting type <sup>3</sup>	Flocking 4	Delay in bare parts <sup>5</sup>	Delay in plumage <sup>6</sup>	Delay in iris <sup>7</sup>	Overlap with breeding <sup>8</sup>	Plumage dichro. <sup>9</sup>	References <sup>10</sup>
NO OVERLAP WITH BREEDING													
<b>Solitary breeding</b>													
<i>Pyrrhonorax graculus</i>	Corvidae	214	.	R	S	NC	F	P	P	A	NO	M	1,2,3,4,5,6
<i>Pyrrhonorax pyrrhonorax</i>	Corvidae	273	236	R	S	NC	SF	A	A	A	NO	M	1,2,3,4,5,6,7
<i>Molothrus aenus</i>	Fringillidae	69	57	M	S	NC	F	A	P	A	NO	D	8,9,10,11,12
<i>Molothrus ater</i>	Fringillidae	48	38	M	S	NC	F	A	A	A	NO	D	8,9,12,13,14
<i>Serinus flaviventris</i>	Fringillidae	16	.	R	.	.	F	A	P	A	NO	D	15,16,17
<i>Serinus totta</i>	Fringillidae	.	.	R	S	NC	SF	A	A	A	NO	D	15,16,17,18
<i>Serinus pusillus</i>	Fringillidae	11.6	11.5	R	S	NC	F	A	P	A	NO	D	6,15,16,17
<i>Serinus rothschildi</i>	Fringillidae	.	.	R	.	.	S	A	A	A	NO	M	15,16,17
<i>Zonotrichia querula</i>	Fringillidae	37.4	33.7	M	S	NC	SF	A	P	A	NO	M	1218,19,20,21,22,23,24,25
<i>Zonotrichia capensis</i>	Fringillidae	21	20	R	S	NC	S	A	A	A	NO	M	7,10,19,20,21,26
<i>Calamospiza melanocorys</i>	Fringillidae	39.6	36.4	M	S	NC	F	A	P	A	NO	D	12,13,19,21,25,27
<i>Calcarius lapponicus</i>	Fringillidae	24.8	22.5	M	S	NC	F	A	A	A	NO	D	12,13,19,21,25,28,29
<i>Spizella passerina</i>	Fringillidae	12.3	.	M	S	NC	F	P	P	A	NO	M	19,21,25,30
<i>Spizella arborea</i>	Fringillidae	18.6	17.1	M	S	NC	F	A	A	A	NO	M	12,19,21,25,31,32
<i>Dendroica discolor</i>	Fringillidae	7.5	6.6	M	S	NC	S	A	P	A	NO	D	13,33,34,35,36,37
<i>Dendroica adelaidae</i>	Fringillidae	6.7	.	R	S	NC	S	A	A	A	NO	M	33,34,36,38,39

<i>Dendroica castanea</i>	Fringillidae	8.9	7.7	M	S	NC	SF	A	P	A	NO	D	10,12,13,33,34,40
<i>Dendroica fusca</i>	Fringillidae	10.1	10.3	M	S	NC	S	A	A	A	NO	D	10,12,13,33,34,41,42
<i>Dendroica petechia</i>	Fringillidae	10	9.6	M	S	NC	S	P	P	A	NO	D	12,13,33,34,43,44
<i>Dendroica striata</i>	Fringillidae	11.9	12.7	M	S	NC	S	A	A	A	NO	D	10,12,13,33,34,45
<i>Dendroica angelae</i>	Fringillidae	8.5	.	R	S	NC	SF	.	P	.	NO	M	33,34,36
<i>Dendroica tigrina</i>	Fringillidae	11.1	10.2	M	S	NC	S	A	A	A	NO	D	12,13,33,34,46
<i>Wilsonia canadensis</i>	Fringillidae	10.3	9.7	M	S	NC	SF	A	P	A	NO	D	10,12,13,34,47
<i>Wilsonia citrina</i>	Fringillidae	10.8	10.1	M	S	NC	S	A	A	A	NO	D	7,12,13,34,48
<i>Lagonosticta senegala</i>	Passeridae	8.3	8.3	R	S	NC	SF	A	P	A	NO	D	7,15,49,50,51
<i>Pytilia melba</i>	Passeridae	13.5	13.5	R	S	NC	S	A	A	A	NO	D	7,15,18,49,50,51,52
<i>Uraeginthus ianthinogaster</i>	Passeridae	13.1	13.1	R	S	NC	SF	P	P	P	NO	D	7,15,49,50,52,53
<i>Uraeginthus bengalus</i>	Passeridae	10.3	10.3	R	S	NC	F	A	A	A	NO	D	7,15,49,50,51,52,53
<i>Parus cristatus</i>	Paridae	11.4	10.7	R	S	NC	SF	A	A	P	NO	D	54,55,56
<i>Parus ater</i>	Paridae	9.6	8.9	M	S	NC	SF	A	A	A	NO	D	54,55,56,57
<i>Phylloscopus trochilus</i>	Sylviidae	9.6	9.1	M	S	NC	SF	P	P	A	NO	M	51,53,57,58,59,60
<i>Phylloscopus collybita</i>	Sylviidae	8.2	7.2	M	S	NC	SF	A	A	A	NO	M	51,53,57,58,59,60
<i>Leptodon cayensis</i>	Accipitridae	484	.	R	S	NC	S	P	P	P	NO	M	7,61,62,63,64,65
<i>Henicopernis longicauda</i>	Accipitridae	337	730	R	S	NC	S	A	A	A	NO	M	61,62,65,66
<i>Anser albifrons</i>	Anatidae	2130	1905	M	S	NC	F	P	P	A	NO	M	67,68,69
<i>Anser fabalis</i>	Anatidae	3198	2843	M	S	NC	S	A	A	A	NO	M	67,68,69
<i>Cariama cristata</i>	Cariamidae	1400	.	R	S	NC	S	P	P	.	NO	M	70,71,72
<i>Mesitornis variegata</i>	Mesitornithidae	107	.	R	S	NC	S	A	A	A	NO	M	70,71,73

<i>Pluvialis squatarola</i>	Charadriidae	199	.	M	S	NC	S	A	P	A	NO	D	74,75,76,77,78,79,80,81,82,83
<i>Charadrius ruficollis</i>	Charadriidae	133	.	M	S	NC	SF	A	A	A	NO	M	74,75,79
<i>Chionis minor</i>	Chionididae	625	551	R	S	NC	SF	P	A	A	NO	M	84,85
<i>Chionis alba</i>	Chionididae	735	638	M	S	NC	SF	A	A	A	NO	M	84,86
<i>Polihierax semitorquatus</i>	Falconidae	.	.	R	S	NC	S	P	P	A	NO	D	53,61,65,87,88
<i>Microhierax caerulescens</i>	Falconidae	40	.	R	S	NC	S	A	A	A	NO	M	61,65,88,89
<i>Actophilornis africanus</i>	Jacanidae	139	324	R	S	NC	SF	A	P	A	NO	M	51,53,74,75,79,90,91
<i>Microparra capensis</i>	Jacanidae	41	.	R	S	NC	S	A	A	A	NO	M	53,74,75,79,90,91
<i>Tetraogallus caucasicus</i>	Phasianidae	1932	1734	R	S	NC	F	A	P	A	NO	D	92,93,94
<i>Tetraogallus altaicus</i>	Phasianidae	3000	2540	R	S	NC	F	A	A	A	NO	M	93,94
<i>Perdix perdix</i>	Phasianidae	418	393	M	S	NC	F	A	P	A	NO	D	92,93,95,96
<i>Alectoris chukar</i>	Phasianidae	536	501	R	S	NC	F	A	A	A	NO	M	92,93,95,97
<i>Cacatua sulphurea</i>	Psittacidae	.	.	R	S	NC	SF	P	A	P	NO	M	98,99,100,101
<i>Cacatua ophthalmica</i>	Psittacidae	.	.	R	S	NC	SF	A	A	A	NO	M	98,99,100
<i>Calyptorhynchus baudinii</i>	Psittacidae	663	666	R	S	NC	F	P	A	A	NO	M	99,100,102
<i>Calyptorhynchus lathami</i>	Psittacidae	465	405	R	S	NC	SF	A	A	A	NO	D	99,100
<i>Platycercus elegans</i>	Psittacidae	140	125	M	S	NC	SF	A	P	A	NO	M	98,99,102,103
<i>Melopsittacus undulatus</i>	Psittacidae	29	29	M	C	NC	F	A	A	A	NO	M	98,99,102,103
<i>Gallirallus australis</i>	Rallidae	978	725	R	S	NC	SF	P	A	P	NO	M	71,104,105,106,107
<i>Gallirallus owstoni</i>	Rallidae	241	211.9	R	S	NC	S	A	A	A	NO	M	71,105,107
<i>Himantopus novaehollandiae</i>	Recurvirostridae	219	227	R	S	NC	SF	P	P	P	NO	M	7,74,75,79,104,108
<i>Recurvirostra novaehollandiae</i>	Recurvirostridae	326	323	R	C	NC	SF	A	A	A	NO	M	74,75,79,104

<i>Pterocnemia pennata</i>	Rheidae	20000	.	R	S	NC	F	A	P	A	NO	D	109,110,111
<i>Rhea americana</i>	Rheidae	22500	.	R	S	NC	F	A	A	A	NO	D	109,110,111,112,113,114
<i>Amazilia yucatanensis</i>	Trochilidae	4.05	3.67	R	S	NC	S	A	P	A	NO	M	11,115
<i>Amazilia rutila</i>	Trochilidae	5.17	4.92	R	S	NC	S	A	A	A	NO	M	11,115
<b>Colonial breeding</b>													
<i>Gymnorhinus cyanocephalus</i>	Corvidae	103	.	R	C	C	F	A	P	A	NO	M	1,2,3,116,117
<i>Cyanocitta stelleri</i>	Corvidae	128	.	R	S	NC	SF	A	A	A	NO	M	1,2,3,117,118,119,120
<i>Cacicus cela</i>	Fringillidae	.	.	R	C	NC	SF	P	P	P	NO	D	8,10,121
<i>Cacicus chrysonotus</i>	Fringillidae	.	.	R	C	NC	SF	.	A	.	.	D	8,10,121
<i>Melospiza georgiana</i>	Fringillidae	19	.	M	C	NC	SF	A	P	A	NO	M	19,21,25,122
<i>Melospiza lincolni</i>	Fringillidae	19	18.6	M	C	NC	S	A	A	A	NO	M	12,19,21,25,123,124
<i>Passer ammodendrii</i>	Passeridae	26	.	R	C	NC	F	P	P	A	NO	D	7,15,125,126
<i>Passer melanurus</i>	Passeridae	23.5	20.3	R	C	NC	F	A	A	A	NO	D	7,15,18,125,126
<i>Pastor roseus</i>	Sturnidae	74	72	M	C	NC	F	A	P	A	NO	D	6,127
<i>Temenuchus pagodarum</i>	Sturnidae	47	.	M	C	NC	SF	A	A	A	NO	M	89,127
<i>Alca torda</i>	Alcidae	727	.	M	C	NC	SF	P	P	A	NO	M	128,129,130,131
<i>Alle alle</i>	Alcidae	153	146	M	C	NC	F	P?	A	A	NO	M	128,129,130
<i>Cephus grylle</i>	Alcidae	431	434	R	C	NC	SF	P	P	A	NO	M	128,129,130
<i>Brachyramphus marmoratus</i>	Alcidae	217	223	M	S	NC	SF	A	A	A	NO	M	128,130,132,133,134
<i>Branta canadensis</i>	Anatidae	5166	2595	M	C	NC	F	A	P	A	NO	M	67,68,69,135
<i>Branta sandvicensis</i>	Anatidae	2270	1925	R	S	NC	SF	A	A	A	NO	M	67,68,136,137
<i>Streptoprocne zonaris</i>	Apodidae	103.8	.	R	C	NC	F	A	P	A	NO	M	11,138,139
<i>Collocalia esculenta</i>	Apodidae	9.5	.	R	C	NC	SF	A	A	A	NO	M	102,130,139,140

<i>Dromas ardeola</i>	Dromadidae	.	325	M	C	NC	F	A	P	A	NO	M	74,75,83,90,141
<i>Pluvianus aegyptius</i>	Glareolidae	81	.	R	S	NC	SF	A	A	A	NO	M	74,75,83,90
<i>Sula serrator</i>	Sulidae	2300	.	M	C	NC	SF	P	P	P	NO	M	84,142,143
<i>Sula abbotti</i>	Sulidae	1410	1467	R	C	NC	SF	A	A	A	NO	D	84,142,143
<i>Eudocimus ruber</i>	Threskiornithidae	588	741	M	C	NC	F	P	P	P	NO	M	7,144,145,146,147
<i>Mesembrinibis cayennensis</i>	Threskiornithidae	720	773	R	S	NC	S	A	A	A	NO	M	7,72,144,147
<b>Cooperative breeding</b>													
<i>Aphelocoma ultramarina arizonae</i>	Corvidae	132	129	R	S	C	F	P	P	A	NO	M	1,2,3,12,148,149,150,151,152, 153,154,155
<i>Aphelocoma ultramarina couchii</i>	Corvidae	.	.	R	S	NC	SF	A	A	A	NO	M	1,2,3,12,150,152,153,154,155, 156,157
<i>Ptilostomus ater</i>	Corvidae	128	.	R	S	C	F	P	A	A	NO	M	2,3,5,7,53,158
<i>Perisoreus infaustus</i>	Corvidae	88	82	R	S	NC	SF	A	A	A	NO	M	1,2,3,5,6,159,160
<i>Buphagus erythrorhynchus</i>	Sturnidae	51	51	R	S	C	SF	P	A	P	NO	M	53,127,158,161
<i>Pholia sharpii</i>	Sturnidae	48	41	R	S	NC	SF	A	.	.	NO	M	53,158
<i>Turdoides squamiceps</i>	Sylviidae	74	.	R	S	C	F	P	A	P	NO	M	54
<i>Illadopsis albipectus</i>	Sylviidae	35.2	32.3	R	S	NC	S	A	A	A	NO	M	53,158
OVERLAP WITH BREEDING													
<b>Solitary breeder</b>													
<i>Tephrodornis gularis</i>	Corvidae	42	.	R	S	NC	F	A	P	P	O	D	89,162
<i>Tephrodornis pondicerianus</i>	Corvidae	20.2	.	R	S	NC	SF	A	A	A	NO	D	89,162
<i>Carduelis flammea</i>	Fringillidae	18	17.3	M	S	NC	F	A	P	A	O	D	6,12,13,15,16,17,57,163
<i>Carduelis tristis</i>	Fringillidae	14.7	14	M	S	NC	F	A	A	A	NO	D	12,13,15,16,17,164
<i>Carduelis spinus</i>	Fringillidae	14.2	13.4	M	S	NC	F	A	P	A	O	D	6,15,16,17,57,165
<i>Carduelis pinus</i>	Fringillidae	14.6	.	M	S	NC	F	A	A	A	NO	D	7,12,15,16,17

<i>Carduelis cannabina</i>	Fringillidae	21.3	19.4	M	S	NC	F	A	P	A	O	D	6,15,16,17,57
<i>Carduelis flavirostris</i>	Fringillidae	17.5	.	M	S	NC	F	P	A	A	NO	M	15,16,17
<i>Pinicola enucleator</i>	Fringillidae	54.6	55	M	S	NC	SF	A	P	A	O	D	6,12,13,15,16,166,167
<i>Pyrrhula pyrrhula</i>	Fringillidae	29.8	28.9	M	S	NC	S	A	A	A	NO	D	6,15,16,57,166,168,169
<i>Setophaga ruticilla</i>	Fringillidae	7.2	6.8	M	S	NC	S	A	P	A	O	D	10,12,13,33,34,170,171,172
<i>Dendroica caerulescens</i>	Fringillidae	9	8.7	M	S	NC	S	A	A	A	NO	D	12,13,33,34,36,173,174
<i>Catharopeza bishopi</i>	Fringillidae	17.2	.	R	S	NC	S	.	P	.	O	M	33,34,36
<i>Mniotilta varia</i>	Fringillidae	11	.	M	S	NC	S	A	A	A	NO	D	12,13,33,34,175
<i>Piranga ludoviciana</i>	Fringillidae	30.3	29.8	M	S	NC	S	A	P	A	O	D	11,12,63,176,177,178
<i>Cardinalis cardinalis</i>	Fringillidae	45.1	43	R	S	NC	SF	A	A	A	NO	D	12,178,179
<i>Loxops coccineus</i>	Fringillidae	10.3	10.1	R	S	NC	F	A	P	A	O	D	180
<i>Loxops caeruleirostris</i>	Fringillidae	10.7	11	R	S	NC	S	A	A	A	NO	D	181
<i>Melanotis hypoleucus</i>	Mimidae	62	.	R	S	NC	S	A	P	A	O	M	7,11,183,184
<i>Mimus polyglottos</i>	Mimidae	50.5	46.4	R	S	NC	S	A	A	A	NO	M	12,183,184,185
<i>Anthus campestris</i>	Motacillidae	23.4	20.6	M	S	NC	SF	A	P	A	O	M	51,53,57,185,186,187
<i>Anthus bertholotii</i>	Motacillidae	17	16	R	S	NC	S	A	A	A	NO	M	185,187
<i>Cinnynis coccinigastra</i>	Nectariniidae	14.3	.	M	S	NC	SF	A	P	A	O	D	51,158,188
<i>Cinnynis mariquensis</i>	Nectariniidae	11.7	10.2	M	S	NC	SF	A	A	A	NO	D	53,158,188
<i>Chalcomitra amethystina</i>	Nectariniidae	14.7	12.7	M	S	NC	SF	A	P	A	O	D	53,158,188
<i>Chalcomitra balfouri</i>	Nectariniidae	11.5	.	R	S	NC	SF	A	A	A	NO	D	158,188
<i>Peucedramus taeniatus</i>	Peucedraminae	11	11.5	R	S	NC	SF	A	P	A	O	D	11,12,34,178,189
<i>Nectarina famosa</i>	Nectariniidae	17.6	14.5	M	S	NC	SF	A	A	A	NO	D	53,158,178,188

Remiz pendulinus	Paridae	9.2	9.4	M	S	NC	SF	P	P	A	O	D	54,55,158
Anthoscopus caroli	Paridae	6.5	.	R	S	C	SF	A	A	A	NO	M	53,54,55,158
Sylvia atricapilla	Sylviidae	19.5	19.4	M	S	NC	SF	A	P	P	O	D	51,53,57,58,59,60,190
Sylvia borin	Sylviidae	19	18.4	M	S	NC	SF	A	A	A	NO	M	51,53,57,58,59,60,190
Vireo atricapillus	Vireonidae	9.2	8.8	M	S	NC	S	A	P	P	O	D	11,12,191,192,193
Vireo philadelphicus	Vireonidae	12.2	.	M	S	NC	S	A	A	A	NO	M	11,12,192,193,194
Dendrocygna arcuata	Anatidae	866	732	M	S	NC	F	A	P	A	O	M	67,84,195,196
Dendrocygna bicolor	Anatidae	770.5	743.3	M	S	NC	F	A	A	A	NO	M	67,135,195,197
Netta rufina	Anatidae	1135	967	M	S	NC	F	P	P	P	O	D	67,69,87,198
Marmaronetta angustirostris	Anatidae	563	492	M	C	NC	SF	A	A	A	NO	D	67,69,87,198,199
Oxyura jamaicensis	Anatidae	584	513	M	S	NC	F	A	P	A	O	D	67,69,135,200,201
Biziura lobata	Anatidae	2398	1551	R	S	NC	S	A	A	A	NO	D	67,84,196,200,201
Ixobrychus minutus	Ardeidae	149	146	M	S	NC	S	A	P	A	O	D	69,87,202,203,204
Botaurus stellaris	Ardeidae	966	867	M	S	NC	S	A	A	A	NO	M	7,69,87,202,203,204
Centropus superciliosus	Cuculidae	160	180	R	S	NC	S	A	P	A	O	M	53,205,206,207
Centropus monachus	Cuculidae	171	237	R	S	NC	S	A	A	A	NO	M	53,205,206,207
Casuaris casuaris	Casuariidae	30000	58000	R	S	NC	S	.	P	.	O	M	104,109,110,111
Apteryx australis	Apterygidae	2120	2540	R	S	NC	S	A	A	A	NO	M	104,109,110,111
Haematopus ostralegus	Haematopodidae	587	.	M	S	NC	F	P	P	P	O	M	74,75,79,81,83,208
Ibidorhyncha struthersii	Ibidorhynchidae	300	287	R	S	NC	S	A	P	A	NO	M	74,75,79,83,209
Stercorarius pomarinus	Laridae	648	740	M	S	NC	SF	P	P	A	O	M	81,210,211,212,213
Catharacta skua	Laridae	1735	1935	M	S	NC	SF	A	A	A	NO	M	81,210,211,213

Chrysolophus pictus	Phasianidae	642	608	R	S	NC	SF	A	P	A	O	D	92,214,215
Phasianus colchicus	Phasianidae	1150	850	R	S	NC	F	A	A	A	NO	D	92,214,215,216,217
Gallus gallus	Phasianidae	910	612	R	S	NC	SF	A	P	A	O	D	215,218
Francolinus africanus	Phasianidae	450.6	428.6	R	S	NC	SF	A	A	A	NO	D	90,93,215,219
Ptilonorhynchus violaceus	Ptilorhynchidae	201	.	R	S	NC	F	P	P	.	O	D	220,221,222
Cormobates leucophaeus	Climacteridae	23.1	25.2	R	S	NC	S	A	A	A	NO	D	221,223
Nyctea scandiaca	Strigidae	1806	2279	M	S	NC	S	A	P	A	O	D	129,224,225,226
Bubo virginianus	Strigidae	1304	1706	R	S	NC	S	A	A	A	NO	M	224,227
Turnix velox	Turnicidae	37	53	M	S	NC	SF	A	P	A	O	D	71,104,228,229
Turnix melanogaster	Turnicidae	65.3	100.5	R	S	NC	S	A	A	A	NO	D	71,104,228,229,230
Tyto longimembris	Tytonidae	313	395	R	S	NC	S	A	P	A	O	D	102,224,231
Tyto alba	Tytonidae	350	359	R	S	NC	S	A	A	A	NO	D	102,129,224,225,231
Pyrocephalus rubinus	Tyrannidae	11.9	13.3	R	S	NC	S	A	P	A	O	D	10,11,12,233,234,235
Sayornis phoebe	Tyrannidae	19.7	16.9	M	S	NC	S	A	A	A	NO	M	10,12,234,236,237
<b>Colonial breeding</b>													
Phainopepla nitens	Bombycillidae	22.1	.	M	C	NC	SF	P	P	P	O	D	11,12,238,239
Ptilogonys cinereus	Bombycillidae	33.6	.	M	S	NC	F	A	A	A	NO	D	7,11,240
Progne subis	Hirundinidae	47.9	48.8	M	C	NC	S	A	P	A	O	D	10,12,241,242,243,244
Phaeoprogne tapera	Hirundinidae	36.1	.	M	S	NC	SF	A	A	A	NO	M	10,233,243,245
Tachycineta bicolor	Hirundinidae	21.7	20.7	M	C	NC	SF	A	P	A	O	D	12,243,245,246,247
Tachycineta thalassina	Hirundinidae	14.4	13.9	M	C	NC	SF	A	A	A	NO	D	12,243,245,247,248
Xantococephalus xantococephalus	Fringillidae	98	57	M	C	NC	F	A	P	A	O	D	8,9,12,13,249,250,251,252
Sturnella neglecta	Fringillidae	115	93	M	S	NC	SF	A	A	A	NO	M	8,9,12,249,253

Quiscalus mexicanus	Fringillidae	191	107	M	C	NC	F	A	P	P	O	D	7,8,11,12,254
Quiscalus quiscula	Fringillidae	120	92	M	C	NC	F	A	A	A	NO	D	8,12,254
Passer luteus	Passeridae	15.2	14.5	R	C	NC	F	P	P	A	O	D	6,15,51,126
Passer domesticus	Passeridae	28.6	28.5	R	C	NC	F	A	A	A	NO	D	6,15,126,255,256,257
Lonchura leucogastroides	Passeridae	11.7	.	R	C	NC	F	A	P	A	O	M	7,15,49,258
Lonchura fringilloides	Passeridae	16.7	.	M	C	NC	F	A	A	A	NO	M	7,15,49,53,258
Acrocephalus scirpaceus	Sylviidae	11.4	11.1	M	C	NC	S	P	A	P	O	M	51,53,57,58,59,60
Acrocephalus paludicola	Sylviidae	10.1	10.8	M	S	NC	S	A	A	A	NO	M	51,58,59,60
Egretta caerulea	Ardeidae	364	315	M	C	NC	SF	P	P	P	O	M	202,203,259,260
Egretta thula	Ardeidae	369	.	M	C	NC	F	A	A	A	NO	M	202,203,259,261
Ardea purpurea	Ardeidae	918	830	M	C	NC	S	.	P	.	O	M	51,53,69,90,202,203,204
Ardea alba	Ardeidae	935	812	M	C	NC	SF	A	A	A	NO	M	202,203,263
Falco vespertinus	Falconidae	149	182	M	C	NC	SF	P	P	P	O	D	51,53,61,65,87,88,92
Falco sparverius	Falconidae	111	120	M	S	NC	S	A	A	A	NO	D	7,61,65,88,263,264,265
Pelecanus onocrotalus	Pelecanidae	11500	7600	M	C	NC	F	P	P	P	O	M	53,69,87,109,110,266,267
Scopus umbretta	Scopidae	422	.	R	S	NC	S	A	A	A	NO	M	51,53,87,109,110
Phoenicopterus ruber	Phoenicopteridae	3540	2530	M	C	NC	F	A	P	A	O	M	7,69,87,109,110,145,268,269
Tachybaptus dominicus	Podicipedidae	139	122	R	S	NC	SF	A	A	A	NO	M	109,110,145,270
Diomedea nigripes	Procellariidae	3400	2990	M	C	NC	SF	A	P	A	O	M	271,272,273,274,275,276
Diomedea immutabilis	Procellariidae	3310	2990	M	C	NC	SF	A	A	A	NO	M	271,272,273,274,275,277
Macronectes giganteus	Procellariidae	4940	3850	M	C	NC	SF	A	P	A	O	M	84,272,275,278
Fulmarus glacialis	Procellariidae	795	740	M	C	NC	SF	A	A	A	NO	M	84,272,275,279

<i>Spheniscus demersus</i>	Spheniscidae	3310	2960	R	C	NC	F	P	P	A	O	M	7,275,280,281
<i>Eudyptula minor</i>	Spheniscidae	1172	1048	R	C	NC	S	A	A	A	NO	M	84,275,280,282
<b>Cooperative breeding</b>													
<i>Cyanocorax morio</i>	Corvidae	204	.	R	S	C	F	P	A	A	O	M	1,2,3,7,11,283
<i>Cyanocorax cyanomelas</i>	Corvidae	222	.	R	S	NC	F	A	A	A	NO	M	1,2,3,7,10,283
<i>Malarus splendens</i>	Maluridae	10.6	9.6	R	S	C	SF	P	P	A	O	D	223,284,285
<i>Stipiturus malachurus</i>	Maluridae	7.7	7.8	R	S	NC	S	A	A	A	NO	D	223,284,285
<i>Pomatostomus temporalis</i>	Pomatostomidae	75	.	R	S	C	F	A	A	P	O	M	7,286,287
<i>Pomatostomus superciliosus</i>	Pomatostomidae	35	.	R	S	C	F	A	A	A	NO	M	7,286
<i>Prunella modularis</i>	Prunellidae	19.8	18.1	M	S	C	S	P	A	P	O	D	57,187
<i>Prunella collaris</i>	Prunellidae	40.5	38	R	S	C	SF	A	A	A	NO	M	89,187
<b>Lekking</b>													
<i>Rupicola peruviana</i>	Tyrannidae	266	221	R	S	L	SF	A	P	A	O	D	7,10,288,289
<i>Pipreola riefferii</i>	Tyrannidae	50.4	.	R	S	NC	SF	A	A	A	NO	D	7,10,288,289
<i>Procnias alba</i>	Tyrannidae	210	.	M	S	L	S	.	P	.	O	D	7,10,288,289
<i>Iodopleura isabellae</i>	Tyrannidae	20	.	R	S	NC	S	A	A	A	NO	D	7,10,72,288,289
<i>Meleagris gallopavo</i>	Phasianidae	7800	4300	R	S	L	F	P	A	P	O	D	290,291,292,293
<i>Bonasa umbellus</i>	Phasianidae	593	523.8	R	S	NC	SF	A	A	A	NO	D	292,294,295
<i>Centrocercus urophasianus</i>	Phasianidae	3200	1700	R	S	L	F	P	P	A	O	D	218,294,296,297
<i>Tympanuchus cupido</i>	Phasianidae	1030	820	R	S	L	F	A	A	A	NO	D	218,294,298
<i>Tetrao tetrix</i>	Phasianidae	1269	945	R	S	L	F	A	P	A	O	D	92,218,294
<i>Falcipecten canadensis</i>	Phasianidae	492	456	R	S	NC	SF	A	A	A	NO	D	7,218,294,299,300
<i>Philomachus pugnax</i>	Scolopacidae	170	102	M	S	L	F	P	P	A	O	D	74,75,79,81,83,90,301,302
<i>Calidris melanotos</i>	Scolopacidae	70	52	M	S	NC	SF	A	A	A	NO	M	74,75,79,81,83,303,304,305

## OVERLAP UNKNOWN

**Solitary breeding**

<i>Mycerobos icteroides</i>	Fringillidae	67	.	R	S	NC	SF	P	P	A	.	D	7,15,16,306
<i>Hesperiphona vespertinus</i>	Fringillidae	56.7	55.4	R	S	NC	F	A	A	A	NO	D	6,12,13,15,16,307,308,309
<i>Emberiza aureola</i>	Fringillidae	22.1	20.8	M	S	NC	F	A	P	P	.	D	28,310
<i>Emberiza rustica</i>	Fringillidae	21	20	M	S	NC	F	A	A	A	NO	D	28,310,311
<i>Irena puella</i>	Irenidae	62.5	.	R	S	NC	SF	A	P	A	.	D	7,89,221
<i>Chloropsis cochinchinensis</i>	Irenidae	24	.	R	S	NC	S	A	A	A	NO	D	7,89,221
<i>Luscinia calliope</i>	Muscicapidae	21.4	20.2	M	S	NC	S	P	P	A	.	D	89,187
<i>Luscinia megorhynchos</i>	Muscicapidae	20.9	19.4	M	S	NC	S	A	A	A	NO	M	51,57,187
<i>Brachypteryx montana</i>	Muscicapidae	21.6	.	R	S	NC	S	A	P	A	.	D	7,89
<i>Brachypteryx stellata</i>	Muscicapidae	.	.	R	S	NC	S	A	A	A	NO	M	89
<i>Pardalotus punctatus</i>	Pardalotidae	9.2	.	M	S	NC	F	A	P	A	.	D	7,312,313
<i>Dasyornis brachypterus</i>	Pardalotidae			R	S	NC	S	A	A	A	NO	M	312,313
<i>Erythrura cyaneovirens</i>	Passeridae	13	.	R	S	NC	F	A	P	A	.	M	7,15,49
<i>Erythrura prasina</i>	Passeridae	.	.	M	S	NC	F	A	A	A	NO	D	15,49
<i>Pitta cyanea</i>	Pittidae	109	.	R	S	NC	S	P	P	A	.	D	314
<i>Pitta iris</i>	Pittidae	62.3	67	R	S	NC	S	A	A	A	NO	M	223,314
<i>Haliastur indus</i>	Accipitridae	536	.	R	S	NC	S	P	P	A	.	M	61,62,65,84,89
<i>Elanoides forficatus</i>	Accipitridae	465	465	M	S	NC	SF	A	A	A	NO	M	61,62,64,315
<i>Hieraaetus spilogaster</i>	Accipitridae	1280	1580	R	S	NC	S	A	P	P	.	M	51,53,61,65,87
<i>Hieraaetus wahlbergi</i>	Accipitridae	641	.	M	S	NC	S	A	A	A	NO	M	51,53,61,65,87

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<i>Chenonetta jubata</i>	Anatidae	815	800	M	S	NC	F	A	P	A	.	D	67,84,196,316
<i>Anas gracilis</i>	Anatidae	507	474	M	S	NC	F	A	A	A	NO	M	67,84,316,317,318
<i>Batrachostomus hodgsoni</i>	Batrachostomidae	51	.	R	S	NC	S	P	P	P	.	D	319,320,321,322
<i>Podargus strigoides</i>	Podargidae	450	395	R	S	NC	S	A	A	A	NO	D	84,320,321,322
<i>Anthroceros albirostris</i>	Bucetoridae	738	624	R	S	NC	SF	A	P	A	.	D	319,323
<i>Tockus erythrorhynchus</i>	Bucetoridae	177	131	R	S	NC	SF	A	A	A	NO	D	51,53,205,323
<i>Chordeiles minor</i>	Caprimulgidae	79	.	M	S	NC	SF	A	P	A	.	D	321,322,324
<i>Chordeiles acutipennis</i>	Caprimulgidae	46	49	M	S	NC	SF	A	A	A	NO	D	321,322,325
<i>Caprimulgus carolinensis</i>	Caprimulgidae	110	108	M	S	NC	S	A	P	A	.	D	321,322,326,327
<i>Caprimulgus vociferus</i>	Caprimulgidae	55.3	50.6	M	S	NC	S	A	A	A	NO	D	321,322
<i>Ducula aurorae</i>	Columbidae	.	.	R	S	NC	SF	P	P	A	.	M	328
<i>Ducula galeata</i>	Columbidae	.	.	R	S	NC	SF	A	A	A	NO	M	328
<i>Penelopina nigra</i>	Cracidae	890	.	R	S	NC	SF	A	P	A	.	D	7,72,94,329,330
<i>Penelope argyrotis</i>	Cracidae	.	.	R	S	NC	SF	A	A	A	NO	.	72,94,329
<i>Talegalla fuscirostris</i>	Megapodiidae	1327	1138	R	S	NC	S	P	P	A	.	M	331,332
<i>Leipoa ocellata</i>	Megapodiidae	2250	1768	R	S	NC	S	A	A	A	NO	M	104,331,332,333
<i>Scotopelia peli</i>	Strigidae	2188	.	R	S	NC	S	A	P	A	.	M	51,53,205,224
<i>Bubo bubo</i>	Strigidae	2458	3164	R	S	NC	S	A	A	A	NO	M	129,224
<i>Coturnicops noveboracensis</i>	Rallidae	59	52	M	S	NC	S	A	P	A	.	M	71,105,334
<i>Coturnicops exquisitus</i>	Rallidae	.	.	M	S	NC	S	A	A	A	NO	M	71,105
<i>Laterallus albigularis</i>	Rallidae	50	45	R	S	NC	S	P	P	P	.	M	7,63, 71,105
<i>Laterallus jamaicensis</i>	Rallidae	26.9	26.9	M	S	NC	S	A	A	A	NO	D	63,71,105,335

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Laterallus exilis	Rallidae	32.4	34.7	R	S	NC	S	P	P	P	.	M	71,105
Laterallus leucopyrrhus	Rallidae	.	46.5	R	S	NC	S	A	A	A	NO	M	71,105
Crex egregia	Rallidae	130	.	R	S	NC	S	P	P	P	.	D	51,53,71,90,105
Crex crex	Rallidae	165.5	145	M	S	NC	S	A	A	A	NO	D	53,71,90,92,105
Canirallus oculus	Rallidae	278	276	R	S	NC	S	.	P	P	.	M	71,90,105
Eulabeornis castaneiventris	Rallidae	745.8	628	R	S	NC	S	A	A	A	NO	M	71,104,105
Gallinula melanops	Rallidae	195	225	R	S	NC	S	.	P	.	.	M	71,105
Gallinula ventralis	Rallidae	410	364	M	C	NC	SF	A	A	A	NO	D	71,104,105
Crypturellus soui	Tinamidae	198	235	R	S	NC	SF	A	P	A	.	D	7,63,72,109,111,233,336
Nothocercus bonapartei	Tinamidae	763	.	R	S	NC	S	A	A	A	NO	D	7,63,72,109,111,233,330
Heliodoxa imperatrix	Trochilidae	.	.	R	S	NC	S	A	P	A	.	D	233,337
Heliodoxa rubinoides	Trochilidae	7.7	.	R	S	NC	S	A	A	A	NO	M	7,233,337
Pharomachus mocinno	Trogonidae	195	.	R	S	NC	SF	A	P	A	.	D	11,338,339,340,341
Priotelus temmurus	Trogonidae	58	.	R	S	NC	S	A	A	A	NO	M	36,338,339
<b>Colonial breeding</b>													
Artamus superciliosus	Corvidae	40	.	M	C	NC	F	A	P	A	.	D	286,312,313
Artamus leucorhynchus	Corvidae	47.4	.	M	C	C	F	A	A	A	NO	M	286,312,313
Agelaius ruficapillus	Fringillidae	42	32	M	C	NC	F	A	P	A	.	D	8,10,254
Molothrus badius	Fringillidae	45	45	R	S	C	F	A	A	A	NO	M	7,8,10,254
Cacicus melanicterus	Fringillidae			R	C	NC	SF	A	P	A	.	D	8,342
Psarocolius oseryi	Fringillidae			R	C	NC	SF	A	A	A	NO	M	8,342,343
Hypocolius ampelinus	Hypocoliidae	51.3	.	M	C	NC	SF	A	P	A	.	D	7,89,187
Pycnonotus cafer	Pycnonotidae	31.1	.	R	S	NC	SF	A	A	A	NO	M	7,89

<i>Ploceus cucullatus</i>	Ploceidae	45.2	36.6	R	C	NC	F	A	P	P	.	D	53,344
<i>Ploceus ocularis</i>	Ploceidae	25.2	.	R	S	NC	S	A	A	A	NO	D	53,344,345
<i>Egretta picata</i>	Ardeidae	264	234	M	C	NC	S	P	P	A	.	M	7,84,202,203
<i>Egretta intermedia</i>	Ardeidae	500	.	M	C	NC	SF	A	A	A	NO	M	7,51,90,202,203
<i>Sterna fuscata</i>	Laridae	239	249	M	C	NC	F	A	P	A	.	M	84,346,347
<i>Gygis alba</i>	Laridae	107	.	R	C	NC	S	A	A	A	NO	M	84,348
<i>Diomedea cauta</i>	Procellariidae	4430	3450	M	C	NC	SF	P	P	.	.	M	84,271,272,273,275,349
<i>Phoebetria palpebrata</i>	Procellariidae	3080	3140	M	C	NC	SF	A	A	A	NO	M	84,271,272,273,275
<b>Cooperative breeding</b>													
<i>Cyanocorax melanocyaneus</i>	Corvidae	110	.	R	S	C	SF	P	A	P	.	M	1,2,3,11,151,283,350
<i>Cyanocorax yncas</i>	Corvidae	100	.	R	S	C	SF	A	A	A	NO	M	1,2,3,12,151,283,350,351
<i>Aphelocoma unicolor</i>	Corvidae	125	.	R	S	C	F	P	A	A	.	M	1,2,3,11,153,352
<i>Aphelocoma caerulescens</i>	Corvidae			R		C	SF	A	A	A	NO	M	1,2,3,12,153,353
<i>Dryoscopus cubla</i>	Corvidae	27.1	25.4	R	S	C	SF	A	P	P	.	D	53,162
<i>Laniarius atrococcineus</i>	Corvidae	48.8	.	R	S	NC	S	A	A	A	NO	M	162,354
<i>Macroagelaius imthurni</i>	Fringillidae	.	.	R	S	C	F	A	P	A	.	D	8,9,10,254
<i>Gymnomystyx mexicanus</i>	Fringillidae	93	.	R	S	NC	SF	A	A	A	NO	M	7,8,9,10,254
<i>Lichenostomus penicillatus</i>	Meliphagidae	19.8	.	R	S	C	SF	P	P	A	.	M	7,312,313
<i>Lichenostomus virescens</i>	Meliphagidae	24.6	.	R	S	NC	S	A	A	A	NO	M	7,312,313
<i>Gerygone mouki</i>	Pardalotidae	.	.	R	S	C	F	A	A	P	.	M	312,313,314,355
<i>Aphelocephala leucopsis</i>	Pardalotidae	.	.	R	S	C	F	A	A	A	NO	M	312,313,314,355
<i>Acanthiza lineata</i>	Pardalotidae	6.7	.	R	S	C	F	A	P	A	.	M	7, 312,313,314,355
<i>Acanthiza nana</i>	Pardalotidae	5.9	.	R	S	C	F	A	A	A	NO	M	7, 312,313,314,355

<i>Smicornis brevirostris</i>	Pardalotidae	5.1	.	R	S	C	SF	A	P	P	.	M	7, 312,313,314,355
<i>Acanthiza robustirostris</i>	Pardalotidae	6.5	.	R	S	NC	S	A	A	A	NO	M	7, 312,313,314,355
<i>Acanthiza uropygialis</i>	Pardalotidae	.	.	M	S	C	F	A	P	P	.	M	312,313,314,355
<i>Acanthiza iredalei</i>	Pardalotidae	.	.	R	S	C	F	A	A	A	NO	M	312,313,314,355
<i>Lamprotornis caudatus</i>	Sturnidae	118	.	R	S	C	SF	A	P	P	.	M	51,127,158
<i>Lamprotornis chalybaeus</i>	Sturnidae	94	79	M	S	NC	SF	A	P	A	NO	M	51,53,127,158
<i>Spreo bicolor</i>	Sturnidae	105	102	R	S	C	SF	P	P	P	.	M	127,158
<i>Hylopsar purpureiceps</i>	Sturnidae	67	60	R	S	NC	SF	A	A	A	NO	M	127,158
<i>Penelopides exarthus</i>	Bucetoridae	350	370	R	S	C	SF	A	P	A	.	D	323,356
<i>Penelopides mindorensis</i>	Bucetoridae	367	328	R	S	.	S	A	A	A	.	D	323
<i>Tanysiptera sylvia</i>	Halcyonidae	49.4	50.3	M	S	C	S	A	P	A	.	D	102,357,358
<i>Dacelo novaeguineae</i>	Halcyonidae	307.2	352.1	R	S	C	S	A	A	A	NO	D	102,357,359
<i>Megapodius nicobariensis</i>	Megapodiidae	757	926	R	S	C	S	P	P	A	.	M	331
<i>Megapodius forstenii</i>	Megapodiidae	.	650	R	S	NC	S	A	A	A	NO	M	331
<i>Porzana atra</i>	Rallidae	80.1	74.9	R	S	C	F	P	A	P	.	D	71,105,107,360
<i>Porzana tabuensis</i>	Rallidae	45.3	37.6	R	S	NC	S	A	A	A	NO	M	71,104,105,360
<b>Unknown breeding type</b>													
<i>Cyanolyca pulchra</i>	Corvidae	.	.	R	.	.	S	A	P	A	.	M	2,3,10
<i>Cyanolyca viridicynana</i>	Corvidae	106	93	R	.	.	S	A	A	A	NO	M	2,3,7,10
<i>Corvus tristis</i>	Corvidae	635	.	R	.	.	SF	P	P	P	.	M	2,3,7,66
<i>Corvus moneduloides</i>	Corvidae	275	.	R	S	NC	S	A	A	A	NO	M	2,3,7,361

<sup>1</sup> Migration: M = migratory, R = resident or sedentary

<sup>2</sup> Breeding density: S = solitary, C = colonial breeder

<sup>3</sup> Nesting type: NC = non-cooperative breeder, C = cooperative breeder, L = lekking

<sup>4</sup> Flocking: F = flocking, S = solitary, SF = occasionally flocking

<sup>5,6,7</sup> Delay: A = absent, P = present

<sup>8</sup> Overlap with breeding: NO = no overlap between delay and breeding, O = overlap occurs

<sup>9</sup> Plumage dichromatism: D = dichromatic species, M = monochromatic species

<sup>10</sup> References: (1) (Lawton and Lawton, 1986); (2) (Madge and Burn, 1994); (3) (Goodwin, 1986); (4) (Rolando et al., 1997); (5) (Cibois and Pasquet, 1999); (6) (Cramp and Perrins, 1994a); (7) (Dunning, 1993); (8) (Jaramillo and Burke, 1999); (9) (Lanyon and Omland, 1999); (10) (Ridgely and Tudor, 1989); (11) (Howell and Webb, 1995); (12) (Rohwer et al., 1980); (13) (Rohwer and Butcher, 1988); (14) (Lowther, 1993); (15) (Clement, 1992); (16) (Badyaev, 1997); (17) (Arnaiz-Villena et al., 1999); (18) (McLachlan and Liversidge, 1978); (19) (Byers et al., 1996); (20) (Zink et al., 1991); (21) (Patten and Fugate, 1998); (22) (Rohwer et al., 1981); (23) (Norment, 1995); (24) (Norment and Shackleton, 1993); (25) (Rising, 1996); (26) (Novoa et al., 1996); (27) (Shane, 2000); (28) (Cramp and Perrins, 1994b); (29) (Hunt et al., 1995); (30) (Middleton, 1998); (31) (Naugler, 1993); (32) (McNicholl, 1987); (33) (Lovette and Bermingham, 1999); (34) (Curson et al., 1994); (35) (Nolan et al., 1999); (36) (Raffaële et al., 1998); (37) (Latta and Faaborg, 2001); (38) (Lovette et al., 1998); (39) (Staicer, 1996); (40) (Williams, 1996); (41) (Morse, 1994); (42) (Chipley, 1977); (43) (Lowther et al., 1999); (44) (Morton, 1976); (45) (Hunt and Eliason, 1999); (46) (Baltz and Latta, 1998); (47) (Conway, 1999); (48) (Stutchbury, 1994); (49) (Goodwin, 1982); (50) (Mackworth-Præd and Grant, 1972); (51) (Barlow and Wacher, 1997); (52) (Christidis, 1987); (53) (Zimmerman et al.); (54) (Cramp and Perrins, 1993); (55) (Harrap and Quinn, 1995); (56) (Slikas et al., 1996); (57) (Jenni and Winkler, 1994); (58) (Cramp, 1992); (59) (Baker, 1997); (60) (Urban et al., 1997); (61) (Brown and Amadon, 1968); (62) (Griffiths, 1994); (63) (Stiles and Skutch, 1989); (64) (Robinson, 1994); (65) (Ferguson-Lees and Christie, 2001); (66) (Beehler et al., 1986); (67) (Johnsgard, 1978); (68) (Livezey, 1996b); (69) (Cramp and Simmons, 1977); (70) (del Hoyo et al., 1996); (71) (Livezey, 1998); (72) (Sick, 1993); (73) (Langrand, 1990); (74) (Hayman et al., 1986); (75) (Chu, 1994); (76) (Balachandran et al., 2000); (77) (Serra et al., 1999); (78) (Turpie and Hockey, 1997); (79) (Johnsgard, 1981); (80) (Paulson, 1995); (81) (Cramp and Simmons, 1983); (82) (Myers et al., 1979); (83) (Prater et al., 1977); (84) (Marchant and Higgins, 1990); (85) (Burger, 1982); (86) (Shaw, 1986); (87) (Brown et al., 1982); (88) (Griffiths, 1999); (89) (Grimmett et al., 1999); (90) (Urban et al., 1986); (91) (Whittingham et al., 2000); (92) (Cramp and Simmons, 1980); (93) (Johnsgard, 1988); (94) (del Hoyo et al., 1994); (95) (Armstrong et al., 2001); (96) (Carroll, 1993); (97) (Christensen, 1996); (98) (Miyaki et al., 1998); (99) (Juniper and Parr, 1998); (100) (Brown and Toft, 1999); (101) (Coates and Bishop, 1997); (102) (Higgins and Davies, 1999); (103) (Leeton et al., 1994); (104) (Marchant and Higgins, 1993); (105) (Taylor, 1998); (106) (Miskelly, 1981); (107) (Trewick, 1997); (108) (Greene, 1999); (109) (del Hoyo et al., 1992); (110) (van Tuinen et al., 1998); (111) (Davies, 2002); (112) (Bruning, 1974); (113) (Reboreda and Fernandez, 1997); (114) (Martella et al., 1996); (115) (Johnsgard, 1997); (116) (Marzluff and Balda, 1992); (117) (de los Monteros and Cracraft, 1997); (118) (Bekoff et al., 1998); (119) (Brown, 1963); (120) (Greene et al., 1998); (121) (Lanyon and Omland, 1999); (122) (Mowbray, 1997); (123) (Wortmanwunder, 1997); (124) (Ammon, 1995); (125) (Allende et al., 2001); (126) (Summers-Smith, 1988); (127) (Feare and Craig, 1998); (128) (Gaston and Jones, 1998); (129) (Cramp, 1985); (130) (Friesen et al., 1996); (131) (Camphuysen and Webb,

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