

## Appendix 1

Appendix 1. Descriptive studies of mixed-species flocks that include information on leadership, in alphabetical order of the author(s) names<sup>1</sup>. Species included in the reduced, phylogenetically-independent dataset are specially marked (\*for species in leader-associate pairs, <sup>s</sup>for species in leader-occasional pairs, and <sup>#</sup>for species in associate-occasional pairs).

	Author	Leader species		Associate species		Occasional species	
		Species	Group size	Species	Group size	Species	Group size
1	Austin and Smith (1972)	<i>Psaltriparus minimus</i> <sup>s</sup>	15.5	<i>Baeolophus wollweberi</i>	4.3	<i>Auriparus flaviceps</i> <sup>s</sup>	1.5
2	Balda et al. (1972)	<i>Gymnorhynchus cyanocephalus</i> *	113.5	<i>Colaptes auratus</i> <sup>#</sup>	3.8	<i>Dendrocopos pubescens</i> <sup>#</sup>	1.6
3	Bell (1980)	<i>Acanthiza pusilla</i> <sup>*s</sup>	2	<i>Rhipidura fuliginosa</i> <sup>#</sup>	1.8	<i>Pachycephala pectoralis</i> <sup>#s</sup>	1.6
4	Bell (1983)	<i>Gerygone chrysogaster</i>	2.8	<i>Monarcha guttula</i> <sup>#</sup>	1.5	<i>Arses telescopthalmus</i> <sup>#</sup>	1.2
5	Bell (1983)	<i>Pomatostomus isidorei</i> *	4.7	<i>Pitohui ferrugineus</i> <sup>#</sup>	5.1	<i>Dicrurus bracteatus</i> <sup>#</sup>	1.1
6	Bohórquez (2003)	<i>Chlorospingus semifuscus</i> *	2	<i>Tangara arthus</i> *	1.2	<i>Premnornis guttuligera</i>	1.3
7	Buskirk et al (1972)	<i>Chlorospingus ophthalmicus</i>	4.7	<i>Tangara icterocephala</i>	n/a	<i>Cranioleuca erythroptus</i>	1
8	Chen and Hsieh (2002)	<i>Alcippe morrisonia</i> <sup>*s</sup>	32.5	<i>Stachyris ruficeps</i> *	3.8	<i>Dicrurus aeneus</i> <sup>s</sup>	2.6
9	Croxall (1976)	<i>Dicrurus paradiseus</i> <sup>*s</sup>	3.2	<i>Aethopyga siparaja</i> <sup>#</sup>	1.2	<i>Nectarinia hypogrammica</i> <sup>#s</sup>	1
10	Dean (1990)	<i>Mohoua novaseelandiae</i>	4.6	<i>Gerygone igata</i>	2.6	<i>Rhipidura fuliginosa</i>	1.7
11	Earlé (1983)	<i>Batis capensis</i> <sup>*s</sup>	1.8	<i>Phylloscopus ruficapilla</i> *	1.7	<i>Zosterops pallidus</i> <sup>s</sup>	4
12	Gram (1998)	<i>Poliophtila caerulea</i> <sup>*s</sup>	3.1	<i>Vireo solitarius</i> *	1.1	<i>Mniotilta varia</i> <sup>s</sup>	1
13	Gram (1998)	<i>Regulus calendula</i> <sup>s</sup>	9.4	<i>Dendroica townsendii</i>	2.1	<i>Lepidocolaptes affinis</i> <sup>s</sup>	1.8
14	Gram (1998)	<i>Vermivora superciliosa</i> *	6	<i>Dendroica virens</i> *	1.8	<i>Sittasomus griseicapillus</i>	1.8
15	Greig-Smith (1978)	<i>Parus leucomelas</i>	3.1	<i>Eremomela pusilla</i>	4.1	<i>Chalcomitra senegalensis</i>	1.1
16	Hart and Freed (2003) <sup>2</sup>	<i>Loxops coccineus</i> <sup>*s</sup>	10.3	<i>Oreomystis mana</i> <sup>#</sup>	8	<i>Hemignathus virens</i> <sup>#s</sup>	6.3
17	Herzog et al. (2002)	<i>Oreomanes fraseri</i>	2.6	<i>Mecocerculus leucophrys</i>	1.6	<i>Asthenes dorbignyi</i>	1.4
18	Hindwood (1937)	<i>Daphoenositta chrysoptera</i>	13.5	<i>Acanthiza reguloides</i>	6	<i>Pachycephala pectoralis</i>	2
19	Hino (1998)	<i>Newtonia brunneicauda</i> <sup>*s</sup>	2	<i>Terpsiphone mutata</i> *	1.4	<i>Phyllastrephus madagascariensis</i> <sup>s</sup>	2.9
20	Hutto (1987)	<i>Poecile sclateri</i>	2.4	<i>Regulus calendula</i>	1.6	<i>Sitta carolinensis</i>	1.8
21	King and Rappole (2001) <sup>2</sup>	<i>Tephrrodornis pondicerianus</i> <sup>*s</sup>	16.5	<i>Aegithina tiphia</i> *	8.5	<i>Picoides canicapillus</i> <sup>s</sup>	1.4
22	King and Rappole (2001) <sup>2</sup>	<i>Garrulax pectoralis</i>	17.9	<i>Dicrurus paradiseus</i>	1	<i>Picus canus</i>	1.2
23	Kotagama and Goodale (2004)	<i>Turdoides rufescens</i> *	16.2	<i>Harpactes fasciatus</i> <sup>#</sup>	1.9	<i>Megalaima flavifrons</i> <sup>#</sup>	2
24	Laurent (1986)	<i>Aegithalos caudatus</i>	8.6	<i>Parus caeruleus</i> <sup>#</sup>	8.6	<i>Parus ater</i> <sup>#</sup>	2.8

25	McClure (1967)	<i>Alcippe poiocephala</i>	7.1	<i>Phylloscopus borealis</i> <sup>#</sup>	5.4	<i>Irena puella</i> <sup>#</sup>	2.4
26	McLean et al. (1987)	<i>Mohoua albicilla</i>	11.4	<i>Rhipidura fuliginosa</i>	2	<i>Gerygone igata</i>	1.1
27	Morse (1970)	<i>Baeolophus bicolor</i>	3	<i>Regulus calendula</i>	2.3	<i>Melanerpes carolinus</i>	1.3
28	Morse (1970)	<i>Poecile carolinensis</i>	5.5	<i>Regulus satrapa</i> <sup>#</sup>	3.4	<i>Certhia americana</i> <sup>#</sup>	1.2
29	Morse (1970)	<i>Poecile atricapillus</i>	7.4	<i>Sitta canadensis</i>	4.9	<i>Certhia americana</i>	1.5
30	Morse (1978)	<i>Parus caeruleus</i> <sup>*s</sup>	6.6	<i>Regulus regulus</i> <sup>*</sup>	2.6	<i>Parus major</i> <sup>s</sup>	1.8
31	Moynihan (1962)	<i>Tangara inortata</i>	2.8	<i>Thraupis palmarum</i> <sup>#</sup>	1.2	<i>Chlorophanes spiza</i> <sup>#</sup>	1
32	Munn (1985)	<i>Lanio versicolor</i> <sup>s</sup>	2.4	<i>Terenura humeralis</i>	2.2	<i>Hemithraupis guira</i> <sup>s</sup>	2
33	Munn (1985)	<i>Thamnomanes schistogynus</i> <sup>*s</sup>	2.6	<i>Myrmotherula axillaries</i> <sup>*#</sup>	2.4	<i>Myrmotherula hauxwelli</i> <sup>#s</sup>	2
34	Partridge and Ashcroft (1976)	<i>Zosterops ceylonensis</i> <sup>*</sup>	25	<i>Pycnonotus pencillatus</i> <sup>*#</sup>	6	<i>Rhopocichla atriceps</i> <sup>#</sup>	6
35	Powell (1979)	<i>Basileuterus tristriatus</i>	2.3	<i>Premnoplex brunnescens</i> <sup>#</sup>	1.8	<i>Chlorospingus ophthalmicus</i> <sup>#</sup>	2
36	Ragusa-Netto (2002)	<i>Saltator atricollis</i> <sup>s</sup>	3.7	<i>Neothraupis fasciata</i>	3.8	<i>Sporophila bouvreuil</i> <sup>ß</sup>	7.5
37	Read (1987)	<i>Mohoua ochrocephala</i>	10	<i>Cyanoramphus auriceps</i>	3	<i>Rhipidura fuliginosa</i>	n/a
38	Seki and Sato (2002)	<i>Aegithalos caudatus</i>	7.6	<i>Parus major</i>	1.5	<i>Dendrocopos kizuki</i>	n/a
39	Short (1961)	<i>Campylorhynchus megalopterus</i> <sup>*s</sup>	17.8	<i>Lepidocolaptes affinis</i> <sup>*</sup>	5.8	<i>Trogon mexicanus</i> <sup>s</sup>	1.5
40	Vuilleumier (1967)	<i>Aphrastura spinicauda</i> <sup>*</sup>	5.5	<i>Pygarrhichas albogularis</i> <sup>*</sup>	1	<i>Picooides lignarius</i>	1.5
41	Willis (1960)	<i>Habia rubica</i>	n/a	<i>Hylophilus ochraceiceps</i> <sup>#</sup>	1.9	<i>Xiphorhynchus flavigaster</i> <sup>#</sup>	1.2
42	Willis (1973)	<i>Neospingus speculariferus</i> <sup>s</sup>	2.5	<i>Vireo latimeri</i>	1	<i>Spindalis portoricensis</i> <sup>s</sup>	2
43	Willis (1989)	<i>Anabazenops fuscus</i> <sup>s</sup>	6.5	<i>Biatas nigropectus</i>	2	<i>Anabacerthia amaurotis</i> <sup>s</sup>	n/a
44	Willis (1989)	<i>Philydor rufus</i>	5	<i>Orchesticus abeillei</i>	2	<i>Pachyrhamphus castaneus</i>	2
45	With and Morrison (1990)	<i>Baeolophus ridgwayi</i> <sup>*s</sup>	3.3	<i>Poecile gambeli</i> <sup>*</sup>	3.3	<i>Sitta canadensis</i> <sup>s</sup>	1
46	Zamora et al. (1992)	<i>Saxicola rubrica</i>	1	<i>Sylvia undata</i>	1	<i>Phylloscopus collybita</i>	1

<sup>1</sup>: In addition to these papers, three papers were found that including information on leadership but sampled the same study site as did other papers included in the dataset: Willis (1972), Munn and Terborgh (1979), Ragusa-Netto (2000).

Nine other papers included some information on leadership, but it was judged to be inadequate for this study: Cody (1971), Moynihan (1979), Diamond (1987), Veena and Lokesh (1993), Hutto (1994), Latta and Wunderle (1996), Jullien and Thiollay (1998), Maldonado-Coelho and Marini (2004), Tubelis et al. (2006).

Eight papers included information on leadership, but not information on the number of individuals per flock: Gradwohl and Greenberg (1980), Laman (1992), Garnett and Crowley (1995), Mönkkönen et al. (1996), Develey and Peres (2000), Maldonado-Coelho and Marini (2000), Develey and Stouffer (2001), Thomson and Ferguson (2007).

A final thirty three papers describing terrestrial mixed-flock systems did not include leadership information: Gannon (1934), Winterbottom (1943), Davis (1946), Stanford (1947), Sedgwick (1949), Winterbottom (1949), Ogasawara (1965), Wiley (1971), Ulfstrand (1975), Jones (1977), MacDonald and Henderson (1977), Rubenstein et al. (1977), Herrera (1978), Wiley (1980), Morrison et al. (1987), Mountainspring (1987), Ewert and Askins (1991), Eguchi et al. (1993), Stotz (1993), Poulsen (1996), Lee and Jabło ski (1999), Fernández-Juricic (2000), King and Rappole (2000), Tellería et al. (2001), Botero (2002), Fernández-Juricic (2002), Robin and Davidar (2002), Pomara et al. (2003), Nimnuan et al. (2004), Lee et al. (2005), Van Houtan et al. (2006), Pomara et al. (2007), Sridhar and Sankar (2008).

<sup>2</sup>: The original paper did not include information on leadership, but additional data was collected from the authors.

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