

**Appendix A from W. A. Boyle and C. J. Conway, “Why Migrate? A Test of the Evolutionary Precursor Hypothesis” (Am. Nat., vol. 169, no. 3, p. 344)**

**Raw Data**

**Table A1**

Raw data for 379 species in the Tyranni used in raw species analyses and to calculate independent contrasts

Species <sup>a</sup>	Migration <sup>b</sup>	Diet <sup>c</sup>	Habitat <sup>d</sup>	Foraging group size <sup>e</sup>	Elevation <sup>f</sup>	Mass (g) <sup>g</sup>	Joins mixed-species flocks? <sup>h</sup>
<i>Phyllomyias burmeisteri</i>	4	2.00	4	2	2.0	11.33	Yes
<i>Phyllomyias fasciatus</i>	2	2.00	4	2	1.0	11.00	Yes
<i>Phyllomyias griseiceps</i>	0	2.00	5	1	1.5	7.67	Yes
<i>Phyllomyias uropygialis</i>	1	1.67	4	3	2.0	9.00	Yes
<i>Tyrannulus elatus</i>	0	2.67	5	2	1.0	7.75	Yes
<i>Myiopagis gaimardii</i>	1	2.00	4	1	1.0	12.67	Yes
<i>Myiopagis caniceps</i>	1	2.00	4	1	1.5	10.50	Yes
<i>Myiopagis flavivertex</i>	0	1.00	3	2	1.0	11.67	Yes
<i>Myiopagis viridicata</i>	4	2.00	4	1	1.0	12.60	Yes
<i>Elaenia flavogaster</i>	2	2.40	5	2	1.0	25.20	No
<i>Elaenia spectabilis</i>	4	2.00	5	1	1.0	28.67	No
<i>Elaenia albiceps</i>	5	2.00	5	1	1.5	15.67	Yes
<i>Elaenia parvirostris</i>	5	2.50	4	3	1.5	16.67	Yes
<i>Elaenia strepera</i>	6	2.00	5	1	1.5	18.33	Yes
<i>Elaenia cristata</i>	1	2.50	6	2	1.5	18.00	No
<i>Elaenia chiriquensis</i>	3	2.00	5	2	1.5	15.63	No
<i>Elaenia ruficeps</i>	0	2.00	6	2	1.0	19.00	No
<i>Elaenia frantzii</i>	2	2.40	5	3	2.0	18.25	Yes
<i>Elaenia pallatangae</i>	0	2.33	5	1	2.0	16.33	Yes
<i>Ornithion brunneicapillus</i>	0	1.33	4	2	1.0	7.25	Yes
<i>Ornithion inermis</i>	0	1.00	4	2	1.0	6.67	Yes
<i>Camptostoma imberbe</i>	3	1.67	5	1	1.0	7.23	Yes
<i>Suiriri suiriri</i>	3	2.00	6	2	1.5	12.67	No
<i>Mecocerculus poecilocercus</i>	0	1.50	4	3	2.0	11.00	Yes
<i>Mecocerculus hellmayri</i>	0	1.00	4	1	2.0	11.00	Yes
<i>Mecocerculus stictopterus</i>	0	1.33	4	3	2.0	10.67	Yes
<i>Mecocerculus calopterus</i>	0	1.00	4	2	2.0	9.00	Yes
<i>Mecocerculus minor</i>	0	2.00	5	3	2.0	11.00	Yes
<i>Anairetes reguloides</i>	0	1.00	1	3	2.0	6.00	Yes
<i>Anairetes alpinus</i>	0	1.00	5	2	2.0	10.00	No
<i>Anairetes flavirostris</i>	4	1.50	6	3	2.0	6.50	Yes
<i>Anairetes parulus</i>	4	1.00	5	3	2.0	6.00	Yes
<i>Anairetes agraphia</i>	0	1.00	2	3	2.0	10.00	Yes
<i>Serpophaga cinerea</i>	0	1.00	6	2	2.0	8.00	No

**Table A1 (Continued)**

Species <sup>a</sup>	Migration <sup>b</sup>	Diet <sup>c</sup>	Habitat <sup>d</sup>	Foraging group size <sup>e</sup>	Elevation <sup>f</sup>	Mass (g) <sup>g</sup>	Joins mixed-species flocks? <sup>h</sup>
<i>Serpophaga hypoleuca</i>	1	1.00	1	2	1.0	6.00	No
<i>Serpophaga nigricans</i>	1	1.00	1	2	1.0	9.00	No
<i>Serpophaga munda</i>	3	1.00	4	3	1.0	6.50	No
<i>Phaeomyias murina</i>	4	2.00	1	1	1.0	9.33	Yes
<i>Capsiempis flaveola</i>	0	2.00	1	3	1.0	8.00	No
<i>Polystictus pectoralis</i>	4	1.00	6	2	1.5	9.50	Yes
<i>Polystictus superciliaris</i>	0	1.00	6	3	2.0	6.00	No
<i>Pseudocolopteryx sclateri</i>	0	1.00	1	3	1.0	7.67	No
<i>Pseudocolopteryx acutipennis</i>	4	1.00	1	3	1.5	8.00	No
<i>Pseudocolopteryx flaviventris</i>	3	1.00	1	3	1.0	8.00	No
<i>Pseudotriccus pelzelni</i>	0	1.00	2	1	2.0	10.50	Yes
<i>Pseudotriccus simplex</i>	0	1.00	2	1	2.0	10.00	No
<i>Pseudotriccus ruficeps</i>	0	1.50	2	3	2.0	10.00	No
<i>Corythopsis torquatus</i>	0	1.00	1	1	1.0	15.33	No
<i>Corythopsis delalandi</i>	0	1.00	1	1	1.0	15.33	No
<i>Euscarthmus meloryphus</i>	3	1.00	1	1	1.0	7.25	No
<i>Euscarthmus rufomarginatus</i>	0	2.00	1	2	1.0	6.00	No
<i>Pseudelaenia leucospodia</i>	0	1.00	6	2	1.0	11.00	No
<i>Stigmatura napensis</i>	0	1.00	5	3	1.0	10.00	No
<i>Stigmatura budytoides</i>	2	1.00	1	3	1.5	11.00	No
<i>Zimmerius vilissimus</i>	1	2.80	4	2	2.0	9.83	Yes
<i>Zimmerius cinereicapilla</i>	0	2.50	4	2	2.0	12.00	Yes
<i>Zimmerius villarejoi</i>	0	2.00	4	2	1.0	7.00	Yes
<i>Zimmerius chrysops</i>	0	2.75	4	2	2.0	11.00	Yes
<i>Zimmerius viridiflavus</i>	0	2.50	4	2	2.0	10.00	Yes
<i>Phylloscartes poecilotis</i>	0	1.00	3	2	2.0	8.00	Yes
<i>Phylloscartes ophthalmicus</i>	0	1.00	3	3	2.0	11.00	Yes
<i>Phylloscartes venezuelanus</i>	0	1.00	3	2	2.0	9.00	Yes
<i>Phylloscartes eximius</i>	0	1.00	3	2	1.0	9.00	No
<i>Phylloscartes ventralis</i>	0	1.00	3	3	2.0	8.33	Yes
<i>Phylloscartes kronei</i>	0	1.00	4	2	1.0	9.00	Yes
<i>Phylloscartes beckeri</i>	0	1.00	4	1	2.0	9.00	Yes
<i>Phylloscartes flavovirens</i>	0	1.00	4	1	1.5	8.50	Yes
<i>Phylloscartes virescens</i>	0	1.00	4	1	1.0	8.50	Yes
<i>Phylloscartes gualaquiza</i>	0	1.00	4	2	2.0	8.00	Yes
<i>Phylloscartes nigrifrons</i>	0	2.00	4	3	2.0	11.00	Yes
<i>Phylloscartes superciliaris</i>	0	2.00	4	3	2.0	8.00	Yes
<i>Phylloscartes ceciliae</i>	0	1.00	4	1	1.0	8.00	Yes
<i>Phylloscartes flaviventris</i>	0	1.00	4	3	2.0	8.00	Yes
<i>Phylloscartes parkeri</i>	0	1.00	4	2	2.0	8.00	Yes
<i>Phylloscartes roquettei</i>	0	1.00	3	2	1.0	8.00	No
<i>Phylloscartes paulistus</i>	0	1.00	3	2	1.0	8.00	Yes
<i>Phylloscartes oustaleti</i>	0	1.00	4	2	1.0	9.00	Yes
<i>Phylloscartes difficilis</i>	0	1.00	2	2	2.0	7.50	No
<i>Phylloscartes sylviolus</i>	0	1.00	4	3	1.0	8.00	Yes
<i>Mionectes striaticollis</i>	0	3.00	3	1	2.0	15.00	Yes
<i>Mionectes olivaceus</i>	1	3.33	2	1	1.5	14.88	Yes
<i>Mionectes oleaginous</i>	1	3.17	2	1	1.0	12.25	Yes

Table A1 (Continued)

Species <sup>a</sup>	Migration <sup>b</sup>	Diet <sup>c</sup>	Habitat <sup>d</sup>	Foraging group size <sup>e</sup>	Elevation <sup>f</sup>	Mass (g) <sup>g</sup>	Joins mixed-species flocks? <sup>h</sup>
<i>Mionectes macconnelli</i>	0	2.67	2	1	2.0	13.33	Yes
<i>Leptopogon amaurocephalus</i>	0	2.00	3	1	1.0	11.40	Yes
<i>Leptopogon superciliosus</i>	1	2.00	3	1	2.0	12.25	Yes
<i>Leptopogon rufipectus</i>	0	2.00	3	2	2.0	13.00	Yes
<i>Leptopogon taczanowskii</i>	0	1.50	3	1	2.0	13.00	Yes
<i>Sublegatus arenarum</i>	0	2.00	5	1	1.0	13.00	No
<i>Sublegatus obscurior</i>	0	2.00	5	1	1.0	14.00	No
<i>Sublegatus modestus</i>	4	1.50	5	1	1.5	12.17	No
<i>Inezia tenuirostris</i>	0	2.00	5	1	1.0	6.00	Yes
<i>Inezia inornata</i>	4	2.00	1	2	1.0	6.00	Yes
<i>Myiobrycon ornatus</i>	0	1.00	2	2	2.0	13.50	Yes
<i>Tachuris rubrigastra</i>	4	1.00	6	3	1.5	7.00	No
<i>Myiornis atricapillus</i>	0	1.00	4	2	1.0	5.10	No
<i>Myiornis ecaudatus</i>	0	1.00	4	2	1.0	4.67	Yes
<i>Oncostoma cinereigulare</i>	0	1.50	2	2	1.5	6.43	No
<i>Oncostoma olivaceum</i>	0	2.00	2	2	1.5	7.00	No
<i>Lophotriccus pileatus</i>	0	1.00	3	1	2.0	7.75	Yes
<i>Lophotriccus vitiosus</i>	0	1.00	3	1	1.0	7.00	Yes
<i>Lophotriccus eulophotes</i>	0	1.00	3	1	1.0	6.50	Yes
<i>Lophotriccus galeatus</i>	0	1.00	3	1	1.0	7.00	Yes
<i>Hemitriccus minor</i>	0	1.00	3	2	1.0	7.00	No
<i>Hemitriccus spodiops</i>	0	1.00	1	1	2.0	7.00	No
<i>Hemitriccus flammulatus</i>	0	1.00	2	2	1.0	10.50	Yes
<i>Hemitriccus diops</i>	0	1.00	2	2	1.5	10.33	Yes
<i>Hemitriccus obsoletus</i>	0	1.00	2	2	2.0	10.00	No
<i>Hemitriccus josephinae</i>	0	1.00	3	2	1.0	10.00	No
<i>Hemitriccus zosterops</i>	0	1.00	3	1	1.0	8.67	Yes
<i>Hemitriccus griseipectus</i>	0	1.00	3	1	1.0	9.00	Yes
<i>Hemitriccus orbitatus</i>	0	1.00	3	2	1.0	10.00	No
<i>Hemitriccus iohannis</i>	0	1.00	1	3	1.0	11.00	No
<i>Hemitriccus striaticollis</i>	0	1.00	3	2	1.0	9.00	No
<i>Hemitriccus nidipendulus</i>	0	1.00	1	1	1.0	8.00	No
<i>Hemitriccus margaritaceiventer</i>	0	1.00	2	2	1.5	8.33	No
<i>Hemitriccus minimus</i>	0	1.00	4	2	1.0	7.00	No
<i>Hemitriccus granadensis</i>	0	1.00	2	1	2.0	8.00	Yes
<i>Hemitriccus rufigularis</i>	0	1.00	3	2	2.0	9.00	Yes
<i>Poecilotriccus ruficeps</i>	0	1.00	1	3	2.0	7.00	Yes
<i>Poecilotriccus luluae</i>	0	1.00	1	2	2.0	7.00	No
<i>Poecilotriccus capitalis</i>	0	1.00	2	1	1.0	7.50	No
<i>Poecilotriccus russatus</i>	0	1.00	1	2	2.0	7.00	No
<i>Poecilotriccus plumbeiceps</i>	0	1.00	1	2	2.0	6.00	No
<i>Poecilotriccus fumifrons</i>	0	1.00	1	2	1.0	7.00	No
<i>Poecilotriccus latirostris</i>	0	1.00	1	2	1.0	8.50	No
<i>Poecilotriccus sylvia</i>	0	1.50	1	2	1.0	7.33	No
<i>Poecilotriccus calopterus</i>	0	1.00	5	2	1.0	7.50	No
<i>Poecilotriccus pulchellus</i>	0	1.00	1	2	1.5	8.00	No
<i>Taeniopteryx andrei</i>	0	1.00	2	2	1.0	9.00	No
<i>Todirostrum maculatum</i>	0	1.00	5	2	1.0	7.00	No

**Table A1 (Continued)**

Species <sup>a</sup>	Migration <sup>b</sup>	Diet <sup>c</sup>	Habitat <sup>d</sup>	Foraging group size <sup>e</sup>	Elevation <sup>f</sup>	Mass (g) <sup>g</sup>	Joins mixed-species flocks? <sup>h</sup>
<i>Todirostrum cinereum</i>	0	1.00	5	2	1.5	6.13	No
<i>Todirostrum nigriceps</i>	1	1.00	4	2	1.0	6.33	Yes
<i>Todirostrum pictum</i>	0	1.00	4	2	1.0	7.00	Yes
<i>Todirostrum chrysocrotaphum</i>	0	1.00	4	2	1.0	11.33	Yes
<i>Cnipodectes subbrunneus</i>	0	1.00	2	1	1.5	23.00	Yes
<i>Rhynchocyclus olivaceus</i>	0	1.00	2	1	1.0	20.67	Yes
<i>Rhynchocyclus brevirostris</i>	1	1.50	3	1	2.0	22.67	Yes
<i>Rhynchocyclus pacificus</i>	0	1.00	2	2	1.0	25.00	Yes
<i>Rhynchocyclus fulvipectus</i>	0	1.00	2	1	2.0	26.00	Yes
<i>Tolmomyias sulphurescens</i>	0	1.75	5	2	1.5	15.30	Yes
<i>Tolmomyias traylori</i>	0	1.00	3	1	1.0	12.00	Yes
<i>Tolmomyias assimilis</i>	0	2.00	3	2	1.0	15.50	Yes
<i>Tolmomyias poliocephalus</i>	0	1.00	4	2	1.0	11.33	Yes
<i>Tolmomyias flaviventris</i>	0	2.00	4	2	1.0	11.33	Yes
<i>Platyrinchus cancrinus</i>	0	1.00	2	2	1.0	10.50	No
<i>Platyrinchus saturatus</i>	0	1.00	2	2	1.0	11.00	Yes
<i>Platyrinchus mystaceus</i>	0	1.00	2	1	2.0	10.00	Yes
<i>Platyrinchus coronatus</i>	0	1.00	2	2	1.0	9.00	Yes
<i>Platyrinchus platyrhynchos</i>	0	1.00	3	2	1.0	12.33	No
<i>Platyrinchus leucoryphus</i>	0	1.00	3	1	1.0	17.00	No
<i>Onychorhynchus coronatus</i>	1	1.00	3	1	1.0	16.25	Yes
<i>Myiophobus flavicans</i>	0	1.00	2	3	2.0	11.00	No
<i>Myiophobus phoenicomitra</i>	0	1.00	2	3	2.0	11.00	No
<i>Myiophobus roraimae</i>	0	1.00	2	1	2.0	13.00	No
<i>Myiophobus pulcher</i>	0	1.00	4	3	2.0	9.00	Yes
<i>Myiophobus lintoni</i>	0	1.00	3	3	2.0	10.00	Yes
<i>Myiophobus ochraceiventris</i>	0	1.50	4	3	2.0	11.00	Yes
<i>Myiophobus cryptoxanthus</i>	0	2.00	5	2	2.0	11.00	No
<i>Myiophobus fasciatus</i>	4	1.60	1	2	2.0	10.30	No
<i>Myiobius villosus</i>	0	1.00	2	2	2.0	13.33	Yes
<i>Myiobius barbatus</i>	0	1.00	2	2	1.0	11.75	Yes
<i>Myiobius atricaudus</i>	0	1.00	2	2	1.0	10.00	Yes
<i>Terenotriccus erythrurus</i>	0	1.00	3	1	1.0	7.00	Yes
<i>Neopipo cinnamomea</i>	0	1.00	3	1	1.0	7.00	Yes
<i>Pyrrhomyias cinnamomeus</i>	0	2.00	5	2	2.0	10.67	Yes
<i>Hirundinea ferruginea</i>	4	1.00	6	3	1.5	22.50	No
<i>Lathrotriccus eulerei</i>	4	1.00	2	1	1.0	11.25	Yes
<i>Lathrotriccus griseipectus</i>	1	1.00	2	1	1.5	11.00	No
<i>Aphanotriccus capitalis</i>	0	1.00	1	2	1.5	11.33	No
<i>Aphanotriccus audax</i>	0	1.00	2	2	1.0	11.00	No
<i>Cnemotriccus fuscatus</i>	4	1.00	2	2	1.0	12.75	Yes
<i>Empidonax flaviventris</i>	6	1.50	1	1	1.0	11.94	No
<i>Empidonax virescens</i>	6	1.43	4	1	1.5	12.81	Yes
<i>Empidonax alnorum</i>	6	1.50	5	1	1.0	13.09	No
<i>Empidonax traillii</i>	6	1.50	5	1	1.0	13.10	No
<i>Empidonax albigularis</i>	3	1.50	1	1	2.0	11.67	No
<i>Empidonax minimus</i>	6	1.00	5	1	1.0	10.11	No
<i>Empidonax hammondii</i>	6	1.00	3	1	2.0	10.33	No

**Table A1 (Continued)**

Species <sup>a</sup>	Migration <sup>b</sup>	Diet <sup>c</sup>	Habitat <sup>d</sup>	Foraging group size <sup>e</sup>	Elevation <sup>f</sup>	Mass (g) <sup>g</sup>	Joins mixed-species flocks? <sup>h</sup>
<i>Empidonax wrightii</i>	5	1.00	5	1	1.5	12.13	No
<i>Empidonax oberholseri</i>	6	1.00	5	1	2.0	10.99	No
<i>Empidonax affinis</i>	1	1.00	3	1	2.0	11.50	No
<i>Empidonax difficilis</i>	6	1.50	3	1	1.5	10.59	No
<i>Empidonax occidentalis</i>	5	1.50	3	1	2.0	11.13	No
<i>Empidonax flavescens</i>	1	1.50	5	1	2.0	12.00	No
<i>Empidonax fulvifrons</i>	3	1.00	3	1	2.0	7.97	No
<i>Empidonax atriceps</i>	1	1.00	4	1	2.0	9.00	No
<i>Contopus cooperi</i>	6	1.00	5	1	2.0	32.76	No
<i>Contopus pertinax</i>	4	2.00	5	1	2.0	27.07	Yes
<i>Contopus lugubris</i>	0	1.00	5	1	2.0	22.67	No
<i>Contopus fumigatus</i>	0	1.00	5	1	2.0	19.00	No
<i>Contopus ochraceus</i>	0	1.00	5	1	2.0	23.00	No
<i>Contopus sordidulus</i>	6	1.00	4	1	2.0	13.04	No
<i>Contopus virens</i>	6	1.00	4	1	1.0	14.02	No
<i>Contopus cinereus</i>	3	1.00	5	1	1.0	12.13	Yes
<i>Contopus nigrescens</i>	0	1.00	4	2	2.0	10.00	No
<i>Mitrephanes phaeocercus</i>	1	1.00	5	2	1.5	8.83	No
<i>Mitrephanes olivaceus</i>	0	1.00	3	2	2.0	9.00	Yes
<i>Sayornis nigricans</i>	2	1.00	6	1	1.0	19.05	No
<i>Sayornis phoebe</i>	6	2.00	5	1	1.0	19.60	No
<i>Sayornis saya</i>	6	1.00	6	1	1.5	21.38	No
<i>Pyrocephalus rubinus</i>	4	1.00	6	1	1.0	13.17	No
<i>Lessonia rufa</i>	5	1.00	6	3	1.5	14.00	No
<i>Knipolegus poecilocercus</i>	0	1.00	2	1	1.0	14.00	Yes
<i>Knipolegus cyanirostris</i>	4	1.00	5	2	1.5	15.50	No
<i>Knipolegus poecilurus</i>	0	1.00	5	2	2.0	14.67	Yes
<i>Knipolegus orenocensis</i>	0	1.00	5	2	1.0	19.00	No
<i>Knipolegus aterrimus</i>	4	1.00	5	1	1.5	24.00	No
<i>Knipolegus lophotes</i>	0	2.00	6	2	1.5	32.00	No
<i>Knipolegus nigerrimus</i>	1	1.00	6	2	2.0	20.00	No
<i>Hymenops perspicillatus</i>	4	1.00	6	1	2.0	24.00	No
<i>Ochthornis littoralis</i>	0	1.00	6	2	1.0	13.00	No
<i>Satrapa icterophrys</i>	5	1.00	5	1	1.5	20.00	No
<i>Agriornis lividus</i>	0	1.00	6	2	1.5	99.00	No
<i>Agriornis micropterus</i>	4	1.00	6	1	1.5	73.00	No
<i>Xolmis dominicanus</i>	0	1.00	6	2	1.5	43.00	No
<i>Myiotheretes striaticollis</i>	1	1.00	5	2	2.0	64.00	No
<i>Myiotheretes fuscorufus</i>	0	1.00	4	3	2.0	32.00	Yes
<i>Neoxolmis rufiventris</i>	4	1.00	6	3	1.0	77.00	No
<i>Gubernetes yetapa</i>	0	1.00	6	3	1.0	67.00	No
<i>Muscipipra vetula</i>	3	1.00	5	3	1.5	27.00	No
<i>Fluvicola pica</i>	0	1.00	6	2	1.0	13.00	No
<i>Arundinicola leucocephala</i>	0	1.00	6	2	1.0	14.25	No
<i>Ochthoeca frontalis</i>	0	1.00	2	1	2.0	11.00	Yes
<i>Ochthoeca pulchella</i>	0	1.00	2	1	2.0	12.00	No
<i>Ochthoeca</i> <i>cinnamomeiventris</i>	0	1.00	2	2	2.0	12.00	No
<i>Ochthoeca rufipectoralis</i>	0	1.00	5	2	2.0	12.00	Yes

Table A1 (Continued)

Species <sup>a</sup>	Migration <sup>b</sup>	Diet <sup>c</sup>	Habitat <sup>d</sup>	Foraging group size <sup>e</sup>	Elevation <sup>f</sup>	Mass (g) <sup>g</sup>	Joins mixed-species flocks? <sup>h</sup>
<i>Ochthoeca fumicolor</i>	1	1.00	6	2	2.0	16.33	No
<i>Colorhamphus parvirostris</i>	4	1.00	5	1	1.0	9.00	No
<i>Colonia colonus</i>	1	1.00	5	2	1.0	16.40	No
<i>Machetornis rixosa</i>	1	1.00	6	3	1.0	33.67	No
<i>Legatus leucophaeus</i>	5	3.67	5	2	1.0	24.00	No
<i>Myiozetetes cayanensis</i>	1	2.00	5	3	1.5	26.00	No
<i>Myiozetetes similis</i>	2	2.33	5	3	1.5	26.25	No
<i>Myiozetetes granadensis</i>	1	2.25	5	3	1.0	29.00	No
<i>Myiozetetes luteiventris</i>	0	2.00	4	3	1.0	17.00	Yes
<i>Phelpsia inornata</i>	0	2.00	5	3	1.0	29.00	No
<i>Pitangus sulphuratus</i>	4	2.00	5	3	1.0	65.25	Yes
<i>Pitangus lictor</i>	0	1.00	5	3	1.0	24.67	No
<i>Megarynchus pitangua</i>	4	2.00	5	3	1.0	66.80	Yes
<i>Conopias albobittatus</i>	0	2.00	4	3	1.0	24.00	Yes
<i>Conopias parvus</i>	0	2.00	4	3	1.0	22.50	Yes
<i>Myiodynastes hemichrysus</i>	0	1.50	4	3	2.0	41.67	No
<i>Myiodynastes chrysocephalus</i>	1	1.50	5	2	2.0	38.33	Yes
<i>Myiodynastes bairdii</i>	0	2.00	5	2	1.0	45.00	No
<i>Myiodynastes luteiventris</i>	6	2.25	4	3	1.5	45.82	No
<i>Tyrannopsis sulphurea</i>	0	2.00	5	3	1.0	55.00	No
<i>Empidonomus varius</i>	5	2.00	5	1	1.0	26.25	Yes
<i>Empidonomus aurantioatrocristatus</i>	6	1.33	5	1	1.0	27.75	No
<i>Tyrannus melancholicus</i>	4	1.80	5	1	1.0	38.59	No
<i>Tyrannus couchii</i>	3	2.00	5	3	1.0	41.33	Yes
<i>Tyrannus vociferans</i>	5	2.33	6	1	2.0	44.55	No
<i>Tyrannus crassirostris</i>	3	2.00	5	2	1.0	55.55	No
<i>Tyrannus verticalis</i>	6	1.25	6	1	1.5	39.74	Yes
<i>Tyrannus forficatus</i>	5	2.00	6	3	1.5	41.28	No
<i>Tyrannus savana</i>	5	1.50	6	3	1.0	30.00	No
<i>Rhytipterna holerythra</i>	0	2.33	3	2	1.0	38.33	Yes
<i>Rhytipterna simplex</i>	0	2.00	3	3	1.0	34.67	Yes
<i>Sirystes sibilator</i>	1	2.00	4	2	1.0	30.67	Yes
<i>Myiarchus tuberculifer</i>	4	2.00	5	1	1.5	19.99	Yes
<i>Myiarchus swainsoni</i>	6	2.00	4	1	1.0	24.75	Yes
<i>Myiarchus ferox</i>	0	2.00	4	2	1.0	26.67	No
<i>Myiarchus cephalotes</i>	0	1.00	5	1	2.0	23.67	Yes
<i>Myiarchus cinerascens</i>	5	2.00	5	1	1.0	27.44	No
<i>Myiarchus nuttingi</i>	0	2.00	5	3	1.5	23.00	No
<i>Myiarchus crinitus</i>	6	2.00	5	1	1.0	34.08	No
<i>Myiarchus tyrannulus</i>	4	2.00	5	2	1.0	34.50	No
<i>Ramphotricon megacephalum</i>	0	1.00	2	1	1.0	14.00	Yes
<i>Ramphotricon ruficauda</i>	0	1.00	3	2	1.0	18.33	Yes
<i>Ramphotricon fuscicauda</i>	0	1.00	3	2	1.0	19.00	Yes
<i>Attila cinnamomeus</i>	0	2.00	3	2	1.0	38.33	Yes
<i>Attila citriniventris</i>	0	2.00	4	1	1.0	34.50	Yes
<i>Attila bolivianus</i>	0	2.00	3	1	1.0	44.00	Yes
<i>Attila rufus</i>	0	2.00	3	2	1.5	43.00	Yes

**Table A1 (Continued)**

Species <sup>a</sup>	Migration <sup>b</sup>	Diet <sup>c</sup>	Habitat <sup>d</sup>	Foraging group size <sup>e</sup>	Elevation <sup>f</sup>	Mass (g) <sup>g</sup>	Joins mixed-species flocks? <sup>h</sup>
<i>Attila spadiceus</i>	0	2.00	5	1	1.5	37.00	Yes
<i>Ampelion rubrocristatus</i>	0	3.00	5	3	2.0	65.33	No
<i>Ampelion rufaxilla</i>	0	3.00	4	1	2.0	73.50	No
<i>Zaratornis stresemanni</i>	1	4.00	5	3	2.0	51.50	No
<i>Doliornis sclateri</i>	0	3.00	4	2	2.0	61.00	No
<i>Phytotoma raimondii</i>	0	4.00	6	2	1.0	40.00	No
<i>Phytotoma rutila</i>	3	4.00	5	3	1.5	36.33	No
<i>Phytotoma rara</i>	1	4.00	5	3	1.5	40.50	No
<i>Carpornis cucullata</i>	0	3.00	3	1	1.5	75.33	No
<i>Carpornis melanocephala</i>	0	4.00	3	1	1.0	64.50	No
<i>Pipreola riefferii</i>	0	4.00	4	3	2.0	51.00	Yes
<i>Pipreola arcuata</i>	0	4.00	3	1	2.0	120.00	Yes
<i>Pipreola aureopectus</i>	0	4.00	3	1	2.0	47.33	Yes
<i>Pipreola pulchra</i>	0	4.00	3	1	2.0	55.50	No
<i>Pipreola frontalis</i>	0	4.00	3	1	2.0	42.50	Yes
<i>Pipreola formosa</i>	0	4.00	3	1	2.0	45.00	Yes
<i>Ampelioides tshudii</i>	1	3.40	3	3	2.0	81.33	Yes
<i>Rupicola rupicola</i>	0	3.00	3	1	1.0	183.33	No
<i>Rupicola peruvianus</i>	0	3.00	3	1	2.0	251.67	No
<i>Phoenicircus carnifex</i>	0	4.00	4	1	1.0	82.67	No
<i>Phoenicircus nigricollis</i>	0	3.67	3	1	1.0	95.50	No
<i>Cotinga amabilis</i>	1	3.00	4	3	1.5	71.67	No
<i>Cotinga ridgwayi</i>	1	4.00	4	1	1.5	56.00	No
<i>Cotinga maynana</i>	0	4.00	4	1	1.0	69.00	Yes

<sup>a</sup> We follow the American Ornithologists' Union (1998, 2005; Remsen et al. 2006) on all taxonomic issues, including the ordering and spelling of species names in this list.

<sup>b</sup> We considered a species to be migratory when any source reported migratory populations. Migration categories: 0 = no populations of species known or suspected to be migratory, 1 = altitudinal movements and other movements less than 100 km, 2 = 100–300 km, 3 = 300–700 km, 4 = 700–1,500 km, 5 = 1,500–3,000 km, 6 = more than 3,000 km. We assigned a species to the shortest migratory distance category (category 1) when at least some populations of that species migrate locally. Because information on movement patterns for many Neotropical species is scant, we also placed species in the shortest migratory category when sources mentioned that movement patterns were suggestive of migration. For all other migratory species, we measured the shortest distance between the reported northern edge of the nonbreeding range and the northern edge of the breeding range (for Nearctic migrants) or the shortest distance between the reported southern edge of the nonbreeding range and the southern edge of the breeding range (for austral migrants). For partially migratory species, we used the longest estimate of migratory distance that corresponds to the minimum distance individuals of that species must migrate. When sources described species as austral latitudinal migrants but we found no information on migratory distance, we placed them in migration category 2. We chose the longest distance population to represent the species.

<sup>c</sup> Diet categories: 1 = highly insectivorous, 2 = more insects (and/or other animals) than fruit, 3 = more fruit than insects, 4 = highly frugivorous. If diet categories from all sources were consistent, we used that category to represent the species. When classifications from different sources resulted in two categories being noted for a species, we entered the mean value from all available sources for that species. If classifications from different sources resulted in three categories being noted, we eliminated these ambiguous species from our data set.

<sup>d</sup> We classified species on the basis of habitats used for foraging when sources distinguished between habitats occupied for different behaviors. Habitat categories: 1 = generally found near the ground overtopped by vegetation, dense thickets, tangles (including bamboo), and low thickets in forested or nonforested contexts; 2 = understory of forest; 3 = middle levels of forest; 4 = forest canopy; 5 = edge or disturbed habitats with matrix of trees and open areas, gardens, orchards, woodlands, scrub; 6 = open areas, savannas, deserts, or other places without many trees. For forest-interior species, when foraging height was given in height above ground, we defined understory (category 2) as up to ~4 m and midstory (category 3) as ~4–10 m. When classifying the habitat associations of a species, we entered more than one habitat category from a given source if more than one habitat appeared with equal prominence in descriptions of nonbreeding foraging behavior. If only one habitat category was common to data from all sources, we chose that category. If no numbers were common to all data, we used the categories resulting from descriptions in del Hoyo et al. (2004) and Stotz et al. (1996) because these were the most taxonomically complete sources we consulted. If these two sources shared only one category, we used that category. If these two sources shared more than one category, we used the shared category that most commonly appeared in all the sources for that species. If two or more numbers were used equally frequently among del Hoyo et al. (2004), Stotz et al. (1996), and all other sources, we eliminated the species from our data set. If there were no categories in common between del Hoyo et al. (2004) and Stotz et al. (1996) but there was information from other sources, we used the category from either del Hoyo et al. (2004) or Stotz et al. (1996) that appeared most frequently in other sources. When classifications could not be resolved by rechecking original sources, we eliminated these ambiguous species from analyses.

## App. A from W. A. Boyle and C. J. Conway, "Precursors to the Evolution of Migration"

<sup>e</sup> Foraging group size categories refer to the number of conspecifics that typically forage together. Foraging group size categories: 1 = solitary; 2 = pairs; 3 = small groups, family groups, and large groups. To assign a species to a category when more than one foraging group size was noted in sources, we followed these guidelines: if only one category was noted among all the sources available for a species, then we used that category. If both categories 1 and 2 were noted, we classified a species as belonging to the more common category among sources. If categories 1 and 2 appeared equally commonly, we used the category noted by del Hoyo et al. (2004). If del Hoyo et al. (2004) did not mention foraging group size for a given species and categories 1 and 2 appeared equally commonly, we eliminated the species from analyses. If multiple categories were listed for a species and category 3 appeared more than once or was the categorization based on that of del Hoyo et al. (2004), we chose the group category to represent the species. If category 3 appeared only once, we used the most common of the designations across all sources to represent the species.

<sup>f</sup> Elevation categories: 1 = primarily lowland species, 2 = primarily montane species. Montane species were those that generally spend the nonbreeding season above 700 m, not regularly occurring in lowland areas. An intermediate category (1.5) represents species with wide altitudinal ranges, not easily classified as either primarily lowland or primarily montane. Where either category 1 or 2 was noted in combination with category 1.5, we classified the species as 1 or 2. Where both 1 and 2 were noted or only 1.5 was noted, we classified the species as 1.5.

<sup>g</sup> We took the average value of all body mass values available from all sources, males and females combined.

<sup>h</sup> If any source noted that the species joins mixed-species flocks, we classified this species as one that joins mixed-species flocks. If we found descriptions of flocking behavior and foraging group size for a species but no source ever mentioned the species joining mixed-species flocks, we classified the species as not joining mixed-species flocks.