

Table A1.3. Summary from univariate glm models of species abundance by environmental predictor variables (i.e., proportion forest and human land use). Summary includes the intercept, estimate, standard error of the estimate, log-likelihood ratio test statistic (LR), and associated p -value from `summary.manyglm` and `anova.manyglm`. Significant species by environmental predictor values (i.e., p -values ≤ 0.05) are designated in bold and highlighted to indicate directionality of the association with positive (green) and negative (orange). Species are listed in taxonomic order by English and scientific names.

English	Scientific	Human Land Use					Forest				
		Intercept	Estimate	SE	LR Test	p -value	Intercept	Estimate	SE	LR Test	p -value
Wood Duck	<i>Aix sponsa</i>	-1.66	-0.12	2.21	0.00	0.96	-1.24	-1.66	2.02	0.51	0.49
Ring-necked Duck	<i>Aythya collaris</i>	-9.50	7.09	6.81	1.80	0.16	-4.05	-7.29	9.87	1.17	0.23
Northern Bobwhite	<i>Colinus virginianus</i>	-3.87	4.61	1.38	9.68	0.00	-0.56	-3.86	1.47	5.91	0.02
Ring-necked Pheasant	<i>Phasianus colchicus</i>	-2.61	-2.54	1.98	1.87	0.17	-3.38	-0.40	1.60	0.07	0.83
Ruffed Grouse	<i>Bonasa umbellus</i>	-2.06	1.14	2.27	0.20	0.58	-1.37	-0.58	2.06	0.04	0.82
Wild Turkey	<i>Meleagris gallopavo</i>	-3.49	6.37	1.30	24.68	0.00	1.71	-8.08	1.69	22.92	0.00
Rock Pigeon	<i>Columba livia</i>	0.47	3.13	0.36	47.75	0.00	2.75	-3.18	0.34	62.87	0.00
Mourning Dove	<i>Zenaida macroura</i>	-2.89	-0.24	1.44	0.03	0.88	-2.82	-0.58	1.36	0.18	0.66
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	-1.28	-1.62	1.11	1.78	0.23	-2.37	1.29	0.92	1.77	0.21
Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>	-2.70	-12.56	12.89	2.43	0.10	-14.59	13.31	11.68	4.55	0.05
Eastern Whip-poor-will	<i>Antrostomus vociferus</i>	-2.57	5.95	1.21	11.34	0.00	1.25	-3.66	1.13	7.10	0.01
Chimney Swift	<i>Chaetura pelagica</i>	-0.35	-2.68	0.84	10.13	0.00	-1.92	1.69	0.67	4.96	0.02
Ruby-throated Hummingbird	<i>Archilochus colubris</i>	-1.45	4.08	0.51	47.36	0.00	1.50	-4.15	0.54	56.69	0.00
Killdeer	<i>Charadrius vociferus</i>	-7.66	7.30	7.38	0.33	0.43	-2.46	-7.56	9.18	0.47	0.40
Upland Sandpiper	<i>Bartramia longicauda</i>	-4.42	1.14	2.09	0.30	0.60	-3.65	-0.88	2.06	0.19	0.67
American Woodcock	<i>Scolopax minor</i>	-5.34	2.37	2.53	0.93	0.37	-3.92	-0.95	2.40	0.17	0.67
Turkey Vulture	<i>Cathartes aura</i>	-2.53	-3.23	3.30	0.73	0.40	-2.85	-3.09	3.34	0.56	0.48
Osprey	<i>Pandion haliaetus</i>	-4.58	0.86	2.41	0.13	0.71	-3.92	-0.95	2.40	0.17	0.71

Sharp-shinned Hawk	<i>Accipiter striatus</i>	-4.14	-0.13	2.43	0.00	0.90	-4.43	0.67	2.08	0.10	0.73
Cooper's Hawk	<i>Accipiter cooperii</i>	-4.10	1.64	1.83	0.71	0.41	-2.81	-2.09	1.99	1.31	0.26
Bald Eagle	<i>Haliaeetus leucocephalus</i>	-4.58	-0.04	2.97	0.00	0.84	-4.94	0.95	2.51	0.14	0.65
Broad-winged Hawk	<i>Buteo platypterus</i>	-6.62	3.85	3.46	1.48	0.25	-1.82	-55.19	42.01	7.79	0.01
Red-tailed Hawk	<i>Buteo jamaicensis</i>	-1.61	-0.31	0.79	0.14	0.72	-1.72	-0.06	0.71	0.01	0.94
Belted Kingfisher	<i>Megaceryle alcyon</i>	-0.69	-1.85	0.97	3.30	0.06	-2.60	2.91	0.79	11.67	0.00
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>	-1.26	-0.92	1.44	0.15	0.66	-1.48	-0.48	1.30	0.09	0.75
Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>	-0.65	0.73	0.70	0.80	0.33	0.00	-1.10	0.65	1.90	0.12
Red-bellied Woodpecker	<i>Melanerpes carolinus</i>	0.06	-0.33	0.49	0.43	0.52	-0.11	0.09	0.44	0.04	0.84
Downy Woodpecker	<i>Dryobates pubescens</i>	-1.40	0.09	0.72	0.02	0.91	-1.31	-0.18	0.66	0.07	0.80
Hairy Woodpecker	<i>Dryobates villosus</i>	-0.97	-4.75	1.59	11.45	0.00	-3.62	2.91	1.03	7.03	0.01
Pileated Woodpecker	<i>Dryocopus pileatus</i>	0.22	-0.44	0.40	1.12	0.28	-0.09	0.39	0.36	1.15	0.30
Northern Flicker	<i>Colaptes auratus</i>	-3.53	0.71	1.65	0.20	0.65	-3.42	0.60	1.44	0.16	0.71
American Kestrel	<i>Falco sparverius</i>	-1.29	-8.27	3.39	11.71	0.00	-4.63	2.94	1.36	4.84	0.03
Merlin	<i>Falco columbarius</i>	-5.82	3.54	2.85	1.94	0.19	-3.59	-1.17	2.64	0.28	0.62
Peregrine Falcon	<i>Falco peregrinus</i>	0.22	0.72	0.54	1.14	0.38	0.81	-0.95	0.50	2.52	0.17
Eastern Wood-pewee	<i>Contopus virens</i>	-0.67	-6.72	2.35	11.45	0.00	-3.27	1.92	1.35	1.86	0.17
Yellow-bellied Flycatcher	<i>Empidonax flaviventris</i>	-4.75	-1.43	4.46	0.11	0.49	-5.05	-0.83	4.11	0.04	0.53
Acadian Flycatcher	<i>Empidonax virescens</i>	1.23	-3.93	0.72	28.21	0.00	-0.53	1.36	0.63	4.71	0.03
Alder Flycatcher	<i>Empidonax alnorum</i>	-1.73	3.27	0.61	22.39	0.00	0.49	-2.37	0.61	12.10	0.00
Willow Flycatcher	<i>Empidonax traillii</i>	0.89	-3.63	0.71	25.38	0.00	-1.36	2.61	0.57	17.95	0.00
Least Flycatcher	<i>Empidonax minimus</i>	0.11	-0.65	0.48	1.78	0.20	-0.40	0.72	0.42	2.64	0.10
Eastern Phoebe	<i>Sayornis phoebe</i>	0.08	0.22	0.51	0.17	0.65	0.36	-0.59	0.47	1.20	0.19
Great Crested Flycatcher	<i>Myiarchus crinitus</i>	-0.79	1.87	0.50	11.86	0.00	0.52	-1.56	0.48	8.27	0.01
Eastern Kingbird	<i>Tyrannus tyrannus</i>	-5.39	0.22	4.18	0.00	0.62	-4.05	-7.29	9.87	1.17	0.25
White-eyed Vireo	<i>Vireo griseus</i>	-2.20	-1.82	1.78	0.77	0.41	-3.48	1.59	1.44	0.92	0.38
Yellow-throated Vireo	<i>Vireo flavifrons</i>	0.72	-3.63	1.05	11.16	0.00	-1.77	3.13	0.88	10.31	0.00

Blue-headed Vireo	<i>Vireo solitarius</i>	-0.69	1.78	0.57	7.23	0.00	0.79	-2.61	0.56	19.61	0.00
Warbling Vireo	<i>Vireo gilvus</i>	2.81	-2.42	0.28	57.98	0.00	1.13	2.09	0.24	57.18	0.00
Red-eyed Vireo	<i>Vireo olivaceus</i>	-3.38	-7.33	8.14	1.47	0.18	-4.05	-7.29	9.87	1.17	0.25
Canada Jay	<i>Perisoreus canadensis</i>	1.27	0.46	0.30	1.91	0.18	1.72	-0.87	0.27	8.39	0.00
Blue Jay	<i>Cyanocitta cristata</i>	1.79	0.33	0.33	0.82	0.39	1.84	0.25	0.30	0.55	0.43
American Crow	<i>Corvus brachyrhynchos</i>	0.15	-6.88	1.78	19.74	0.00	-3.22	3.40	1.08	9.43	0.00
Common Raven	<i>Corvus corax</i>	2.38	-1.52	0.29	25.65	0.00	1.30	1.39	0.25	25.69	0.00
Black-capped Chickadee	<i>Poecile atricapillus</i>	-0.12	-27.32	25.96	2.76	0.12	-4.70	0.30	4.96	0.00	0.64
Boreal Chickadee	<i>Poecile hudsonicus</i>	0.44	-0.39	0.87	0.08	0.75	0.08	0.58	0.78	0.31	0.53
Tufted Titmouse	<i>Baeolophus bicolor</i>	-6.54	10.04	1.86	29.20	0.00	1.29	-10.52	2.53	18.65	0.00
Horned Lark	<i>Eremophila alpestris</i>	-1.18	0.83	1.76	0.06	0.85	-0.81	-0.05	1.59	0.00	0.99
Northern Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>	-4.31	6.28	1.70	10.54	0.00	0.51	-8.23	2.37	13.75	0.00
Purple Martin	<i>Progne subis</i>	0.16	1.46	0.71	4.34	0.03	1.52	-2.75	0.65	13.95	0.00
Tree Swallow	<i>Tachycineta bicolor</i>	-2.64	6.24	1.86	8.97	0.03	3.40	-10.39	2.32	7.07	0.04
Bank Swallow	<i>Riparia riparia</i>	-0.52	3.22	0.81	12.01	0.00	1.85	-2.97	0.76	8.47	0.00
Barn Swallow	<i>Hirundo rustica</i>	-3.44	4.92	3.24	1.84	0.28	1.06	-11.42	4.80	5.21	0.06
Cliff Swallow	<i>Petrochelidon pyrrhonota</i>	1.59	-10.73	1.56	78.06	0.00	-2.48	3.75	0.73	22.77	0.00
Golden-crowned Kinglet	<i>Regulus satrapa</i>	-0.51	-18.57	7.91	16.10	0.00	-6.46	5.27	2.03	9.42	0.00
Ruby-crowned Kinglet	<i>Corthylio calendula</i>	1.12	-5.27	0.76	51.76	0.00	-1.71	2.97	0.54	27.20	0.00
Red-breasted Nuthatch	<i>Sitta canadensis</i>	-0.41	-0.49	0.69	0.35	0.53	-0.56	-0.15	0.63	0.05	0.83
White-breasted Nuthatch	<i>Sitta carolinensis</i>	-0.23	-3.76	1.10	12.88	0.00	-1.81	1.09	0.88	1.33	0.29
Brown Creeper	<i>Certhia americana</i>	-1.44	-1.05	1.50	0.31	0.57	-1.86	0.00	1.34	0.00	1.00
Blue-gray Gnatcatcher	<i>Polioptila caerulea</i>	0.37	1.82	0.39	15.46	0.00	1.72	-1.85	0.37	18.78	0.00
House Wren	<i>Troglodytes aedon</i>	1.31	-8.40	1.20	70.25	0.00	-2.67	4.04	0.65	37.32	0.00
Winter Wren	<i>Troglodytes troglodytes</i>	-1.69	0.02	1.48	0.00	0.99	-1.66	-0.08	1.33	0.00	0.94
Sedge Wren	<i>Cistothorus platensis</i>	-2.78	3.00	1.60	2.02	0.11	-0.56	-3.68	1.60	5.15	0.02
Marsh Wren	<i>Cistothorus palustris</i>	-3.45	1.25	1.67	0.39	0.54	-2.55	-1.18	1.63	0.45	0.52

Carolina Wren	<i>Thryothorus ludovicianus</i>	0.61	5.02	0.49	60.55	0.00	4.17	-4.66	0.46	66.81	0.00
European Starling	<i>Sturnus vulgaris</i>	0.68	1.28	0.39	7.69	0.01	1.60	-1.17	0.36	6.65	0.02
Gray Catbird	<i>Dumetella carolinensis</i>	-2.06	2.04	0.84	5.97	0.02	-0.59	-1.76	0.83	3.43	0.05
Brown Thrasher	<i>Toxostoma rufum</i>	-4.53	4.91	1.82	7.45	0.01	-0.74	-5.47	2.23	6.51	0.02
Northern Mockingbird	<i>Mimus polyglottos</i>	-1.46	0.75	0.82	0.68	0.41	-0.92	-0.72	0.76	0.79	0.37
Eastern Bluebird	<i>Sialia sialis</i>	2.05	-5.19	0.68	47.16	0.00	-1.91	5.03	0.50	72.64	0.00
Veery	<i>Catharus fuscescens</i>	0.20	-9.27	2.94	15.60	0.00	-4.35	5.28	1.65	9.30	0.00
Swainson's Thrush	<i>Catharus ustulatus</i>	0.73	-6.05	1.10	37.00	0.00	-2.96	4.32	0.73	31.35	0.00
Hermit Thrush	<i>Catharus guttatus</i>	-1.47	1.07	0.92	0.96	0.32	-1.01	0.01	0.83	0.00	0.99
Wood Thrush	<i>Hylocichla mustelina</i>	2.40	1.41	0.19	45.05	0.00	3.38	-1.22	0.17	40.27	0.00
American Robin	<i>Turdus migratorius</i>	1.78	0.40	0.29	1.83	0.16	2.14	-0.61	0.26	4.52	0.04
Cedar Waxwing	<i>Bombycilla cedrorum</i>	-1.01	7.58	0.56	81.10	0.00	4.14	-6.01	0.55	73.62	0.00
House Sparrow	<i>Passer domesticus</i>	0.55	-31.42	16.06	10.74	0.00	-7.35	6.39	3.07	6.04	0.03
Evening Grosbeak	<i>Coccothraustes vespertinus</i>	-0.33	3.42	0.50	30.43	0.00	2.10	-3.10	0.48	29.34	0.00
House Finch	<i>Haemorhous mexicanus</i>	-0.06	-3.93	1.15	11.30	0.00	-2.16	2.06	0.89	4.90	0.02
Purple Finch	<i>Haemorhous purpureus</i>	-3.02	-4.23	6.39	0.19	0.47	-3.69	-3.23	6.00	0.14	0.52
Red Crossbill	<i>Loxia curvirostra</i>	-3.29	0.66	2.08	0.17	0.71	-3.14	0.43	1.87	0.07	0.81
Pine Siskin	<i>Spinus pinus</i>	1.59	1.18	0.25	18.97	0.00	2.32	-0.65	0.23	6.68	0.00
American Goldfinch	<i>Spinus tristis</i>	-5.58	6.33	1.96	11.18	0.01	-0.88	-5.80	2.33	7.36	0.01
Grasshopper Sparrow	<i>Ammodramus savannarum</i>	2.18	0.06	0.29	0.03	0.87	2.11	0.26	0.26	0.90	0.38
Chipping Sparrow	<i>Spizella passerina</i>	-1.55	1.15	0.95	1.60	0.17	-1.05	0.05	0.87	0.00	0.96
Clay-colored Sparrow	<i>Spizella pallida</i>	-2.16	2.80	0.87	8.14	0.00	-0.19	-2.28	0.87	5.08	0.02
Field Sparrow	<i>Spizella pusilla</i>	-1.60	-12.56	7.44	7.28	0.01	-6.65	4.81	2.47	4.92	0.04
Dark-eyed Junco	<i>Junco hyemalis</i>	2.26	-6.70	0.78	73.07	0.00	-1.47	4.05	0.56	50.95	0.00
White-throated Sparrow	<i>Zonotrichia albicollis</i>	-4.06	1.97	2.32	0.87	0.35	-2.10	-4.17	2.90	1.96	0.17
Vesper Sparrow	<i>Pooecetes gramineus</i>	-3.84	-4.84	6.17	0.88	0.30	-6.15	2.11	3.50	0.36	0.40
LeConte's Sparrow	<i>Ammodramus leconteii</i>	-1.01	3.08	0.61	24.30	0.00	1.13	-2.12	0.60	8.75	0.02
Savannah Sparrow	<i>Passerculus sandwichensis</i>	-10.09	9.82	8.87	1.14	0.27	-0.95	-180.07	106.28	7.43	0.02

Henslow's Sparrow	<i>Centronyx henslowii</i>	2.06	0.78	0.21	11.52	0.00	2.48	-0.24	0.20	1.26	0.26
Song Sparrow	<i>Melospiza melodia</i>	0.26	-2.49	0.69	11.65	0.00	-0.63	-0.01	0.60	0.00	0.99
Swamp Sparrow	<i>Melospiza georgiana</i>	-0.49	-0.93	0.92	0.71	0.40	-1.13	0.79	0.81	0.59	0.44
Eastern Towhee	<i>Pipilo erythrophthalmus</i>	-3.42	1.90	1.91	0.46	0.50	-2.71	0.36	1.69	0.02	0.89
Yellow-breasted Chat	<i>Icteria virens</i>	-1.08	1.99	0.93	3.97	0.04	0.15	-0.98	0.86	0.79	0.36
Bobolink	<i>Dolichonyx oryzivorus</i>	-2.11	3.45	0.78	15.35	0.00	0.35	-2.97	0.80	11.04	0.00
Eastern Meadowlark	<i>Sturnella magna</i>	-3.49	1.30	2.50	0.28	0.57	-1.71	-5.10	3.22	2.19	0.14
Orchard Oriole	<i>Icterus spurius</i>	-0.44	2.40	0.48	16.38	0.00	1.42	-3.02	0.47	33.81	0.00
Baltimore Oriole	<i>Icterus galbula</i>	0.22	2.63	0.36	39.03	0.00	2.09	-2.36	0.34	35.89	0.00
Brown-headed Cowbird	<i>Molothrus ater</i>	-5.08	1.93	3.55	0.23	0.61	-4.29	0.30	3.14	0.01	0.83
Brewer's Blackbird	<i>Euphagus cyanocephalus</i>	0.64	4.13	0.46	42.06	0.00	3.69	-4.46	0.42	62.23	0.00
Common Grackle	<i>Quiscalus quiscula</i>	2.76	-5.05	0.52	68.44	0.00	-0.59	4.01	0.42	62.82	0.00
Ovenbird	<i>Seiurus aurocapilla</i>	-5.54	0.57	4.17	0.02	0.58	-5.00	-1.00	4.19	0.06	0.53
Louisiana Waterthrush	<i>Parkesia motacilla</i>	-0.97	-3.04	1.24	6.29	0.01	-2.52	1.45	0.97	1.60	0.21
Northern Waterthrush	<i>Parkesia noveboracensis</i>	-1.45	-2.36	1.65	1.93	0.16	-3.79	3.41	1.33	6.04	0.02
Golden-winged Warbler	<i>Vermivora chrysoptera</i>	1.86	-5.10	0.56	76.00	0.00	-1.15	3.43	0.43	50.16	0.00
Black-and-white Warbler	<i>Mniotilta varia</i>	-1.81	-14.44	10.26	5.39	0.04	-4.94	0.95	2.51	0.14	0.67
Tennessee Warbler	<i>Leiothlypis peregrina</i>	2.49	-8.13	0.82	100.28	0.00	-1.14	3.56	0.59	33.93	0.00
Nashville Warbler	<i>Leiothlypis ruficapilla</i>	1.32	-3.97	0.68	32.89	0.00	-1.58	3.59	0.51	45.29	0.00
Mourning Warbler	<i>Geothlypis philadelphia</i>	2.18	-1.00	0.32	8.29	0.01	1.54	0.71	0.29	5.03	0.03
Common Yellowthroat	<i>Geothlypis trichas</i>	-0.88	-4.80	3.50	0.75	0.40	-4.32	4.33	2.85	0.91	0.38
Hooded Warbler	<i>Setophaga citrina</i>	2.89	-3.05	0.35	62.32	0.00	0.97	2.29	0.32	39.49	0.00
American Redstart	<i>Setophaga ruticilla</i>	-3.34	-2.42	2.78	0.86	0.38	-3.70	-1.85	2.70	0.55	0.46
Cape May Warbler	<i>Setophaga tigrina</i>	1.37	-10.35	1.76	54.55	0.00	-2.99	4.39	0.86	23.06	0.00
Northern Parula	<i>Setophaga americana</i>	1.36	-7.68	1.17	55.39	0.00	-2.08	3.34	0.72	19.00	0.00
Magnolia Warbler	<i>Setophaga magnolia</i>	-4.28	-2.99	5.07	0.41	0.37	-5.81	1.38	3.50	0.15	0.46
Bay-breasted Warbler	<i>Setophaga castanea</i>	1.61	-7.41	1.14	47.63	0.00	-2.13	3.86	0.73	22.79	0.00
Blackburnian Warbler	<i>Setophaga fusca</i>	1.51	1.27	0.37	8.69	0.01	2.46	-1.34	0.34	10.86	0.00

