

Supplementary Material

A cross-continental look at the patterns of avian species diversity and composition across an urbanisation gradient

Barbara Clucas^{A,C} and John M. Marzluff^B

^ADepartment of Wildlife, Humboldt State University, One Harpst Street, Arcata, CA 95521 USA.

^BSchool of Environmental and Forest Sciences, Box 352100, University of Washington, Seattle, WA 98195, USA.

^CCorresponding author. Email: barbara.clucas@humboldt.edu

Table S1. Species by city, their indicator values, distribution, urban tolerance, biological traits and cluster number from cluster analysis from Clucas and Marzluff (2015)

City	Common name	Scientific Name	Indicator Value	Urban Level	P value	Distribution ^A	Urban Tolerance	Innovation Rate	Diet	Nesting	Bird Feeder	Cluster
Berlin	common chaffinch	<i>Fringilla coelebs</i>			0.323	forest to low suburban	low urban tolerant	0.015	granivorous	open	1	1
Berlin	Eurasian jay	<i>Garrulus glandarius</i>			0.266	forest to low suburban	low urban tolerant	0.046	omnivorous	open	1	1
Berlin	hawfinch	<i>Coccothraustes coccothraustes</i>			0.339	forest to rural	moderately urban intolerant	0.033	granivorous	open	1	1
Berlin	Eurasian tree sparrow	<i>Passer montanus</i>			0.66	rural to dense suburban	moderately urban tolerant	0.010	omnivorous	secondary cavity	1	1
Berlin	common blackbird	<i>Turdus merula</i>			0.364	all sites	urban tolerant	0.053	omnivorous	open	1	1
Berlin	blue tit	<i>Cyanistes caeruleus</i>			0.981	all sites	urban tolerant	0.017	omnivorous	secondary cavity	1	1
Berlin	Eurasian magpie	<i>Pica pica</i>			0.404	all sites but forest	urban tolerant	0.067	omnivorous	open	1	1
Berlin	greenfinch	<i>Carduelis chloris</i>			0.474	all sites but forest	urban tolerant	0.046	granivorous	open	1	1
Berlin	house sparrow	<i>Passer domesticus</i>			0.105	all sites but forest	urban tolerant	0.037	omnivorous	secondary cavity	1	1
Berlin	hooded crow	<i>Corvus cornix</i>	0.538	Urban	0.015	all sites but forest	urban tolerant	0.078	omnivorous	open	0	1
Berlin	common wood pigeon	<i>Columba palumbus</i>			0.339	all sites	urban tolerant	0.011	omnivorous	open	1	1
Berlin	European starling	<i>Sturnus vulgaris</i>			0.102	all sites but forest	urban tolerant	0.016	omnivorous	secondary cavity	1	1
Berlin	European goldfinch	<i>Carduelis carduelis</i>			0.093	rural and urban	urban tolerant	0.043	granivorous	open	1	1
Berlin	feral pigeon	<i>Columba livia domestica</i>			0.108	urban only	urbanophilic	0.000	omnivorous	open	1	1
Berlin	song thrush	<i>Turdus philomelos</i>			0.103	forest only	urbanophobic	0.040	omnivorous	open	0	1
Berlin	great spotted	<i>Dendrocopos</i>			1	rural to dense	moderately urban	0.058	insectivorous	primary	1	2

	woodpecker	<i>major</i>				suburban	tolerant			cavity		
Berlin	Eurasian nuthatch	<i>Sitta europaea</i>			0.874	all sites but urban	moderately urban tolerant	0.005	insectivorous	secondary cavity	1	2
Berlin	European robin	<i>Erithacus rubecula</i>			0.519	all sites but urban	moderately urban tolerant	0.018	insectivorous	open ground	1	2
Berlin	long-tailed tit	<i>Aegithalos caudatus</i>			1	rural to dense suburban	moderately urban tolerant	0.050	insectivorous	open	1	2
Berlin	great tit	<i>Parus major</i>			0.4	all sites	urban tolerant	0.020	insectivorous	primary cavity	1	2
Berlin	crested tit	<i>Lophophanes cristatus</i>			0.108	forest only	urbanophobic	0.000	insectivorous	primary cavity	1	2
Berlin	lesser spotted woodpecker	<i>Dendrocopos minor</i>			0.116	forest only	urbanophobic	0.000	insectivorous	primary cavity	1	2
Berlin	short-toed treecreeper	<i>Certhia brachydactyla</i>			0.303	forest to low suburban	low urban tolerant	0.000	insectivorous	secondary cavity	0	3
Berlin	common redstart	<i>Phoenicurus phoenicurus</i>			1	forest to low suburban	low urban tolerant	0.000	insectivorous	secondary cavity	0	3
Berlin	European serin	<i>Serinus serinus</i>			0.206	rural to low suburban	low urban tolerant	0.000	granivorous	open	0	3
Berlin	white wagtail	<i>Motacilla alba</i>			0.11	rural only	moderately urban intolerant	0.058	insectivorous	secondary cavity	0	3
Berlin	common whitethroat	<i>Sylvia communis</i>			1	rural only	moderately urban intolerant	0.013	insectivorous	open	0	3
Berlin	nightingale	<i>Luscinia megarhynchos</i>			1	rural to dense suburban	moderately urban tolerant	0.000	insectivorous	open ground	0	3
Berlin	winter wren	<i>Troglodytes troglodytes</i>			0.595	all sites but urban	moderately urban tolerant	0.003	insectivorous	secondary cavity	0	3
Berlin	black redstart	<i>Phoenicurus ochruros</i>			0.733	all sites but forest	urban tolerant	0.004	insectivorous	secondary cavity	0	3
Berlin	common house martin	<i>Delichon urbicum</i>			0.18	rural and urban	urban tolerant	0.023	insectivorous	other	0	3
Berlin	Eurasian blackcap	<i>Sylvia atricapilla</i>			1	all sites but forest	urban tolerant	0.025	insectivorous	open	0	3
Berlin	willow warbler	<i>Phylloscopus trochilus</i>			0.112	forest only	urbanophobic	0.000	insectivorous	open ground	0	3
Berlin	wood warbler	<i>Phylloscopus sibilatrix</i>			0.11	forest only	urbanophobic	0.000	insectivorous	open ground	0	3
Berlin	common kestrel	<i>Falco tinnunculus</i>			1	rural only	moderately urban intolerant	0.041	carnivorous	secondary cavity	0	
Berlin	mallard	<i>Anas platyrhynchos</i>			1	rural and urban	urban tolerant	0.004	omnivorous	open ground	0	
Seattle	Purple finch	<i>Haemorhous purpureus</i>			0.514	forest to low suburban	low urban tolerant	0.033	granivorous	open	1	1
Seattle	Song sparrow	<i>Melospiza melodia</i>			0.812	forest to low suburban	low urban tolerant	0.008	omnivorous	open	1	1
Seattle	American goldfinch	<i>Spinus tristis</i>			0.322	rural to dense suburban	moderately urban tolerant	0.017	granivorous	open	1	1
Seattle	Band-tailed pigeon	<i>Patagioenas fasciata</i>			0.509	all sites but urban	moderately urban tolerant	0.000	omnivorous	open	1	1
Seattle	Black-headed grosbeak	<i>Pheucticus melanocephalus</i>			0.377	forest to dense suburban	moderately urban tolerant	0.000	omnivorous	open	1	1
Seattle	Dark-eyed junco	<i>Petrochelidon pyrrhonota</i>			0.376	all sites but urban	moderately urban tolerant	0.000	granivorous	open ground	1	1
Seattle	Pine siskin	<i>Spinus pinus</i>			0.432	rural to dense suburban	moderately urban tolerant	0.017	granivorous	open	1	1

Seattle	Rufous hummingbird	<i>Selasphorus rufus</i>			1	rural to dense suburban	moderately urban tolerant	0.008	nectivorous	open	1	1
Seattle	Spotted towhee	<i>Pipilo maculatus</i>			0.579	all sites but urban	moderately urban tolerant	0.000	omnivorous	open ground	1	1
Seattle	Steller's jay	<i>Cyanocitta stelleri</i>			0.74	all sites but urban	moderately urban tolerant	0.027	omnivorous	open	1	1
Seattle	Western tanager	<i>Piranga ludoviciana</i>			1	rural to dense suburban	moderately urban tolerant	0.000	omnivorous	open	1	1
Seattle	Anna's hummingbird	<i>Calypte anna</i>			0.471	low suburban to urban	urban tolerant	0.032	nectivorous	open	1	1
Seattle	Black-capped chickadee	<i>Poecile atricapillus</i>	0.462	Dense Suburban	0.017	all sites but forest	urban tolerant	0.010	omnivorous	secondary cavity	1	1
Seattle	European starling	<i>Sturnus vulgaris</i>	0.642	Dense Suburban	0.036	all sites but forest	urban tolerant	0.016	omnivorous	secondary cavity	1	1
Seattle	House finch	<i>Haemorhous mexicanus</i>			0.101	low suburban to urban	urban tolerant	0.004	granivorous	open	1	1
Seattle	House sparrow	<i>Passer domesticus</i>			0.067	low suburban to urban	urban tolerant	0.037	omnivorous	secondary cavity	1	1
Seattle	Golden-crowned kinglet	<i>Regulus satrapa</i>			0.289	forest to low suburban	low urban tolerant	0.019	insectivorous	open	0	2
Seattle	Evening grosbeak	<i>Coccothraustes vespertinus</i>			0.305	forest and rural	moderately urban intolerant	0.000	omnivorous	open	0	2
Seattle	Red crossbill	<i>Loxia curvirostra</i>			0.311	forest and rural	moderately urban intolerant	0.031	granivorous	open	0	2
Seattle	Swainson's thrush	<i>Catharus ustulatus</i>			0.422	forest and rural	moderately urban intolerant	0.011	omnivorous	open	0	2
Seattle	Western wood-pewee	<i>Contopus sordidulus</i>			1	rural only	moderately urban intolerant	0.000	insectivorous	open	0	2
Seattle	Willow flycatcher	<i>Empidonax traillii</i>			1	rural only	moderately urban intolerant	0.000	insectivorous	open	0	2
Seattle	Cedar waxwing	<i>Bombycilla cedrorum</i>			0.881	rural to dense suburban	moderately urban tolerant	0.054	omnivorous	open	0	2
Seattle	Yellow-rumped warbler	<i>Setophaga coronata</i>			1	rural to dense suburban	moderately urban tolerant	0.040	insectivorous	open	0	2
Seattle	American crow	<i>Corvus brachyrhynchos</i>			0.542	all sites	urban tolerant	0.077	omnivorous	open	0	2
Seattle	American Robin	<i>Turdus migratorius</i>	0.389	Dense Suburban	0.033	all sites	urban tolerant	0.024	insectivorous	open	0	2
Seattle	Bushtit	<i>Psaltriparus minimus</i>			0.874	all sites but forest	urban tolerant	0.000	insectivorous	open	0	2
Seattle	Rock pigeon	<i>Columba livia</i>			0.062	all sites but forest	urban tolerant	0.000	omnivorous	open	0	2
Seattle	Black-throated gray warbler	<i>Setophaga nigrescens</i>			0.102	forest only	urbanophobic	0.023	insectivorous	open	0	2
Seattle	Pacific-slope flycatcher	<i>Empidonax difficilis</i>			0.112	forest only	urbanophobic	0.000	insectivorous	open	0	2
Seattle	Townsend's warbler	<i>Setophaga townsendi</i>			0.108	forest only	urbanophobic	0.026	insectivorous	open	0	2
Seattle	Brown creeper	<i>Certhia americana</i>			0.286	forest to low suburban	low urban tolerant	0.024	insectivorous	secondary cavity	0	3
Seattle	Pacific wren	<i>Troglodytes pacificus</i>			0.21	forest and rural	moderately urban intolerant	0.000	insectivorous	secondary cavity	0	3
Seattle	Pileated woodpecker	<i>Dryocopus pileatus</i>			1	rural only	moderately urban intolerant	0.038	insectivorous	primary cavity	1	3

Seattle	Red-breasted sapsucker	<i>Sphyrapicus ruber</i>			0.337	forest and rural	moderately urban intolerant	0.000	insectivorous	primary cavity	0	3
Seattle	Vaux's swift	<i>Chaetura vauxi</i>			1	rural only	moderately urban intolerant	0.000	insectivorous	other	0	3
Seattle	Wilson's warbler	<i>Cardellina pusilla</i>			0.109	rural only	moderately urban intolerant	0.000	insectivorous	open ground	0	3
Seattle	Barn swallow	<i>Hirundo rustica</i>			0.884	rural to dense suburban	moderately urban tolerant	0.030	insectivorous	other	0	3
Seattle	Brown-headed cowbird	<i>Molothrus ater</i>			1	suburban	moderately urban tolerant	0.001	insectivorous	other	1	3
Seattle	Chestnut-backed chickadee	<i>Poecile rufescens</i>			0.18	all sites but urban	moderately urban tolerant	0.000	insectivorous	secondary cavity	1	3
Seattle	Northern flicker	<i>Colaptes auratus</i>			0.265	rural to dense suburban	moderately urban tolerant	0.000	insectivorous	primary cavity	1	3
Seattle	Red-breasted nuthatch	<i>Sitta canadensis</i>			0.331	all sites but urban	moderately urban tolerant	0.016	insectivorous	secondary cavity	1	3
Seattle	Bewick's wren	<i>Thryomanes bewickii</i>			0.45	all sites but forest	urban tolerant	0.000	insectivorous	secondary cavity	0	3
Seattle	Violet-green swallow	<i>Tachycineta thalassina</i>			0.701	all sites but forest	urban tolerant	0.000	insectivorous	secondary cavity	0	3
Seattle	Hairy woodpecker	<i>Picoides villosus</i>			0.12	forest only	urbanophobic	0.042	insectivorous	primary cavity	1	3
Seattle	Turkey vulture	<i>Cathartes aura</i>			1	rural only	moderately urban intolerant	0.000	scavenger	secondary cavity	0	
Seattle	Glaucous-winged gull	<i>Larus glaucescens</i>			0.191	dense suburban & urban	urbanophilic	0.007	omnivorous	open ground	0	

^ALow suburban = low density suburban.