

**Supporting Information.** C. Lisa Mahon, Gillian L. Holloway, Erin M. Bayne, and Judith D. Toms. 2019. Additive and interactive cumulative effects on boreal landbirds: winners and losers in a multi-stressor landscape. *Ecological Applications*.

## Appendix S2

Table S1. Model coefficients for the best environmental and disturbance model(s) for 27 landbird species in the Athabasca Oil Sands Area. Generalized Additive Models were a combination of linear terms and spline terms with a negative binominal distribution. Each model includes up to 8 environmental variables, plus additional disturbance variables. For the spline terms the effective degrees of freedom (EDF) is an approximation of the degrees of freedom implemented for the spline term in the model. Fields that are not applicable for a given model term are indicated using --.

Species	Best Model	Model Term	Variable Type	Model Distribution	Coefficient (±SE)	Z/F Test	p-value	EDF
Alder Flycatcher	4a	(Intercept)	--	Linear Term	-3.924 (1.194)	-3.285	0.001	--
		Open Non-forest	Environmental	Linear Term	0.241 (0.064)	3.772	<0.001	--
		Hardwood	Environmental	Linear Term	-0.01 (0.007)	-1.457	0.146	--
		Upland Black Spruce/Pine	Environmental	Linear Term	-0.145 (0.062)	-2.350	0.019	--
		Total Cluster Area	Environmental	Linear Term	0.003 (0.005)	0.594	0.553	--
		Black Spruce Lowlands	Environmental	Linear Term	0.074 (0.058)	1.293	0.197	--
		Harvest Unit	Disturbance	Linear Term	0.296 (0.061)	4.836	<0.001	--
	All Linear	Disturbance	Linear Term	0.066 (0.147)	0.446	0.656	--	
American Robin	4b	(Intercept)	--	Linear Term	12.49 (7.78)	1.605	0.109	--

		JDATE	Environmental	Linear Term	-0.017 (0.007)	-2.520	0.012	--
		Latitude	Environmental	Linear Term	-0.189 (0.138)	-1.362	0.174	--
		Black Spruce Lowlands	Environmental	Linear Term	-0.141 (0.053)	-2.632	0.009	--
		White Spruce	Environmental	Linear Term	-0.073 (0.062)	-1.166	0.245	--
		Total Cluster Area	Environmental	Linear Term	-0.011 (0.004)	-2.597	0.010	--
		Upland Black Spruce/Pine	Environmental	Linear Term	-0.126 (0.054)	-2.318	0.021	--
		Spline - Age	Environmental	GAM Spline Term	--	3.701	0.055	1.00
		Spline - Hardwood	Environmental	GAM Spline Term	--	3.080	0.037	2.07
		Harvest Unit	Disturbance	Linear Term	0.399 (0.119)	3.362	0.001	--
		All Linear	Disturbance	Linear Term	0.439 (0.143)	3.066	0.002	--
		Harvest Unit:All Linear	Disturbance	Interaction Term	-0.158 (0.062)	-2.543	0.012	--
Bay-breasted Warbler	3a	(Intercept)	--	Linear Term	-4.772 (0.6)	-7.948	<0.001	--
		Open Non-forest	Environmental	Linear Term	-0.12 (0.072)	-1.673	0.095	--
		Hardwood	Environmental	Linear Term	0.027 (0.005)	5.720	<0.001	--
		Black Spruce Lowlands	Environmental	Linear Term	0.2 (0.053)	3.786	<0.001	--
		White Spruce	Environmental	Linear Term	0.304 (0.05)	6.067	<0.001	--
		Spline - Latitude	Environmental	GAM Spline Term	--	5.246	0.002	2.47
		Well	Disturbance	Linear Term	-0.263 (0.158)	-1.658	0.098	--
		Wide Linear	Disturbance	Linear Term	0.306 (0.102)	3.012	0.003	--
		Narrow Linear	Disturbance	Linear Term	-0.045 (0.196)	-0.230	0.818	--
Black-and-white Warbler	1a	(Intercept)	--	Linear Term	-3.923 (10.424)	-0.376	0.707	--
		Age	Environmental	Linear Term	-0.02 (0.004)	-4.628	<0.001	--
		JDATE	Environmental	Linear Term	-0.02 (0.008)	-2.622	0.009	--
		Latitude	Environmental	Linear Term	0.449 (0.12)	3.738	<0.001	--
		Longitude	Environmental	Linear Term	0.171 (0.072)	2.371	0.018	--
		White Spruce	Environmental	Linear Term	0.14 (0.056)	2.517	0.012	--
		Upland Black Spruce/Pine	Environmental	Linear Term	-0.144 (0.057)	-2.546	0.011	--
		Spline - Hardwood	Environmental	GAM Spline Term	--	10.083	<0.001	2.91
Black-capped Chickadee	3c	(Intercept)	--	Linear Term	3.606 (7.383)	0.488	0.626	--
		Age	Environmental	Linear Term	0.012 (0.003)	3.587	<0.001	--
		Latitude	Environmental	Linear Term	-0.148 (0.13)	-1.140	0.255	--
		Black Spruce Lowlands	Environmental	Linear Term	-0.108 (0.046)	-2.366	0.019	--
		Spline - Hardwood	Environmental	GAM Spline Term	--	10.140	<0.001	2.09
		Well	Disturbance	Linear Term	2.213 (0.767)	2.884	0.004	--
		Wide Linear	Disturbance	Linear Term	1.147 (0.333)	3.447	0.001	--
		Narrow Linear	Disturbance	Linear Term	0.804 (0.389)	2.069	0.039	--

		Well:Wide Linear	Disturbance	Interaction Term	-1.247 (0.381)	-3.271	0.001	--
		Well:Narrow Linear	Disturbance	Interaction Term	-1.783 (0.683)	-2.610	0.010	--
		Wide Linear:Narrow Linear	Disturbance	Interaction Term	-0.854 (0.313)	-2.729	0.007	--
		Well:Wide Linear:Narrow Linear	Disturbance	Interaction Term	0.977 (0.306)	3.191	0.002	--
Boreal Chickadee	6a	(Intercept)	--	Linear Term	-9.311 (7.698)	-1.210	0.227	--
		Latitude	Environmental	Linear Term	0.164 (0.135)	1.213	0.226	--
		Total Cluster Area	Environmental	Linear Term	-0.008 (0.004)	-1.942	0.053	--
		Spline - Age	Environmental	GAM Spline Term	--	4.944	0.005	2.03
		Spline - Hardwood	Environmental	GAM Spline Term	--	4.732	0.005	2.18
		All Disturbance	Disturbance	Linear Term	-0.133 (0.063)	-2.099	0.037	--
Boreal Chickadee	4a	(Intercept)	--	Linear Term	-8.667 (8.047)	-1.077	0.282	--
		Latitude	Environmental	Linear Term	0.148 (0.14)	1.057	0.291	--
		Total Cluster Area	Environmental	Linear Term	-0.008 (0.004)	-1.796	0.074	--
		Spline - Age	Environmental	GAM Spline Term	--	4.914	0.005	2.01
		Spline - Hardwood	Environmental	GAM Spline Term	--	5.021	0.004	2.20
		Harvest Unit	Disturbance	Linear Term	-0.138 (0.057)	-2.436	0.015	--
		All Linear	Disturbance	Linear Term	-0.063 (0.122)	-0.514	0.608	--
Canada Jay	3a	(Intercept)	--	Linear Term	-0.82 (0.905)	-0.906	0.366	--
		Age	Environmental	Linear Term	0.005 (0.002)	2.298	0.022	--
		Open Non-forest	Environmental	Linear Term	0.074 (0.033)	2.231	0.026	--
		JDATE	Environmental	Linear Term	-0.004 (0.004)	-0.980	0.328	--
		Black Spruce Lowlands	Environmental	Linear Term	0.123 (0.023)	5.242	<0.001	--
		Total Cluster Area	Environmental	Linear Term	-0.006 (0.002)	-2.630	0.009	--
		Upland Black Spruce/Pine	Environmental	Linear Term	0.056 (0.025)	2.231	0.026	--
		Spline - Hardwood	Environmental	GAM Spline Term	--	8.346	<0.001	2.16
		Well	Disturbance	Linear Term	0.249 (0.073)	3.419	0.001	--
		Wide Linear	Disturbance	Linear Term	-0.013 (0.055)	-0.239	0.811	--
		Narrow Linear	Disturbance	Linear Term	-0.445 (0.105)	-4.228	<0.001	--
Cape May Warbler	1a	(Intercept)	--	Linear Term	35.163 (9.309)	3.777	<0.001	--
		Age	Environmental	Linear Term	0.013 (0.005)	2.500	0.013	--
		JDATE	Environmental	Linear Term	-0.023 (0.008)	-2.855	0.005	--
		Longitude	Environmental	Linear Term	0.314 (0.083)	3.794	<0.001	--
		Black Spruce Lowlands	Environmental	Linear Term	0.343 (0.069)	4.962	<0.001	--
		White Spruce	Environmental	Linear Term	0.502 (0.075)	6.647	<0.001	--
		Total Cluster Area	Environmental	Linear Term	-0.014 (0.005)	-2.845	0.005	--

		Upland Black Spruce/Pine	Environmental	Linear Term	0.219 (0.069)	3.149	0.002	--
		Spline - Hardwood	Environmental	GAM Spline Term	--	8.761	<0.001	2.62
		Spline - Latitude	Environmental	GAM Spline Term	--	5.459	0.001	2.80
Chipping Sparrow	6a	(Intercept)	--	Linear Term	-4.068 (3.59)	-1.133	0.258	--
		Latitude	Environmental	Linear Term	0.054 (0.064)	0.853	0.394	--
		White Spruce	Environmental	Linear Term	-0.042 (0.02)	-2.117	0.035	--
		Spline - Hardwood	Environmental	GAM Spline Term	--	18.636	<0.001	2.54
		All Disturbance	Disturbance	Linear Term	-0.068 (0.027)	-2.551	0.011	--
Chipping Sparrow	4a	(Intercept)	--	Linear Term	-2.41 (3.79)	-0.636	0.525	--
		Latitude	Environmental	Linear Term	0.026 (0.067)	0.387	0.699	--
		White Spruce	Environmental	Linear Term	-0.045 (0.021)	-2.179	0.030	--
		Spline - Hardwood	Environmental	GAM Spline Term	--	18.615	<0.001	2.54
		Harvest Unit	Disturbance	Linear Term	-0.05 (0.023)	-2.201	0.029	--
		All Linear	Disturbance	Linear Term	-0.108 (0.062)	-1.743	0.082	--
Common Raven	3c	(Intercept)	--	Linear Term	33.645 (9.038)	3.723	<0.001	--
		Hardwood	Environmental	Linear Term	-0.007 (0.004)	-1.875	0.062	--
		JDATE	Environmental	Linear Term	-0.006 (0.007)	-0.898	0.370	--
		Latitude	Environmental	Linear Term	-0.655 (0.161)	-4.062	<0.001	--
		Spline - Longitude	Environmental	GAM Spline Term	--	4.519	0.004	2.77
		Well	Disturbance	Linear Term	2.066 (0.684)	3.020	0.003	--
		Wide Linear	Disturbance	Linear Term	-0.567 (0.412)	-1.377	0.169	--
		Narrow Linear	Disturbance	Linear Term	0.04 (0.393)	0.101	0.920	--
		Well:Wide Linear	Disturbance	Interaction Term	-0.274 (0.384)	-0.714	0.476	--
		Well:Narrow Linear	Disturbance	Interaction Term	-1.606 (0.562)	-2.857	0.005	--
		Wide Linear:Narrow Linear	Disturbance	Interaction Term	0.456 (0.365)	1.251	0.212	--
		Well:Wide Linear:Narrow Linear	Disturbance	Interaction Term	0.356 (0.284)	1.256	0.210	--
Dark-eyed Junco	4b	(Intercept)	--	Linear Term	-11.871 (6.31)	-1.881	0.061	--
		Hardwood	Environmental	Linear Term	-0.026 (0.004)	-6.651	<0.001	--
		Black Spruce Lowlands	Environmental	Linear Term	0.1 (0.033)	3.019	0.003	--
		Total Cluster Area	Environmental	Linear Term	-0.007 (0.003)	-2.035	0.043	--
		Upland Black Spruce/Pine	Environmental	Linear Term	0.041 (0.035)	1.173	0.242	--
		JDATE	Environmental	Linear Term	0.01 (0.005)	1.924	0.055	--
		Latitude	Environmental	Linear Term	0.173 (0.111)	1.564	0.119	--
		Harvest Unit	Disturbance	Linear Term	0.052 (0.12)	0.437	0.662	--

		All Linear	Disturbance	Linear Term	0.215 (0.105)	2.051	0.041	--
		Harvest Unit:All Linear	Disturbance	Interaction Term	-0.113 (0.066)	-1.698	0.091	--
Hermit Thrush	5b	(Intercept)	--	Linear Term	0.05 (4.492)	0.011	0.991	--
		Open Non-forest	Environmental	Linear Term	0.175 (0.034)	5.160	<0.001	--
		Latitude	Environmental	Linear Term	-0.067 (0.079)	-0.847	0.398	--
		Black Spruce Lowlands	Environmental	Linear Term	0.135 (0.023)	5.946	<0.001	--
		Upland Black Spruce/Pine	Environmental	Linear Term	0.1 (0.022)	4.644	<0.001	--
		Spline - Age	Environmental	GAM Spline Term	--	7.797	<0.001	1.87
		Harvest Unit	Disturbance	Linear Term	0.012 (0.084)	0.138	0.891	--
		Well	Disturbance	Linear Term	-0.126 (0.088)	-1.429	0.154	--
		All Linear	Disturbance	Linear Term	0.26 (0.091)	2.853	0.005	--
		Harvest Unit:All Linear	Disturbance	Interaction Term	-0.069 (0.048)	-1.433	0.153	--
		Harvest Unit:Well	Disturbance	Interaction Term	0.115 (0.046)	2.506	0.013	--
Least Flycatcher	1a	(Intercept)	--	Linear Term	1.359 (1.334)	1.019	0.309	--
		Hardwood	Environmental	Linear Term	0.014 (0.004)	3.224	0.001	--
		JDATE	Environmental	Linear Term	-0.019 (0.007)	-2.621	0.009	--
		Black Spruce Lowlands	Environmental	Linear Term	-0.241 (0.056)	-4.283	<0.001	--
		White Spruce	Environmental	Linear Term	-0.118 (0.054)	-2.201	0.029	--
		Spline - Age	Environmental	GAM Spline Term	--	1.508	0.212	2.76
		Spline - Latitude	Environmental	GAM Spline Term	--	1.830	0.150	2.06
Lincoln's Sparrow	5b	(Intercept)	--	Linear Term	-15.979 (11.815)	-1.352	0.177	--
		Hardwood	Environmental	Linear Term	-0.032 (0.005)	-6.615	<0.001	--
		Upland Black Spruce/Pine	Environmental	Linear Term	-0.219 (0.053)	-4.169	<0.001	--
		White Spruce	Environmental	Linear Term	-0.188 (0.048)	-3.919	<0.001	--
		Longitude	Environmental	Linear Term	-0.266 (0.083)	-3.211	0.001	--
		Latitude	Environmental	Linear Term	-0.247 (0.155)	-1.598	0.111	--
		Harvest Unit	Disturbance	Linear Term	-0.034 (0.139)	-0.244	0.807	--
		Well	Disturbance	Linear Term	0.317 (0.183)	1.736	0.084	--
		All Linear	Disturbance	Linear Term	-0.431 (0.188)	-2.292	0.023	--
		Harvest Unit:All Linear	Disturbance	Interaction Term	0.134 (0.084)	1.595	0.112	--
		Harvest Unit:Well	Disturbance	Interaction Term	-0.165 (0.084)	-1.973	0.049	--
Magnolia Warbler	1a	(Intercept)	--	Linear Term	-1.341 (0.162)	-8.303	<0.001	--
		Black Spruce Lowlands	Environmental	Linear Term	-0.072 (0.034)	-2.121	0.035	--
		Upland Black Spruce/Pine	Environmental	Linear Term	-0.061 (0.034)	-1.792	0.074	--
		Spline - Age	Environmental	GAM Spline Term	--	3.603	0.015	2.66

		Spline - Hardwood	Environmental	GAM Spline Term	--	7.589	<0.001	2.26
Mourning Warbler	2a	(Intercept)	--	Linear Term	32.486 (13.716)	2.368	0.019	--
		Age	Environmental	Linear Term	0.019 (0.004)	4.310	<0.001	--
		JDATE	Environmental	Linear Term	0.031 (0.007)	4.192	<0.001	--
		Latitude	Environmental	Linear Term	-0.367 (0.167)	-2.200	0.029	--
		Longitude	Environmental	Linear Term	0.18 (0.09)	2.002	0.046	--
		Black Spruce Lowlands	Environmental	Linear Term	-0.23 (0.057)	-4.013	<0.001	--
		Upland Black Spruce/Pine	Environmental	Linear Term	-0.235 (0.064)	-3.686	<0.001	--
		Spline - Hardwood	Environmental	GAM Spline Term	--	9.419	<0.001	2.91
		Wide Linear	Disturbance	Linear Term	0.1 (0.125)	0.807	0.421	--
		Narrow Linear	Disturbance	Linear Term	-0.498 (0.292)	-1.705	0.089	--
Northern Flicker	4a	(Intercept)	--	Linear Term	27.108 (9.614)	2.820	0.005	--
		Longitude	Environmental	Linear Term	0.226 (0.087)	2.584	0.010	--
		Hardwood	Environmental	Linear Term	-0.014 (0.005)	-2.860	0.005	--
		Age	Environmental	Linear Term	-0.012 (0.004)	-2.916	0.004	--
		Total Cluster Area	Environmental	Linear Term	-0.012 (0.005)	-2.425	0.016	--
		Black Spruce Lowlands	Environmental	Linear Term	-0.049 (0.049)	-1.004	0.316	--
		JDATE	Environmental	Linear Term	-0.013 (0.008)	-1.651	0.100	--
		Harvest Unit	Disturbance	Linear Term	0.11 (0.05)	2.199	0.029	--
		All Linear	Disturbance	Linear Term	0.094 (0.134)	0.702	0.483	--
Ovenbird	3b	(Intercept)	--	Linear Term	11.11 (3.855)	2.882	0.004	--
		Age	Environmental	Linear Term	-0.002 (0.002)	-1.141	0.255	--
		Open Non-forest	Environmental	Linear Term	-0.061 (0.031)	-1.964	0.051	--
		JDATE	Environmental	Linear Term	-0.004 (0.003)	-1.434	0.153	--
		Longitude	Environmental	Linear Term	0.101 (0.034)	2.948	0.003	--
		Black Spruce Lowlands	Environmental	Linear Term	-0.062 (0.021)	-3.013	0.003	--
		Upland Black Spruce/Pine	Environmental	Linear Term	-0.038 (0.022)	-1.705	0.089	--
		Spline - Hardwood	Environmental	GAM Spline Term	--	60.059	<0.001	2.86
		Spline - Latitude	Environmental	GAM Spline Term	--	5.462	0.001	2.86
		Well	Disturbance	Linear Term	0.418 (0.178)	2.349	0.020	--
		Wide Linear	Disturbance	Linear Term	0.159 (0.069)	2.307	0.022	--
		Narrow Linear	Disturbance	Linear Term	0.09 (0.135)	0.666	0.506	--
		Well:Wide Linear	Disturbance	Interaction Term	-0.07 (0.069)	-1.020	0.309	--
		Well:Narrow Linear	Disturbance	Interaction Term	-0.333 (0.131)	-2.550	0.011	--
Palm Warbler	1a	(Intercept)	--	Linear Term	-4.08 (0.868)	-4.700	<0.001	--
		Hardwood	Environmental	Linear Term	-0.014 (0.007)	-1.969	0.050	--

		Black Spruce Lowlands	Environmental	Linear Term	0.464 (0.067)	6.922	<0.001	--
		Age	Environmental	Linear Term	-0.018 (0.006)	-3.133	0.002	--
		Open Non-forest	Environmental	Linear Term	0.313 (0.077)	4.060	<0.001	--
		Upland Black Spruce/Pine	Environmental	Linear Term	0.224 (0.067)	3.340	0.001	--
		White Spruce	Environmental	Linear Term	0.151 (0.072)	2.091	0.037	--
Red-breasted Nuthatch	2b	(Intercept)	--	Linear Term	19.033 (6.824)	2.789	0.006	--
		JDATE	Environmental	Linear Term	-0.007 (0.006)	-1.306	0.193	--
		Latitude	Environmental	Linear Term	-0.377 (0.122)	-3.081	0.002	--
		Black Spruce Lowlands	Environmental	Linear Term	-0.055 (0.039)	-1.411	0.159	--
		White Spruce	Environmental	Linear Term	0.189 (0.04)	4.758	<0.001	--
		Spline - Age	Environmental	GAM Spline Term	--	5.112	0.004	2.16
		Wide Linear	Disturbance	Linear Term	-0.167 (0.2)	-0.834	0.405	--
		Narrow Linear	Disturbance	Linear Term	-0.573 (0.257)	-2.229	0.027	--
		Wide Linear:Narrow Linear	Disturbance	Interaction Term	0.277 (0.176)	1.574	0.117	--
Red-eyed Vireo	5c	(Intercept)	--	Linear Term	0.173 (5.268)	0.033	0.974	--
		Age	Environmental	Linear Term	-0.004 (0.003)	-1.414	0.158	--
		JDATE	Environmental	Linear Term	0.011 (0.005)	2.366	0.019	--
		Latitude	Environmental	Linear Term	-0.097 (0.093)	-1.042	0.298	--
		Black Spruce Lowlands	Environmental	Linear Term	-0.115 (0.04)	-2.842	0.005	--
		White Spruce	Environmental	Linear Term	-0.108 (0.046)	-2.352	0.019	--
		Total Cluster Area	Environmental	Linear Term	0.007 (0.003)	2.620	0.009	--
		Upland Black Spruce/Pine	Environmental	Linear Term	-0.123 (0.04)	-3.100	0.002	--
		Spline - Hardwood	Environmental	GAM Spline Term	--	14.224	<0.001	2.69
		Harvest Unit	Disturbance	Linear Term	0.369 (0.131)	2.805	0.005	--
		Well	Disturbance	Linear Term	1.048 (0.281)	3.727	<0.001	--
		All Linear	Disturbance	Linear Term	0.669 (0.157)	4.246	<0.001	--
		Harvest Unit:All Linear	Disturbance	Interaction Term	-0.165 (0.081)	-2.030	0.043	--
		Harvest Unit:Well	Disturbance	Interaction Term	-0.214 (0.188)	-1.139	0.256	--
		Well:All Linear	Disturbance	Interaction Term	-0.564 (0.148)	-3.812	<0.001	--
		Harvest Unit:Well:All Linear	Disturbance	Interaction Term	0.125 (0.106)	1.185	0.237	--
Rose-breasted Grosbeak	3b	(Intercept)	--	Linear Term	-0.135 (1.18)	-0.115	0.909	--
		Age	Environmental	Linear Term	-0.004 (0.003)	-1.130	0.259	--
		JDATE	Environmental	Linear Term	-0.013 (0.006)	-2.088	0.038	--
		Black Spruce Lowlands	Environmental	Linear Term	-0.168 (0.042)	-3.980	<0.001	--
		Upland Black Spruce/Pine	Environmental	Linear Term	-0.167 (0.047)	-3.587	<0.001	--
		Spline - Hardwood	Environmental	GAM Spline Term	--	10.793	<0.001	2.89

		Well	Disturbance	Linear Term	1.067 (0.406)	2.631	0.009	--
		Wide Linear	Disturbance	Linear Term	0.201 (0.143)	1.401	0.162	--
		Narrow Linear	Disturbance	Linear Term	0.028 (0.285)	0.097	0.923	--
		Well:Wide Linear	Disturbance	Interaction Term	-0.193 (0.142)	-1.365	0.173	--
		Well:Narrow Linear	Disturbance	Interaction Term	-0.52 (0.319)	-1.633	0.104	--
Ruby-crowned Kinglet	1a	(Intercept)	--	Interaction Term	10.459 (4.726)	2.213	0.028	--
		Open Non-forest	Environmental	Linear Term	0.119 (0.042)	2.859	0.005	--
		JDATE	Environmental	Linear Term	-0.03 (0.005)	-6.551	<0.001	--
		Latitude	Environmental	Linear Term	-0.15 (0.085)	-1.771	0.078	--
		Black Spruce Lowlands	Environmental	Linear Term	0.327 (0.027)	11.926	<0.001	--
		White Spruce	Environmental	Linear Term	0.129 (0.036)	3.590	<0.001	--
		Total Cluster Area	Environmental	Linear Term	-0.01 (0.003)	-3.769	<0.001	--
		Upland Black Spruce/Pine	Environmental	Linear Term	0.252 (0.027)	9.213	<0.001	--
		Spline - Age	Environmental	GAM Spline Term	--	4.397	0.006	2.51
		Spline - Longitude	Environmental	GAM Spline Term	--	4.650	0.004	2.64
White-throated Sparrow	4a	(Intercept)	--	Linear Term	12.275 (3.777)	3.250	0.001	--
		Longitude	Environmental	Linear Term	0.107 (0.034)	3.117	0.002	--
		Black Spruce Lowlands	Environmental	Linear Term	-0.099 (0.023)	-4.253	<0.001	--
		White Spruce	Environmental	Linear Term	-0.05 (0.023)	-2.172	0.031	--
		Total Cluster Area	Environmental	Linear Term	-0.003 (0.002)	-1.797	0.073	--
		Upland Black Spruce/Pine	Environmental	Linear Term	-0.119 (0.024)	-4.974	<0.001	--
		Spline - Hardwood	Environmental	GAM Spline Term	--	1.130	0.305	1.42
		Harvest Unit	Disturbance	Linear Term	0.091 (0.024)	3.813	<0.001	--
		All Linear	Disturbance	Linear Term	-0.134 (0.057)	-2.361	0.019	--
Winter Wren	1a	(Intercept)	--	Linear Term	-5.284 (0.752)	-7.027	<0.001	--
		Age	Environmental	Linear Term	0.011 (0.003)	4.243	<0.001	--
		JDATE	Environmental	Linear Term	0.007 (0.004)	1.734	0.084	--
		Black Spruce Lowlands	Environmental	Linear Term	-0.06 (0.033)	-1.824	0.069	--
		White Spruce	Environmental	Linear Term	0.145 (0.033)	4.338	<0.001	--
		Spline - Hardwood	Environmental	GAM Spline Term	--	2.165	0.103	2.06
		Spline - Latitude	Environmental	GAM Spline Term	--	11.192	<0.001	2.66
Yellow-bellied Sapsucker	3b	(Intercept)	--	Linear Term	15.177 (7.39)	2.054	0.041	--
		JDATE	Environmental	Linear Term	0.016 (0.005)	2.894	0.004	--
		Longitude	Environmental	Linear Term	0.183 (0.066)	2.751	0.006	--
		Black Spruce Lowlands	Environmental	Linear Term	-0.144 (0.042)	-3.409	0.001	--



		White Spruce	Environmental	Linear Term	0.079 (0.041)	1.928	0.055	--
		Spline - Hardwood	Environmental	GAM Spline Term	--	6.233	0.001	--
		Well	Disturbance	Linear Term	1.023 (0.406)	2.521	0.012	--
		Wide Linear	Disturbance	Linear Term	0.236 (0.135)	1.751	0.081	--
		Narrow Linear	Disturbance	Linear Term	-0.165 (0.264)	-0.623	0.534	--
		Well:Wide Linear	Disturbance	Interaction Term	-0.328 (0.146)	-2.240	0.026	--
		Well:Narrow Linear	Disturbance	Interaction Term	-0.625 (0.329)	-1.903	0.058	--
Yellow-rumped Warbler	4a	(Intercept)	Environmental	Linear Term	-0.26 (0.329)	-0.79	0.431	--
		Black Spruce Lowlands	Environmental	Linear Term	0.043 (0.014)	3.07	0.002	--
		Total Cluster Area	Environmental	Linear Term	-0.004 (0.002)	-2.36	0.019	--
		Upland Black Spruce/Pine	Environmental	Linear Term	0.102 (0.014)	7.31	<0.001	--
		Spline - Latitude	Environmental	GAM Spline Term	--	12.403	<0.001	--
		Spline - Longitude	Environmental	GAM Spline Term	--	21.649	<0.001	--
		Harvest Unit	Disturbance	Linear Term	-0.073 (0.019)	-3.81	<0.001	--
		All Linear	Disturbance	Linear Term	0.04 (0.046)	0.87	0.384	--