

Supplementary Material

Table S1. Start dates for mammal monitoring at each site, using chew cards exposed for three nights. T treatment, NT non-treatment.

Monitoring period	Alexander (T)	Taipo (NT)	Wilberforce (T)	Harper (NT)
Winter 2012	01/07/12	08/08/12	30/06/12	19/06/12
Summer 2012/13	18/12/12	11/12/12	27/11/12	20/01/13
Summer 2013/14	03/12/13	10/12/13	21/01/14	14/01/14
Summer 2014/15	16/02/15	02/03/15	11/02/15	02/02/15

Table S2. Possum relative abundance: Generalised linear mixed effect output of models testing whether sites on the East and West Coasts varied in relative possum abundance prior to 1080 application.

Coast	Variable	Estimate	SE	z.value	p.value
East Coast	(Intercept)	-1.582	0.455	-3.474	0.001
East Coast	SiteWilberforce	-0.940	0.707	-1.330	0.184
West Coast	(Intercept)	-1.537	0.675	-2.276	0.023
West Coast	SiteTaipo	-0.036	0.897	-0.040	0.968

Table S3. Possum relative abundance: Generalised linear mixed effect output of model testing whether relative possum abundance on the East Coast differed in their abundance before and after 1080 was applied to the Wilberforce site in 2012. One monitoring period (summer 2012/13) had to be excluded from this analysis because of complete separation.

Variable	Estimate	SE	z.value	p.value
(Intercept)	-1.681	0.535	-3.140	0.002
SiteWilberforce	-0.981	0.830	-1.181	0.238
SeasonSummer 2013/14	4.673	0.909	5.142	0.000
SeasonSummer 2014/15	5.102	1.008	5.060	0.000
SiteWilberforce:SeasonSummer 2013/14	-6.188	1.552	-3.987	0.000
SiteWilberforce:SeasonSummer 2014/15	-4.322	1.291	-3.349	0.001

Table S4. Possum relative abundance: Generalised linear mixed effect outputs of modelled changes in relative possum abundance over time in untreated (no-1080) sites.

Area	Variable	Estimate	SE	z.value	p.value
East Coast	(Intercept)	1.308	0.393	3.330	0.001
East Coast	Season_SWinter 2012	-2.873	0.527	-5.454	0.000
East Coast	Season_SSummer 2013/14	1.511	0.691	2.186	0.029
East Coast	Season_SSummer 2014/15	1.941	0.802	2.419	0.016
West Coast	(Intercept)	-1.067	0.353	-3.025	0.002
West Coast	Season_SWinter 2012	-0.346	0.482	-0.717	0.473
West Coast	Season_SSummer 2013/14	1.397	0.437	3.196	0.001
West Coast	Season_SSummer 2014/15	1.837	0.450	4.086	0.000

Table S5. Mouse relative abundance: Generalised linear mixed effect output of two models testing how mouse abundance changed at sites on the (a) East and (b) West Coasts over time.

Coast	Variable	Estimate	SE	z.value	p.value
East Coast	(Intercept)	-2.466	0.536	-4.605	0.000
East Coast	SeasonSummer 2012/13	-0.955	0.778	-1.228	0.219
East Coast	SeasonSummer 2013/14	-1.681	0.935	-1.799	0.072
East Coast	SeasonSummer 2014/15	2.308	0.526	4.386	0.000
East Coast	treatmenttreatment	1.434	0.666	2.154	0.031
East Coast	SeasonSummer 2012/13:treatmenttreatment	-1.752	1.080	-1.622	0.105
East Coast	SeasonSummer 2013/14:treatmenttreatment	2.892	0.990	2.921	0.003
East Coast	SeasonSummer 2014/15:treatmenttreatment	0.287	0.682	0.421	0.674
West Coast	(Intercept)	-3.203	0.652	-4.915	0.000
West Coast	SeasonSummer 2012/13	-1.049	1.023	-1.026	0.305
West Coast	SeasonSummer 2013/14	1.530	0.647	2.367	0.018
West Coast	SeasonSummer 2014/15	0.092	0.785	0.118	0.906
West Coast	treatmenttreatment	1.056	0.813	1.298	0.194
West Coast	SeasonSummer 2012/13:treatmenttreatment	-1.971	1.481	-1.330	0.183
West Coast	SeasonSummer 2013/14:treatmenttreatment	-1.571	0.820	-1.916	0.055
West Coast	SeasonSummer 2014/15:treatmenttreatment	-2.767	1.315	-2.104	0.035

Table S6. Rat relative abundance: Generalised linear mixed effect outputs of modelled relative rat abundance over time at the Mt Alexander site (1080-treated, West Coast).

Variable	Estimate	SE	z.value	p.value
(Intercept)	-3.570	1.194	-2.990	0.003
SeasonSummer 2013/14	2.314	1.098	2.108	0.035
SeasonSummer 2014/15	3.190	1.099	2.902	0.004
SeasonWinter 2012	2.440	1.103	2.212	0.027

Table S7. Bird mean per 5-minute count at each site each season. Summarised raw averages of bird count data (mean per 5 minute count) separated by monitoring period, species, and site. The species are ordered by the 'Abundance' column, which provides the total number of birds counted across all time periods and sites (repeated on every line for that species).

Monitoring period	Species	Abundance	Harper	Mt Alexander	Taipo	Wilberforce
Winter 2012	bellbirds	3785	0.75	1.25	1.79	1.75
Summer 2012/13	bellbirds	3785	0.77	0.39	0.91	1.62
Summer 2013/14	bellbirds	3785	0.91	2.61	1.62	2.3
Summer 2014/15	bellbirds	3785	0.84	3.33	0.78	6.34
Winter 2012	silvereeye	3308	0.68	0.07	0.68	0.71
Summer 2012/13	silvereeye	3308	1.15	0.59	0.79	1.71
Summer 2013/14	silvereeye	3308	1.94	1.26	1.18	2.04
Summer 2014/15	silvereeye	3308	0.65	6.12	1.68	1.89
Winter 2012	tomtit	1984	0.09	0.17	0.72	0.04
Summer 2012/13	tomtit	1984	0.21	0.81	2.68	0.82
Summer 2013/14	tomtit	1984	0.12	1.63	2.66	0.98
Summer 2014/15	tomtit	1984	0.14	1.28	1.39	1.54
Winter 2012	rifleman	1935	1.59	0.75	0.91	0.66
Summer 2012/13	rifleman	1935	1.68	0.54	0.34	1.11
Summer 2013/14	rifleman	1935	1.84	0.48	0.27	1.41
Summer 2014/15	rifleman	1935	2.41	0.20	0.04	0.51
Winter 2012	chaffinch	1754	0.55	1.48	0.43	0.15
Summer 2012/13	chaffinch	1754	2.34	0.40	0.03	1.67
Summer 2013/14	chaffinch	1754	1.91	0.89	0.09	0.99
Summer 2014/15	chaffinch	1754	1.37	0.16	0.05	0.42
Winter 2012	browncreepers	1604	1.15	0.85	0.28	0.10
Summer 2012/13	browncreepers	1604	2.59	0.63	0.18	0.57
Summer 2013/14	browncreepers	1604	2.21	0.26	0.28	0.72
Summer 2014/15	browncreepers	1604	0.83	0.42	0.38	0.38
Winter 2012	grey warbler	1472	0.04	0.50	0.76	0
Summer 2012/13	grey warbler	1472	0.77	1.04	0.94	0.75

Table S7. Continued.

Monitoring period	Species	Abundance	Harper	Mt Alexander	Taipo	Wilberforce
Summer 2013/14	grey warbler	1472	0.83	0.84	0.84	0.58
Summer 2014/15	grey warbler	1472	0.52	0.98	0.86	0.93
Winter 2012	blackbirds	889	0.02	0.07	0	0.16
Summer 2012/13	blackbirds	889	0.26	0.69	0.89	0.46
Summer 2013/14	blackbirds	889	0.27	1.31	1.18	0.75
Summer 2014/15	blackbirds	889	0.24	0.09	0.08	0.11
Winter 2012	fantail	565	0.02	0.07	0	0
Summer 2012/13	fantail	565	0.10	0.43	0.10	0.15
Summer 2013/14	fantail	565	0.07	0.31	0.12	0.06
Summer 2014/15	fantail	565	0.19	1.37	0.35	0.56
Winter 2012	tui	402	0	0	0.01	0
Summer 2012/13	tui	402	0.04	1.17	0.49	0.01
Summer 2013/14	tui	402	0.01	0.74	0.42	0
Summer 2014/15	tui	402	0	0.20	0.02	0
Winter 2012	redpoll	333	0	0	0	0
Summer 2012/13	redpoll	333	0	0	0	0.04
Summer 2013/14	redpoll	333	0.80	0	0	1.02
Summer 2014/15	redpoll	333	0.14	0	0	0.22
Winter 2012	song thrush	142	0	0	0	0
Summer 2012/13	song thrush	142	0.03	0.10	0.01	0.18
Summer 2013/14	song thrush	142	0.01	0.26	0.04	0.29
Summer 2014/15	song thrush	142	0	0	0	0.03
Winter 2012	longtailed cuckoo	133	0	0	0	0
Summer 2012/13	longtailed cuckoo	133	0.28	0.03	0	0.15
Summer 2013/14	longtailed cuckoo	133	0.17	0.01	0.02	0.22
Summer 2014/15	longtailed cuckoo	133	0	0	0	0.01
Winter 2012	kereru	105	0	0.28	0.01	0
Summer 2012/13	kereru	105	0	0.13	0	0
Summer 2013/14	kereru	105	0	0.21	0.01	0.01
Summer 2014/15	kereru	105	0	0.25	0	0
Winter 2012	kea	103	0.01	0	0.11	0
Summer 2012/13	kea	103	0.11	0	0.06	0.01
Summer 2013/14	kea	103	0.09	0.05	0.05	0
Summer 2014/15	kea	103	0.08	0.06	0.14	0
Winter 2012	finch	62	0	0	0	0
Summer 2012/13	finch	62	0.14	0	0	0.09
Summer 2013/14	finch	62	0.05	0.06	0	0.02
Summer 2014/15	finch	62	0	0.01	0	0.03
Winter 2012	black backed gull	51	0	0.10	0	0
Summer 2012/13	black backed gull	51	0.01	0.21	0	0.03
Summer 2013/14	black backed gull	51	0	0	0	0.02
Summer 2014/15	black backed gull	51	0.01	0.07	0	0.01
Winter 2012	kakariki	50	0	0.05	0	0
Summer 2012/13	kakariki	50	0	0.04	0.04	0
Summer 2013/14	kakariki	50	0	0.01	0	0
Summer 2014/15	kakariki	50	0	0.16	0.07	0.03
Winter 2012	weka	49	0	0.05	0.01	0
Summer 2012/13	weka	49	0	0.01	0.01	0
Summer 2013/14	weka	49	0	0.13	0	0
Summer 2014/15	weka	49	0	0.11	0.03	0
Winter 2012	goldfinch	38	0	0	0	0
Summer 2012/13	goldfinch	38	0.10	0	0	0.01
Summer 2013/14	goldfinch	38	0	0	0	0.03
Summer 2014/15	goldfinch	38	0	0.04	0	0.07
Winter 2012	dunnock	30	0	0	0	0.04
Summer 2012/13	dunnock	30	0.03	0	0	0.01
Summer 2013/14	dunnock	30	0.09	0	0	0.02
Summer 2014/15	dunnock	30	0	0.01	0	0.01
Winter 2012	greenfinch	26	0	0	0	0
Summer 2012/13	greenfinch	26	0.01	0.02	0	0
Summer 2013/14	greenfinch	26	0.01	0.05	0.01	0.03
Summer 2014/15	greenfinch	26	0.01	0.01	0	0.02
Winter 2012	hedge sparrow	19	0	0	0	0.16
Summer 2012/13	hedge sparrow	19	0	0.04	0	0
Summer 2013/14	hedge sparrow	19	0	0.01	0	0
Summer 2014/15	hedge sparrow	19	0	0	0	0

Table S7. Continued.

Monitoring period	Species	Abundance	Harper	Mt Alexander	Taipo	Wilberforce
Winter 2012	magpies	19	0	0.03	0	0.04
Summer 2012/13	magpies	19	0	0	0	0.04
Summer 2013/14	magpies	19	0.01	0	0	0.02
Summer 2014/15	magpies	19	0	0	0	0.03
Winter 2012	falcon	17	0	0	0.01	0
Summer 2012/13	falcon	17	0	0	0.02	0.01
Summer 2013/14	falcon	17	0.02	0	0	0.02
Summer 2014/15	falcon	17	0.01	0.01	0.01	0.01
Winter 2012	canada goose	13	0	0	0	0
Summer 2012/13	canada goose	13	0	0	0	0
Summer 2013/14	canada goose	13	0	0	0	0
Summer 2014/15	canada goose	13	0	0	0	0.08
Winter 2012	swallow	12	0	0	0	0
Summer 2012/13	swallow	12	0	0	0	0
Summer 2013/14	swallow	12	0.04	0	0	0
Summer 2014/15	swallow	12	0.03	0	0	0
Winter 2012	shining cuckoo	9	0	0	0	0
Summer 2012/13	shining cuckoo	9	0	0.03	0	0
Summer 2013/14	shining cuckoo	9	0	0.03	0	0
Summer 2014/15	shining cuckoo	9	0	0	0	0
Winter 2012	robin	7	0	0	0	0
Summer 2012/13	robin	7	0	0.01	0	0
Summer 2013/14	robin	7	0	0	0.01	0
Summer 2014/15	robin	7	0	0.03	0.01	0
Winter 2012	hawk	5	0	0	0	0
Summer 2012/13	hawk	5	0	0	0	0.02
Summer 2013/14	hawk	5	0	0	0	0.02
Summer 2014/15	hawk	5	0	0	0	0
Winter 2012	kaka	4	0	0	0	0
Summer 2012/13	kaka	4	0	0	0	0
Summer 2013/14	kaka	4	0	0	0	0
Summer 2014/15	kaka	4	0	0.01	0.03	0
Winter 2012	rock pigeon	3	0	0	0	0.01
Summer 2012/13	rock pigeon	3	0	0.02	0	0
Summer 2013/14	rock pigeon	3	0	0	0	0
Summer 2014/15	rock pigeon	3	0	0	0	0
Winter 2012	skylark	3	0	0	0	0
Summer 2012/13	skylark	3	0.01	0	0	0
Summer 2013/14	skylark	3	0	0.01	0	0
Summer 2014/15	skylark	3	0	0	0	0
Winter 2012	paradise duck	2	0	0	0	0
Summer 2012/13	paradise duck	2	0	0	0	0
Summer 2013/14	paradise duck	2	0	0.01	0	0
Summer 2014/15	paradise duck	2	0	0	0	0
Winter 2012	starlings	2	0	0	0	0
Summer 2012/13	starlings	2	0	0.01	0	0
Summer 2013/14	starlings	2	0	0.01	0	0
Summer 2014/15	starlings	2	0	0	0	0
Winter 2012	yellowhammer	1	0	0	0	0
Summer 2012/13	yellowhammer	1	0.01	0	0	0
Summer 2013/14	yellowhammer	1	0	0	0	0
Summer 2014/15	yellowhammer	1	0	0	0	0

Table S8. Modelled changes in bird abundance: Generalised linear mixed effect output of models testing how relative bird abundance changed over time. We modelled each species separately.

Species	Variable	Estimate	SE	z.value	p.value
bellbirds	(Intercept)	0.049	0.148	0.330	0.741
bellbirds	treatmenttreatment	0.346	0.213	1.628	0.104
bellbirds	SeasonSummer 2012/13	-0.313	0.112	-2.792	0.005
bellbirds	SeasonSummer 2013/14	0.057	0.103	0.551	0.582
bellbirds	SeasonSummer 2014/15	-0.355	0.112	-3.181	0.001
bellbirds	treatmenttreatment:SeasonSummer 2012/13	-0.032	0.154	-0.205	0.838
bellbirds	treatmenttreatment:SeasonSummer 2013/14	0.405	0.142	2.858	0.004
bellbirds	treatmenttreatment:SeasonSummer 2014/15	1.467	0.145	10.090	0.000
blackbirds	(Intercept)	-4.649	0.768	-6.052	0.000
blackbirds	treatmenttreatment	2.729	0.782	3.490	0.000
blackbirds	SeasonSummer 2012/13	3.866	0.706	5.473	0.000
blackbirds	SeasonSummer 2013/14	4.086	0.705	5.799	0.000
blackbirds	SeasonSummer 2014/15	2.727	0.716	3.809	0.000
blackbirds	treatmenttreatment:SeasonSummer 2012/13	-2.466	0.753	-3.275	0.001
blackbirds	treatmenttreatment:SeasonSummer 2013/14	-2.195	0.750	-2.928	0.003
blackbirds	treatmenttreatment:SeasonSummer 2014/15	-3.261	0.779	-4.185	0.000
browncreepers	(Intercept)	-1.613	0.441	-3.660	0.000
browncreepers	treatmenttreatment	-0.642	0.649	-0.989	0.323
browncreepers	SeasonSummer 2012/13	0.589	0.222	2.654	0.008
browncreepers	SeasonSummer 2013/14	0.808	0.220	3.676	0.000
browncreepers	SeasonSummer 2014/15	-0.081	0.233	-0.346	0.729
browncreepers	treatmenttreatment:SeasonSummer 2012/13	0.027	0.363	0.073	0.942
browncreepers	treatmenttreatment:SeasonSummer 2013/14	-0.471	0.365	-1.288	0.198
browncreepers	treatmenttreatment:SeasonSummer 2014/15	0.230	0.377	0.611	0.541
chaffinch	(Intercept)	-1.584	0.627	-2.528	0.011
chaffinch	treatmenttreatment	0.714	0.755	0.946	0.344
chaffinch	SeasonSummer 2012/13	0.931	0.155	6.007	0.000
chaffinch	SeasonSummer 2013/14	0.760	0.156	4.862	0.000
chaffinch	SeasonSummer 2014/15	0.412	0.163	2.532	0.011
chaffinch	treatmenttreatment:SeasonSummer 2012/13	-0.314	0.227	-1.384	0.166
chaffinch	treatmenttreatment:SeasonSummer 2013/14	-0.246	0.231	-1.066	0.287
chaffinch	treatmenttreatment:SeasonSummer 2014/15	-1.221	0.251	-4.867	0.000
fantail	(Intercept)	-4.637	0.735	-6.306	0.000
fantail	treatmenttreatment	0.743	0.915	0.812	0.417
fantail	SeasonSummer 2012/13	2.206	0.719	3.069	0.002
fantail	SeasonSummer 2013/14	2.063	0.717	2.875	0.004
fantail	SeasonSummer 2014/15	3.140	0.701	4.476	0.000
fantail	treatmenttreatment:SeasonSummer 2012/13	0.095	0.924	0.103	0.918
fantail	treatmenttreatment:SeasonSummer 2013/14	-0.094	0.924	-0.102	0.919
fantail	treatmenttreatment:SeasonSummer 2014/15	0.450	0.905	0.497	0.619
grey warbler	(Intercept)	-1.269	0.178	-7.114	0.000
grey warbler	treatmenttreatment	-0.715	0.291	-2.452	0.014
grey warbler	SeasonSummer 2012/13	1.061	0.162	6.548	0.000
grey warbler	SeasonSummer 2013/14	1.073	0.160	6.710	0.000
grey warbler	SeasonSummer 2014/15	0.852	0.165	5.164	0.000
grey warbler	treatmenttreatment:SeasonSummer 2012/13	0.595	0.283	2.100	0.036
grey warbler	treatmenttreatment:SeasonSummer 2013/14	0.417	0.283	1.473	0.141
grey warbler	treatmenttreatment:SeasonSummer 2014/15	0.940	0.284	3.309	0.001
rifleman	(Intercept)	-0.224	0.463	-0.485	0.628
rifleman	treatmenttreatment	-0.385	0.332	-1.158	0.247
rifleman	SeasonSummer 2012/13	-0.118	0.089	-1.329	0.184
rifleman	SeasonSummer 2013/14	-0.059	0.085	-0.697	0.486
rifleman	SeasonSummer 2014/15	0.122	0.087	1.399	0.162
rifleman	treatmenttreatment:SeasonSummer 2012/13	0.204	0.175	1.164	0.244
rifleman	treatmenttreatment:SeasonSummer 2013/14	0.303	0.172	1.757	0.079
rifleman	treatmenttreatment:SeasonSummer 2014/15	-0.806	0.187	-4.313	0.000
silvereye	(Intercept)	-0.729	0.165	-4.404	0.000
silvereye	treatmenttreatment	-0.270	0.267	-1.011	0.312
silvereye	SeasonSummer 2012/13	0.204	0.168	1.215	0.224
silvereye	SeasonSummer 2013/14	0.767	0.160	4.799	0.000
silvereye	SeasonSummer 2014/15	0.211	0.170	1.240	0.215
silvereye	treatmenttreatment:SeasonSummer 2012/13	0.820	0.264	3.111	0.002
silvereye	treatmenttreatment:SeasonSummer 2013/14	0.401	0.257	1.558	0.119
silvereye	treatmenttreatment:SeasonSummer 2014/15	1.718	0.262	6.559	0.000
tomtit	(Intercept)	-1.592	0.668	-2.383	0.017

Table S8. Continued.

Species	Variable	Estimate	SE	z.value	p.value
tomtit	treatmenttreatment	-0.829	0.932	-0.889	0.374
tomtit	SeasonSummer 2012/13	1.252	0.146	8.578	0.000
tomtit	SeasonSummer 2013/14	1.209	0.144	8.382	0.000
tomtit	SeasonSummer 2014/15	0.633	0.152	4.156	0.000
tomtit	treatmenttreatment:SeasonSummer 2012/13	1.017	0.353	2.878	0.004
tomtit	treatmenttreatment:SeasonSummer 2013/14	1.506	0.350	4.298	0.000
tomtit	treatmenttreatment:SeasonSummer 2014/15	2.118	0.354	5.990	0.000

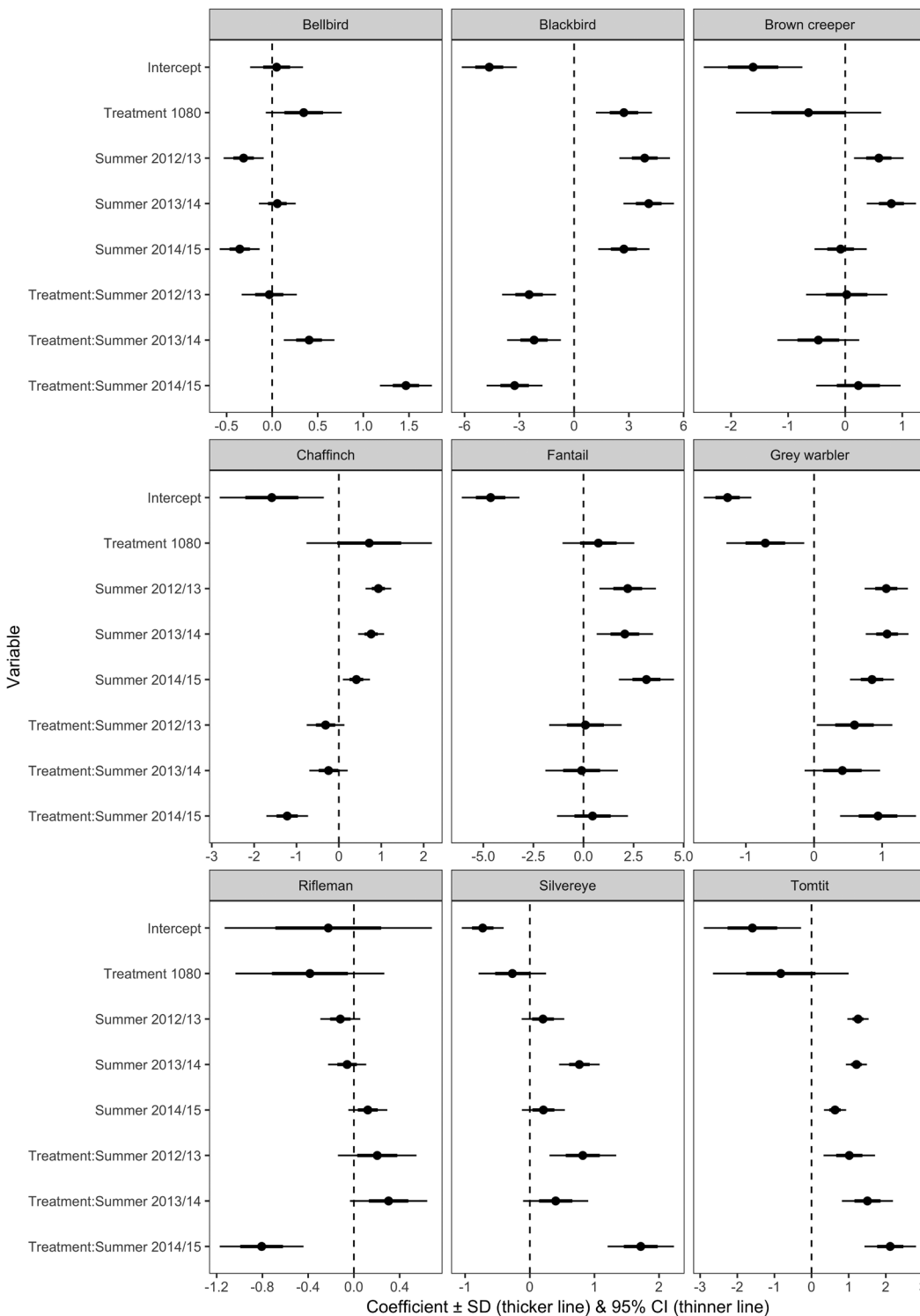


Figure S1. Coefficients (mean \pm confidence intervals) for each bird species from GLMMs testing for effects of time, treatment, and time x treatment. The 1080 treatment effect is tested by the time x treatment interactions. Where confidence intervals do not overlap zero the effect was significant.