

**S2 Table. Alternative model outputs for each of the 22 species included in the study. A) 'Stepped' interpolation for those years where pesticide surveys did not take place (all odd years).** Neonicotinoid usage was assumed to be the same in years where no data were available, as the preceding year (rather than being estimated by a linear interpolation). These data are presented as a means to test the sensitivity of the model to interpolation approaches used. **B) Chronic toxicity values used to calculate the toxicity equivalency factor (TEF).** Chronic LOAEL values (at the 5% tail of acute sensitivity distribution for avian species) were used (rather than acute LD50 values for bobwhite quail *Colinus virginianus*) to calculate the TEF for the three compounds included in the study. Calculations were based on information provided in Table 3.2 of Mineau & Palmer (2013). These data are presented as a means to test the sensitivity of the model to differences between acute and chronic TEFs.

Species	Latin	Model	Model output (A): stepped interpolation					Model output (B): chronic TEF				
			Estimate	SE	p-value	ODR	RMSE	Estimate	SE	p-value	ODR	RMSE
Chaffinch	<i>Fringilla coelebs</i>	QP	0.000802	0.000126	<0.001	0.94	4.58	0.000841	0.000124	<0.001	0.93	4.58
Corn Bunting	<i>Miliaria calandra</i>	QP	0.000397	0.000529	0.453	1.25	2.25	0.000483	0.000530	0.362	1.25	2.25
Goldfinch	<i>Carduelis carduelis</i>	QP	<b>-0.000307</b>	0.00022	0.163	0.98	3.3	<b>-0.000283</b>	0.000215	0.189	0.98	3.30
Greenfinch	<i>Carduelis chloris</i>	QP	0.000840	0.000212	<0.001	1.04	3.59	0.000795	0.000209	<0.001	1.04	3.59
Grey Partridge	<i>Perdix perdix</i>	QP	0.000907	0.000425	<b>0.033</b>	0.67	1.11	0.001015	0.000420	<b>0.016</b>	0.67	1.11
House Sparrow	<i>Passer domesticus</i>	QP	<b>-0.000920</b>	0.000214	<0.001	0.93	7.98	<b>-0.000923</b>	0.000214	<0.001	0.93	7.98
Jackdaw	<i>Corvus monedula</i>	QP	<b>-0.000172</b>	0.000245	0.481	1.24	10.24	<b>-0.000188</b>	0.000240	0.433	1.24	<b>10.24</b>
Kestrel	<i>Falco tinnunculus</i>	P	0.000470	0.000289	0.104	0.81	0.6	0.000546	0.000282	0.053	0.81	0.60
Lapwing	<i>Vanellus vanellus</i>	QP	0.000663	0.000388	0.088	1.68	6.44	0.000605	0.000380	0.111	<b>1.68</b>	6.44
Linnet	<i>Carduelis cannabina</i>	QP	0.001217	0.000273	<0.001	1.15	4.84	0.001409	0.000268	<0.001	1.15	4.84
Red-legged Partridge	<i>Alectoris rufa</i>	QP	<b>-0.001422</b>	0.000243	<0.001	0.74	1.75	<b>-0.001407</b>	0.000244	<0.001	0.74	1.75
Reed Bunting	<i>Emberiza schoeniclus</i>	QP	0.001488	0.000335	<0.001	0.84	1.25	0.000661	0.000320	<b>0.039</b>	0.84	1.25
Rook	<i>Corvus frugilegus</i>	QP	0.001615	0.000285	<0.001	1.14	27.25	0.001617	0.000280	<0.001	1.14	<b>27.25</b>
Skylark	<i>Alauda arvensis</i>	QP	<b>-0.000308</b>	0.000139	<b>0.027</b>	0.97	3.46	<b>-0.000245</b>	0.000138	0.076	0.97	3.46
Starling	<i>Sturnus vulgaris</i>	QP	0.001207	0.000242	<0.001	1.9	20.71	0.001177	0.000239	<0.001	<b>1.92</b>	<b>20.71</b>
Stock Dove	<i>Columbus oenas</i>	QP	<b>-0.000045</b>	0.000283	0.874	1.4	3.01	<b>-0.000010</b>	0.000280	0.973	1.47	3.01
Tree Sparrow	<i>Passer montanus</i>	QP	0.001687	0.000728	<b>0.021</b>	0.83	2.56	0.001649	0.000713	<b>0.021</b>	0.83	2.56
Turtle Dove	<i>Streptopelia turtur</i>	QP	<b>-0.002318</b>	0.000526	<0.001	0.74	0.95	<b>-0.002071</b>	0.000524	<0.001	0.74	0.95
Whitethroat	<i>Sylvia communis</i>	QP	<b>-0.000215</b>	0.000198	0.276	0.85	1.94	<b>-0.000152</b>	0.000195	0.437	0.85	1.94
Woodpigeon	<i>Columbus palumbus</i>	NB	0.000769	0.000155	<0.001	1.11	21.06	0.000735	0.000153	<0.001	1.11	<b>21.06</b>
Yellow Wagtail	<i>Motacilla flava</i>	QP	0.000507	0.000444	0.254	0.75	1.42	0.000623	0.000445	0.162	0.75	1.42
Yellowhammer	<i>Emberiza citrinella</i>	QP	0.000390	0.000206	0.058	0.85	2.34	0.000511	0.000204	<b>0.012</b>	0.85	2.34

Numbers in bold indicate those species with negative estimates (Estimate), models that are over dispersed (ODR) and species with estimates that have a p-value of < 0.05 (p-value), and species with RMSE >10 (RMSE). LOAEL: lowest-observed-adverse-effect level; SE: Standard error; ODR: Over dispersion ratio; RMSE: root mean squared error; QP: quasi-Poisson; P: Poisson; n/a: not available.