Appendix 2. AICc tables for abundance modeling

The abundance of Greater Sage-Grouse as a proxy for the abundance of sagebrush-associated songbirds in Wyoming, USA

Tables detailing the AICc model-selection results for the abundance-modeling stage of the analysis (stage 2). Generalized linear mixed models (GLMMs) were fit to songbird data collected during 144 surveys in central Wyoming, USA, 2012–2013. The distribution assumed in the GLMM varied by model, but the same fixed and random effects were included in all models.

Table A2.1. Model-selection results comparing candidate generalized linear mixed models to estimate Brewer's Sparrow abundance (*N*) in central Wyoming, USA, 2012–2013. All models included the probability of detection estimated in stage 1 of the analysis as an offset term to effectively model songbird density corrected for detectability.

Model	Distribution[†]	K[‡]	AICc[§]	ΔAICc[|]	*w*[¶]
N ~ PopulationIndex + PelletCount + Year + (1|Cluster)	ZINB	7	777.52	0.00	1.00
N ~ PopulationIndex + PelletCount + Year + (1|Cluster)	NB	6	788.14	10.62	0.00
N ~ PopulationIndex + PelletCount + Year + (1|Cluster)	ZIP	6	798.53	21.02	0.00
N ~ PopulationIndex + PelletCount + Year + (1|Cluster)	P	5	842.37	64.85	0.00

[†]Distribution assumed for the response variable. P = Poisson, NB = Negative Binomial, ZIP = zero-inflated Poisson, ZINB = zero-inflated Negative Binomial.
[‡]Number of parameters.
[§]Second-order variant of Akaike's Information Criterion.
[|]Difference in AICc between the model and the top-ranked model in the set.
[¶]Model weight.

Table A2.2. Model-selection results comparing candidate generalized linear mixed models to estimate Sagebrush Sparrow abundance (*N*) in central Wyoming, USA, 2012–2013. All models included the probability of detection estimated in stage 1 of the analysis as an offset term to effectively model songbird density corrected for detectability.

Model	**Distribution**[†]	**K**[‡]	**AICc**[§]	**ΔAICc**[|]	***w***[¶]
N ~ PopulationIndex + PelletCount + Year + (1|Cluster)	P	5	221.28	0.00	0.60
N ~ PopulationIndex + PelletCount + Year + (1|Cluster)	ZIP	6	223.44	2.16	0.20
N ~ PopulationIndex + PelletCount + Year + (1|Cluster)	NB	6	223.46	2.18	0.20
N ~ PopulationIndex + PelletCount + Year + (1|Cluster)	ZINB	7	N/A	N/A	N/A

[†]Distribution assumed for the response variable. P = Poisson, NB = Negative Binomial, ZIP = zero-inflated Poisson, ZINB = zero-inflated Negative Binomial.

[‡]Number of parameters.

[§]Second-order variant of Akaike's Information Criterion. N/A for models that did not converge.

[|]Difference in AICc between the model and the top-ranked model in the set. N/A for models that did not converge.

[¶]Model weight. N/A for models that did not converge.

Table A2.3. Model-selection results comparing candidate generalized linear mixed models to estimate Sage Thrasher abundance (*N*) in central Wyoming, USA, 2012–2013. All models included the probability of detection estimated in stage 1 of the analysis as an offset term to effectively model songbird density corrected for detectability.

Model	Distribution[†]	K[‡]	AICc[§]	ΔAICc[|]	*w*[¶]
N ~ PopulationIndex + PelletCount + Year + (1|Cluster)	P	5	398.08	0.00	0.75
N ~ PopulationIndex + PelletCount + Year + (1|Cluster)	ZIP	6	400.26	2.18	0.25
N ~ PopulationIndex + PelletCount + Year + (1|Cluster)	NB	6	N/A	N/A	N/A
N ~ PopulationIndex + PelletCount + Year + (1|Cluster)	ZINB	7	N/A	N/A	N/A

[†]Distribution assumed for the response variable. P = Poisson, NB = Negative Binomial, ZIP = zero-inflated Poisson, ZINB = zero-inflated Negative Binomial.

[‡]Number of parameters.

[§]Second-order variant of Akaike's Information Criterion. N/A for models that did not converge.

[|]Difference in AICc between the model and the top-ranked model in the set. N/A for models that did not converge.

[¶]Model weight. N/A for models that did not converge.

Table A2.4. Model-selection results comparing candidate generalized linear mixed models to estimate Horned Lark abundance (*N*) in central Wyoming, USA, 2012–2013. All models included the probability of detection estimated in stage 1 of the analysis as an offset term to effectively model songbird density corrected for detectability.

Model	Distribution[†]	K[‡]	AICc[§]	ΔAICc[|]	*w*[¶]
N ~ PopulationIndex + PelletCount + Year + (1|Cluster)	ZINB	7	864.48	0.00	1.00
N ~ PopulationIndex + PelletCount + Year + (1|Cluster)	NB	6	875.13	10.65	0.00
N ~ PopulationIndex + PelletCount + Year + (1|Cluster)	ZIP	6	936.75	72.27	0.00
N ~ PopulationIndex + PelletCount + Year + (1|Cluster)	P	5	990.57	126.09	0.00

[†]Distribution assumed for the response variable. P = Poisson, NB = Negative Binomial, ZIP = zero-inflated Poisson, ZINB = zero-inflated Negative Binomial.
[‡]Number of parameters.
[§]Second-order variant of Akaike's Information Criterion.
[|]Difference in AICc between the model and the top-ranked model in the set.
[¶]Model weight.

Table A2.5. Model-selection results comparing candidate generalized linear mixed models to estimate Vesper Sparrow abundance (*N*) in central Wyoming, USA, 2012–2013. All models included the probability of detection estimated in stage 1 of the analysis as an offset term to effectively model songbird density corrected for detectability.

Model	Distribution[†]	K[‡]	AICc[§]	ΔAICc[|]	*w*[¶]
N ~ PopulationIndex + PelletCount + Year + (1|Cluster)	NB	6	607.39	0.00	0.75
N ~ PopulationIndex + PelletCount + Year + (1|Cluster)	ZINB	7	609.60	2.21	0.25
N ~ PopulationIndex + PelletCount + Year + (1|Cluster)	ZIP	6	690.92	83.53	0.00
N ~ PopulationIndex + PelletCount + Year + (1|Cluster)	P	5	755.89	148.50	0.00

[†]Distribution assumed for the response variable. P = Poisson, NB = Negative Binomial, ZIP = zero-inflated Poisson, ZINB = zero-inflated Negative Binomial.
[‡]Number of parameters.
[§]Second-order variant of Akaike's Information Criterion.
[|]Difference in AICc between the model and the top-ranked model in the set.
[¶]Model weight.

Table A2.6. Model-selection results comparing candidate generalized linear mixed models to estimate Western Meadowlark abundance (*N*) in central Wyoming, USA, 2012–2013. All models included the probability of detection estimated in stage 1 of the analysis as an offset term to effectively model songbird density corrected for detectability.

Model	Distribution[†]	K[‡]	AICc[§]	ΔAICc[|]	*w*[¶]
N ~ PopulationIndex + PelletCount + Year + (1|Cluster)	P	5	196.61	0.00	0.55
N ~ PopulationIndex + PelletCount + Year + (1|Cluster)	NB	6	198.66	2.05	0.20
N ~ PopulationIndex + PelletCount + Year + (1|Cluster)	ZIP	6	198.78	2.18	0.19
N ~ PopulationIndex + PelletCount + Year + (1|Cluster)	ZINB	7	200.87	4.26	0.07

[†]Distribution assumed for the response variable. P = Poisson, NB = Negative Binomial, ZIP = zero-inflated Poisson, ZINB = zero-inflated Negative Binomial.
[‡]Number of parameters.
[§]Second-order variant of Akaike's Information Criterion.
[|]Difference in AICc between the model and the top-ranked model in the set.
[¶]Model weight.