

Appendix 2. Tables of results for covariate reduction and model selection.

Appendix 2a. Parameter estimates for the detection model that included all *a priori* covariates from a dynamic occupancy model and accounted for detection probability and misclassification of subspecies for Florida Grasshopper Sparrow at Avon Park Air Force Range, FL, USA surveyed from 1991–2011. Using 85% CIs, we retained DATE² as a covariate for misclassification; DATE³ as a covariate for certainty; and HOUR as a covariate for detection (Table S1). We retained these detection covariates for subsequent analyses using BLISS for further covariate reduction and Gibbs variable selection for final model selection.

Response variable	Parameter	Covariate	Mean	95% LCI	95% UCI	85% LCI	85% UCI
Detection	β_0	Intercept	-1.10	-1.52	-0.69	-1.41	-0.80
Detection	β_1	DATE	-0.01	-0.12	0.10	-0.09	0.07
Detection	β_2	DATE ²	0.07	-0.02	0.17	0.00	0.14
Detection	β_3	HOUR	-0.40	-0.52	-0.28	-0.49	-0.31
Detection	β_4	HOUR ²	-0.01	-0.10	0.09	-0.08	0.07
Certainty	α_0	Intercept	9.98	7.36	13.21	7.90	12.32
Certainty	α_1	DATE	56.20	41.41	74.53	44.32	69.29
Certainty	α_2	DATE ²	65.30	45.10	89.58	49.28	82.69
Certainty	α_3	DATE ³	22.73	14.62	32.76	16.41	29.68
Misclassification	δ_0	Intercept	-6.03	-7.18	-5.08	-6.84	-5.30
Misclassification	δ_1	DATE	-5.72	-7.94	-3.88	-7.27	-4.28
Misclassification	δ_2	DATE ²	-2.60	-3.81	-1.58	-3.44	-1.80

Appendix 2b. Covariates used for Bayesian latent indicator scale selection (BLISS) to evaluate which spatial scale and function was the best predictor.

Covariate	Description	Units	Spatial buffer	Summary function	Mean (SD)	Range		
SEAS	Seasonality of the most recent burn from 5-m resolution pixels within the spatial buffer of the point count location. Pixel values could range from zero (1 Jan) to 2π (31 Dec). This covariate was included as two components: the sine and cosine transformed covariates, i.e., sinSEAS and cosSEAS.	radians	100-m	minimum	1.15 (0.99)	0.04–6.23		
YSF			400-m	minimum	1.11 (1.20)	0.05–6.21		
	Years-since-fire from 5-m resolution pixels within the spatial buffer for each point count location. Pixel values could range from zero to 35.	years	100-m	mean	1.75 (1.56)	0.01–20.16		
					minimum	0.91 (1.37)	0.00–20.16	
						maximum	4.10 (3.81)	0.01–31.01
					400-m	mean	2.03 (1.34)	0.08–19.12
						minimum	0.27 (0.50)	0.00–6.08
						maximum	11.93 (6.69)	0.08–34.02

Appendix 2c. Bayesian latent indicator scale selection (BLISS) for variable reduction to compare correlated covariates within a dynamic occupancy model that accounted for detection probability and misclassification of subspecies for Florida Grasshopper Sparrow. Covariates receiving the greatest support (probability) in each BLISS set were retained for subsequent analysis. We retained maximum years-since-fire within 400 m (YSF, 1.0 probability) and seasonality within 100 m (SEAS, 1.0 probability) as covariates for persistence. We also retained minimum years-since-fire squared within 400 m (YSF², 0.89 probability) and seasonality within 100 m (SEAS, 1.0 probability) as covariates for colonization. Retained covariates are indicated in bold font.

Response variable	BLISS set	Covariate	Probability
Persistence	1	mean YSF 100 m	0.00
Persistence	1	min YSF 100 m	0.00
Persistence	1	max YSF 100 m	0.00
Persistence	1	mean YSF 400 m	0.00
Persistence	1	min YSF 400 m	0.00
Persistence	1	max YSF 400 m	1.00
Persistence	1	mean YSF 100 m ²	0.00
Persistence	1	min YSF 100 m ²	0.00
Persistence	1	max YSF 100 m ²	0.00
Persistence	1	mean YSF 400 m ²	0.00
Persistence	1	min YSF 400 m ²	0.00
Persistence	1	max YSF 400 m ²	0.00
Persistence	2	SEAS 100 m	1.00
Persistence	2	SEAS 400 m	0.00
Colonization	3	mean YSF 100 m	0.00
Colonization	3	min YSF 100 m	0.00
Colonization	3	max YSF 100 m	0.00
Colonization	3	mean YSF 400 m	0.00
Colonization	3	min YSF 400 m	0.00

Colonization	3	max YSF 400 m	0.00
Colonization	3	mean YSF 100 m ²	0.00
Colonization	3	min YSF 100 m ²	0.00
Colonization	3	max YSF 100 m ²	0.11
Colonization	3	mean YSF 400 m ²	0.00
Colonization	3	min YSF 400 m²	0.89
Colonization	3	max YSF 400 m ²	0.00
Colonization	4	SEAS 100 m	1.00
Colonization	4	SEAS 400 m	0.00
