Appendix 1. Supplementary materials.

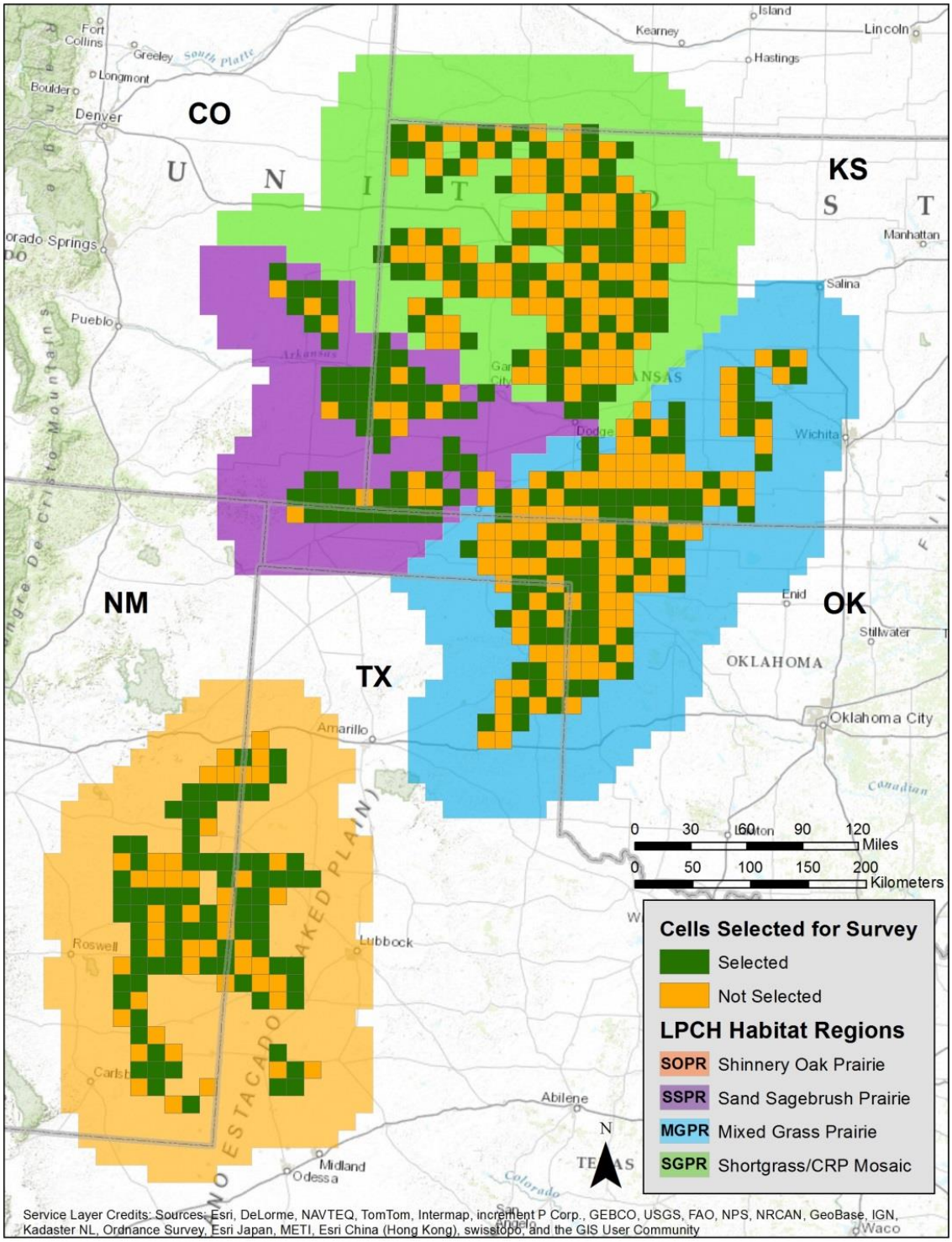

Fig. A1.1. Study area map showing 15-km × 15-km grid cells surveyed for lesser prairie-chickens, 2016. The colored areas surrounding each ecoregion indicate an approximate 77.7-km (30-mi) buffer into which the survey may be expanded in the future.

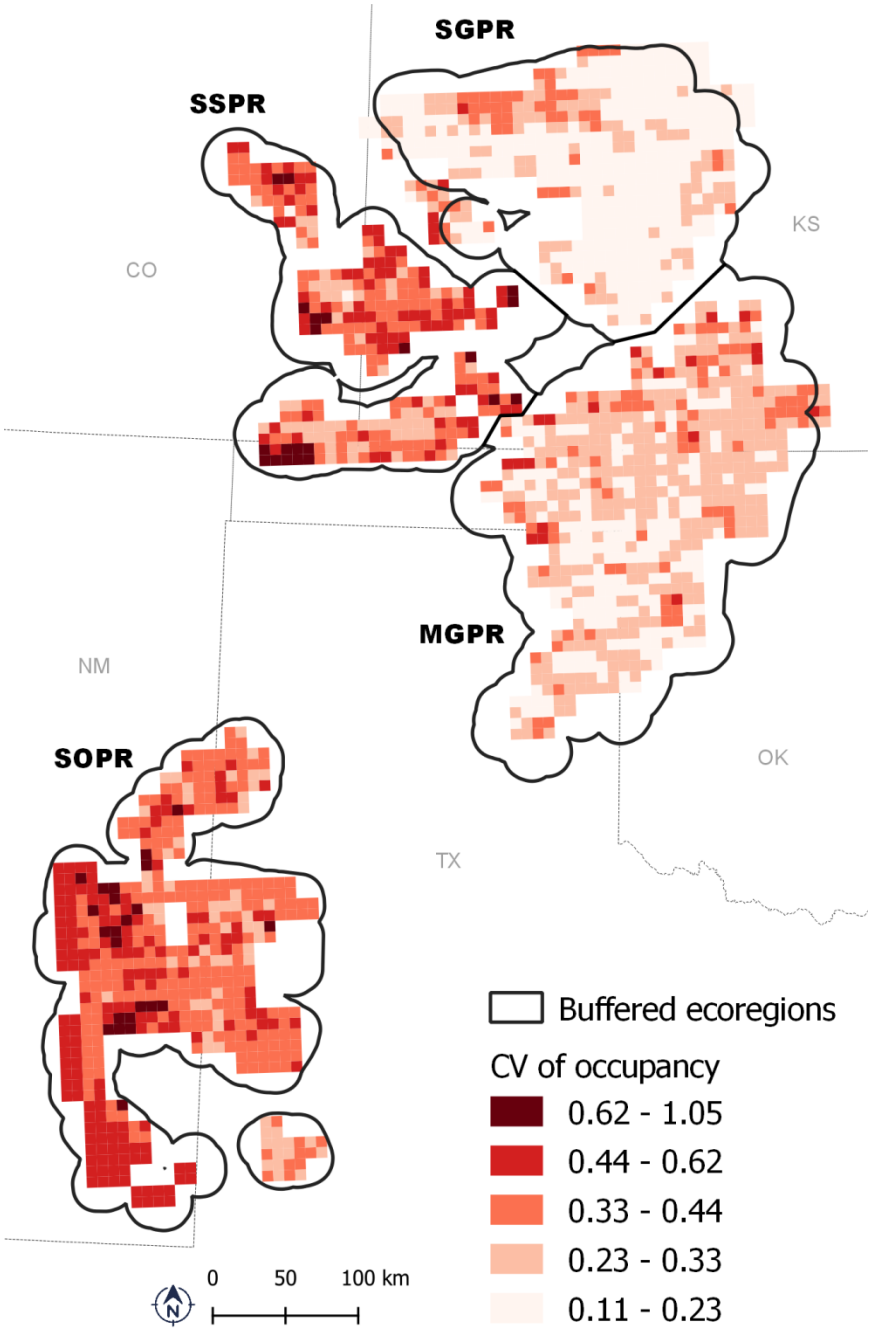

Fig. A1.2. Coefficient of variation (CV) of model-averaged predictions of unconditional small-scale occupancy probability ($\psi^*\theta$) for the lesser prairie-chicken at 7.5-km × 7.5-km quadrants. Black polygons represent the occupied range of the LEPC plus a 16-km buffer, divided into four ecoregions used in conservation planning (SGPR = Shortgrass/CRP Mosaic, SSPR = Sand Sagebrush Prairie, MGPR = Mixed Grass Prairie, SOPR = Shinnery Oak Prairie).

Table A1.1. Model selection for the large-scale occupancy (ψ), small-scale occupancy (θ), and detection (*p*) of the lesser prairie-chicken from the range-wide monitoring program, 2012–2016. The model-selection metrics are the value of the minimized −2 log-likelihood function [$-2\log_e(\mathcal{L})$], parameter number (*K*), Akaike's Information Criterion adjusted for sample size (AIC_c), difference between model and minimum AIC_c value (a) and AIC_c weight (w_i). Models with $\Delta AIC_c < 4$ are shown.

Model	*K*	-2log($\mathcal{L}$)	AIC_c	ΔAIC_c	w_i
ψ(.) θ(Ecoregion) *p*(Date + Observer + Ecoregion + Trend)	12	2651.69	2675.91	0.00	0.075
ψ(.) θ(Ecoregion) *p*(Observer + Time + Trend)	9	2657.88	2676.01	0.10	0.071
ψ(.) θ(Ecoregion) *p*(Date + Observer + Ecoregion + Time + Trend)	13	2649.87	2676.14	0.23	0.067
ψ(.) θ(Ecoregion) *p*(Observer + Trend)	8	2660.30	2676.40	0.49	0.058
ψ(.) θ(Ecoregion) *p*(Date + Observer + Time + Trend)	10	2656.42	2676.57	0.66	0.054
ψ(.) θ(Ecoregion) *p*(Observer + Time)	8	2660.69	2676.79	0.88	0.048
ψ(.) θ(Ecoregion) *p*(Date + Observer + Trend)	9	2658.92	2677.05	1.14	0.042
ψ(.) θ(Ecoregion) *p*(Observer + Ecoregion + Trend)	11	2655.67	2677.86	1.95	0.028
ψ(.) θ(Ecoregion + Year) *p*(Observer + Time + Trend)	13	2651.70	2677.96	2.05	0.027
ψ(.) θ(Ecoregion) *p*(Observer)	7	2663.96	2678.04	2.13	0.026
ψ(.) θ(Ecoregion) *p*(Observer + Ecoregion + Time + Trend)	12	2653.85	2678.08	2.17	0.025
ψ(.) θ(Ecoregion + Year) *p*(Observer + Time)	12	2653.91	2678.14	2.23	0.024
ψ(.) θ(Ecoregion) *p*(Date + Observer + Time)	9	2660.32	2678.45	2.54	0.021
ψ(.) θ(Ecoregion + Year) *p*(Observer + Trend)	12	2654.39	2678.61	2.70	0.019
ψ(.) θ(Ecoregion + Year) *p*(Date + Observer + Ecoregion + Time + Trend)	17	2644.43	2678.87	2.96	0.017
ψ(.) θ(Ecoregion + Year) *p*(Date + Observer + Time + Trend)	14	2650.60	2678.91	3.00	0.017
ψ(.) θ(Ecoregion + Year) *p*(Date + Observer + Ecoregion + Trend)	16	2646.59	2678.98	3.08	0.016
ψ(.) θ(Ecoregion) *p*(Observer + Ecoregion + Time)	11	2656.95	2679.14	3.23	0.015
ψ(.) θ(Ecoregion) *p*(Observer + Ecoregion)	10	2659.52	2679.68	3.77	0.011
ψ(.) θ(Ecoregion + Year) *p*(Date + Observer + Trend)	13	2653.43	2679.69	3.78	0.011
ψ(.) θ(Ecoregion + Year) *p*(Date + Observer + Time)	13	2653.52	2679.78	3.87	0.011
ψ(.) θ(Ecoregion + Year) *p*(Observer)	11	2657.62	2679.81	3.90	0.011
ψ(.) θ(Ecoregion) *p*(Date + Observer + Ecoregion + Time)	12	2655.63	2679.85	3.94	0.010
ψ(.) θ(Ecoregion) *p*(Date + Observer)	8	2663.75	2679.85	3.94	0.010

Table A1.2. Parameter estimates, Standard Errors (SE), and Lower and Upper 90% Confidence Limits (LCL and UCL, respectively) for the detection (*p*) of the lesser prairie-chicken from the best and second best model and range-wide monitoring program, 2012–2016.

Model					
	Parameter	Estimate	SE	LCL	UCL
Model 1					
	p(intercept)	-3.185	1.393	-5.476	-0.893
	p(MGPR)	-0.648	0.330	-1.191	-0.105
	p(SSPR)	0.445	0.452	-0.299	1.189
	p(SOPR)	-0.549	0.363	-1.146	0.048
	p(Date)	0.026	0.013	0.004	0.048
	p(Observer)	1.017	0.170	0.737	1.298
	p(Trend)	0.221	0.085	0.080	0.361
Model 2					
	p(intercept)	-0.871	0.315	-1.390	-0.352
	p(Time)	0.288	0.185	-0.017	0.593
	p(Observer)	1.027	0.171	0.745	1.309
	p(Trend)	0.129	0.077	0.002	0.257

Table A1.3. Plausible combinations model selection for large-scale occupancy (ψ) of the lesser prairie-chicken from the range-wide monitoring program, 2012–2016. The model-selection metrics are the value of the minimized -2 log-likelihood function -2$\log_e(\mathcal{L})$], parameter number (*K*), Akaike's Information Criterion adjusted for sample size (AIC_c), difference between model and minimum AIC_c value (ΔAIC_c) and AIC_c weight (w_i). High-weight submodels with w_i < 0.001 and high likelihood submodels with -2log($\mathcal{L}$) < maximum -2log($\mathcal{L}$) of high weight models are shown.

Model [a]	*K*	-2log(*L*)	AIC_c	ΔAIC_c	w_i
ψ(CRP + GrassPatch + Shrub)	17	2545.03	2579.48	0.00	0.697
ψ(CRP + CRP^2 + GrassPatch + Shrub)	18	2544.67	2581.17	1.69	0.299

Table A1.4. Plausible combinations model selection for small-scale occupancy (θ) of the lesser prairie-chicken from the range-wide monitoring program, 2012–2016. The model-selection metrics are the value of the minimized -2 log-likelihood function -2$\log_e(\mathcal{L})$], parameter number (K), Akaike's Information Criterion adjusted for sample size (AIC_c), difference between model and minimum AIC_c value (ΔAIC_c) and AIC_c weight (w_i). High-weight submodels with w_i < 0.001 and high-likelihood submodels with -2log($\mathcal{L}$) < maximum -2log($\mathcal{L}$) of high weight models are shown.

Model [a]	K	-2log($\mathcal{L}$)	AIC_c	ΔAIC_c	w_i
θ(CRP + Grass + Grass^2 + Shrub + Ecoregion + Ecoregion*CRP + Ecoregion*Grass^2)	28	2494.53	2551.71	0.00	0.803
θ(CRP + Grass + Shrub + Ecoregion + Ecoregion*CRP + Ecoregion*Grass)	27	2500.13	2555.23	3.52	0.138
θ(CRP + Grass + Grass^2 + Shrub + Ecoregion + Ecoregion*CRP + Ecoregion*Grass)	28	2500.13	2557.31	5.60	0.049

[a] All models include p(Ecoregion + Year + Observer) and ψ(Year).

Table A1.5. Plausible combinations model selection for detection (p) of the lesser prairie-chicken from the range-wide monitoring program, 2012–2016. The model-selection metrics are the value of the minimized -2 log-likelihood function $-2\log_e(\mathcal{L})$], parameter number (K), Akaike's Information Criterion adjusted for sample size (AIC_c), difference between model and minimum AIC_c value (ΔAIC_c) and AIC_c weight (w_i). High-weight submodels with $w_i < 0.001$ and high likelihood submodels with $-2\log(\mathcal{L})$ < maximum $-2\log(\mathcal{L})$ of high weight models are shown.

Model [a]	K	$-2\log(\mathcal{L})$	AIC_c	ΔAIC_c	w_i
p(Time + Observer + Trend)	13	2654.00	2680.26	0.00	0.140
p(Observer + Trend)	12	2656.36	2680.59	0.33	0.119
p(Time + Observer)	12	2656.69	2680.91	0.65	0.101
p(Ecoregion + Date + Observer + Trend)	16	2648.70	2681.10	0.84	0.092
p(Date + Time + Observer + Trend)	14	2652.98	2681.29	1.03	0.084
p(Date + Observer + Trend)	13	2655.46	2681.72	1.46	0.068
p(Ecoregion + Observer + Trend)	15	2651.69	2682.03	1.77	0.058
p(Observer)	11	2660.06	2682.25	1.99	0.052
p(Ecoregion + Time + Observer + Trend)	16	2649.94	2682.33	2.07	0.050
p(Date + Time + Observer)	13	2656.44	2682.71	2.45	0.041
p(Ecoregion + Time + Observer)	15	2652.94	2683.28	3.02	0.031
p(Ecoregion + Observer)	14	2655.61	2683.92	3.66	0.023
p(Year + Ecoregion + Date + Observer)	19	2645.61	2684.16	3.90	0.020
p(Date + Observer)	12	2659.95	2684.18	3.92	0.020
p(Ecoregion + Date + Time + Observer)	16	2651.91	2684.30	4.05	0.019
p(Year + Time + Observer)	16	2651.92	2684.31	4.06	0.018
p(Year + Observer)	15	2654.19	2684.54	4.28	0.016
p(Year + Date + Time + Observer)	17	2650.55	2684.99	4.73	0.013
p(Ecoregion + Date + Observer)	15	2654.83	2685.18	4.92	0.012
p(Year + Date + Observer)	16	2653.13	2685.52	5.27	0.010

[a] All models include θ(Ecoregion) and ψ(Year).