SUPPLEMENTAL MATERIAL

18 September 2015

Wallace, Z. P., P. L. Kennedy, J. R. Squires, L. E. Olson, and R. J. Oakleaf. 2015. Human-made Structures, Vegetation, and Weather Influence Ferruginous Hawk Breeding Performance. Journal of Wildlife Management.

Table S1. Summary statistics for continuous covariates used in models of daily nest survival for ferruginous hawks in Wyoming, USA, 2010–2012. We estimated covariates for a 1.5-km radius putative ferruginous hawk breeding territory and averaged daily covariates over observation intervals. Covariates are defined in Table 1 and below[a].

Covariate category	Covariate name	Units	Mean	Min.	Max.
Prey abundance	squirrel	*n*	92.48	0.00	777.41
	leporid	*n*	27.78	0.00	382.73
	prairie dog	*n*	139.33	0.00	3,218.44
Vegetation	bare	%	44.64	14.92	86.42
	shrub	%	16.55	0.77	38.08
	grass	%	22.24	4.08	64.66
Weather	precip	mm	1.17	0.00	3.19
	temp min	C°	2.83	–0.05	7.01
	temp max	C°	18.43	14	25.36
	storm	*n*	0.03	0.00	0.10
Anthropogenic infrastructure	well dist	m	6,511.17	113.97	19,883.28
	well pad	*n*	2.95	0.00	18.00
	oil road	km	3.31	0.00	18.50
	other road	km	2.86	0.00	13.84

[a]Covariates were defined as follows: squirrel, abundance of ground squirrels (*Urocitellus* spp.); leporid, abundance of leporids (*Sylvilagus* spp., *Lepus townsendii*); prairie dog, abundance of white-tailed prairie dogs (*Cynomys leucurus*); bare, cover of bare ground; shrub, combined cover of all shrub genera; grass, combined cover of all grass species; temp min, minimum daily temperature; temp max, maximum daily temperature; precip, total daily precipitation; storm, number of days with severe storm events (hail, heavy rain, heavy snow, high wind, thunderstorm wind, winter storms); well dist, distance to nearest active oil and gas well pad; well pad, number of active oil and gas well pads; oil road, length of improved roads associated with oil and gas fields; other road, length of improved roads not associated with oil and gas fields.

Table S2. Summary statistics for continuous covariates used in models of fledgling production for ferruginous hawks in Wyoming, USA, 2010–2012. We estimated covariates for a 1.5-km radius putative ferruginous hawk breeding territory. We averaged or summed daily covariates over monthly periods and pooled over months that were strongly correlated. Covariates are defined in Table 1 and below[a].

Covariate category	Covariate name	Units	Mean	Min.	Max.
Prey abundance	squirrel	*n*	88.59	0.00	777.41
	leporid	*n*	28.65	0.00	382.73
	prairie dog	*n*	147.16	0.00	3,218.44
Vegetation	bare	%	44.63	14.92	86.42
	shrub	%	16.22	0.77	38.10
	grass	%	22.55	4.08	64.66
Weather	Apr precip	mm	28.92	1.11	65.86
	May precip	mm	45.29	0.30	145.12
	Jun precip	mm	19.35	0.00	78.88
	Apr-Jun temp min	C°	2.07	–0.86	5.52
	Apr-Jun temp max	C°	17.58	13.64	22.97
	Apr storm	*n*	1.09	0.00	5.00
	May storm	*n*	0.76	0.00	4.00
	Jun storm	*n*	1.23	0.00	4.00
Anthropogenic infrastructure	well dist	m	6,272.20	114.00	19,883.30
	well pad	*n*	3.09	0.00	18.00
	oil road	km	3.42	0.00	18.51
	other road	km	2.86	0.00	13.84

[a]Covariates were defined as follows: squirrel, abundance of ground squirrels (*Urocitellus* spp.); leporid, abundance of leporids (*Sylvilagus* spp., *Lepus townsendii*); prairie dog, abundance of white-tailed prairie dogs (*Cynomys leucurus*); bare, cover of bare ground; shrub, combined cover of all shrub genera; grass, combined cover of all grass species; temp min, minimum daily temperature; temp max, maximum daily temperature; precip, total daily precipitation; storm, number of days with severe storm events (hail, heavy rain, heavy snow, high wind, thunderstorm wind, winter storms); well dist, distance to nearest active oil and gas well pad; well pad, number of active oil and gas well pads; oil road, length of improved roads associated with oil and gas fields; other road, length of improved roads not associated with oil and gas fields.