Ecography

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Supplementary material

Appendix 1

Table A1. Winter Ungulate Resource Selection Models

Comparison of logistic regression models predicting the relative probability of occurrence for 3 ungulate species during winter (October–March). Models were fitted to ungulate sightings from 5 fixed-wing winter aircraft surveys of the West Side of the Athabasca River caribou range, northeastern Alberta, Canada, 2004–2007. The covariates and models for each prey species were formulated using previously published literature from our study area (Bradshaw et al. 1995, Stuart-Smith et al. 1997, James et al. 2004, Osko et al. 2004) as well as more generally within the boreal forest, in combination with our knowledge of the system. Further, given the caribou-centric context of this work, the models were constructed to represent hypothesis related to the use of uplands, peatlands and industrial footprint. Relative measures of model support are shown, including number of estimated parameters (K), Akaike's Information Criterion adjusted for small samples (AIC_c), AIC_c difference (Δ_i), and AIC_c weight (w_i). Values in boldface type indicate the top model for each species.

Model	Variables[a]	K	AIC_c	Δ_i	w_i
Moose					
Global	BG + BU + CM + CY + DC + DS + DU + EL + FN + MX + UC + WT	13	1051	4	0.112
1	BG + BU + CM + DC + DS + DU + EL + FN + MX	10	1052	5	0.074
2	CM + DC + DU + MX	5	1102	55	0
3	BG + BU + CM + DC + DU + FN + MX + UC	9	1054	7	0.024
4	**BG + BU + CM + DC + DU + FN + MX + WT**	**9**	**1047**	**0**	**0.790**
White-tailed deer					
Global	BG + CM + DC + DR + DU + EL + FN + IW_d + LF	12	550	7	0.025

	+ MX + UC				
1	CM + DR + DU + EL+ IW_d + LF + MX +UC	9	565	22	0
2	DC + DU + FN + IW_d + LF + MX	7	549	6	0.044
3	**BG + DC + DR + DU + EL + IW_d + MX + UC**	**9**	**543**	**0**	**0.852**
4	DR + DC + DU + FN + IW_d + LF + MX + UC	9	548	5	0.079
Caribou					
Global	BG + BU + DC + DU + FN + LF	7	228	3	0.177
1	BG + DC + DU + FN + LF	6	233	8	0.014
2	BG + FN + LF	4	241	16	0
3	**BG + BU + DU + FN**	**5**	**225**	**0**	**0.805**
4	BG + DU + FN	4	236	11	0.004

[a] BG = bog, BU = burn, CM = middle-aged cutblock, CY = young-aged cutblock, DR = distance to all-season road, DC = deciduous forest, EL = elevation, DS = distance to stream, DU = distance to upland boundary, FN = fen, IW_d = interpolated winter white-tailed deer abundance, LF = linear feature density, MX = mixed-wood forest, UC = upland conifer forest, WT = water.

Table A2. Summer Ungulate Resource Selection Models

Comparison of logistic regression models predicting the relative probability of occurrence for 3 ungulate species during summer (April–September). Models were fitted to ungulate pellet data from 176 transects surveyed in the West Side of the Athabasca River caribou range, northeastern Alberta, Canada, 2005–2007. The covariates and models for each prey species were formulated using previously published literature from our study area (Bradshaw et al. 1995, Stuart-Smith et al. 1997, James et al. 2004, Osko et al. 2004) as well as more generally within the boreal forest, in combination with our knowledge of the system. Further, given the caribou-centric context of this work, the models were constructed to represent hypothesis related to the use of uplands, peatlands and industrial footprint. Relative measures of model support are shown, including number of estimated parameters (K), Akaike's Information Criterion corrected for small samples (AIC_c), AIC_c difference (Δ_i), and AIC_c weight (w_i). Values in boldface type indicate the top model for each species.

Model	Variables[a]	K	AIC_c	Δ_i	w_i
Moose					
Global	BG + BU + CM + DA + DC + DR + DS + DU + EL + FN + IS_m + LF + DS × FN	14	208	12	0.003
1	BG + BU + DA + DC + DS + DU + IS_m + LF	9	203	7	0.034
2	BU + CM + DC + DS + DU	6	208	12	0.003
3	**BU + FN + DR + IS_m**	**5**	**196**	**0**	**0.837**
4	BU + CM + DS + FN + IS_m + DS × FN	7	200	4	0.124
White-tailed deer					
Global	BG + CM + DA + DC + DR + DS + DU + EL + FN + IS_d + LF + MX + UC	14	157	5	0.080

1	CM + DC + DR + DU + EL + FN + IS_d + LF + MX + UC	11	157	5	0.082
2	**BG + CM + DC + DU + EL + FN + IS_d + MX + UC**	**10**	**152**	**0**	**0.827**
3	DC + EL + IS_d + MX + UC	6	162	10	0.007
4	DA + DC + EL + IS_d + MX + UC	7	163	11	0.003
Caribou					
Global	BG + BU + DC + DU + FN + LF	7	122	4	0.105
1	BG + FN	3	138	19	0
2	BG + BU + FN + LF	5	122	3	0.123
3	BG + BU + DC + FN	5	122	3	0.158
4	**BG + BU + DU + FN**	**5**	**119**	**0**	**0.609**

[a] BG = bog, BU = burn, CM = middle-aged cutblock, DA = distance to the Athabasca river, DC = deciduous forest, DR = distance to all-season road, DS = distance to stream, DU = distance to upland boundary, EL = elevation, FN = fen, IS_d = interpolated summer white-tailed deer pellet abundance, IS_m = interpolated summer moose pellet abundance, LF = linear feature density, MX = mixed-wood forest, UC = upland conifer forest.

Table A3. Beaver Resource Selection Models

Comparison of logistic regression models predicting the relative probability of beaver lodge occurrence. Models were fitted to beaver lodge sightings (n = 743) obtained from a fixed-wing aircraft survey of the West Side of the Athabasca River caribou range, northeastern Alberta, Canada, October 2007. The covariates and models shown below were formulated using previously published literature from our study area (Martell et al. 2006) as well as more generally within the boreal forest, in combination with our knowledge of the system. Relative measures of model support are shown, including number of estimated parameters (K), Akaike's Information Criterion (AIC), AIC difference (Δ_i), and AIC weight (w_i). Values in boldface type indicate the top model.

Model	Variables[a]	K	AIC_c	Δ_i	w_i
Global	BG + DC + DS + EL + FN + MX + WT + DS × FN	9	1838	2	0.214
1	BG + DC + DS + FN + WT	6	1840	4	0.070
2	DC + DS + FN + WT	5	1846	10	0.003
3	BG + DS + FN + WT	5	1847	11	0.002
4	**BG + DC + DS + FN + WT + DS × FN**	**7**	**1836**	**0**	**0.710**

[a] BG = bog, DC = deciduous forest, DS = distance to stream, EL = elevation, FN = fen, MX = mixed-wood forest, WT = water.

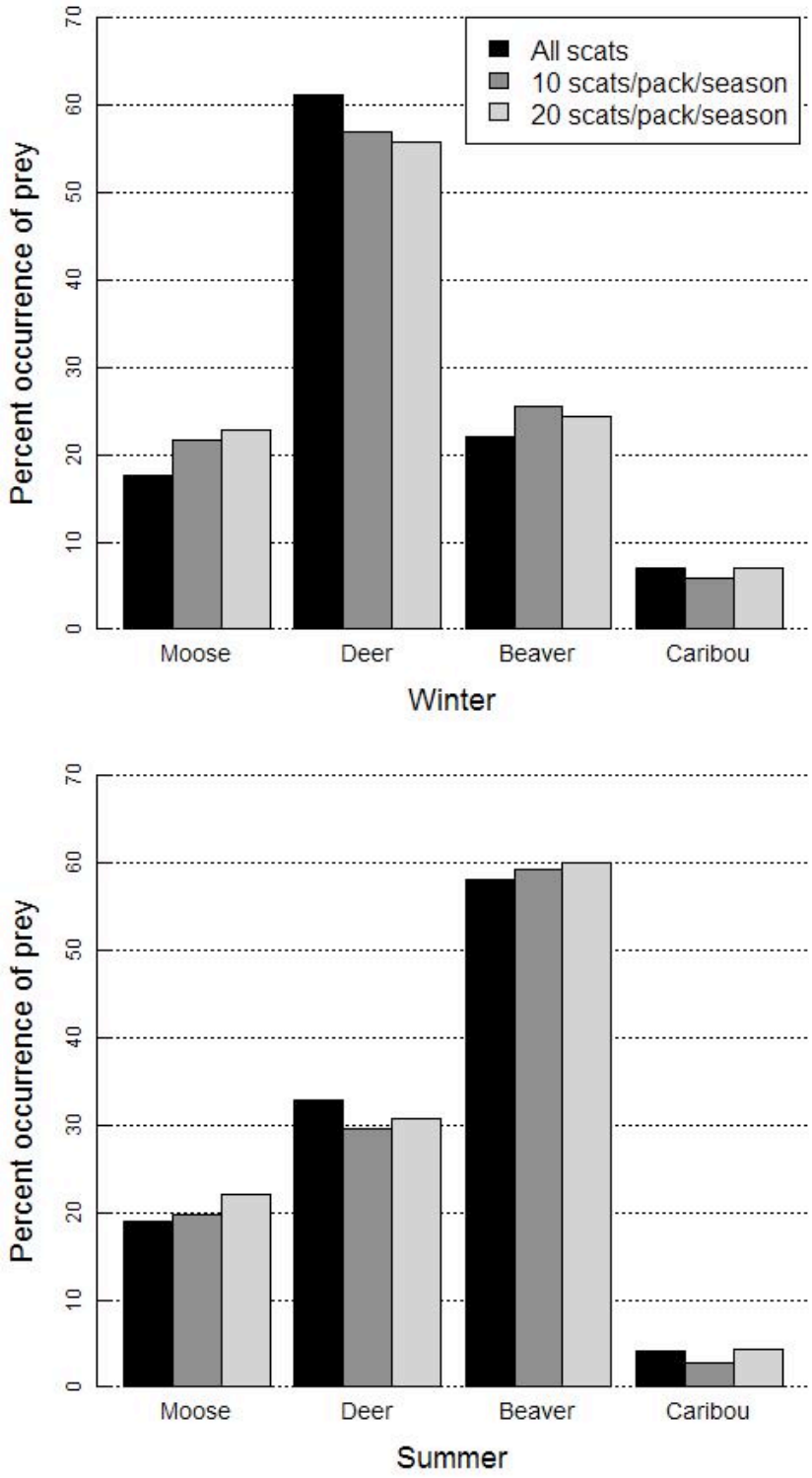

Figure A1.

Differences in the diet (determined from prey remains in scats) of wolves between winter (October–March) and summer (April–September) as determined by: (1) using all scats

collected, (2) 10 random scats per wolf pack per season, and (3) 20 random scats per wolf pack per season. Wolf scats were collected from eight Global Positioning Systems collared packs in the West and East Sides of the Athabasca River caribou ranges, northeastern Alberta, Canada, 2006–2007. Deer = white-tailed deer.

References

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