

Supplementary Material Table S1. Source of raster files of environmental predictors used in our models by categories (aerial and topographical and landcover features).

Features	Predictor	Name	Source	Year
Aerial and topographical	Elevation	High Resolution Digital Elevation Model (HRDEM) - CanElevation Series	Natural Resources Canada	2016
	Terrain ruggedness index	Calculated from Elevation	Natural Resources Canada	2016
	Northness	Calculated from Elevation	Natural Resources Canada	2016
	Eastness	Calculated from Elevation	Natural Resources Canada	2016
	Mean annual wind speed	Average wind speed at 10 m from ground	Global Wind Atlas	2021
Land cover	Forest cover	2010 North American Land Cover 30-meter	Commision de la coopération environnementale	2010
	Distance to water	2010 North American Land Cover 30-meter	Commision de la coopération environnementale	2010

Supplementary Material Table S2. Performance (AIC and Boyce index) of candidate models for landscape, foraging and nesting levels of selection for habitat selection models in breeding golden eagles in Eastern North America. Bold indicates selected model. Abbreviations: TRI = Terrain ruggedness index; mElevation = Mean elevation; rElevation = relative elevation; WindSpeed = Mean annual wind speed; Forest = Forest cover; DistWater = distance to nearest water feature.

Level of selection	Predictors	Mode AIC	Δ AIC (from previous)	% lowest AIC	Mode Boyce index
Landscape	TRI	128	-	0%	0.54
	TRI + mElevation	123	5	19%	0.59
	TRI + mElevation + WindSpeed	123	0	21%	0.56
	TRI + mElevation + DistWater	122	1	31%	0.6
	TRI + mElevation + DistWater + Forest	117	5	29%	0.62
Foraging	TRI	139202	-	0%	0.99
	TRI + rElevation	138322	880	0%	0.99
	TRI + rElevation + Forest	137245	1077	0%	0.99
	TRI + rElevation + Forest + DistWater	135182	2063	3%	0.99
	TRI + rElevation + Forest + DistWater + WindSpeed	134060	1122	97%	0.99
Nest	TRI	1017	-	2%	0.87
	TRI + rElevation	995	22.47	12%	0.79
	TRI + rElevation + Northness	996	-1.47	25%	0.78
	TRI + rElevation + Northness + Eastness	989	7	20%	0.80
	TRI + rElevation + Northness + Eastness + WindSpeed	990	-1	19%	0.73
	TRI + rElevation + Northness + Eastness + DistWater	991	-1	22%	0.77

Supplementary Material Table S3. Summary of individual tracking duration of breeding golden eagles and sample size by bioclimatic zones in Eastern North America.

Bioclimatic zone	Eagle ID	Sex	Year of tracking		No. summers	Total summers	Total individual
			Start	End			
Boreal	27	Female	2011	2012	2	48	13
	GOEA01	Female	2013	2013	1		
	GOEA03	Male	2007	2010	4		
	GOEA04_Manu	Male	2014	2021	8		
	GOEA05	Male	2008	2013	6		
	GOEA08	Male	2009	2018	9		
	GOEA11_Lucky	Male	2018	2018	1		
	GOEA12	Male	2013	2020	8		
	GOEA14_Ti_Louis	Male	2019	2020	2		
	GOEA15_Charlie	Female	2016	2017	2		
	GOEA17_Celia	Female	2017	2018	2		
	GOEA26_Fulton	Male	2020	2021	2		
	Martin_Gap	Male	2014	2014	1		
Polar	252	Female	2016	2016	1	33	17
	30	Female	2014	2014	1		
	319	Male	2008	2008	1		
	35	Male	2014	2016	2		
	36	Male	2013	2013	1		
	572	Male	2018	2018	1		
	70	Female	2015	2015	1		
	73	Female	2017	2018	2		
	74	Unknown	2015	2017	3		
	GOEA10_Jue	Female	2015	2015	1		
	GOEA18_Nakturalik	Female	2018	2021	4		

GOEA19_Alfred	Male	2018	2021	4
GOEA22_Michel	Male	2019	2021	3
GOEA23_Arnaud	Male	2019	2021	3
GOEA24_Charlot	Male	2019	2021	3
GOEA28_Athena	Female	2021	2021	1
GOEA29_Joly	Female	2021	2021	1
