

Table A1.1 Key of covariate abbreviations used in following models. ²denotes the inclusion of a parabolic effect indicating that occupancy/detection will increase then decrease. Surveys completed during May-July 2022 in southern 11 counties of Illinois, USA.

Candidate Model Set	Covariate Abbreviation	Description
Landscape Composition (values summarized using 2019 NLCD)	WAT	Proportion of water cover in subblock
	PAST	Proportion of pasture cover in subblock
	CONI	Proportion of conifer cover in subblock
	CAN	Proportion of forest cover in subblock
	CAN ²	Very high forest cover may lead to decreases in occupancy probability.
Forest Patch Configuration (values summarized using 2019 NLCD)	COR	Mean core area of forest patches
	COR ²	High amounts of core area in the area may lead to decreases in occupancy probability
	CONT	Forest patch contiguity
	PAN	Proportion of forest edge shared with pasture
	URN	Proportion of forest edge shared with urban
	AGN	Proportion of forest edge shared with row crop agriculture
Forest Disturbance History (values summarized using LandTrendr Algorithm and LCMS Land Use)	YSD	Years since most recent disturbance
	MAG	Mean magnitude of disturbances
	MAG ²	Extreme disturbances will likely not yield increases in occupancy probability.
	DUR	Mean duration of disturbances
	CF	Proportion of disturbed area
	CF ²	Large areas of disturbance will likely not yield increases in occupancy probability.
Detection	TMP	Daily high temperature from nearest weather station
	PRECIP	Daily precipitation from CHIRPS
	DOY	Day of year
	DOY ²	Parabolic relationship (peak calling in the middle of the breeding season)
	MP	Moon phase (0-0.5=waxing, 0.5=full moon, 0.5-1=waning)
	MP ²	Parabolic relationship representing peak calling while moon is full.

Table A1.2 Written statements of *a priori* models from each candidate set. Each set included an intercept-only model and all models included intercepts. ² denotes a quadratic relationship of variable. Each model was calculated using the detection model with the lowest AIC value. Surveys completed during May-July 2022 in southern 11 counties of Illinois, USA.

Candidate Model Set	<i>Model Name</i>	Model Statements
Landscape Composition	<i>Global</i>	CONI+PAST+WAT+CAN ²
	<i>Breeding Habitat</i>	CONI+CAN ²
	<i>Foraging Habitat</i>	PAST+WAT
Forest Configuration	<i>Global</i>	CONT+COR ² +URN+AGN+PAN
	<i>Patch Shape</i>	CONT+COR ²
	<i>Edge Composition</i>	URN+AGN+PAN
Disturbance	<i>Global</i>	YSD+DUR+MAG ² +CF ²
	<i>Temporal</i>	YSD+DUR
	<i>Intensity</i>	MAG ² +CF ²
Detection	<i>Global</i>	TMP+PRECIP+DOY ² +MP ²
	<i>Environmental</i>	TMP+PRECIP
	<i>Temporal</i>	DOY ² +MP ²