Appendix F. Moran's *I* spatial correlograms for California condor ecological niche models.

Moran's *I* values, *z*-scores, and *p*-values were calculated at various distance bands (from 10 km - 200 km) for each activity-specific niche model with all occurrence data (solid lines) and for each model after the occurrence data were thinned by removing all locations within 5 km of one another (dashed lines) (see text for details). Peaks in *z*-scores show distances at which spatial clustering is most pronounced. Filled circles represent significant Moran's *I* *z*-scores ($P < 0.05$; reject the null hypothesis of no spatial autocorrelation in model residuals). Open circles represent non-significant Moran's *I* *z*-scores ($P \geq 0.05$) where we failed to reject the null hypothesis of no spatial autocorrelation.

Activity-specific niche models had significant spatial autocorrelation of model residuals (see Figs. F1, F2 & F3). Thinning data by removing points within 5 km of one another reduced spatial autocorrelation in all models (Figs. F1, F2 & F3). Thinned models retained high predictive performance, despite severe reduction in sample size (Table 2).

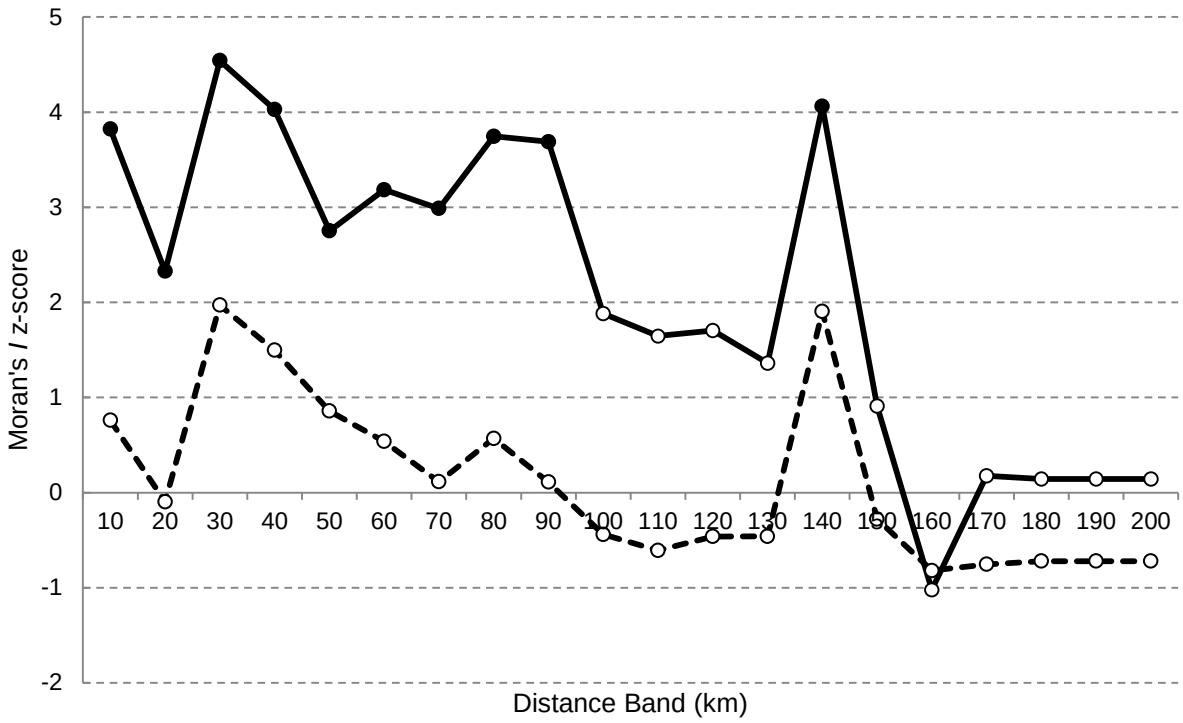

Figure F1. Moran's *I* spatial correlograms for California condor nest models showing the degree of spatial autocorrelation of model residuals at various distance bands for thinned (dashed line) and unthinned (solid line) models. Open circles represent non-significant Moran's *I* *z*-scores ($P \geq 0.05$) and filled circles represent significant Moran's *I* *z*-scores ($P < 0.05$).

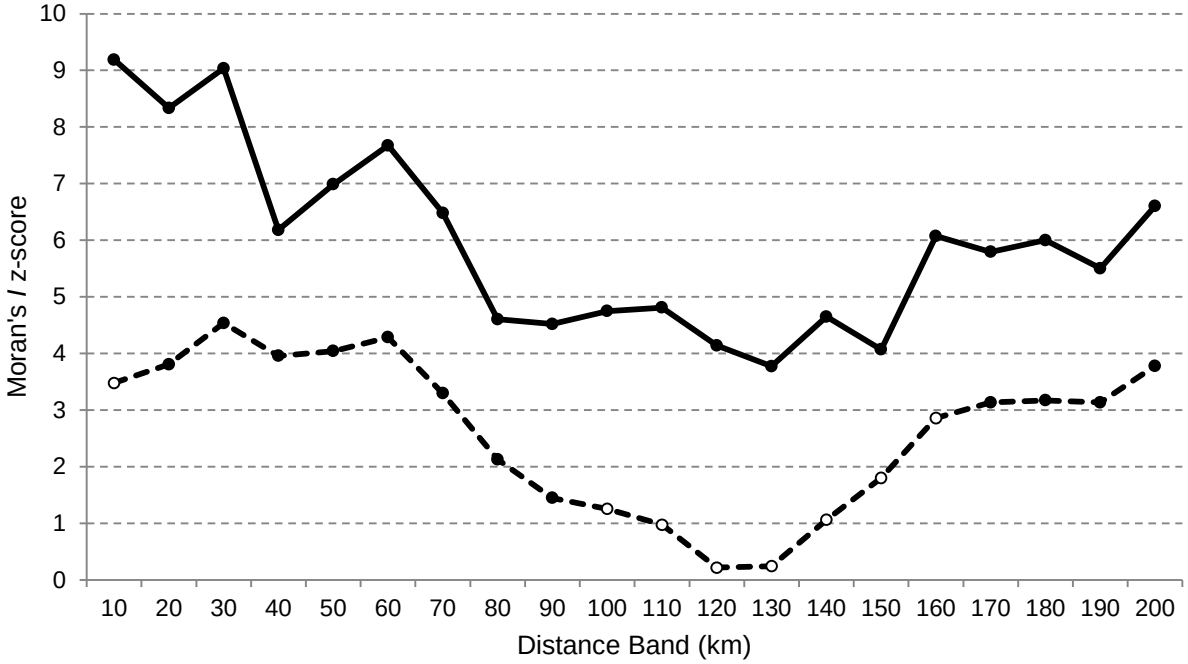

Figure F2. Moran's *I* spatial correlograms for California condor roost model showing the degree of spatial autocorrelation of model residuals at various distance bands for thinned (dashed line) and unthinned (solid line) models. Open circles represent non-significant Moran's *I* *z*-scores ($P \geq 0.05$) and filled circles represent significant Moran's *I* *z*-scores ($P < 0.05$).

Figure F3. Moran's *I* spatial correlograms for California condor feeding model showing the degree of spatial autocorrelation of model residuals at various distance bands for thinned (dashed line) and unthinned (solid line) models. Open circles represent non-significant Moran's *I* *z*-scores ($P \geq 0.05$) and filled circles represent significant Moran's *I* *z*-scores ($P < 0.05$).