

Modeling and identifying roadkill hotspots with professional and crowdsourced data for prioritization of mitigation planning

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This study develops a spatiotemporal roadkill distribution model that utilizes crowdsourced observations and validates it on 12 reptilian species. The model addresses uncertainty by referencing ensemble species distribution models (SDM) that are based on professionally collected data. We also investigate spatiotemporal uncertainty and the implications that it has on seasonal modelling. Our results show both the efficacy of the proposed model and increases in uncertainty attributable to increasing temporal resolution. Therefore, beyond demonstrating the potential that crowdsourced data has in supplementing roadkill mitigation strategies, our analysis illustrates the inverse relationship between temporal resolution and model reliability. When considering this tradeoff, we strongly suggest careful consideration of data availability and the biological relevance of temporal components as suggested from literature and empirical evidence. The model and investigation presented here can provide researchers and decision-makers with useful information and insights for the design of appropriate roadkill mitigation strategies, or, at the very least, areas that are in need of increased surveillance.