**Predicting anthropogenic food supplementation from individual tracking data**

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To understand the effect of anthropogenic food subsidies on wildlife populations, we first need to quantify where and when individuals can access such food sources. The Red Kite *Milvus milvus* is an opportunistic raptor species and uses both inadvertent and deliberate food subsidies provided by members of the public. Here we present a new approach using GPS tracking data to identify where anthropogenic food subsidies occur. We tracked 235 individuals at hourly intervals over an average of 2.9 breeding seasons in Switzerland, and combined these data with locations of 125 known feeding stations obtained through interviews. We used two sequential random forest models, at both individual movement and population levels, to predict where anthropogenic food subsidies are exploited by red kites. The first model classified locations that were frequently and regularly revisited, and successfully predicted 96.2% of locations that were within a 50 m radius of a known feeding site. These predicted locations were aggregated in 500 m grid cells to calculate the proportion of individuals and locations associated with predicted food subsidy. A second model related the presence of known food subsidies to the aggregated predictions. In our study area, 83.2% of known anthropogenic food provision locations could be correctly identified using red kite tracking data, and we show how the locations of such anthropogenic food subsidies can be predicted across the landscape. Biologging data can therefore identify ephemeral food sources, and facilitate an assessment of the importance of anthropogenic food subsidies on tracked populations.