Bat Alert Map

Name of LERC	Thames Valley Environmental Records Centre (TVERC)
Contact for enquiries	*www.tverc.org*
Case study	Bat alert map for household planning applications
Summary	TVERC has created a bat alert map which is designed to be used by ecologists and planners working for the local authorities to help householders decide whether or not they would need a bat survey carried out prior to submitting a planning application.
Issue/project to be addressed	Bats are European protected species which means that the bats, and the places they roost and hibernate are protected from damage and disturbance. This means that when a householder is proposing to carry out works to a roof, a loft conversion or an extension, they need to consider whether those works are likely to affect bats. It is not always clear to householders whether or not a survey is required, which is where the bat alert map is useful. Local authority ecologists spend a significant amount of time determining whether householders putting in applications for work to roof-spaces need to submit a bat survey. Arguably, their limited time would be better spent ensuring that high quality mitigation measures were put in place where there is going to be an impact on biodiversity. Reading Borough Council commissioned TVERC to produce a 'bat alert' map which can be published on the website to indicate to householders whether they need a bat survey. The map is based on bat data TVERC holds and includes information where surveys where carried out for bats, but none were found ('negative' records). We used these bat data along with information about habitats, urban density and building age to

	model where bats choose to roost. We can then use this model to predict where else bats might roost. We then create alert zones which means that if your house is in an alert zone and you are planning works to it, then you will be required to submit a bat survey with your planning application. We are still developing this model (which is a development of the model based on work carried out by Duncan Fisher, Ecologist at Wokingham BC.), but both Reading and Wokingham councils are keen to use a version of it.
Action taken	TVERC approached this in three different ways: 1. Using habitat data, data about the urban environment and bat roost records to create a habitat suitability model for Reading. TVERC analysed this data using the Random Forest method. These analyses identified the key factors that predict the likely presence of bat roosts in Reading. TVERC were able to apply the results of the analysis to the rest of Reading to create an alert map for bat roosts. 2. TVERC created a heat map of bat roosts for Reading, which shows where bat roosts are concentrated in the borough. 3. Using the metrics generated for modelling, and under guidance from Reading Borough Council's ecological advisor, TVERC calculated the mean distances to each habitat and then applied these distances to each grid cell in Reading to create a 'bat max' map of all of the possible locations with similar habitat constraints across the borough. TVERC used the following data to construct the bat alert map: • TVERC and Reading BC bat roost records • TVERC habitats and land use data • Valuation Office Agency data on the decade of construction for buildings

	• OS MasterMap building data
Results/The change that has been made	The three different approaches to the bat alert map taken in this project produce three different solutions to the bat alert map. The random forest model is the most parsimonious, selecting only 39% of the grid squares in Reading. (map 1) The heat map selects 51% of the grid squares (map 2) and the bat max model selects 69% of the grid squares (map 3). There is a great deal of overlap between the different maps G:\Active contract work\P17-23 Reading bat alert map\Outputs\Bat map comparison.jpeg. Both the random forest model and the bat max approach select 48 roost records (40%); only the heat map selects all of the records as this map is based on the location and density of the roost records. There is a balance to be struck between accurately predicting bat roosts in building and asking everyone applicant to carry out a survey for bats as part of a development application. TVERC believe that the relevant local planning authority should decide where to strike this balance. Clearly, the heat map approach correctly selects all existing roosts, but is a poor predictor of where roosts might be. The accuracy of the random forest model is the same as the bat max approach, but the model requires far fewer surveys for the same accuracy. No model can ever be 100% accurate.
Sharing best Practice	Other LERC's could offer a similar service to their Local authorities.
Any other information	

Map 1.

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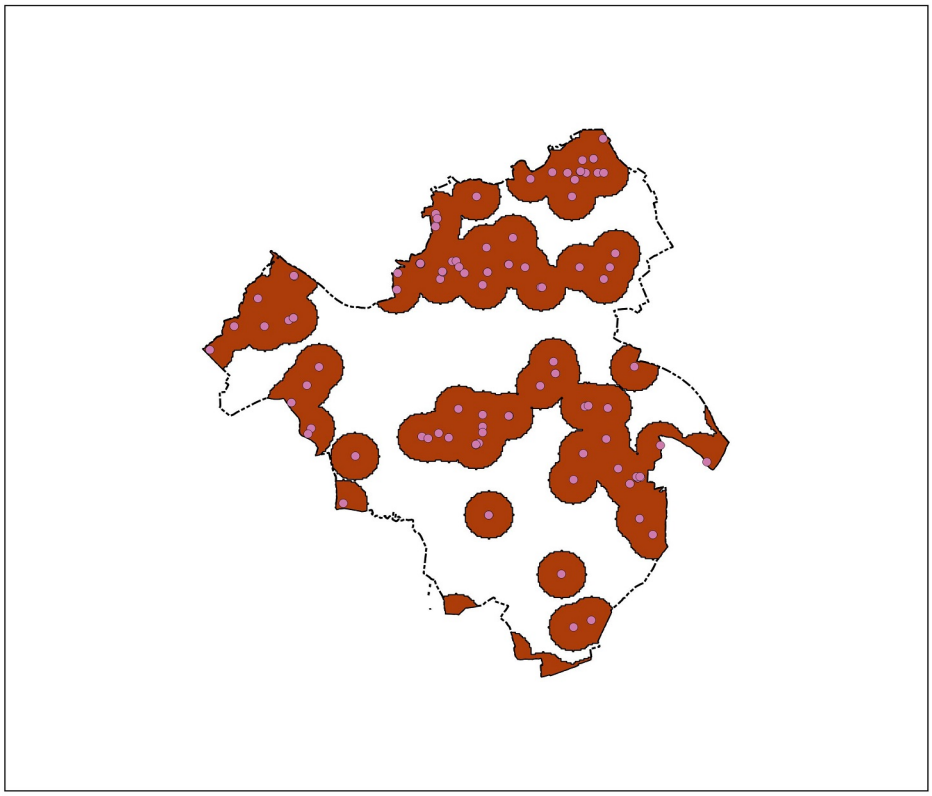
Reading bat alert map: random forest model

Legend
- Bat roost records
- Bat model
- Reading Boundary

1 0 1 2 3 4 km

Map 2



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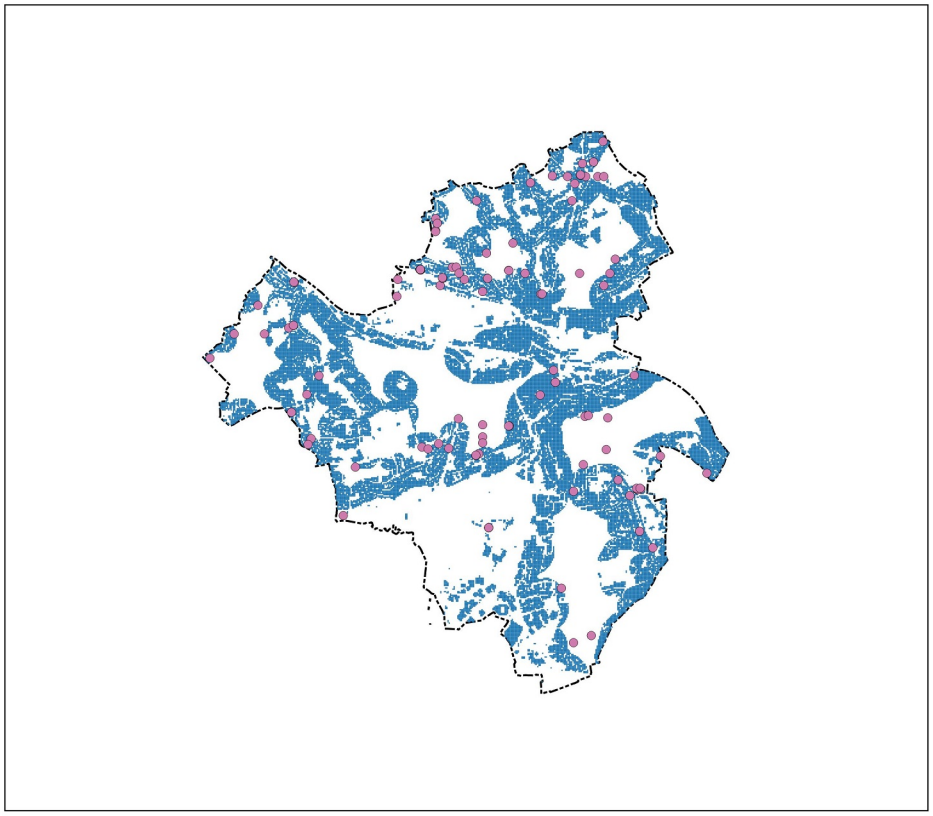
Reading bat alert map: heat map

Legend
- Bat roost records
- Bat heat map
- Reading Boundary

1 0 1 2 3 4 km

Map 3



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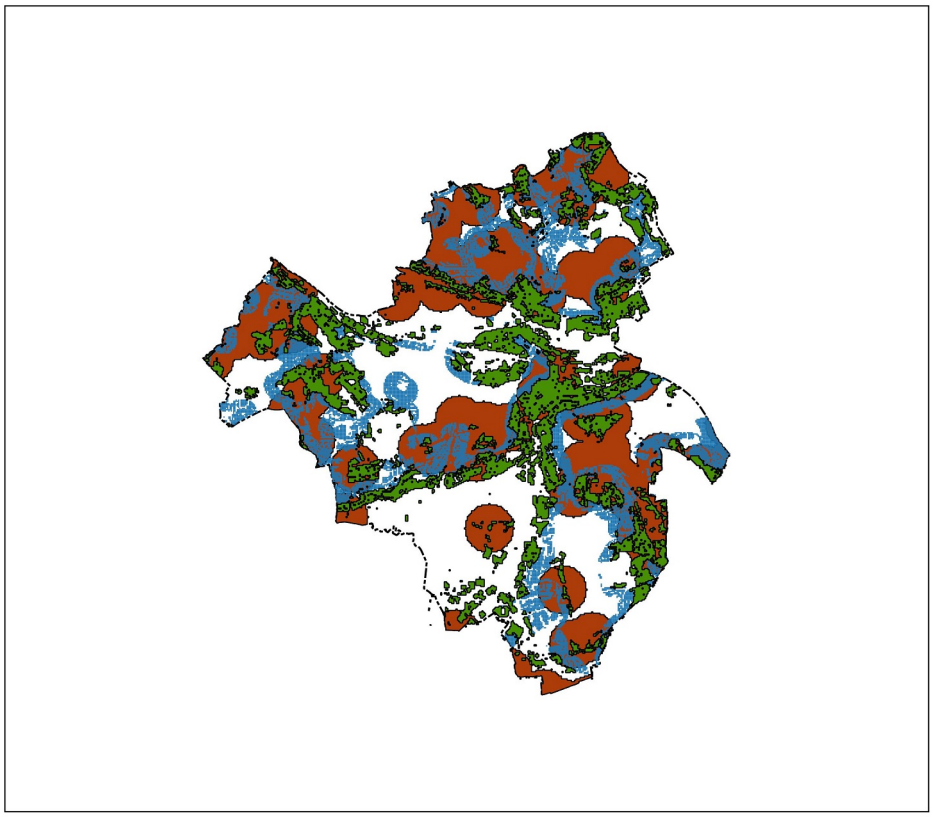
Reading bat alert map: bat max

Legend
- Bat roost records
- Bat max
- Reading Boundary

1 0 1 2 3 4 km

Map 4



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Reading bat maps: comparing outputs

Legend
- Bat model
- Bat max
- Bat heat map
- Reading Boundary

1 0 1 2 3 4 km