Do hot spots go cold?
What does this mean for species conservation long-term?

ANET Conference 2018

Cathryn Dexter, Amy Blacker, Justin Scott, Darryl Jones

Research Overview

Background

- Placement of wildlife road mitigation is commonly based on the identification of wildlife vehicle-strike 'hot spots'.

- Long-term wildlife vehicle-strike data sets are rare

- The nature of mitigation for wildlife on roads is reactive

Aim

- To examine methods that accurately reflect hot spots overtime

- To understand what role hot spots play for species conservation planning long-term

Method selection

- 15 years of records from Moggill Koala Hospital database in south-east Queensland were analysed

- Trialled different approaches: linear regression gradient, Logic decision tree classification and time series, grid overlay and kernel density

- Numerous iterations within two commonly used methods

- The Grid Overlay Method: 500m x 500m was effective in counting and ranking actual numbers of vehicle strikes, though points landing on the grid cell borders biased results for cell ranking

- Kernel Density Method: with a 50m cell size, 250 m bandwidth, and a density in the top 50% was the most responsive for this analyses where we broke 15 years of data into five year blocks

Method comparisons

Fig.1. 500m x 500 m Grid Overlay method trialled using two grid overlays, this had problems for aggregate statistics when breaking the 15 years down into three five-year time blocks.

Fig.2. 500m x 500m Grid Overlay method trialled, but some points were split over two cells if they fell on the cell grid line (circled areas) biasing cell reporting
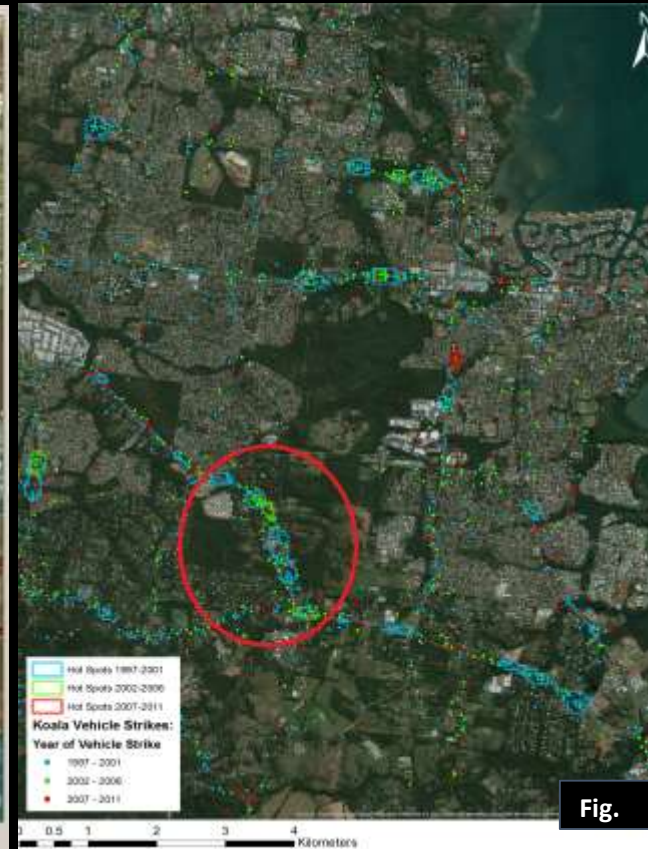
Fig.3. 15 years of data, using Kernel Density Function, separated into 5 year blocks shows cold spots (blue borders) begin to emerge after 5 years and highlights some roads don't have hot spots they are 'hot' roads

Results and Conclusion

- At a regional spatial scale hot spots may not contribute greatly to species decline through road related mortality

- Only 13% of koala vehicle-strikes in south-east Queensland occurred in hots spots.

- At the local spatial scale hot spots may contribute to higher localised decline
- but may represent less than 50% of vehicle-strikes

- The idiosyncrasies of a given strategy used to detect hot spots may result in bias of hot spot detection

- Deriving hot spots requires more work by researchers

- Conservation planning must not just focus on mitigating hot spots to reduce the decline of species impacted by roads, it must look more broadly at mitigating the impacts of vehicle-strike overtime and across entire landscapes