Research Questions

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Below are some examples of research questions that could be explored with the dingo GPS data set. These are just suggestions to get you thinking - feel free to come up with your own questions too!

The focus of papers that have previously analysed this data focused on broad-scale behaviours like home ranges (Newsome, Ballard, Dickman, Fleming, and Howden 2013) and landscape-scale resource selection (Newsome, Ballard, Dickman, Fleming, and Ven 2013), but there are a number of other research questions that could be addressed, particularly at fine-scales. Some suggestions are:

How do dingo behaviours differ between individuals at mine sites and those elsewhere?

- Do non-mine dingoes spend more time in higher energy foraging states?
- When do they switch behaviours, how does that differ between mine/non-mine IDs

Methods

- Hidden Markov models (Langrock et al. 2012; McClintock et al. 2012)
- Behavioural change point analysis (BCPA) (Gurarie, Andrews, and Laidre 2009; Gurarie 2013; Gurarie et al. 2016)
- Machine learning for behavioural classification

What is the influence of the surrounding environment on the dingoes' movement?

- Does this differ between mine and non-mine sites?

Methods

- Step selection functions (SSFs) (Fortin et al. 2005; Thurfjell, Ciuti, and Boyce 2014; Johannes Signer, Fieberg, and Avgar 2019)

How do dingoes' behaviours change across the day?

- Assessing temporal dynamics in movement and habitat selection
- Looking at behavioural state changes across the day

Methods

- Descriptive (summarising data across the day)
- Temporally dynamic SSFs (Forrest et al. 2024; Klappstein et al. 2024)
- HMMs with temporal covariate on state transition matrix

How do dingoes connect through the landscape?

- Generating connectivity pathways and movement corridors

Methods

- Step selection functions with simulations (J. Signer et al. 2023; Hofmann et al. 2023; Forrest et al. 2024; Cowan et al. 2025)
- Connectivity analyses
  - Betweenness/connectivity (Hofmann et al. 2023; Cowan et al. 2025)
  - Least-cost paths (Etherington 2016),
  - ConScape (Dorber et al. 2023; Van Moorter et al. 2023)
  - CircuitScape https://circuitscape.org/

Do dingoes near mines have a higher probability of disease transmission?

- Do dingoes near mines revisit the same sites more often, or more often with other individuals?
- Are their social networks more connected?

Methods

- Social network analysis
- Revisitation (Bracis, Bildstein, and Mueller 2018)

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