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)

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

- Do they select for linear features such as roads?
- Does their movement and habitat selection 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?

- Are there temporal dynamics in their movement and habitat selection?
- Does the probability of switching behaviours vary throughout the day?

Methods

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

How do dingoes connect through the landscape?

- What are their connectivity pathways and movement corridors?
- Would adding more roads increase or decrease their landscape connectivity?

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, such as dumps?
- Which dingoes interact more often with other individuals?
- Are dingoes at mine sites have more connected social networks?

Methods

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

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