Functional Response and the Effort : Outcomes Relationship for Aerial Shooting of Deer

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Queensland Government
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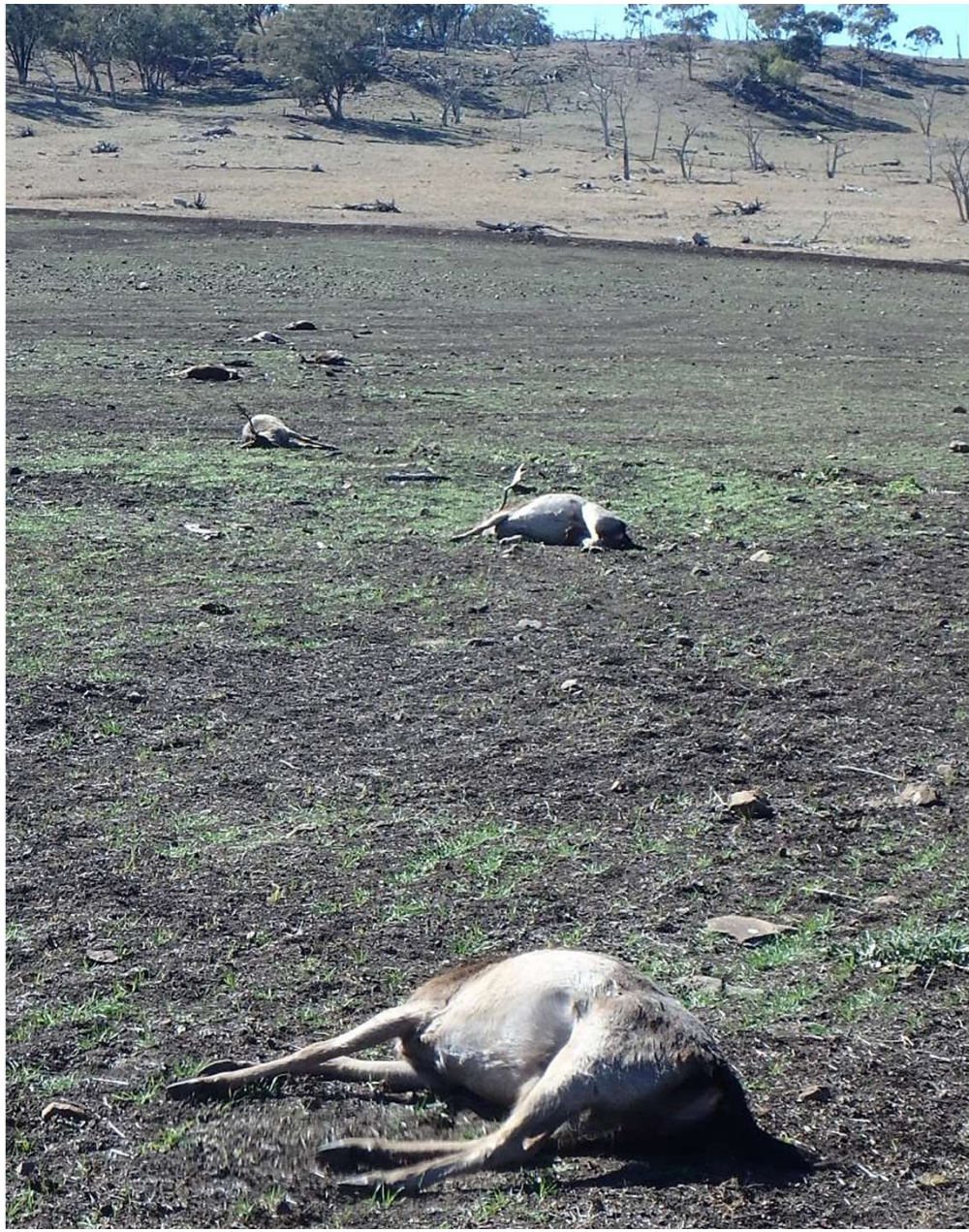
LANDSCAPE SOUTH AUSTRALIA LIMESTONE COAST
ACT Government Environment and Planning
THE UNIVERSITY OF MELBOURNE

Aerial shooting can be a good control tool

- Remove many animals quickly
- Search and kill over large areas



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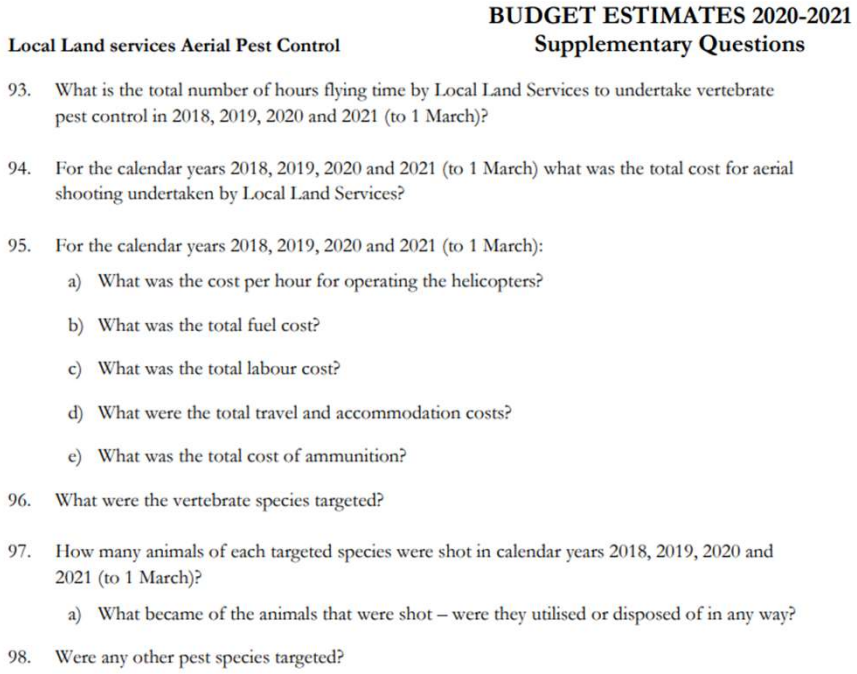
Aerial shooting can also be:

- Expensive
- Logistically demanding
- Highly scrutinised



BUDGET ESTIMATES 2020-2021
Supplementary Questions

Local Land services Aerial Pest Control

93. What is the total number of hours flying time by Local Land Services to undertake vertebrate pest control in 2018, 2019, 2020 and 2021 (to 1 March)?

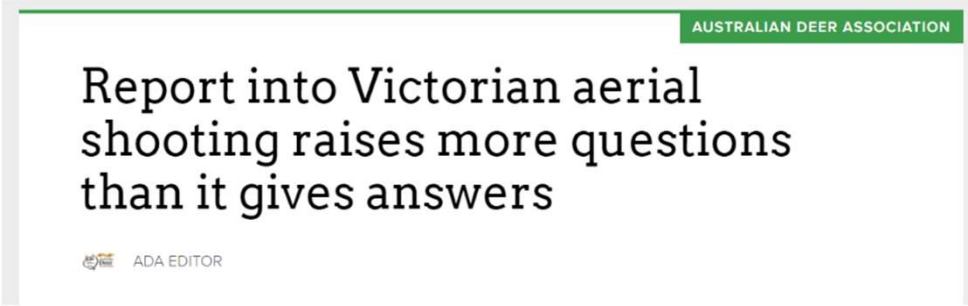
94. For the calendar years 2018, 2019, 2020 and 2021 (to 1 March) what was the total cost for aerial shooting undertaken by Local Land Services?

95. For the calendar years 2018, 2019, 2020 and 2021 (to 1 March):
    a) What was the cost per hour for operating the helicopters?
    b) What was the total fuel cost?
    c) What was the total labour cost?
    d) What were the total travel and accommodation costs?
    e) What was the total cost of ammunition?

96. What were the vertebrate species targeted?

97. How many animals of each targeted species were shot in calendar years 2018, 2019, 2020 and 2021 (to 1 March)?
    a) What became of the animals that were shot – were they utilised or disposed of in any way?

98. Were any other pest species targeted?



AUSTRALIAN DEER ASSOCIATION

Report into Victorian aerial shooting raises more questions than it gives answers

ADA EDITOR

How can we optimise our chances of *doing something useful*?*

* and defensible

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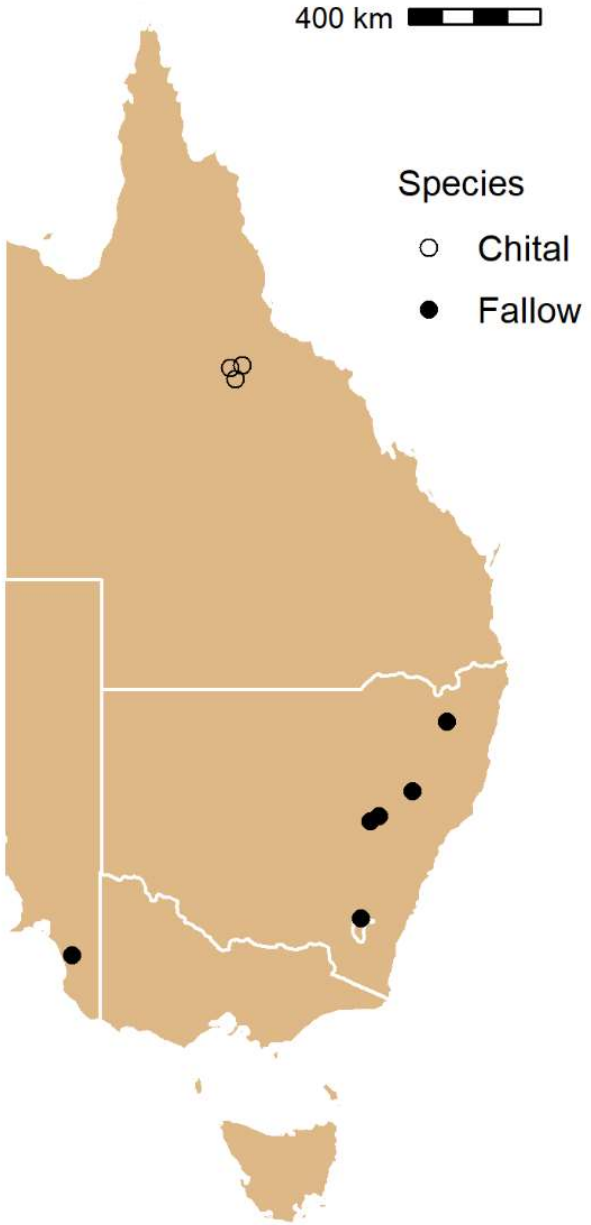
Methods: survey and shoot

- 12 operations, 9 sites, 49 days: fallow and chital
- Aerial survey before shoot



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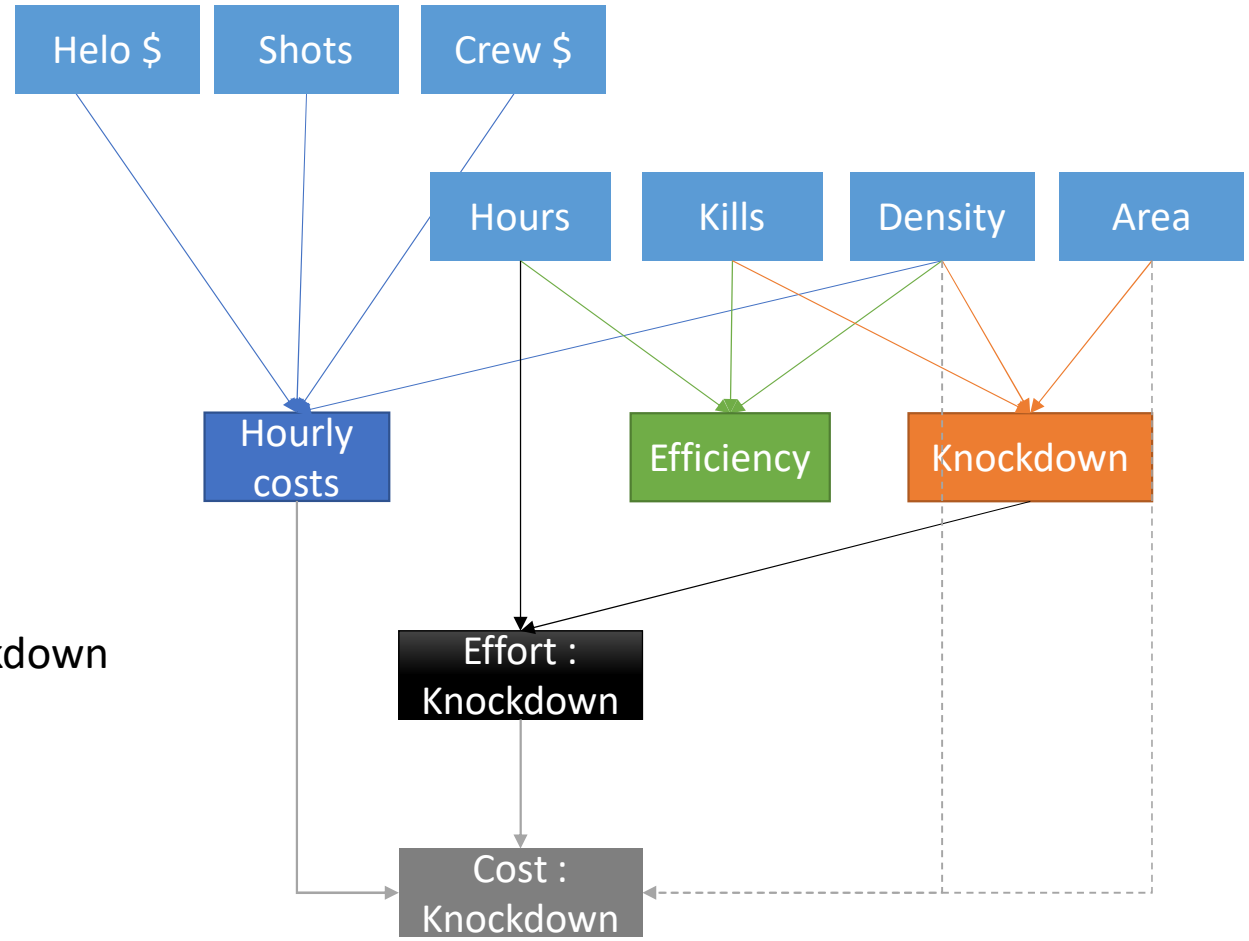
Methods: analysis

- Collect input data, then estimate:
  - Knockdowns
  - Efficiency
  - Hourly costs
  - Effort : Knockdown
- Predict total costs from density and knockdown
- Bayesian models for uncertainty



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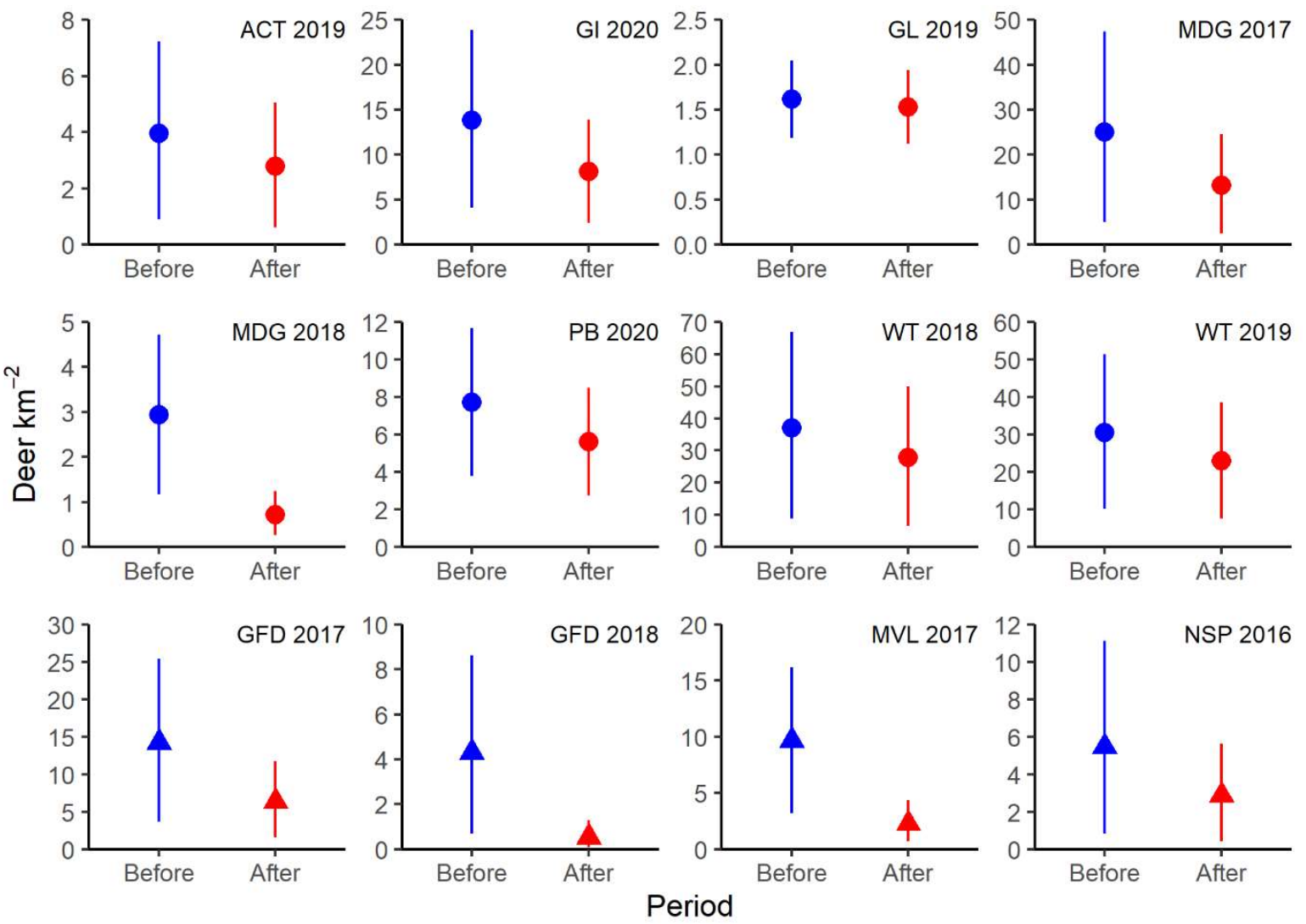
Results: knockdown

- 1.6 : 39.3 deer km^{-2}
- 5 : 88% knockdown
- 7 achieved ≥ 35%



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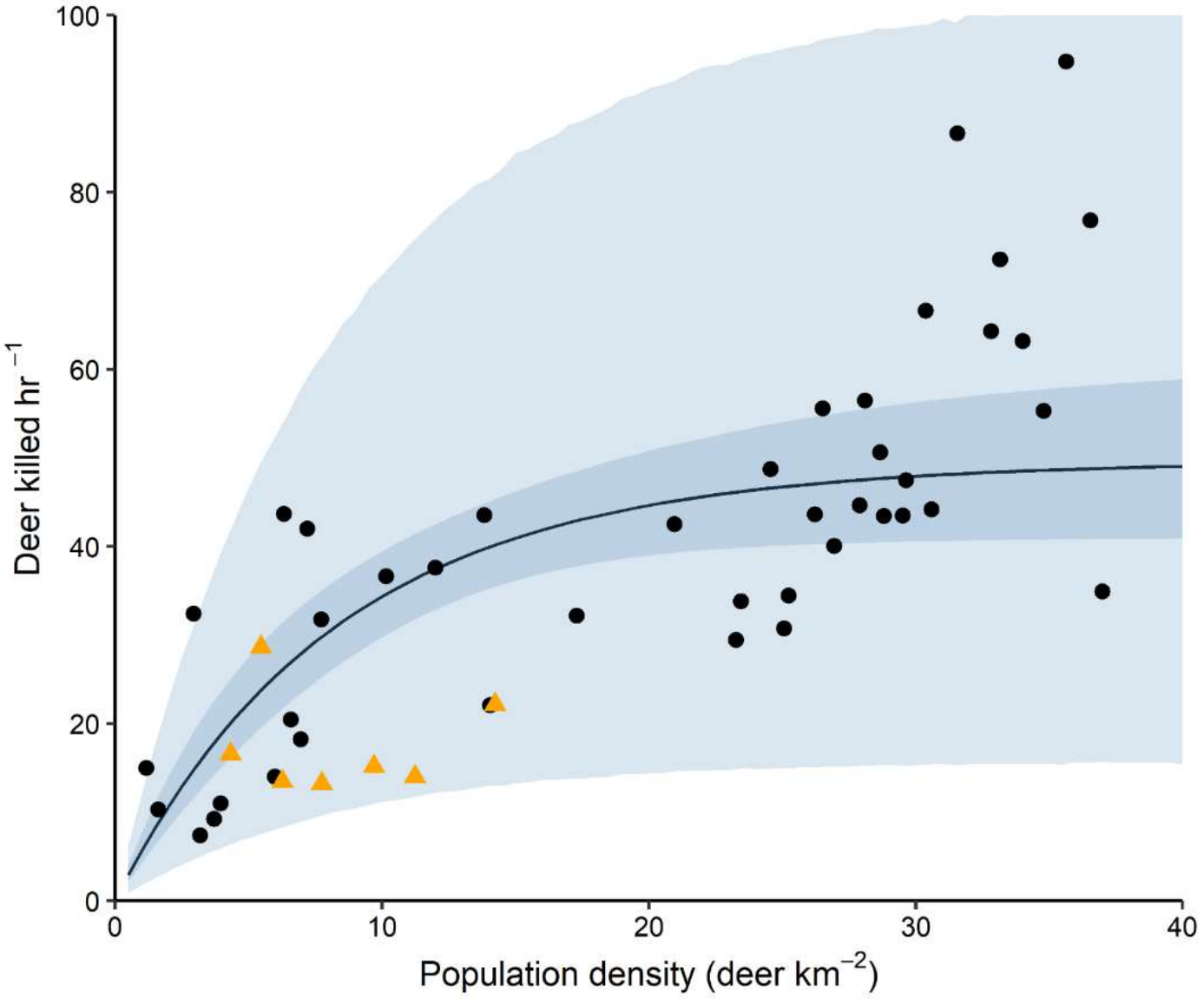
Results: efficiency

- Max expected kill rate = 50 deer hr^{-1}
- No refuge



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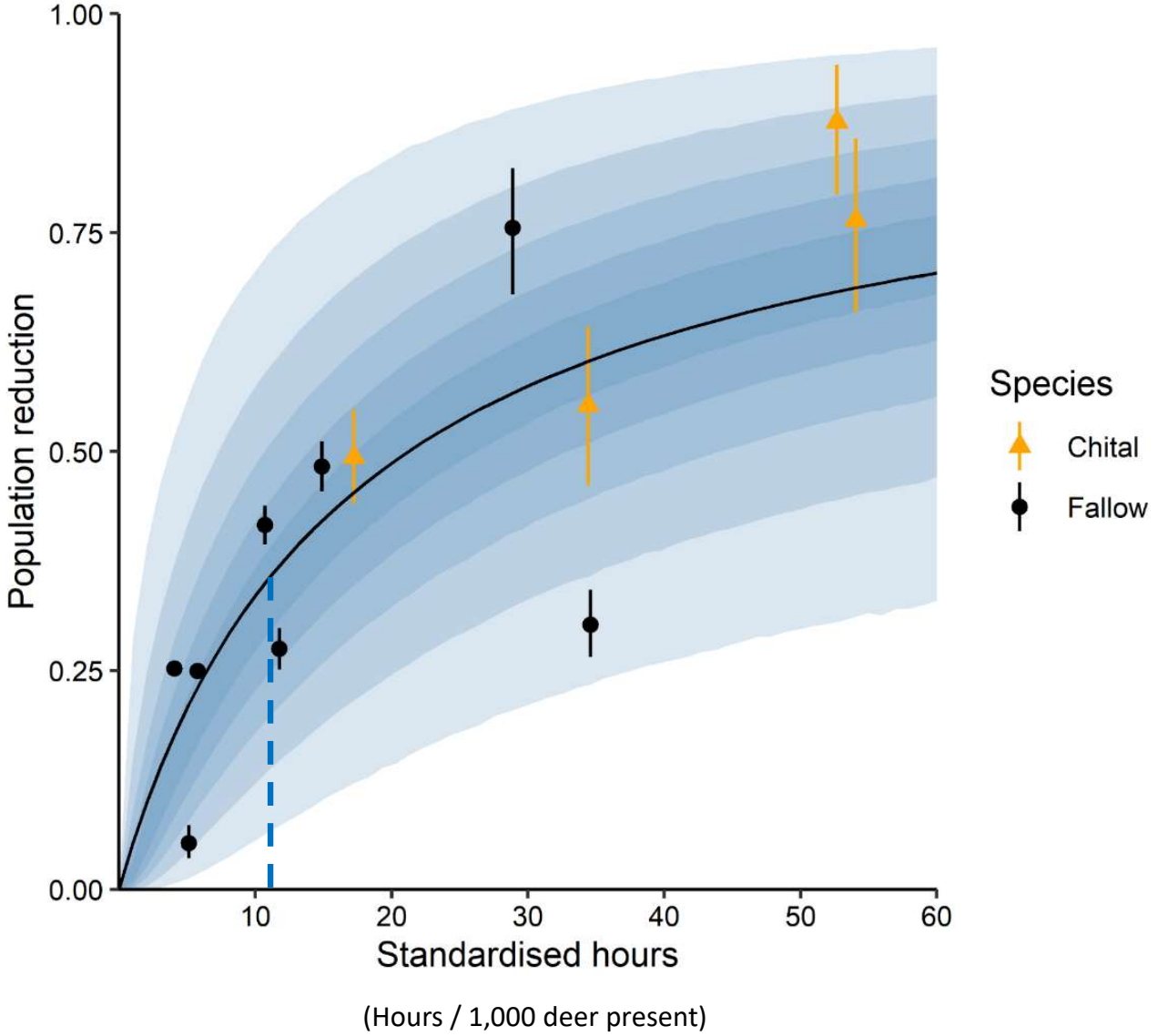
Results: Effort → Knockdown

- Diminishing returns above
  - 18 hrs / 1,000 deer
  - 45% knockdown
- 35% knockdown
  = 11 hrs / 1,000 deer



(Hours / 1,000 deer present)

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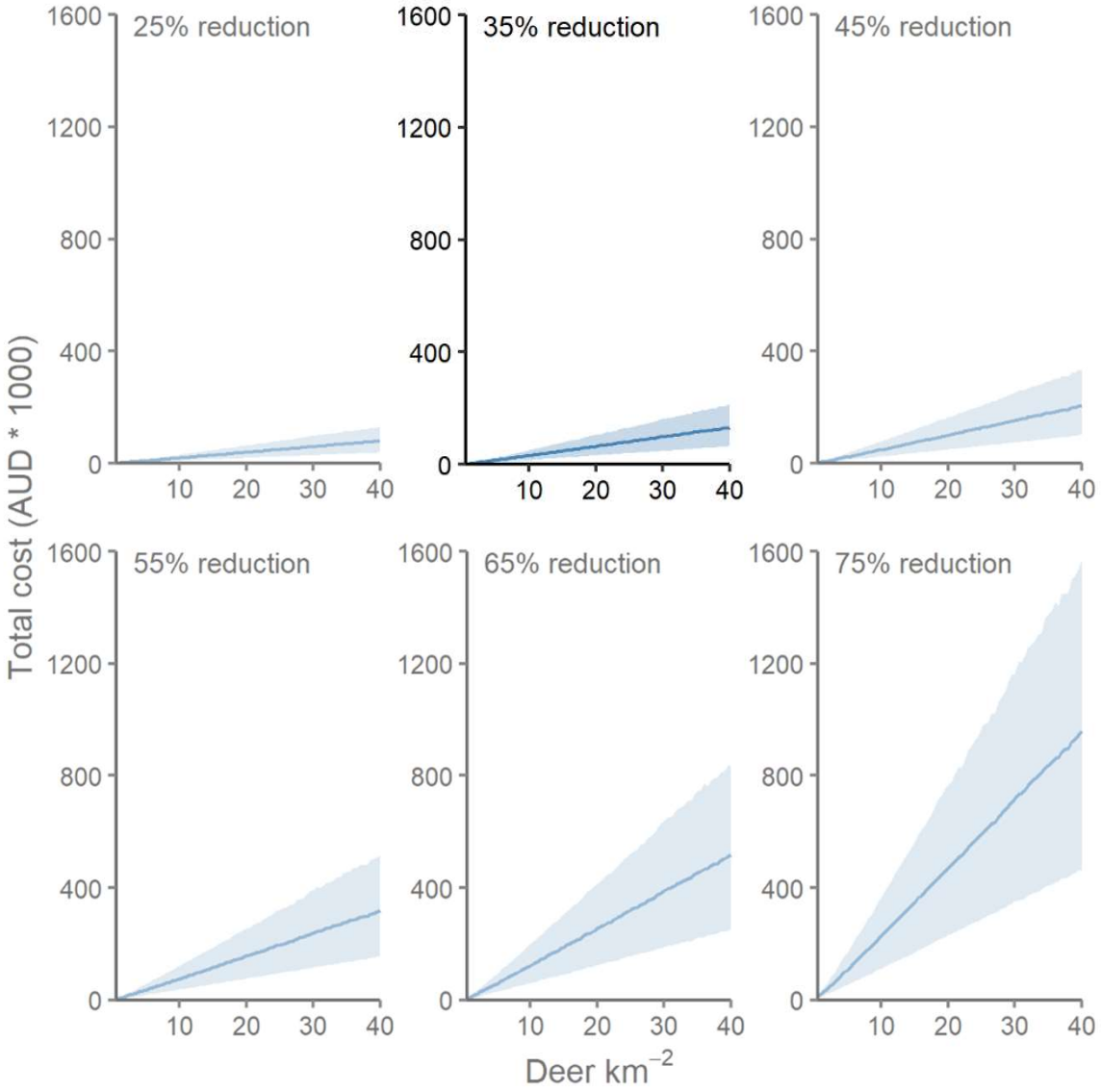
Results: Cost → Knockdown

- Total cost for 135 km^2 site with Jet Ranger
- Cost increased with deer density
- Slope increased with desired knockdown
- 35% knockdown, 5 to 40 deer km^{-2}
  = $15k to $131k



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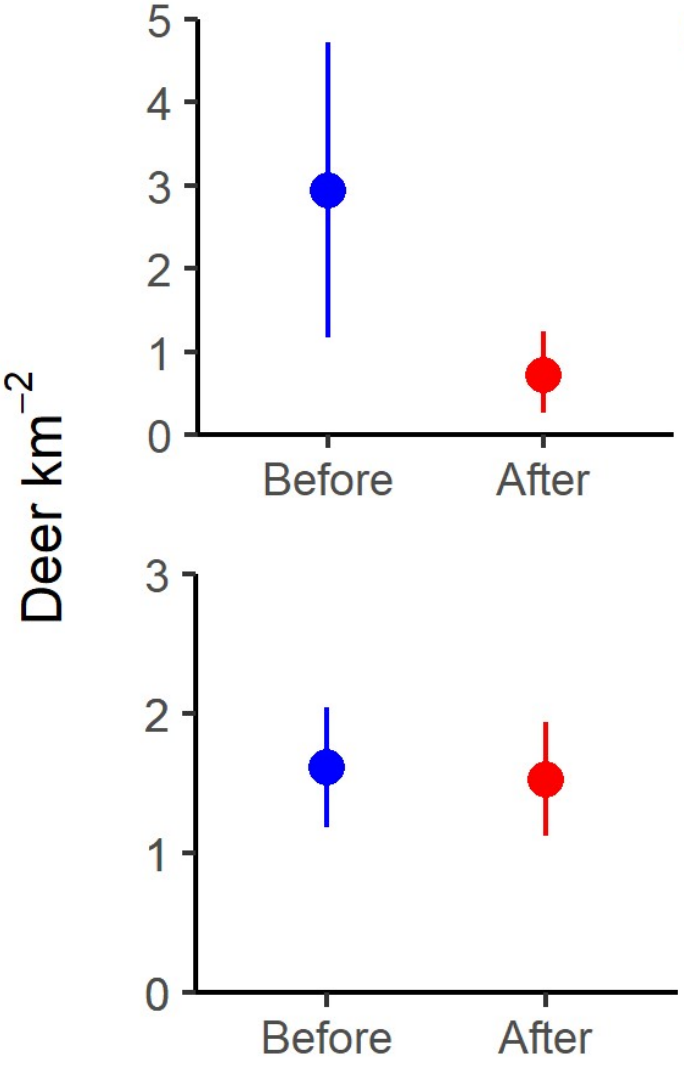
Take homes

- Aerial shooting *can* be effective

- Pre-shoot survey to:
  - establish objectives
  - plan for success
  - evaluate results
  - demonstrate best practice



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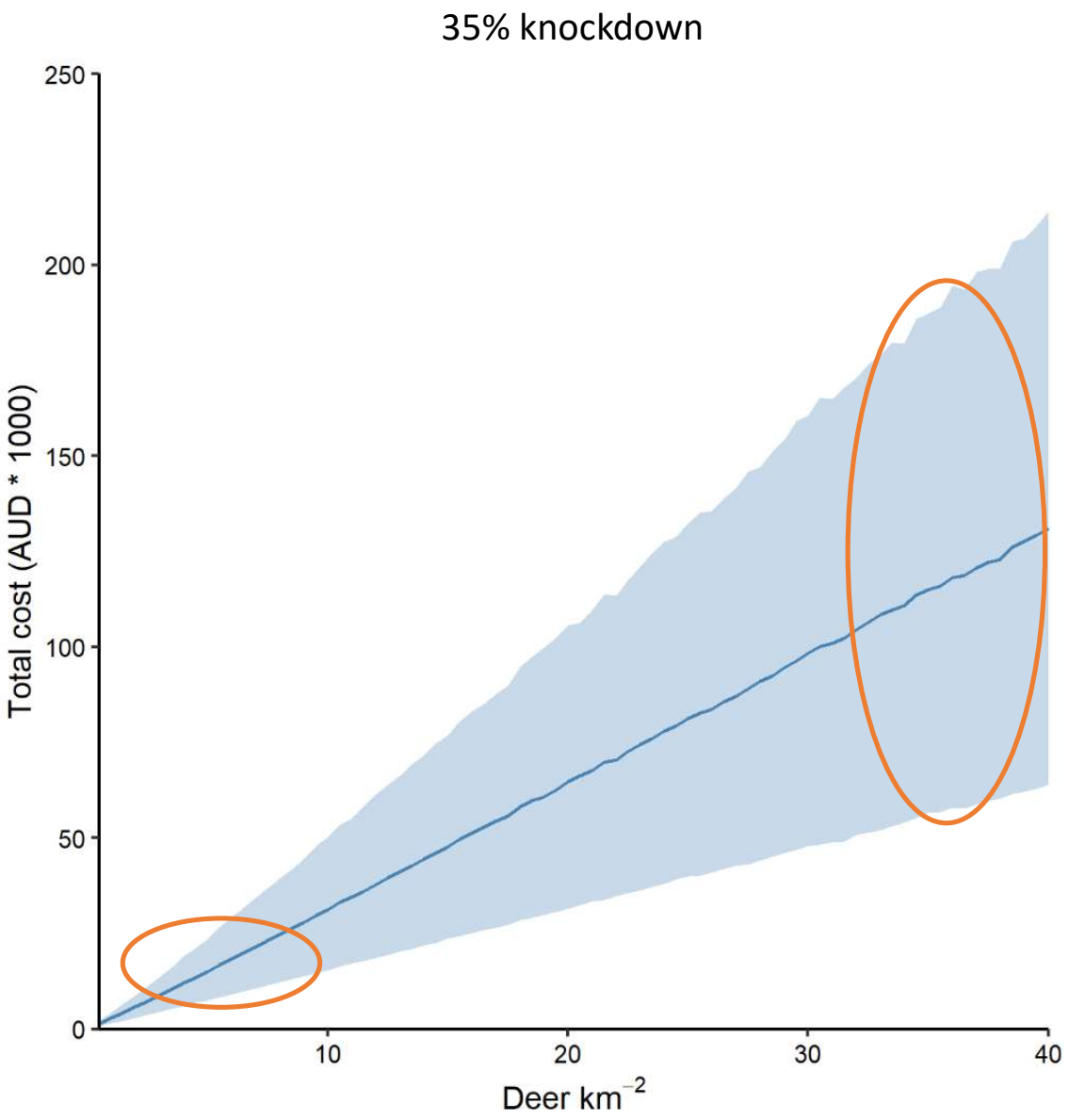
Take homes

- Aerial shooting *can* be effective
- Pre-shoot survey to:
  - establish objectives
  - plan for success
  - evaluate results
  - demonstrate best practice
- Act before density gets too high



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