Spatial modeling of extraction and enforcement in developing country protected areas (Albers, 2010, Resource and Energy Economics)

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Optimal enforcement
and
Pragmatic versus dogmatic approaches to protected area management
and
Incorporating distance into economics models
and
What place for theory these days

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Today's talk

- Before Albers' 2010 paper
    - Becker and optimal enforcement
- Albers' paper
- Extensions
- Relevance to 2025

Gary Becker

- Bring economics into the law of enforcement

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Key aspects of Prof Albers' paper

- **Model**
  - **Focus on role of distance as a cost**
  - **Distance and enforcement as substitutes**
- **Take home messages**
  - Pragmatic approaches versus dogmatic

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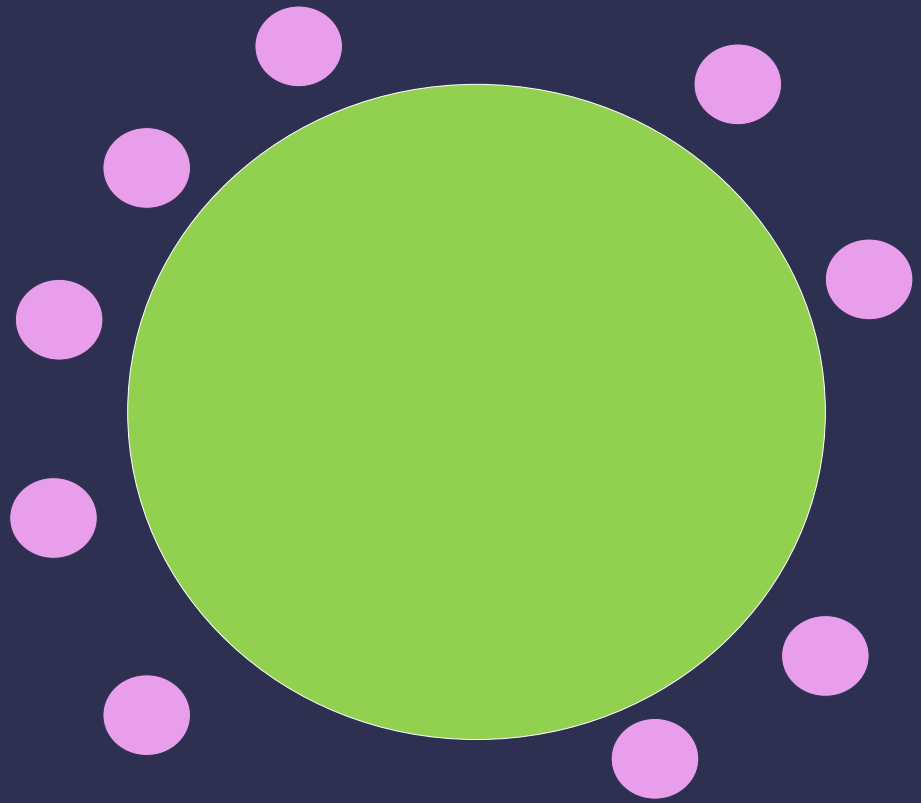
Basics of the model

- Imagine a protected area with people living around the outside



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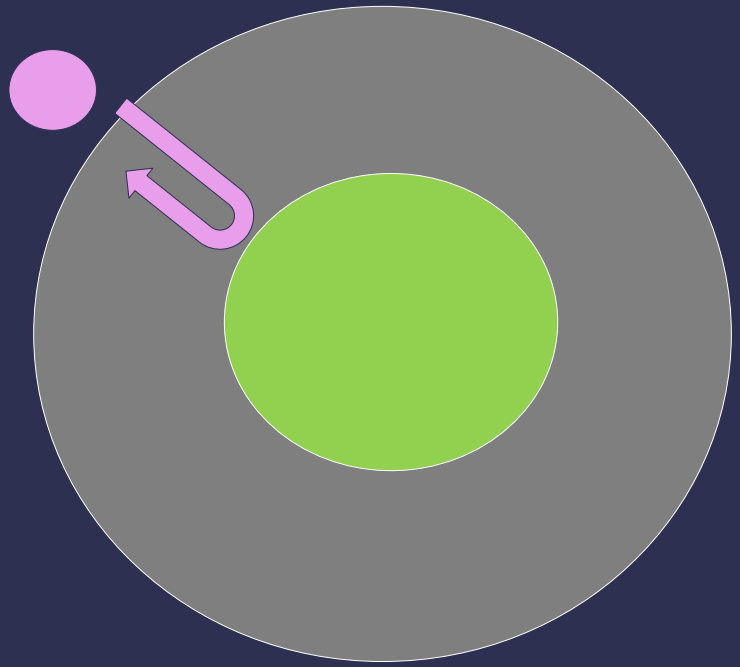
Basics of the model

- Extractors make a ”distance decision”
    - How far into the forest to go to collect resources
- As such, protected area manager should incorporate spatial considerations into their enforcement decisions



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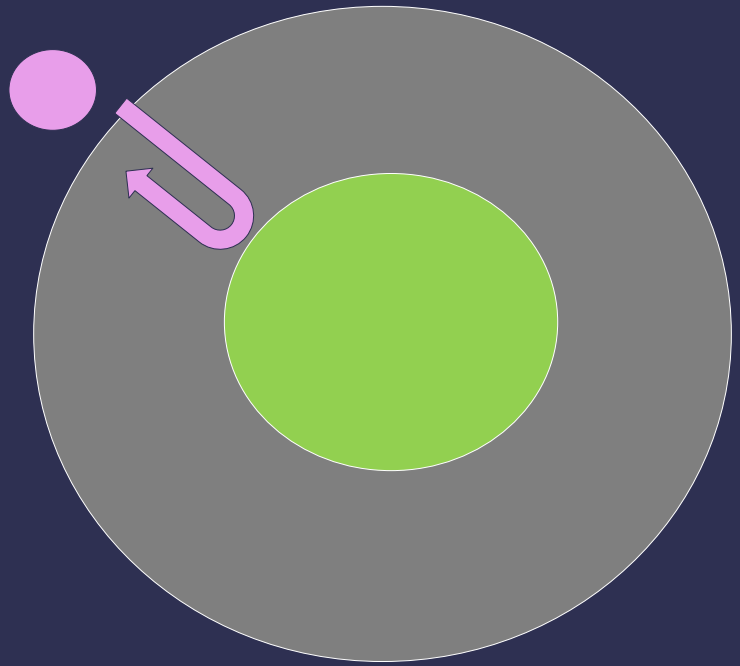
Basics of the model

- Extractors make a ”distance decision”
  - How far into the forest to go to collect resources
  - What makes them turn around?
  - Some non-linearity in the model



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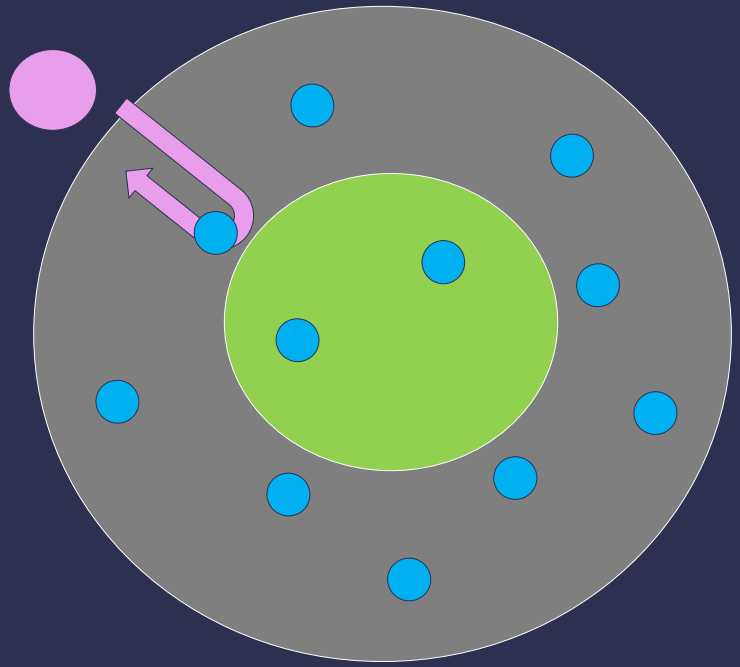
Basics of the model

- Recognising extractor behaviour, what might an optimal enforcement strategy look like
    - That takes explicit account of how distance influences extractors



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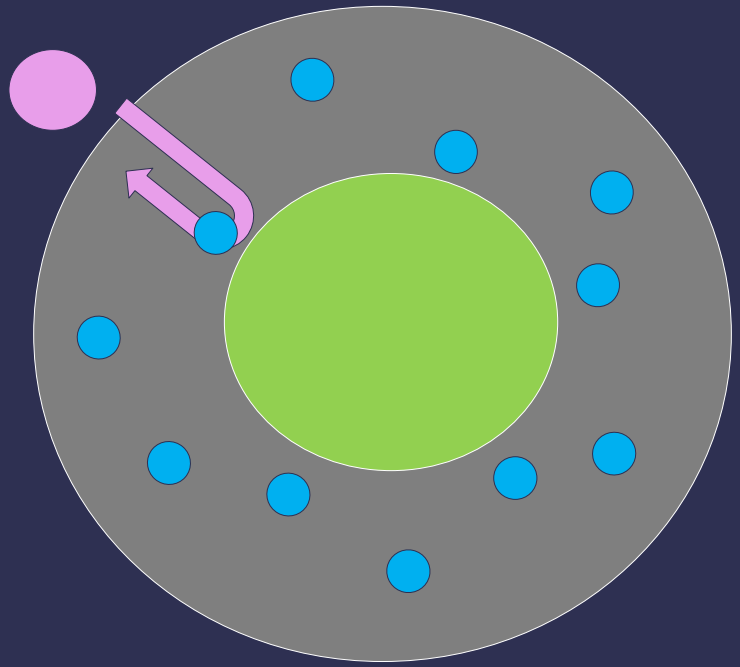
Basics of the model

- No point in protecting deep in the forest
    - Extractors don't go there even without enforcement
- Can concentrate patrols closer to the edge of the forest
    - Some deterrence to extractors
    - But probably not full deterrence
    - Also therefore implications for conflict



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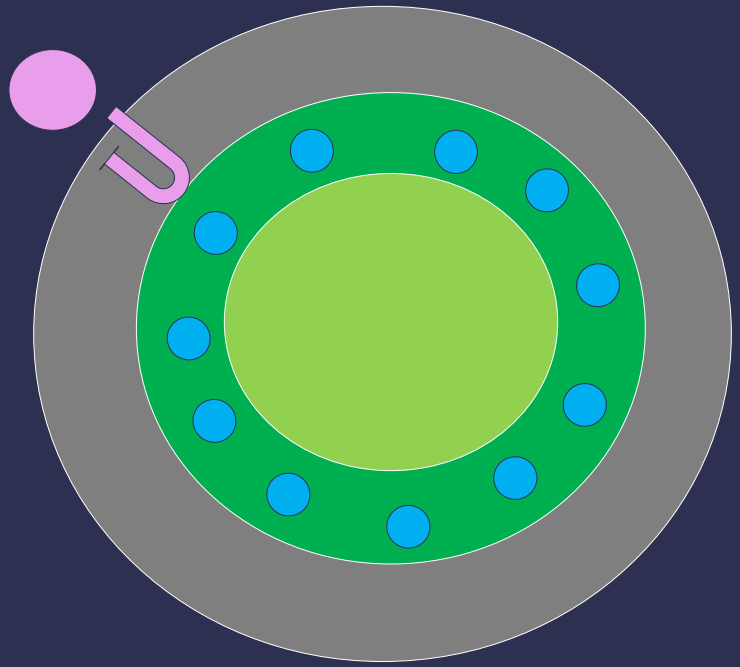
Extension to model

- If conflict is recognised as costly, can "compromise"
  - Allow some extraction in a buffer zone
  - Enforce a ring
  - Leave core where villagers will not enter
- What if multiple patches of forest
- Extractors can switch which patch they go to



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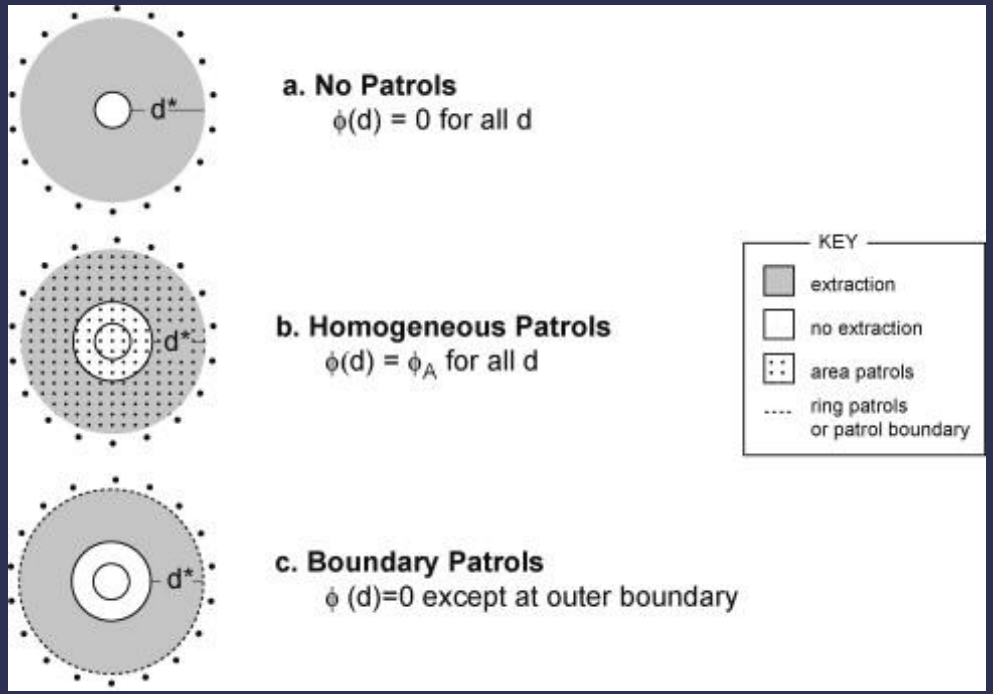
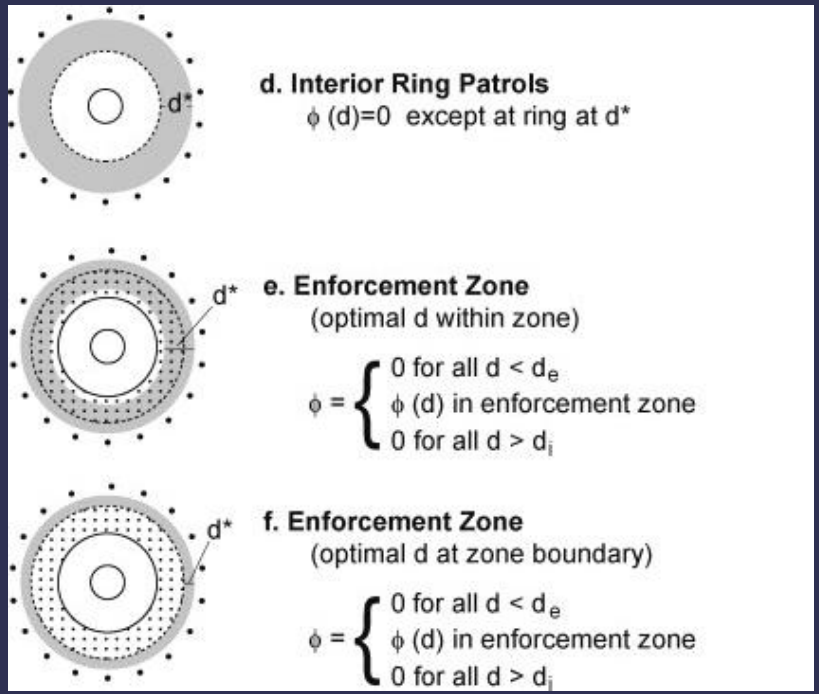
Schematic of results





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Implications and relevance to 2025

- What is lost if distance and space is not explicitly accounted for
- How a better understanding of spatial aspects of resource extraction and enforcement can reduce ”costs of conflict”
- In the era of big data, do we still need theory?
- Zoning for carbon offsets
- Zoning for blue carbon

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Thank you!


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