

Indirect influence of human activities on wildlife mortality

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Motivation

Most of our understanding of how humans contribute to wildlife mortality focuses on direct anthropogenic sources of mortality, e.g. hunting, poaching, harvest, and vehicle collision. However, a large body of literature (e.g. mark-recapture) implies that human activities may indirectly influence wildlife mortality, but has yet to be empirically demonstrated. Failing to identify the indirect pathways by which human activities drive wildlife mortality likely means that we undervalue the anthropogenic influence on biodiversity loss.

We aim to:

- Test for the presence of indirect causal pathways between human activities and mortality from sources that are not directly related to humans
- Investigate which components of human activities create indirect causal pathways for different species
- Investigate how temporal exposure to human activities creates indirect causal pathways

Questions, Hypotheses, and Approaches

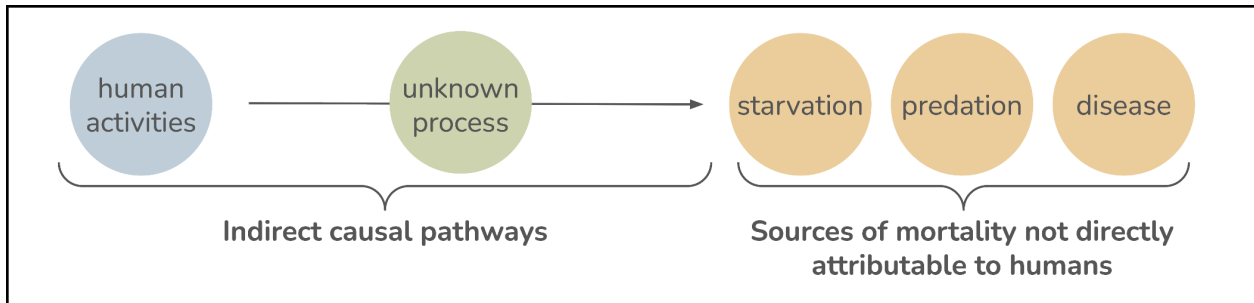
Q1: Are there indirect causal pathways between human activities and mortality from sources that are not directly related to humans?

H₀: Human activities do not elevate risk for dying from sources not directly related to humans.

H₁: Human activities elevate risk for dying from sources not directly related to humans.

Approach:

- Use Cox Proportional Hazards to test for an effect of human footprint on mortality risk from sources of mortality not directly related to humans (e.g., predation, starvation, disease).
- Test effect for each species
- Use value of Human Footprint Index (HFI)
- If HFI has a significant effect, confirm H1



Q2: Which components of human activities create indirect causal pathways?

Approach:

- For species with significant results from Q1...
- Repeat analysis from Q1, disaggregating HFI into component parts (e.g., linear infrastructure, human density)

Q3: Are indirect causal pathways created by lagged or chronic exposure to human activities?

Approach:

- For species with significant results from Q1...
- Investigate the temporal exposure to human activities seasonally and over life times

