The Economic Value of Biodiversity in India
Running Notes

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Project Description

This project aims to produce the first measure of willingness to pay (WTP) for biodiversity. This provides a monetary measure to value biodiversity which can be applied to a wide variety of applications in environmental economics and natural captial accounting. The data relies on E-bird observations of diverse bird species observations. The sample is limited to local, long-time users who are residents (not tourists) in India. The methodology to calculate WTP relies on a revealed preference throughh the random utility model (RUM). The RUM determines the value of seeking out diverse species of birds by comparing the value of alternative counterfactual bird siting locations and the cost to go to these counterfactuals. Monetary value is determined through the RUM by estimating the travel cost of the reveal preference compared to counterfactual locations.

Notes

For notes, we present the most recent first so that notes are choronologically most recent.

Meeting: 2/28/2025

Action Items:

- Ryan: Get the correct e-bird file from Matt (Requested)
- Ryan: Merge code files into scripts folder. (DONE)
- Ryan: Initate a document for literature review with template example (DONE)
- We need to specalize and define tasks. Volunteer over email. Tasks: Lit review, sample selection, characterize the sample, theory person (DONE)
- And set up a recurring meeting time. Need a poll. Try for next two weeks from now. (DONE)
- Jovin: Provide your github username so Ryan can make you a collaborator on the github repo. (DONE)

Funding:

- No longer pursue IonE funding

Coding:

- Matt was able to replicate everything
  - Created a YAML to process file names
  - No longer needs new file paths
- Ryan stuck on loading data
- Need to all use the same exact file download for e-bird
- script 1: processes e-bird data, determines user homes, and calculates home for those who don't report it.
- script 2: Creates the hotspot observations. Measures distance from home to hotspot.
- script 3: Most important. 12,000 hotspots so too many counterfactuals. This script reduces the counterfactual set by clustering hotspots nearby (likley parks) and only consider hotspots within a distance of home.
- The final data set is a panel of person (user) ID by trip ID appended to all counterfactual trips for this user.
- When we actually estimate this, we will need to plan for a no-trip counterfactual.
- One of the main things we need to do is make the computation easier for us. Otherwise it becomes too computationally intensive.
- Keep all the scripts in scripts folder.

Data:

- We will need to bring in site attribute data
- So data on landscape measurements.
- Matt says that not all intermediate files are being save
- Specifically, the master file is not saving
- Need to identify our sample population
    - Need a careful (defensiable) data-driven criteria for sample
    - Needs to be regular, local users (not temporary or tourists)
    - Determine this based on usage frequency and mobility patterns
    - Consider overlaying protected areas polygons on top of the observations/hotspots
    - Buffers may create a censoring problem. So we would just test this against larger and larger buffers
- Need to find ways to characteristize the users (demographics) without having any information about them.
    - Important for welfare calculations.
    - Try to match with DHS data
    - Or overlap home location with SHRUG data set
    - Econometrically, take attribtues about where they live against the average for the country, how do high and low WTP birders fall within the distribution
    - Potentially use this as weights for welfare calculations.

Methods:

- If we get a random shock to bird population, then we can think about the causal effect of increasing biodiversity

Paper/Writing:

- For the ML cluster, will want to read up later to find out if there is a better way or more common practice in economics.
- Create a lit review. Three groups:
    1. estimates of WTP in developing countries generally using the discrete choice travel cost method (Ted Miguel water quality paper).
    2. WTP for environmental quality papers and what design they are using to estimate (e.g., contingent valuation, stated preferences – something from ecology)
    3. Review of any updated versions of the mixed logit model – new adapations of the model from class
- For this: question, data used, design, and finding (dollar estimates would be great).
- Create a document in the docs folder