Bird Atlas
Requirements & Broad Plan
How to divide Kerala spatially?

- Align to Survey of India Toposheets
  - 7.5’ x 7.5’ is the most finest scale available.
    - 13.3km x 13.3km cells
    - This is good for a country, state can be finer.
  - Use a factor of this scale as cell size for the state.
    - Option 1: 3.750’x3.750’ [6.6 x6.6km]
    - Option 2: 1.875’x1.875’ [3.3 x3.3km]
- Sub–cell Size is uniform across the country
  - 0.625’ x 0.625’ [1.1 x 1.1km]
  - Only cell size can vary
Statistics

- Kerala Size: 38500 sq.km
- Forest: Non-forest: 11000:27500

- # 7.500’ x 7.500’ Cells: 218
- # 3.750’ x 3.750’ Cells: 870
- # 1.875’ x 1.875’ Cells: 3535

Note: Even if we select 3.75’ x 3.75’, it will have to be divided into four quadrants (each of size 1.875’ x 1.875’) and random sub-cells selected in each of the quadrants. This is to avoid quadrant bias in a cell.
When do we sample?

- Twice a year
  - E.g. August & February
- Avoid months of passage migration
  - Moving population requires more sampling
- Can we have >1 month for 1 cycle?
  - 1.5 months? 2 months?
    - July–mid – August–end or August start – Sept–mid
- What time of the day would we sample?
  - Forests: As in surveys, 6:00–10:00, 16:00–18:00
  - Non–forests: No constraints?
    - E.g wetlands can be covered in midday
    - Avoid after dark hours.
What is each sample?

- Every team should have at least two observers
  - One expert birder and one enthusiast
  - Can we have more?
- Protocol = Traveling, Duration = 15 minutes
- Estimate the distance traveled.
- Mark all the species and estimate the number of birds seen during birding.
How frequently do we sample?

- 4 lists/sub-cell in each cycle
- If possible, different teams do the replicates.
- If possible, replicates done on different days.
- If possible, every team attempts to cover different parts of a sub-cell. E.g.
  - Team 1 does 2 different walk-paths on Day 1
  - Team 2 does same 2 walk-paths on Day 2
How many sub–cells to sample?

- Alappuzha proto–atlas covered 12.5% of the district in four days.
  - Two 1.1x1.1 sub–cells in each cell.
- We can choose a variable model for different districts based on birder density
  - 10–40%
  - Alappuzha might be able to do even 40%
    - E.g. 4 out of 9 sub–cells.
  - 10% => 1 sub–cell in a set of 9 sub–cells.
- If sub–cell sample density is high, distribution data at a smaller scale (1.875’x1.875’) is possible.
How do cover entire Kerala?

- Pilot work in two districts
- Attempt 2 or 3 districts each year
- We complete the atlas in 5–7 years.

<table>
<thead>
<tr>
<th>Year</th>
<th>Districts</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015–16</td>
<td>Alappuzha, Thrissur</td>
</tr>
<tr>
<td>2016–17</td>
<td>[Please volunteer]</td>
</tr>
<tr>
<td>2017–18</td>
<td>[Please volunteer]</td>
</tr>
<tr>
<td>2018–19</td>
<td>[Please volunteer]</td>
</tr>
<tr>
<td>2019–20</td>
<td>Idukki,</td>
</tr>
</tbody>
</table>

- Alternatively, do one shot in 2016–17 or 2017–18 whenever we are ready.
What is the expected output?

- Out of 500 species of birds in Kerala
  - ~100 are vagrants (or sea birds). E.g. Red Knot
  - ~100 are very rare (or nocturnal). E.g. Malay Night-Heron
  - CBMP outputs roughly 250–275 species

- Hence, densities of ~300 species mapped across Kerala would be an expected output.
  - Nocturnal bird densities may not reflect true status
Bird Atlas
Detailed Plan & Coordination
Where to bird in a sub–cell?

- Cells and sub–cells marked in Google Earth and toposheet.
- Identify at least 2–3 walk–paths in a sub–cell looking at the maps & GE.
- Attempt to cover all habitat types.
- Forest areas should have sufficient buffer planned.
  - Allow time for extra walks (rain, elephant, logistics)
- Report eBird list links in an excel sheet.
How to handle non-forests?

- A team visits each cell for a day?
- Or two teams visit four cells and complete half the replicates
- Next day, they swap and complete four cells.
- Combined survey style meeting during weekends to split responsibilities
- Let us take an example and work out...
How to handle forests?

- Identify base camps and assign cells.
- One day 0.5 cell for each team.
- Next day the teams swaps.
- Let's take an example and work out
Edge-cases

- What happens in border areas? Do we leave the random sub-cells out?
- What happens when cells are at sea?
- What happens when cells are inaccessible lakes?
- What happens if a cell is not visited during a season?
- What happens in inclement weather?
- What happens in cloudy overcast?
Data Quality

- Bird Atlas vs CBMP
- Pairing Bird-watchers vs Free for all
- Dropping lists that are sub-optimal
  - Rains, Winds, Unusual crowd, Flooding
  - Lead observer pre-occupied / absent.
Estimates for the two districts

- How many birders?
- How many expert birders?
- How will birders from other districts contribute?
- How many days?
- How to split the district amongst core leads?
- How to cover forests?
- What directions to be given to KFD
- Who will lead and where?
Outreach
# Outreach Targets in Districts

<table>
<thead>
<tr>
<th>Ready for Atlas</th>
<th>Need <em>eBird</em> Outreach</th>
<th>Need Birding Outreach</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alappuzha</td>
<td>Kottayam</td>
<td>Idukki</td>
</tr>
<tr>
<td>Thrissur</td>
<td><em>To be discussed</em></td>
<td><em>To be discussed</em></td>
</tr>
</tbody>
</table>
How can we improve

- eBird penetration among bird-watchers from the districts of 2\textsuperscript{nd} category?

- General bird-watching knowledge amongst our target audience in the 3\textsuperscript{rd} category of districts?