# Spatial Capture Recapture Interpretation and Designs 

Koustubh Sharma \& Justine Shanti Alexander



## Our first study area?



## Spatial Capture Recapture Estimates

| Coefficients |  |  |  |  |
| ---: | ---: | ---: | ---: | ---: |
| beta | -4.53 | SE | Icl | ucl |
| lambda0 | 2.75 | 0.04 | -5.00 | -4.05 |
| sigma | 5.73 | 0.03 | 2.59 | 2.90 |
|  |  |  | 5.67 | 5.79 |


| Parameter | Estimates |  |  |  | cl |
| ---: | ---: | ---: | ---: | ---: | ---: | ---: |
|  | link | Estimate | SE | Icl | ucl |
| $\mathbf{D}$ | log | 0.01 | 0.0026 | $6.71 \mathrm{e}-03$ | $18 \mathrm{e}-03$ |
| lambda0 | Log | 15.57 | 1.22 | 13.4 | 18.14 |
| sigma | Log | 308.69 | 9.41 | $2.91 \mathrm{E}+02$ | 327.69 |


| Abundance | Estimate |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |
|  | estimate | SE.estimate | Ic\| | ucl | n |
| Abundance | 25.39 | 3.75 | 20.63 | 36.346 | 17 |

## SCR Parameters



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- Detection Probability (or Encounter rate) at activity centers
- 15.57 (95\% CI: 13.4-18.14)



## SCR Parameters



## Data requirements

- Multiple encounters to build detection functions
- Several snow leopards encountered on more than one unit


# Let's take the message to snow leopards 



## Random distribution



## Random distribution



## Scenario 1：

## large sampling frame



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## Scenario 1:

 large sampling frame

## Scenario 1:

 large sampling frame

## Scenario 1：

 no－large sampling frame

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Count $=33$ Traps $=32$

## Scenario 1: <br> large sampling frame




## Scenario 2:

## Small sampling frame

## Scenario 2: Small sampling frame




# Scenario 3: w- Intermediary sampling frame 

Count $=17$
Traps $=23$
Encounters $=43$

## Scenario 3: Intermediary sampling frame




Scenario 3: XXREMOVEXX


## Scenario 4:

 no. Clustered sampling frameCount $=17$ Traps $=32$ Encounters = 55

Scenario 4:

## Clustered sampling frame




## What if we had traps everywhere




## What do the four scenarios show?



## Effective sampling



## What are we estimating?

- Activity Centers (number of animals)
- Activity Range (How far animals range)
- Encounter Rate (How many encountered at activity center)


## What is our sampling unit?

- Number of snow leopards

- Number of encounters
- Number of distances



## What is our sampling unit?

- Number of snow leopards
- Number of encounters
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How do we reduce errors?

## What is our sampling unit?

- Number of snow leopards
- Number of encounters
- Number of distances


## How do we reduce errors?

- Increase samples
- Stratify
- Model


## Sampling advisory

- Exclude areas not represented or used by snow leopards from integration area
- Survey long-enough to get several encounters
- Use enough traps to get several encounters of several animals on several traps


## What if...

- Not enough snow leopards?


## What if...

- Not enough cameras


## What if...

- Not enough identifiable encounters

