# Counting Elusive Animals

# The 2011 Bwindi Gorilla Census

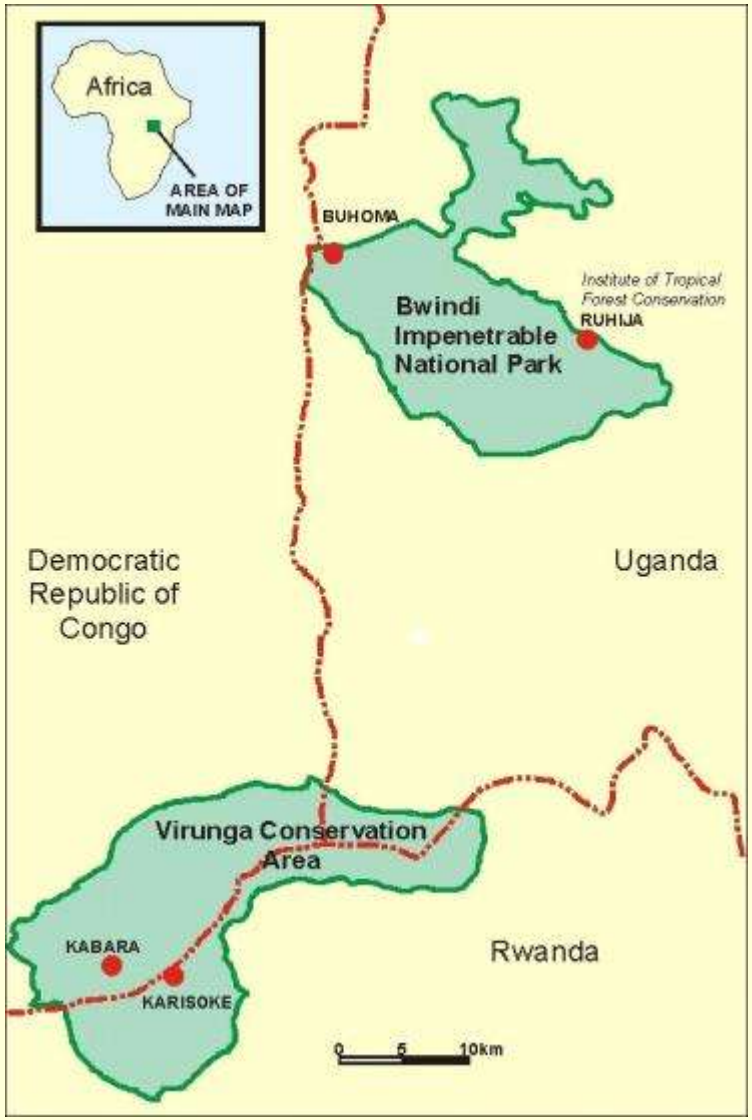
# Why conduct a census of the gorilla population?

- **Monitor status of the small, endangered population.**

- **Assess the effectiveness of conservation management strategies.**

- **Identify areas of concern & plan for future conservation strategies.**

# Bwindi Impenetrable National Park




**Contains ~ half of the world's mountain gorillas.**

**1997: 300**

**2002: 320**

**2006: 336/302**

**Bwindi is one of the richest ecosystems in Africa!**

- **Intermediate in altitude (1100 – 2600m).**
- **Food availability & gorilla diet differ from other sites; variability within Bwindi.**

# Goals of the 2011 Bwindi Census

- **Estimate population size & compare results with previous censuses.**
- **Monitor population health.**
- **Record illegal activities & signs of large mammals.**



# Sweep Method

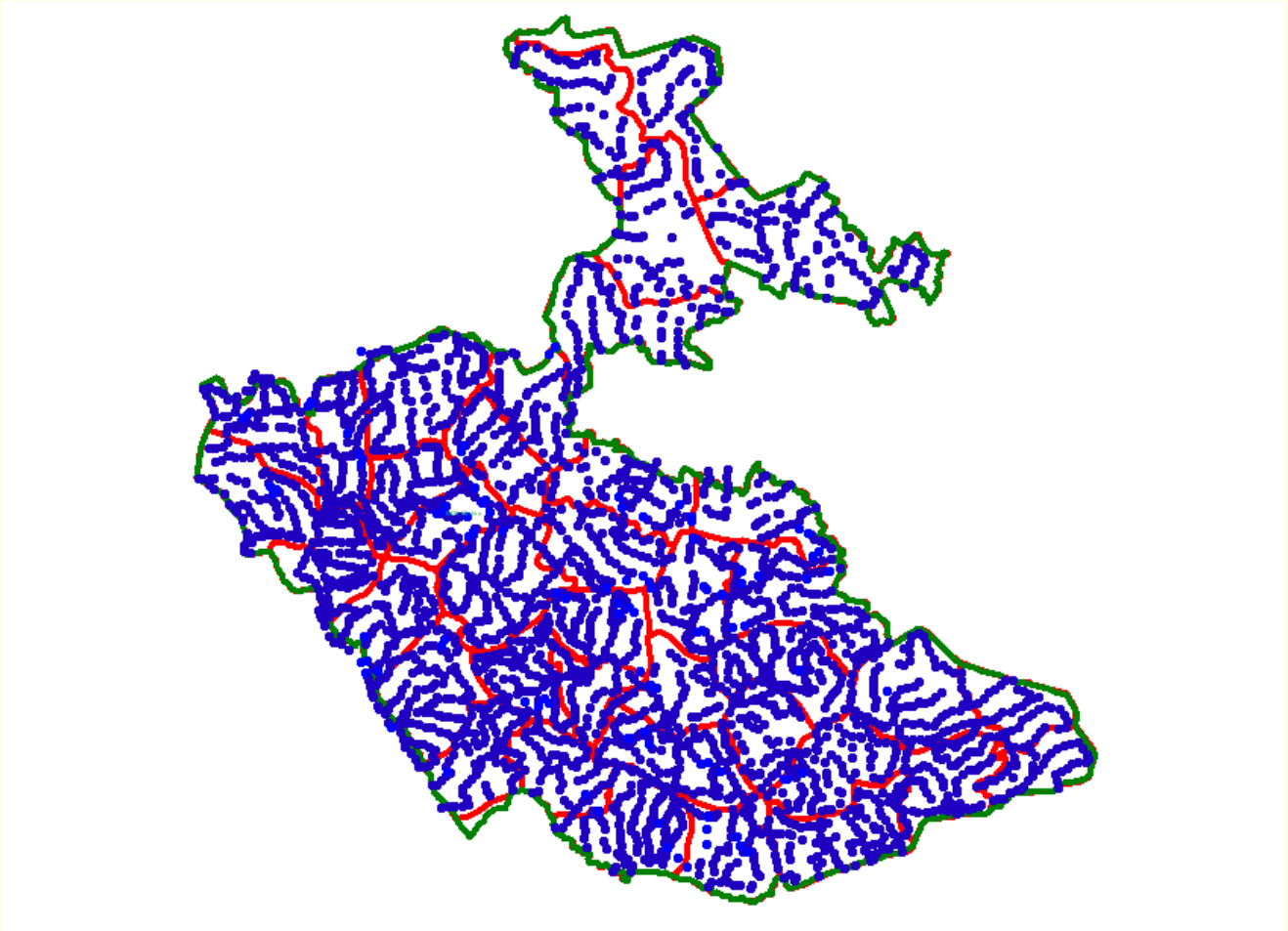
# Sweep Census Method

**4-6 Teams systematically move through the forest looking for fresh signs of gorillas, traversing the park from East to West.**

**Follow fresh trails of gorillas to 3 consecutive nest sites.**

**Estimate group composition based on nest counts and size of dung.**

# Trails walked by census teams ~600 km



# Indirect Methods to Count Animals are not without problems!

## Potential inaccuracies of ‘sweep method’:

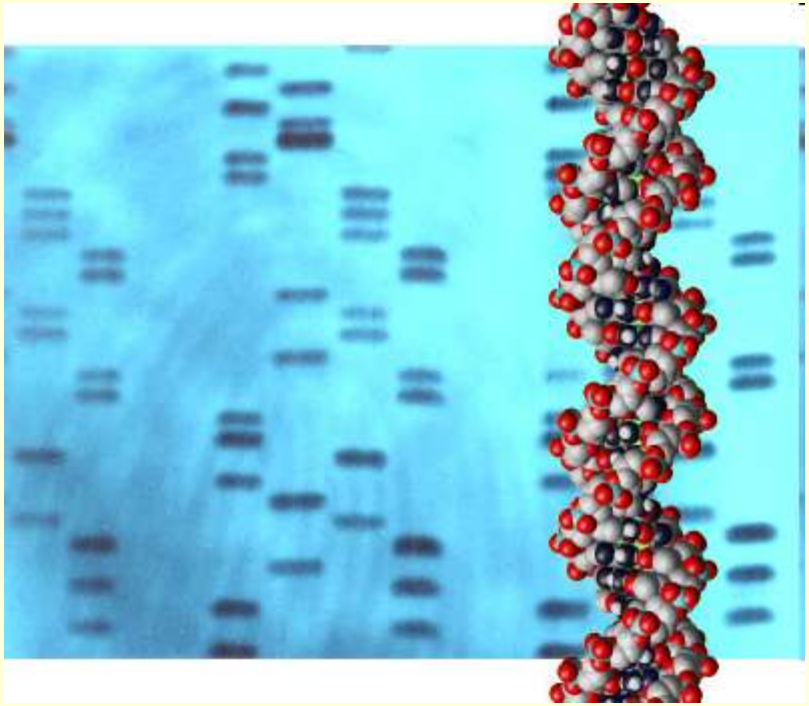
- **We assume gorillas make only one nest per night.**
- **Number of nests found from same group can vary.**
- **Dung of young infants nesting with mothers can be missed.**
- **Possibility of double counting groups.**

## How to reduce the inaccuracies?

# Genetic Census

# Genetic Census Method

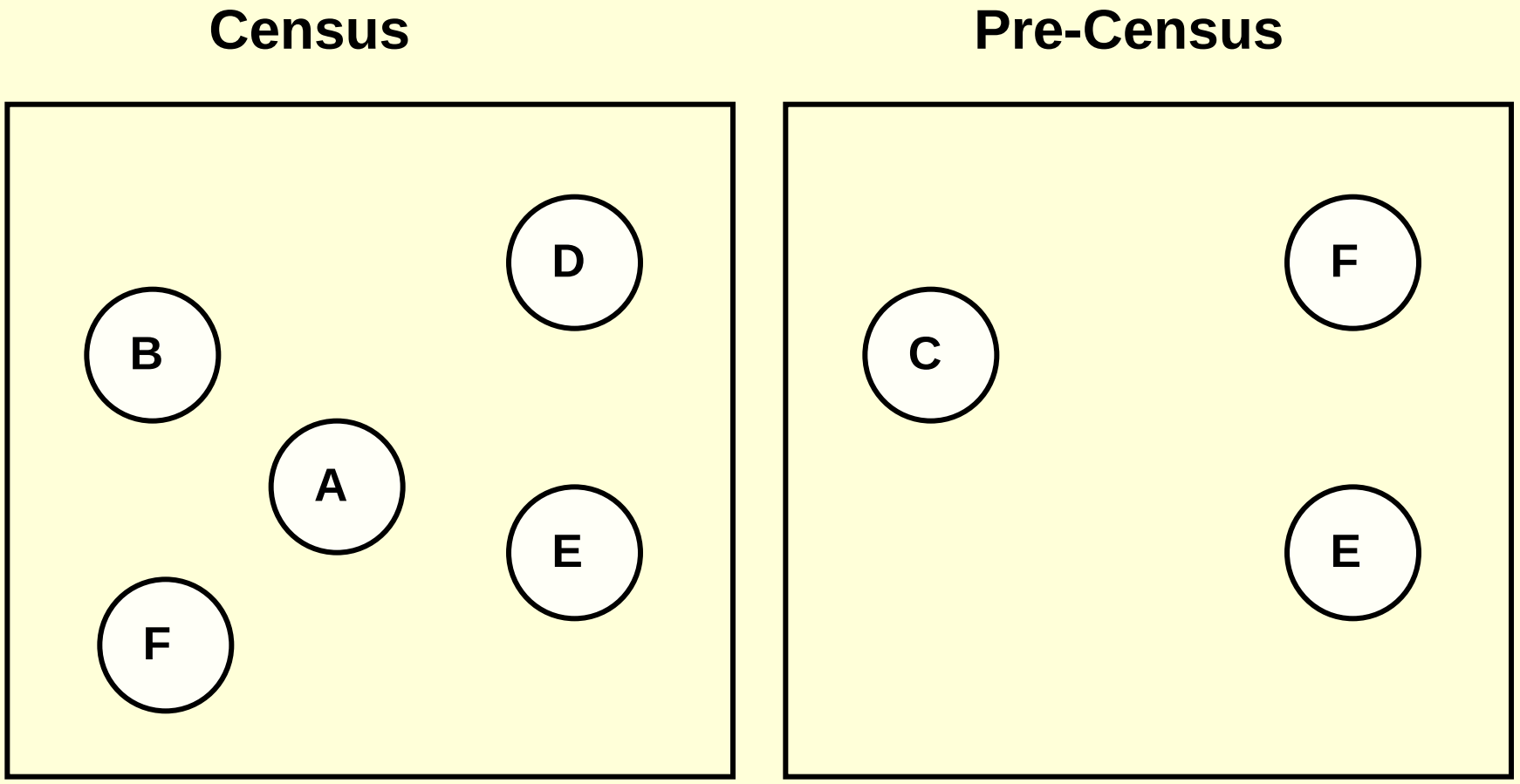
- DNA collected non-invasively from faecal samples
- Samples genotyped to 16 microsatellite loci



# Pre-Census

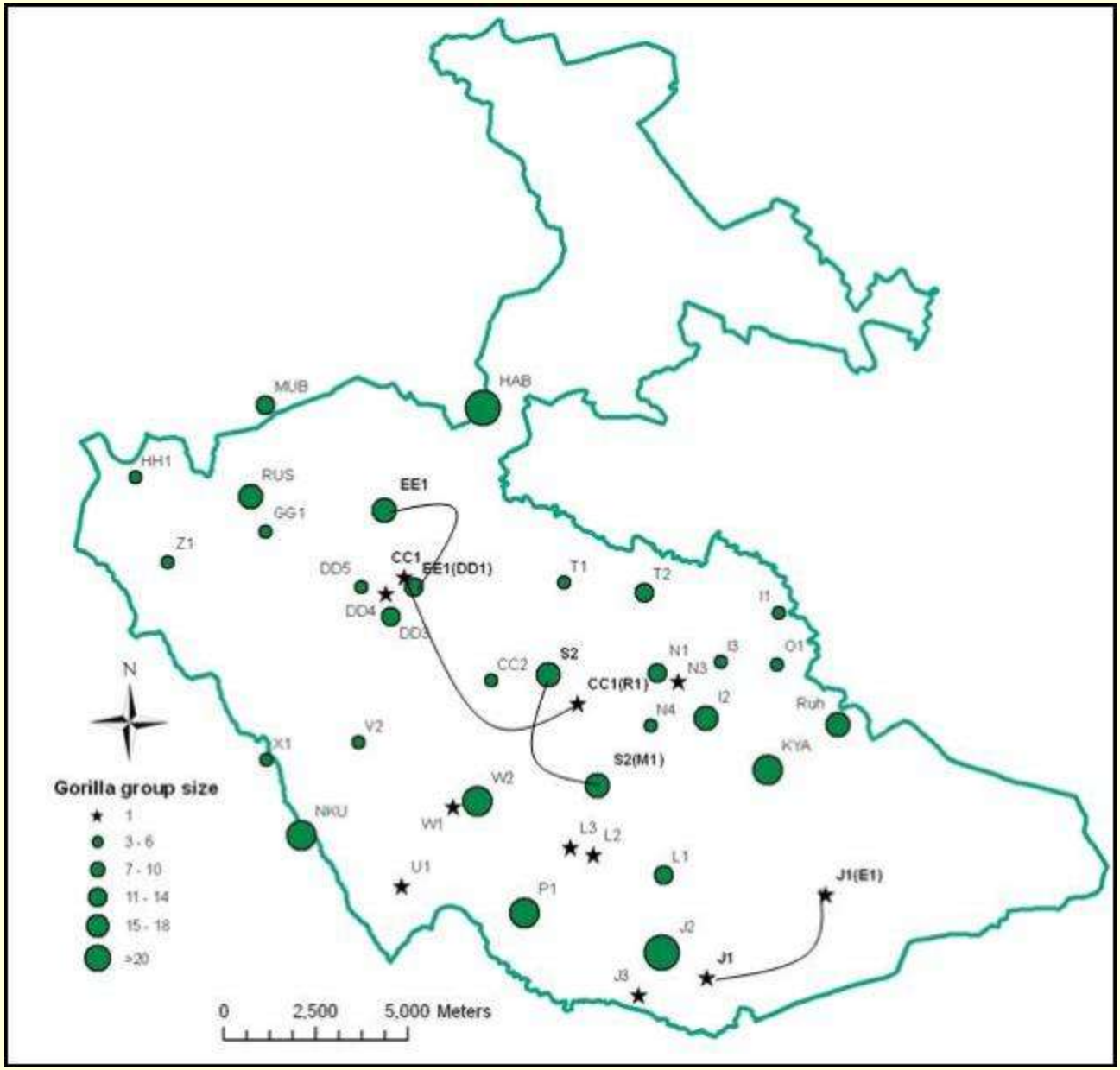
# Pre-Census

## Capture-Recapture



# 2006 Census

# Results


MUB
HAB
HH1
RUS
EE1
GG1
Z1
CC1
EE1(DD1)
DD5
T1
T2
I1
DD4
DD3
CC2
S2
N1
I3
O1
N3
CC1(R1)
N4
I2
Ruh
V2
X1
KYA
S2(M1)
W2
W1
NKU
L3
L2
L1
U1
P1
J1(E1)
J2
J1
J3
N
Gorilla group size
1
3 - 6
7 - 10
11 - 14
15 - 18
>20
0
2,500
5,000 Meters

# 2006 Census - Results

**Field Method**

- 30 groups & 11 solitary males
- 317 gorillas individuals from nest counts
- Added a correction factor for missed infants: 19 gorillas
- Estimated total: 336

**Genetic Method**

- 28 groups & 10 solitary males
- Genotyped 257 unique individuals
- Added 27 gorillas with no genotype
- Missed infants: 12-17 gorillas
- Revised total = 302

# Why the discrepancy?:

1. **Gorillas making more than one nest per night:**
   **14 individuals too many**

2. **Two groups were double counted: 22 gorillas too many**

3. **Solitary males: 1 gorilla too many**
   **2 cases of individuals thought to be different were the same**
   **2 nests thought to be the same gorilla were different**

- **However, field methods are still largely accurate:**
- **Genetics confirmed several cases of double-counts of groups.**

# Pathogen Analysis

**Monitoring population health:**

**Parasites** **Viruses** **Bacteria**

# What else can the genetics tell us?

- **Genetic tracking of known individuals:  case of silverback ‘Ntegenisa’**
- **1999:  emigrated from Kyagurilo Research Group, but already genotyped**
- **2002:  identified genetically as a solitary male in the census**
- **2006:  identified genetically as the silverback in a group of 9 gorillas**


# Acknowledgements

**IGCP**
**UWA**
**UNCST**
**ITFC**
**MPI-EVA**
**WCS**

**RDB**
**ICCN**
**DFGFI**








# Thanks for Listening