Population Dynamics of Bwindi Mountain Gorillas:

Update on 2011 Census Analysis

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Participating Organizations

Uganda Wildlife Authority

International Gorilla Conservation Programme
(a coalition of the African Wildlife Foundation,
World Wide Fund for Nature,
and Fauna & Flora International)
Max Planck Institute for Evolutionary Anthropology
Institute of Tropical Forest Conservation
Dian Fossey Gorilla Fund International
Mountain Gorilla Veterinary Project
Conservation through Public Health

L'Institut Congolais pour la Conservation de la Nature
Rwanda Development Board

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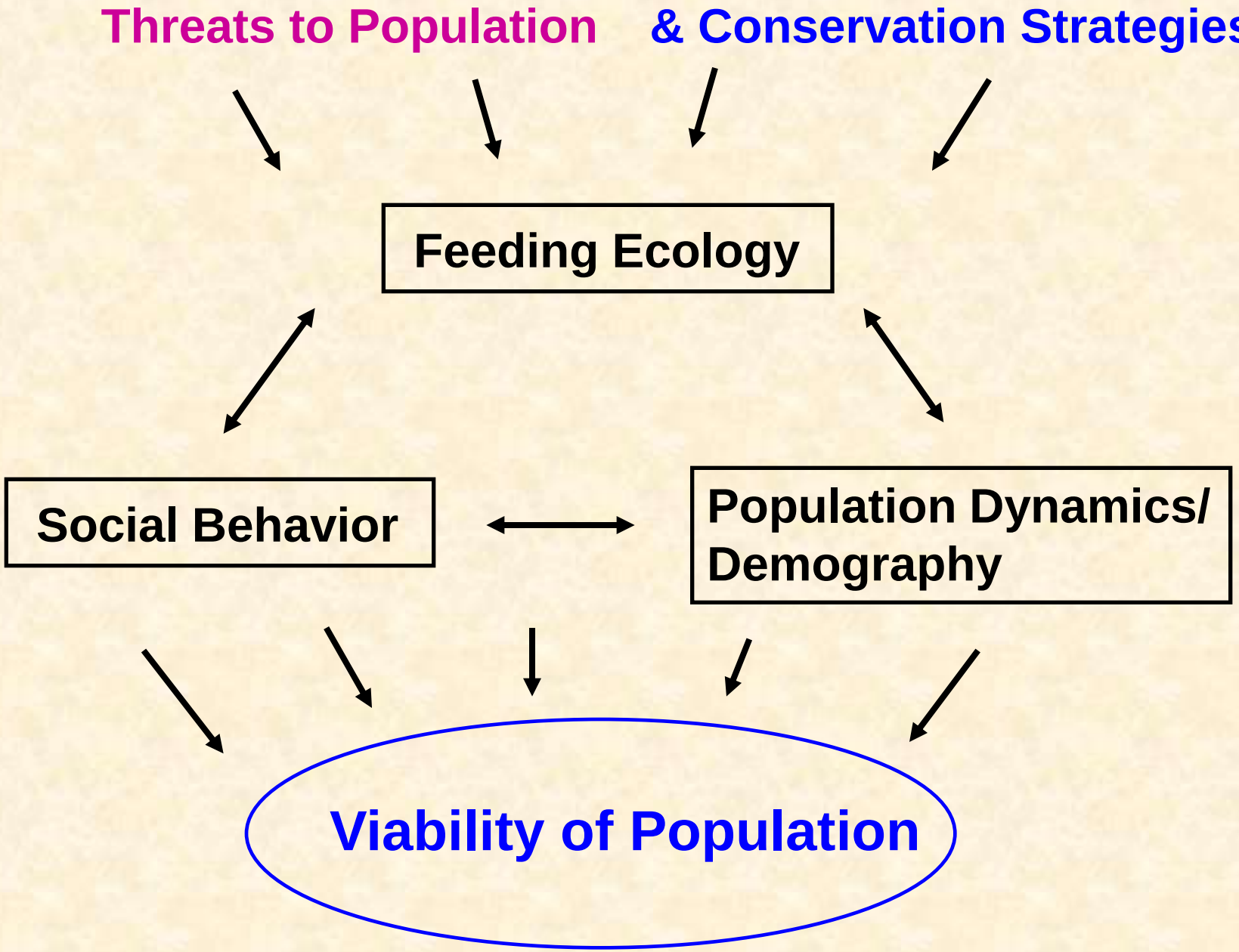
and the Wildlife Conservation Society

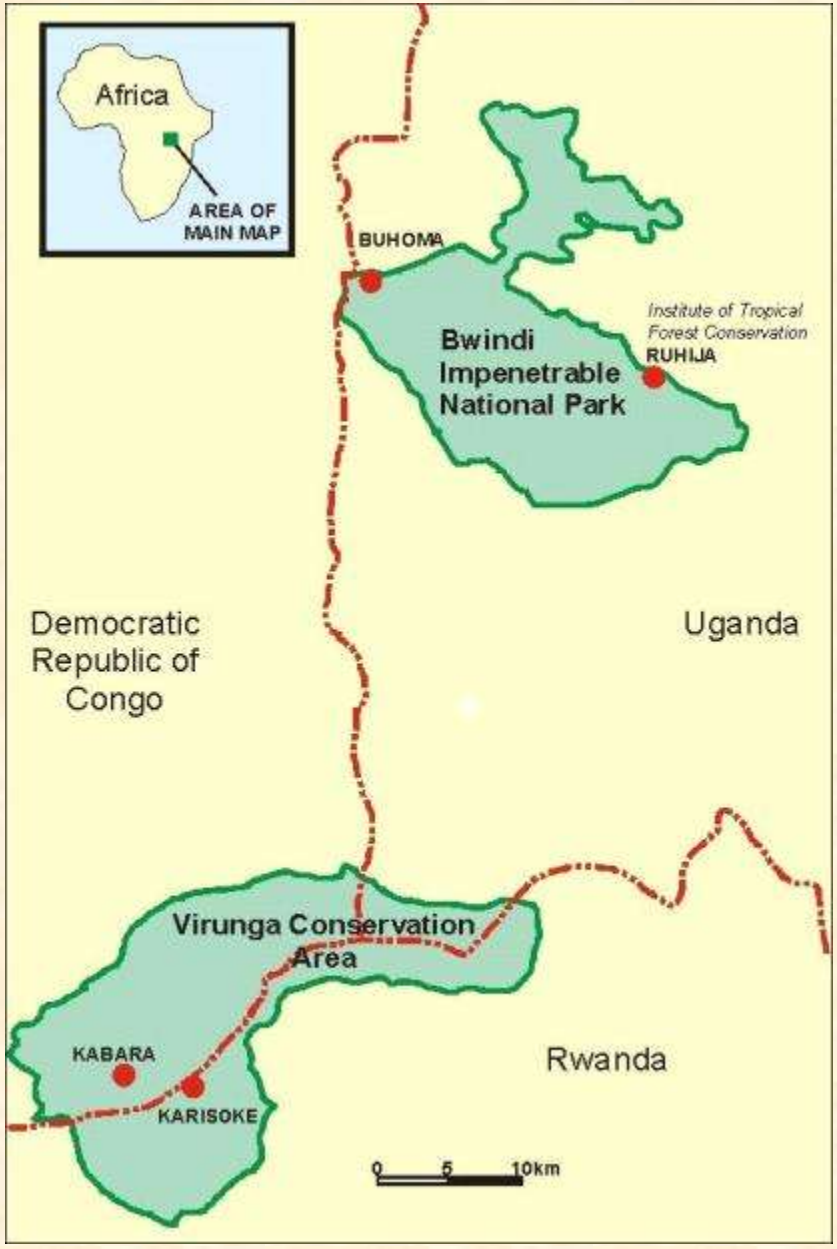

Threats to Population
& Conservation Strategies
Feeding Ecology
Social Behavior
Population Dynamics/
Demography
Viability of Population

Why conduct a census of the gorilla population?

*Monitor the status of the small, endangered population.

*Assess the effectiveness of conservation management strategies.

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



-Mountain Gorillas found in only 2 locations

-Critically Endangered

<u>Bwindi Impenetrable National Park</u>

Censuses in 1997, 2002, 2006, 2011

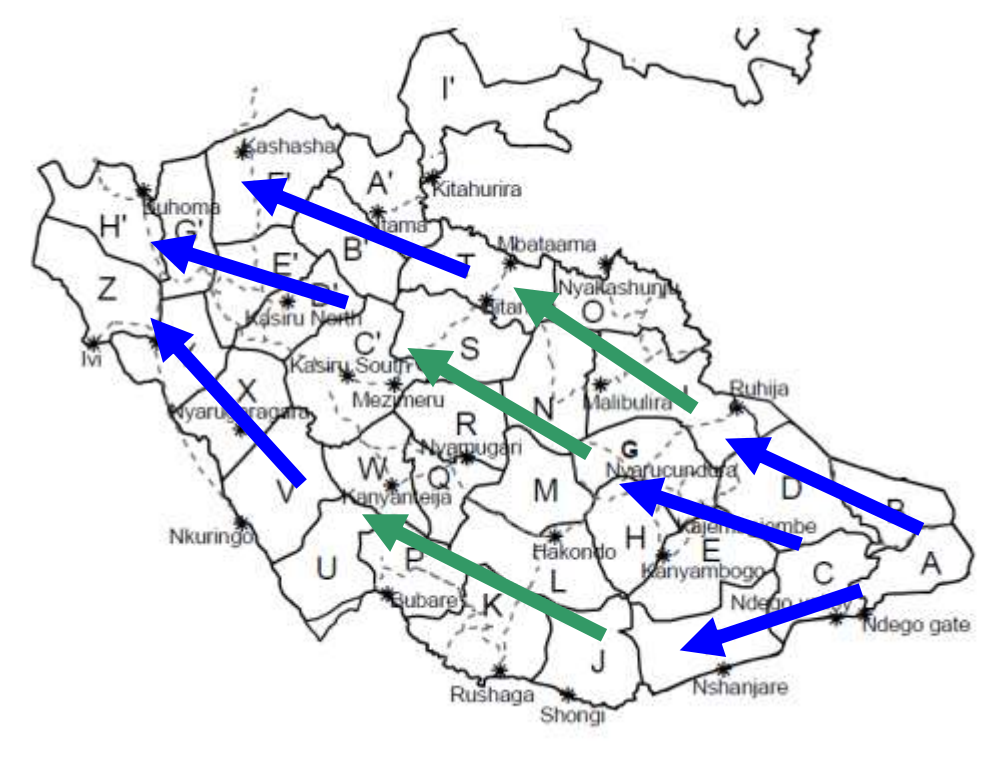
<u>Virunga Volcanoes:</u>

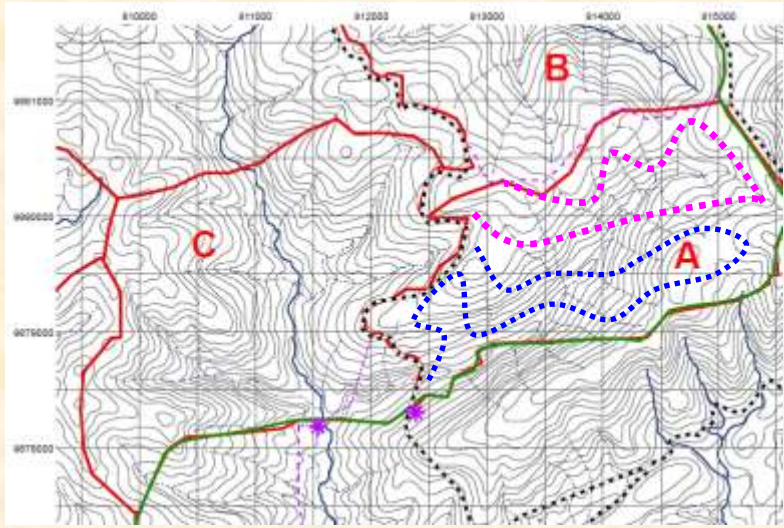
Censuses in 1971, 1976, 1980, 1986, 1989, 2003, 2010

‘SWEEP CENSUS’ METHODS:

-Systematically move through the forest looking for signs of gorillas, large mammals & illegal activities.

-6 teams of people traverse park in a zig-zag manner from east to west.





‘SWEEP CENSUS’ METHODS:

-When fresh gorilla trails are found, follow them to 3 consecutive nest sites.

-Estimate group composition based on number of nests and size of dung.

Indirect Methods to Count Animals are not without problems!

Potential Inaccuracies of 'Sweep Method':

-Assumes that each individual in the population is detected.

-Assumes 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 or missing groups entirely.

How to reduce the inaccuracies?

-Concurrently conduct a 'genetic census' using genetic identities of individuals obtained from fecal samples.

Genetic Analysis Provided more Accurate information by:

***Ensuring that groups with similar nest numbers & in close proximity are all unique groups.**

***Confirming the number of individuals in each group (number of nests found varies; some gorillas may make more than one nest each night).**

2006 Census – Combined Sweep and Genetic methods.

-Found approximately 300 gorillas in Bwindi, not 340.

-These results provide a more accurate, refined estimate of the number of gorillas in Bwindi.

-They do not indicate that the population has been declining!

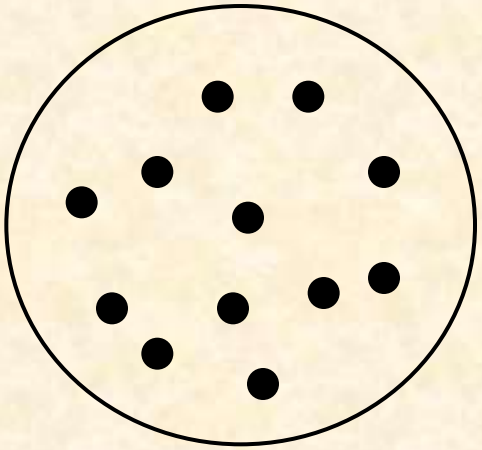
-Due to the possibility of overcounts or undercounts in the previous Bwindi gorilla censuses, we cannot determine if the population has been increasing or decreasing.

-Repeating genetic census methods will enable us to monitor group composition, dispersal of individuals and changes in the population size.

With only a Single Sweep –
Still have problem of possible undetected groups

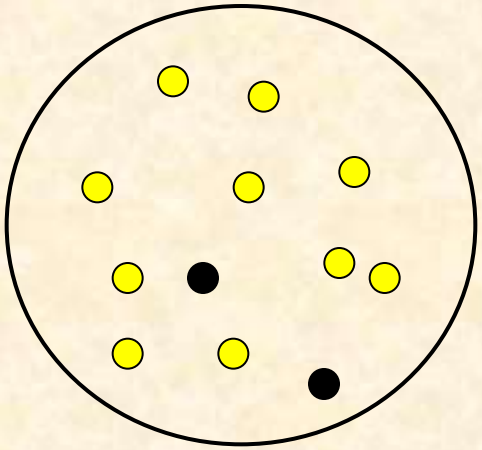
Idea behind Mark-Recapture Method

Reality



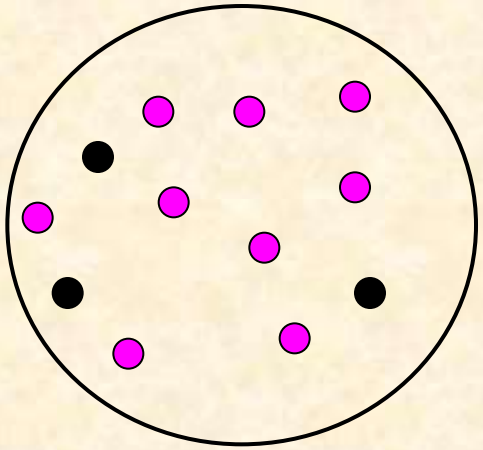
12 groups in population

First Sweep (or ‘capture’)



10 groups found, but don’t know how many not found.

Second Sweep (or ‘capture’)



9 groups found, but includes 2 groups missed in 1st sweep

GOALS OF 2011 BWINDI CENSUS:

1. **Use a mark-recapture approach to estimate the population size of the Bwindi mountain gorillas**

2. **Conduct 2 complete sweep censuses and use genetic analysis**

3. **Compare results with 2006 census.**

4. **Collect information on illegal activities large mammals.**
   - compare results with previous censuses in Bwindi.

5. **Analysis of parasites, viruses, and bacteria from entire gorilla population (from fecal samples) by Makerere University, PREDICT, MGVP, CTPH, Robert Koch Institute.**

How will we arrive at final number of gorillas?

Habituated gorillas – use known composition (~160)

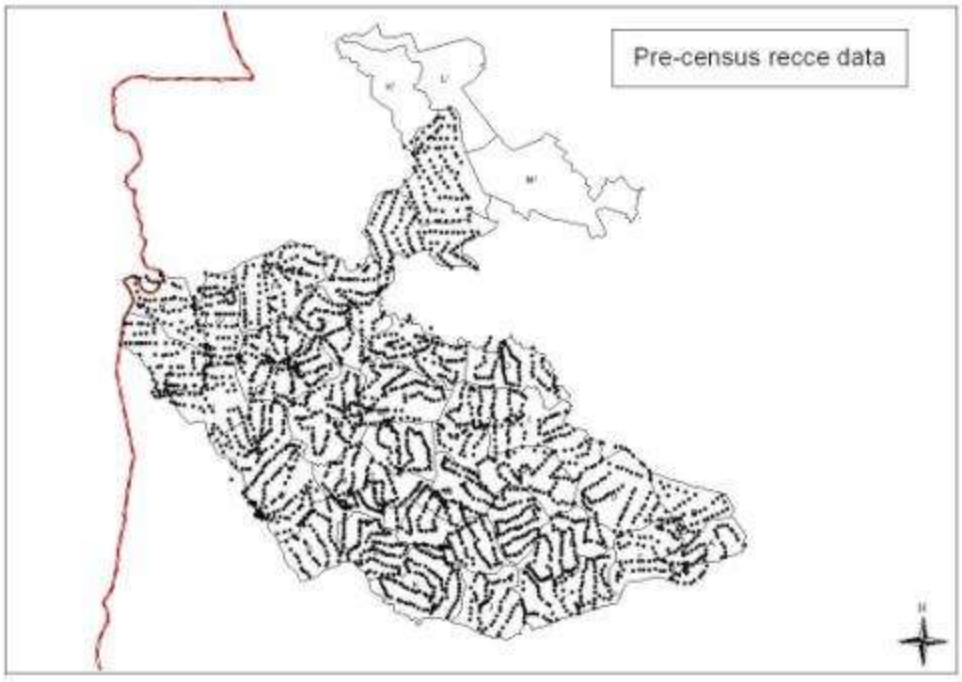
Unhabituated gorillas – nest site data and genetic analysis of fecal samples from 2 'sweeps/captures'.

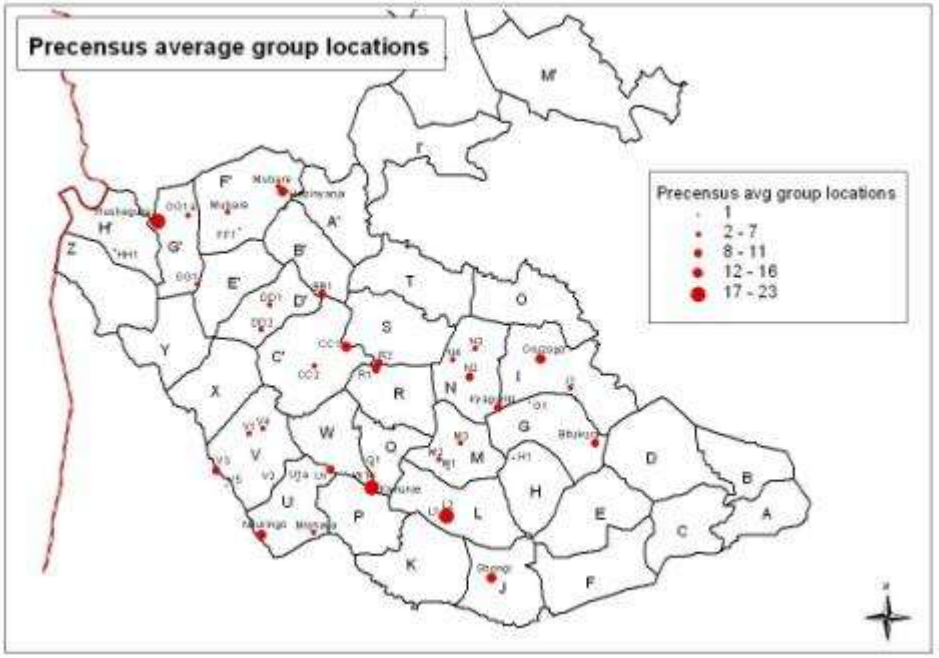
Correction Factor for Undetected Infants

1st Sweep (Capture) - 'PreCensus' -- February – August 2011

-Had 1-3 teams sweep the forest.

~550 fecal samples collected – laboratory analysis began in September

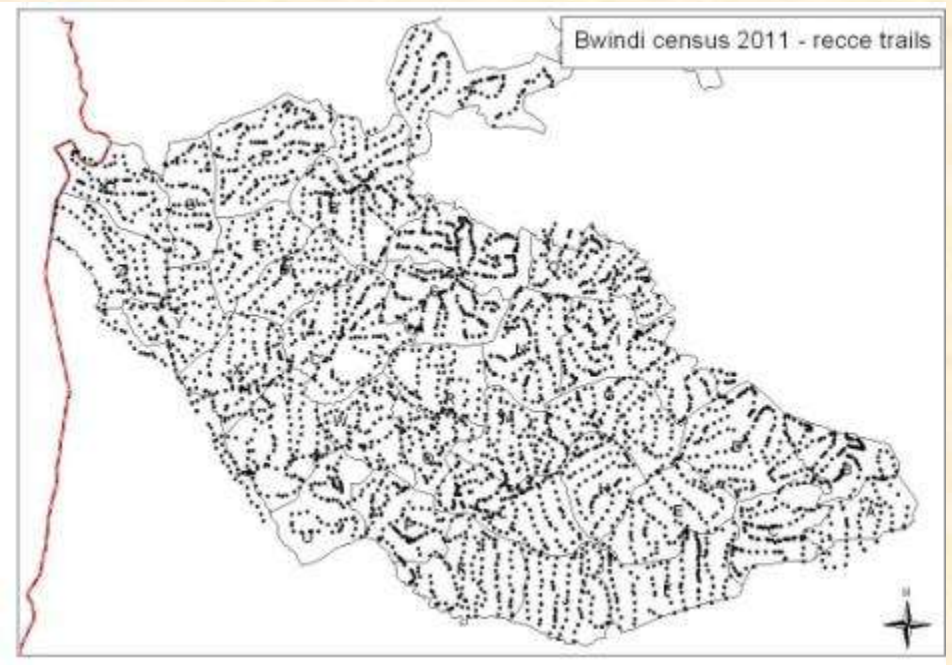


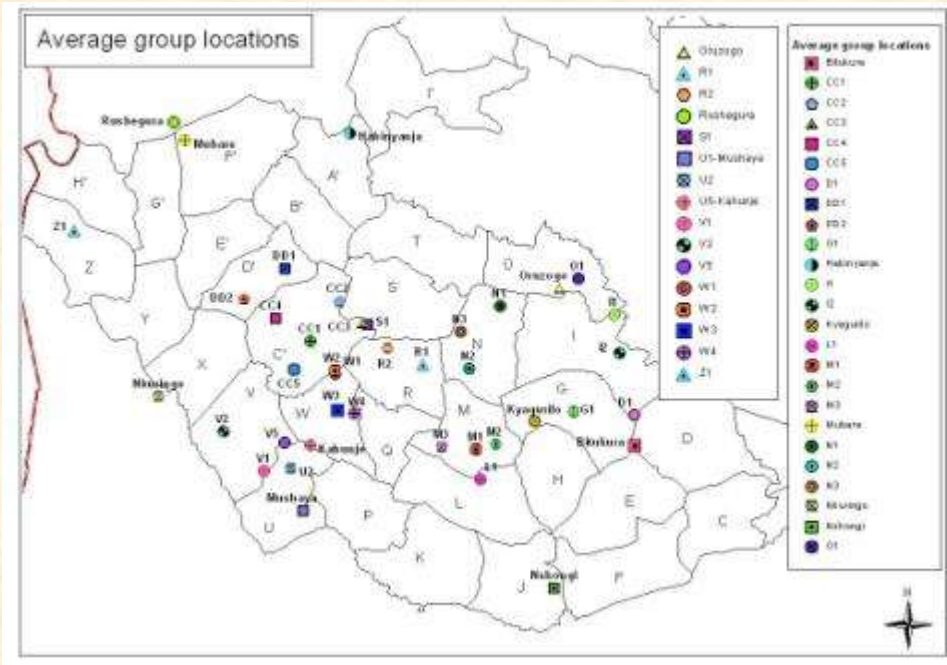


2nd Sweep (Capture) - 'Census' -- September – October 2011

-Had 6 teams sweep the forest.

~650 fecal samples collected





Genetic Analysis – In Progress

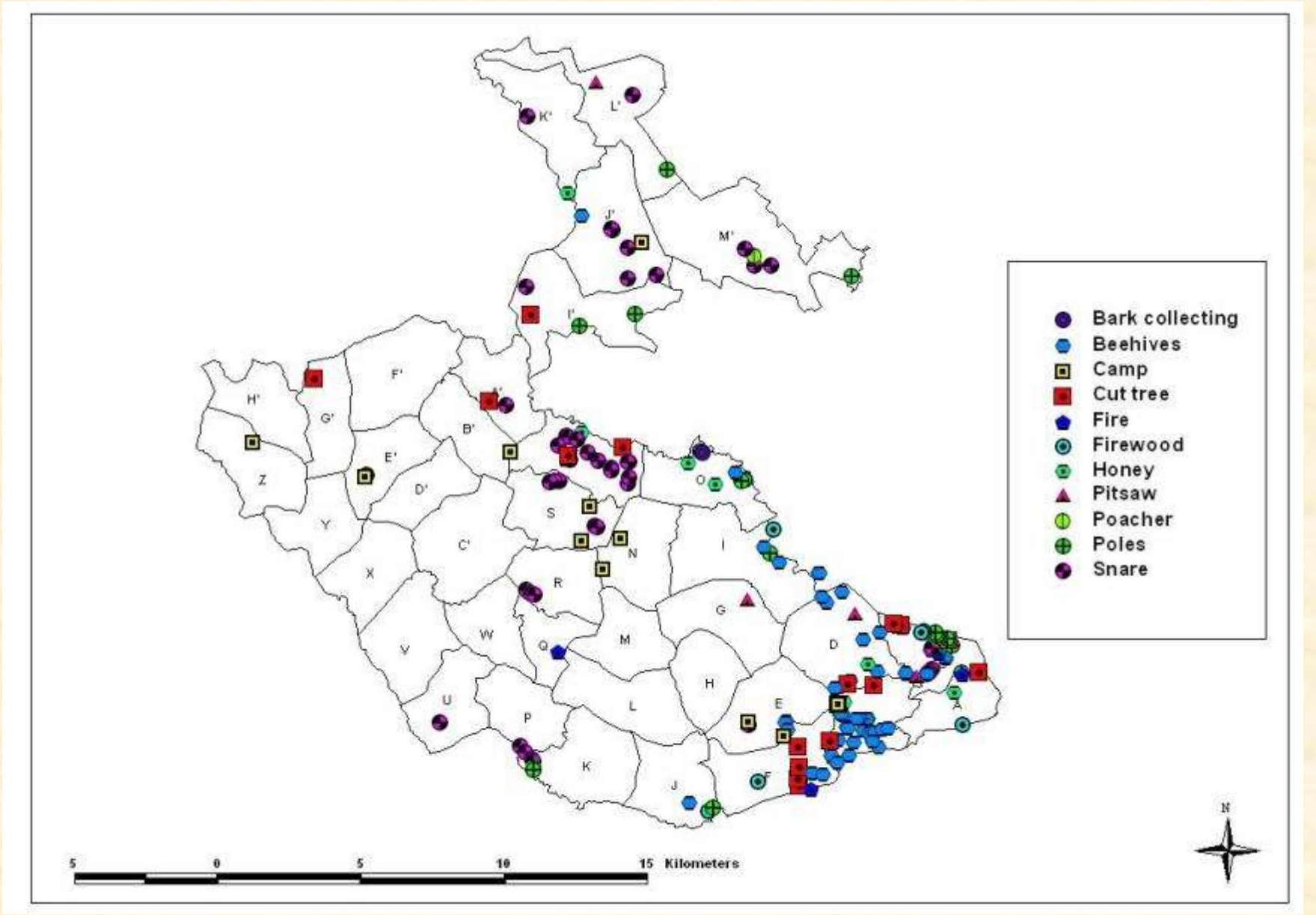
1st Sweep:
-Analysis conducted in Germany September 2011- January 2012
~275 samples genotyped at 6-13 microsatellite loci

2nd Sweep:
-Samples arrived in Germany in December 2011.
-Analysis ongoing.

Should have results by October/November 2012.

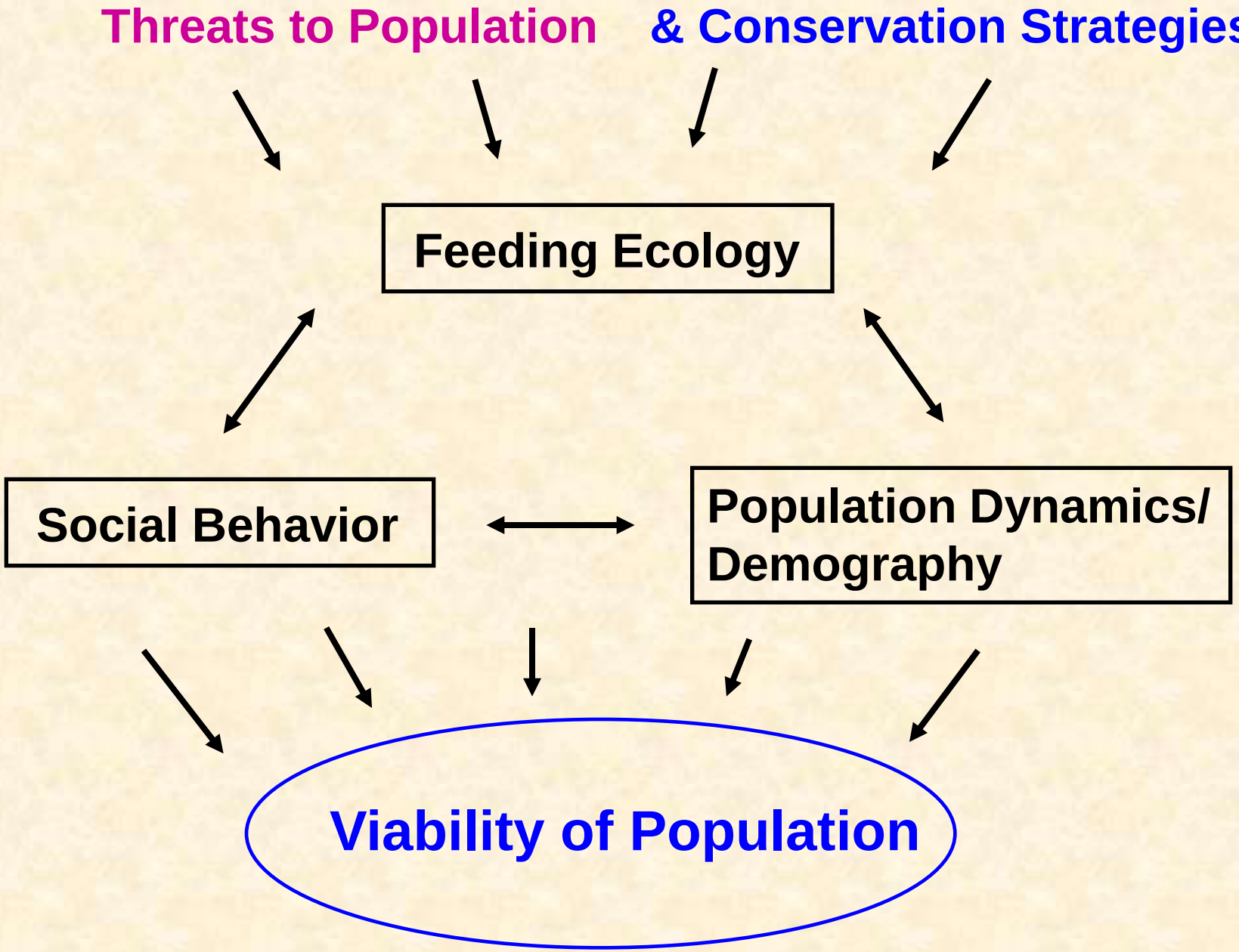
Please be patient!

Illegal Activities – Preliminary Summary



Illegal Activities – Preliminary Summary

SNARES	Number Found
Bwindi - 2011	74
Bwindi - 2006	76
Virungas - 2003	241
Virungas -2010	218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Upcoming PhD project (Nicole Seiler)

To better understand their ecological requirements,

we will investigate Habitat Utilization by Bwindi Gorillas (Ranging patterns in relation to Food Availability)

-including an examination of when and where the habituated gorillas are outside of the park:

- **-crop raiding**
- **-in buffer zone/tourist areas**

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