The 15th Emerging New Researchers in the Geography of Health and Impairment Conference

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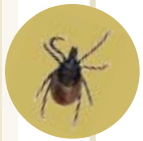

Methods for Mapping and Assessing Human Exposure to Lyme Disease :

A case study in a suburban forest of France

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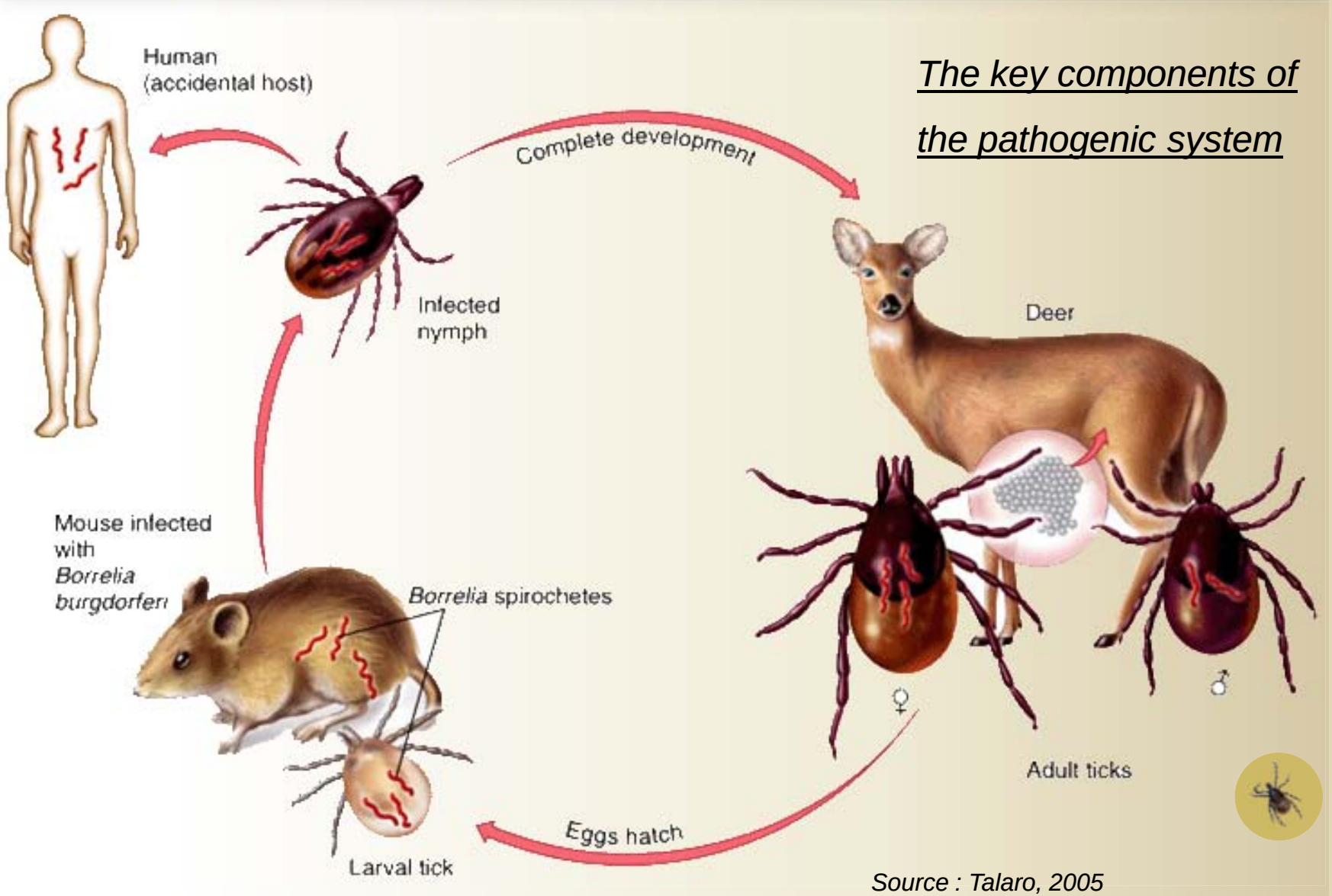
PRESENTATION OUTLINE

1. What is Lyme disease (LD) ?
2. Some issues for the assessment of LD risk
3. Methods for assessing human exposure to LD
4. Conclusions and perspectives

1. What Is Lyme Disease ?

- Most common vector-borne disease in the Europe and the U.S
- Transmitted by the bite of an infected tick
- A disease that can cause skin, joint, heart and nervous system problems
- Lyme disease can affect people of all ages
- Named after the town of Lyme, Connecticut, where it was first described in 1977

1. What Is Lyme Disease ?

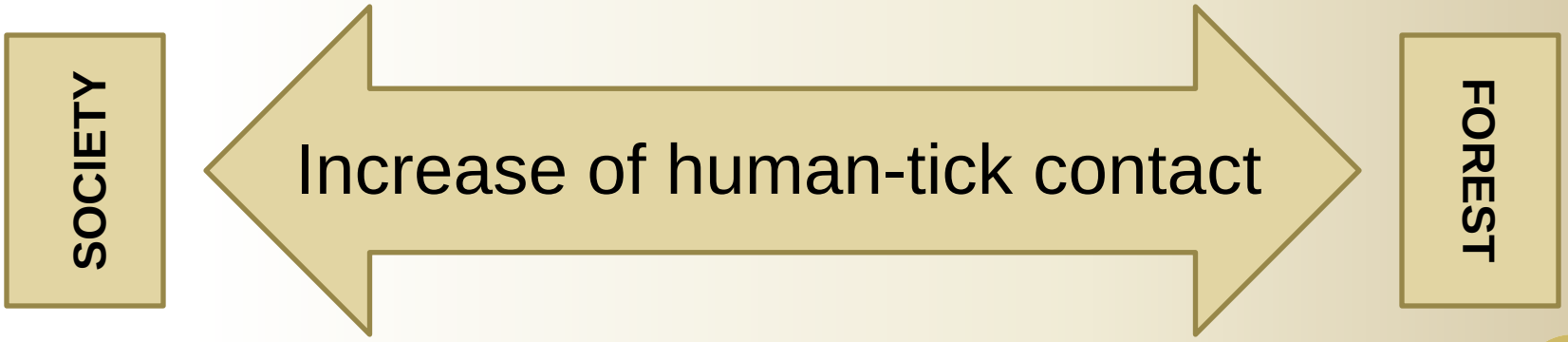


The key components of the pathogenic system

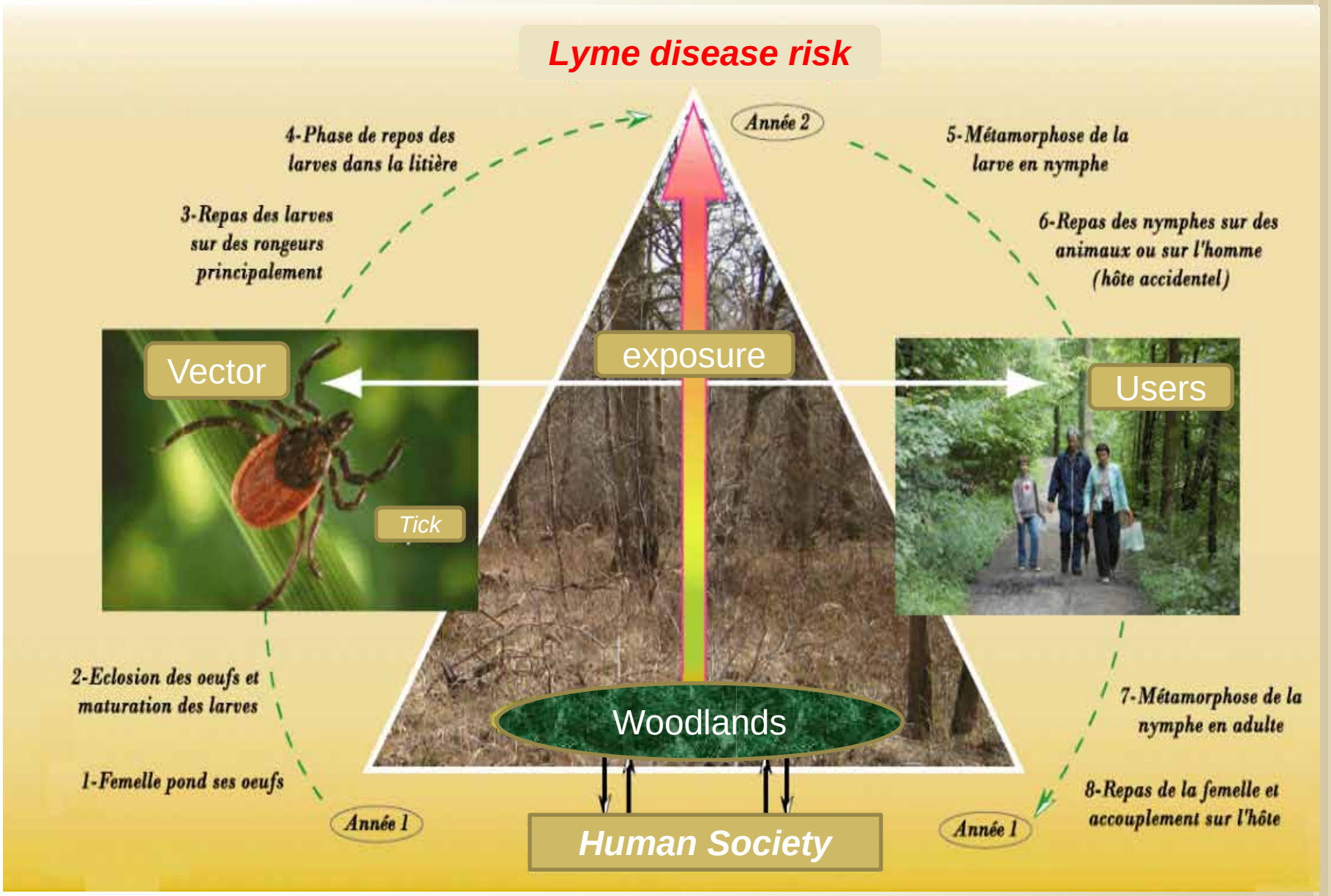
Source : Talaro, 2005

A public health issue in suburban areas

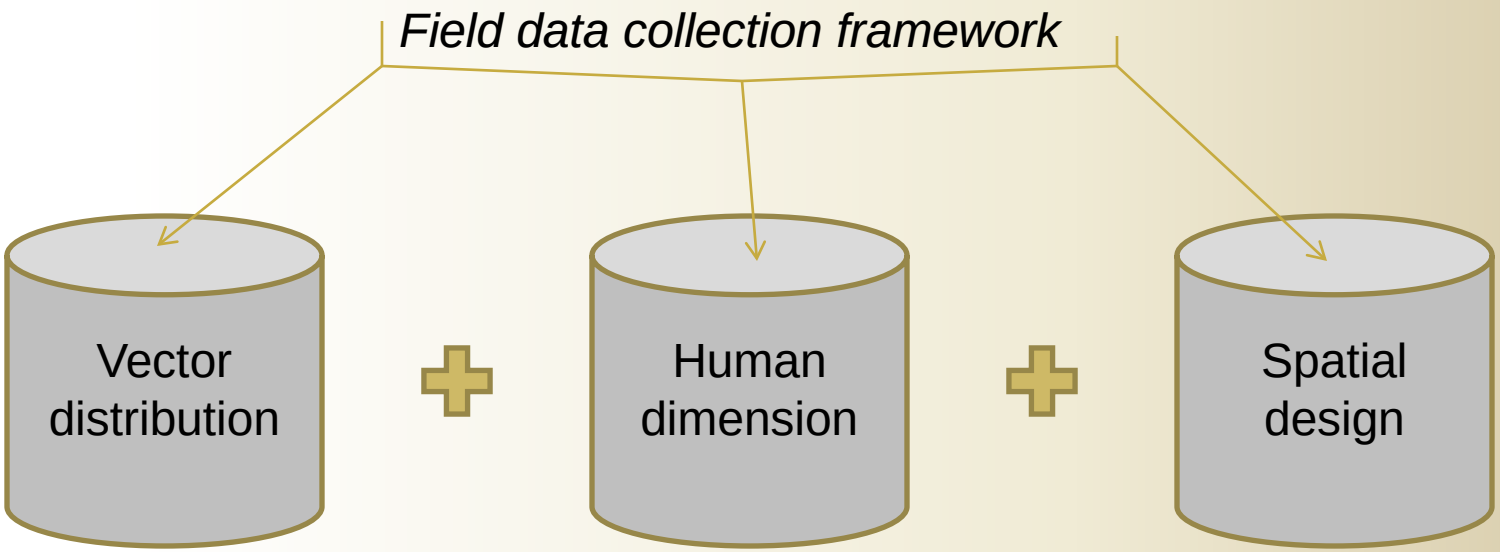
- Encroachment of human settlement into the forest areas
- A large number of people who visit urban forests



Disease emerged when humans moved into tick environment


Lyme disease risk
Année 2
4-Phase de repos des larves dans la litière
5-Métamorphose de la larve en nymphe
3-Repas des larves sur des rongeurs principalement
6-Repas des nymphes sur des animaux ou sur l'homme (hôte accidentel)
Vector
exposure
Users
Tick
2-Eclosion des oeufs et maturation des larves
7-Métamorphose de la nymphe en adulte
Woodlands
1-Femelle pond ses oeufs
8-Repas de la femelle et accouplement sur l'hôte
Année 1
Année 1
Human Society

A major indicator : human-tick contact



Spatio-temporal analysis of human-tick contact

A case study in the Forest of Sénart (near from Paris)

- Workpackage -

Ticks collection methodo-logy (drap sampling)

9 forest stands

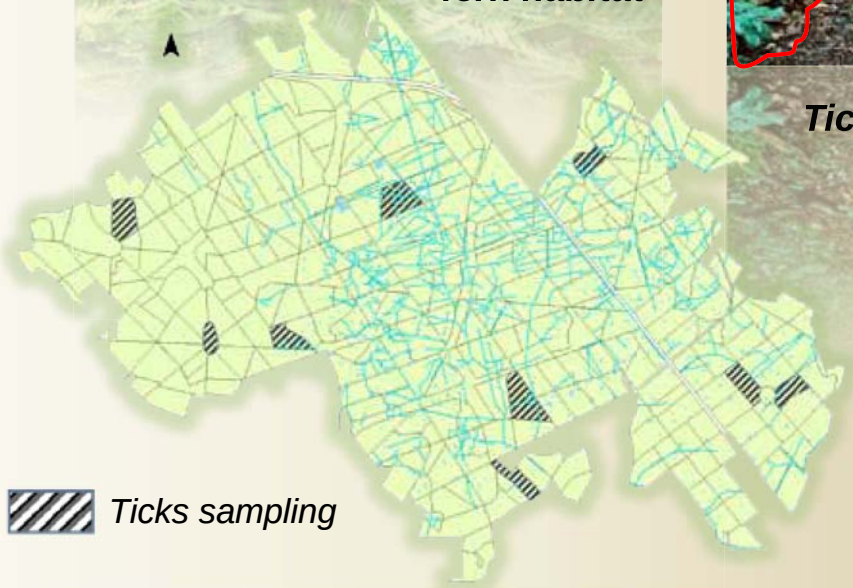
Statistical Analysis

- densities of ticks (per ha)
- densities of infected ticks
- infection prevalence

Examples of ticks habitat

Ticks are abundant in moist fern habitat

Ticks live on the edge



Ticks sampling

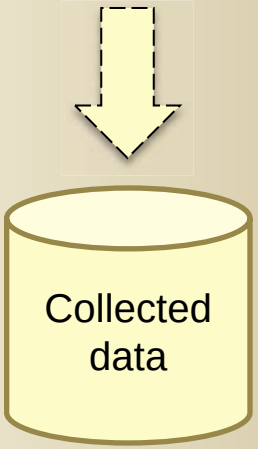
Acknowledgement :
Institut Pasteur (Paris), CNR of Borrelia

Data collection on visitors and their activities inside the forest

Forest users

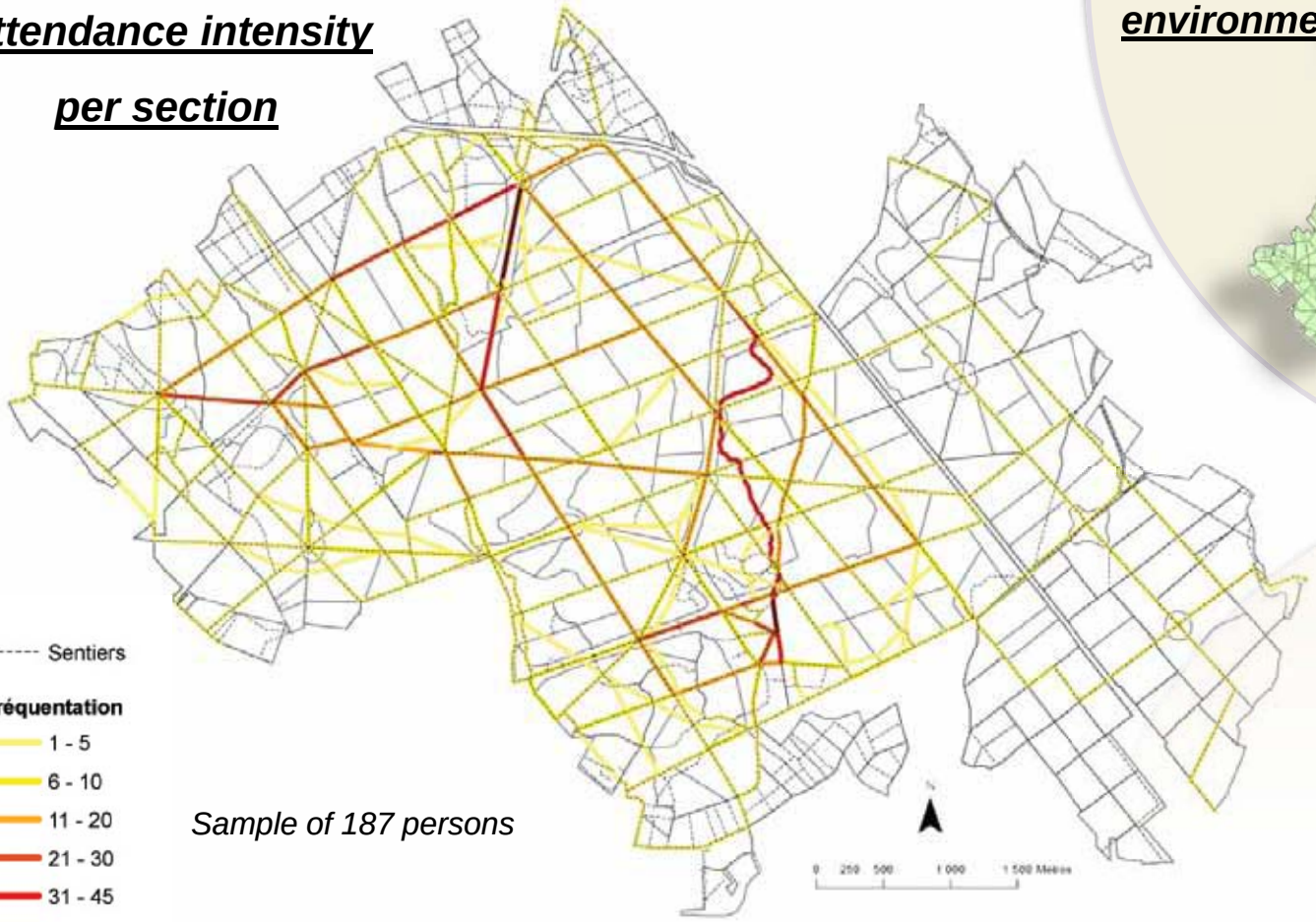
Personal interviews

Courtesy of Hedi Haddad



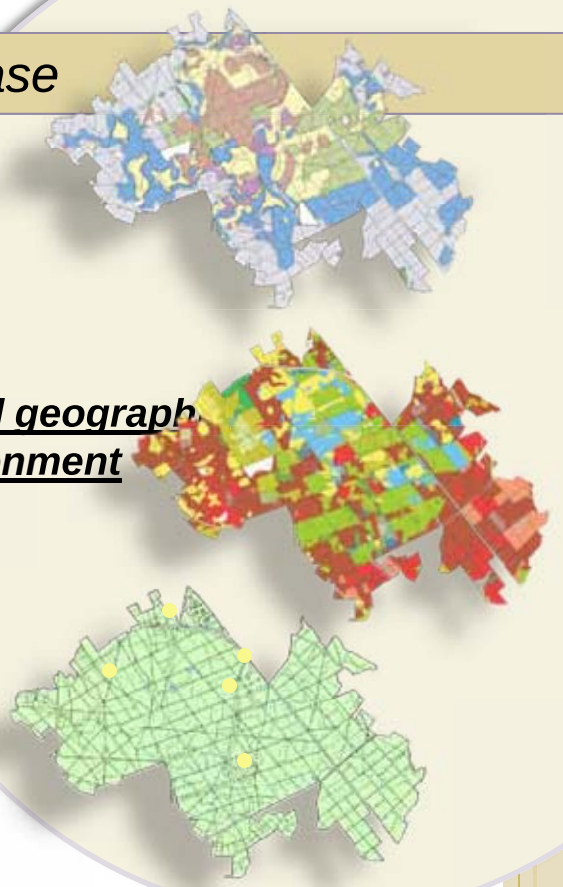
The « routes » the visitors follow in the forest of Sénart

Attendance intensity per section



Sample of 187 persons

Virtual geograph environment



- *Type of planting*
- *Forest stations*
- *Recreation areas*

Accessibility into the understory

Risk of human exposure

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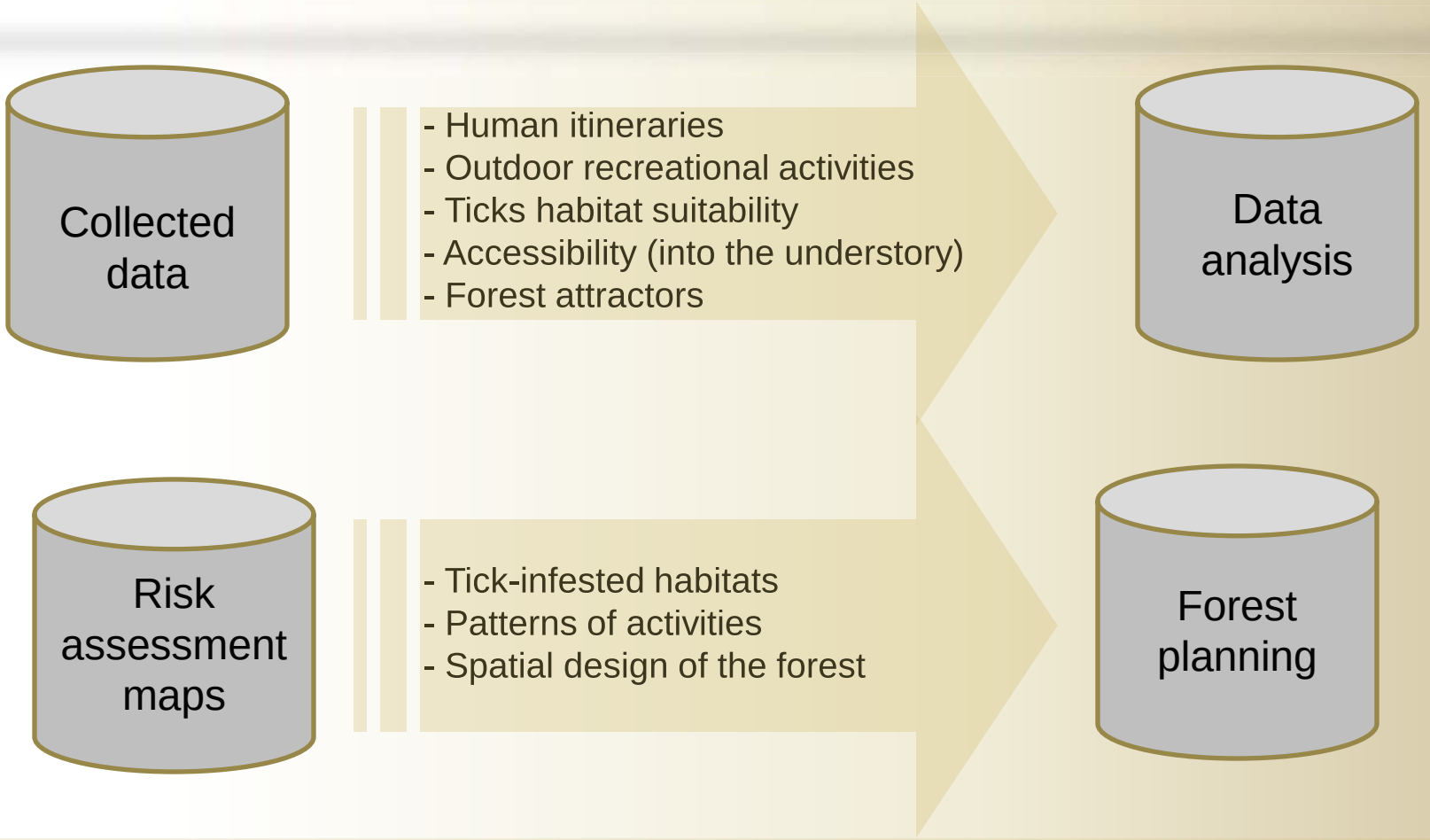
« Attractors »

Daffodils, Lily of the valley, mushrooms, *etc.*

4. Conclusions and Perspectives



Outcome benefit : to develop a multi-agent geosimulation tool allowing forest officers to assess different intervention scenarios

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THANK YOU FOR YOUR ATTENTION !

Source :

EUCALB, 2006

You can prevent Lyme Disease by keeping ticks off your body !

But we geographers can minimize Lyme Disease risk using the landscape and design !