VBORNET

"European Network for Arthropod Vector Surveillance for Human Public Health"

AGM Antwerp 2011

WP3 – Vector surveillance and distribution data

- *"To maintain and update existing **databases for vector surveillance and distribution**, and create new databases for arthropod vector surveillance based on available data"*
- Subdivisions
  - 4.3.1 Support to the development of the VBORNET network
  - 4.3.2 Data access and sharing
  - 4.3.3 Arthropod vector surveillance
  - 4.3.4 Arthropod vector distribution maps
    - Mosquitoes
    - Ticks
    - Phlebotominae
    - Other Arthropods

Main objectives

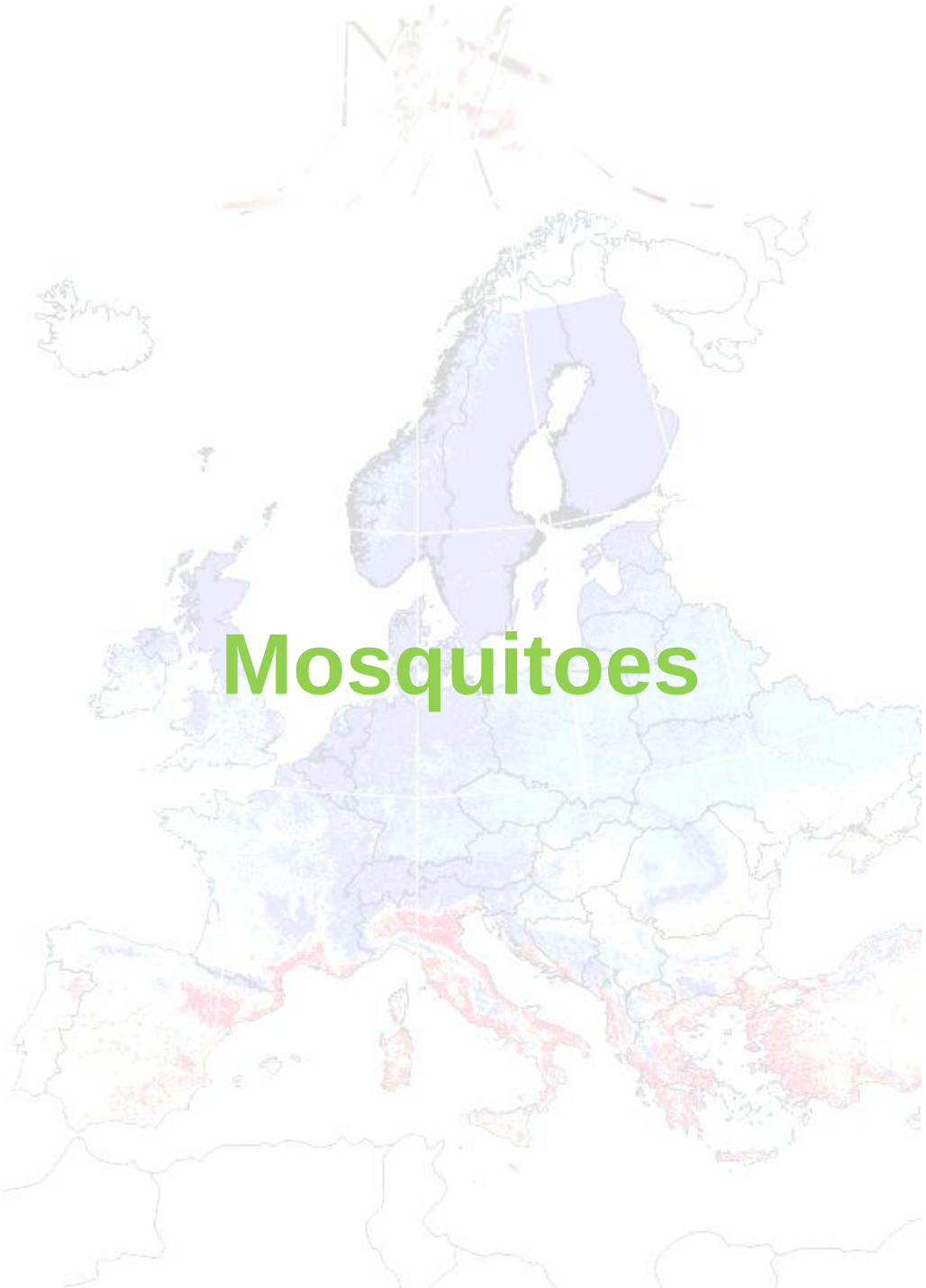
- Create
  - Expert data base
  - Database for vector distribution and surveillance (active & passive search)
  - Links with existing networks at national & international levels
    (Eden(ext), EFSA, ….)
  - ID vector related PH resources and activities (country based)
- Close collaboration with PH
- Rapid consolidation established network (‘emerging diseases’)

Methods

- Searchable web tool = VBORNET vector questionnaire
  - Expert insert data (field, surveillance, identification, publication)
  - Data is validated by focal points (+ admin levels adjusted)
  - Iterative flexible process
  - Maps are generated
- Expert database
  - Continuing active & passive search
  - Iterative flexible process

Vectors

- Mosquitoes
  - Focal point: Dr. F Schaffner
- Ticks
  - Focal point: Dr. L Vial
- Phlebotomes
  - Focal point: Dr. B Alten
- Other arthropods
  - Focal point: Dr. P.-E. Fournier



Mosquitoes

Mosquitoes year 1

- Mosquitoes: known active and potential vectors

- First step: invasive species
  - *Aedes albopictus*
  - *Aedes aegypti*
  - *Aedes japonicus*

  } *distribution & surveillance maps presented at AGM 1*

- Creation of state of the art maps based on the expert validated presence/absence data

- Admin levels 0 (country) - 1 (region) - 2 (province/district) – 3 (administrative unit of the territory)

Mosquitoes year 2: objectives

- Continue updating invasive species distribution & surveillance maps

  + include all reported exotic/invading mosquitoes & possible nuisance species (PH problem)

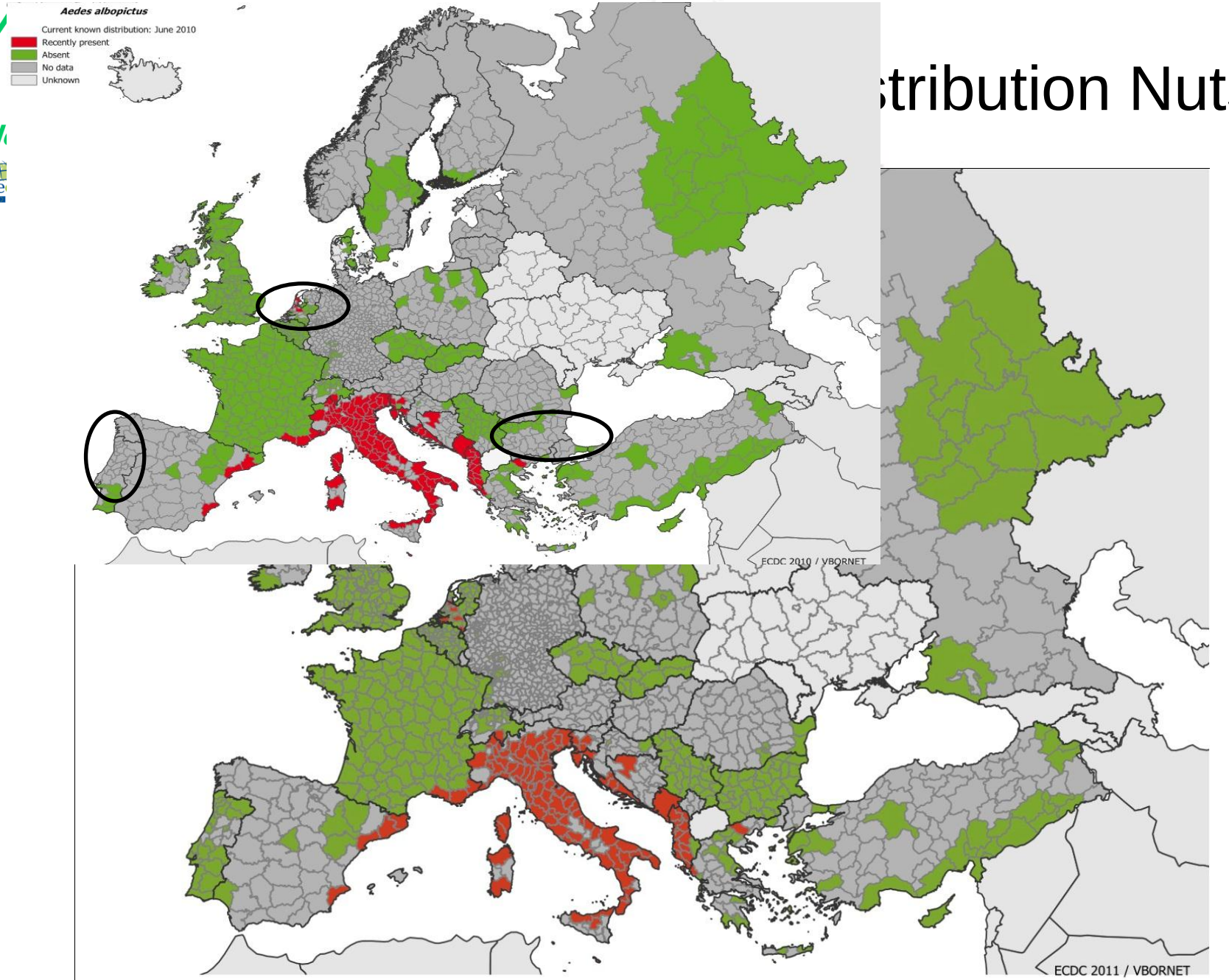
    - *Aedes vexans*

    -*Anopheles plumbeus*

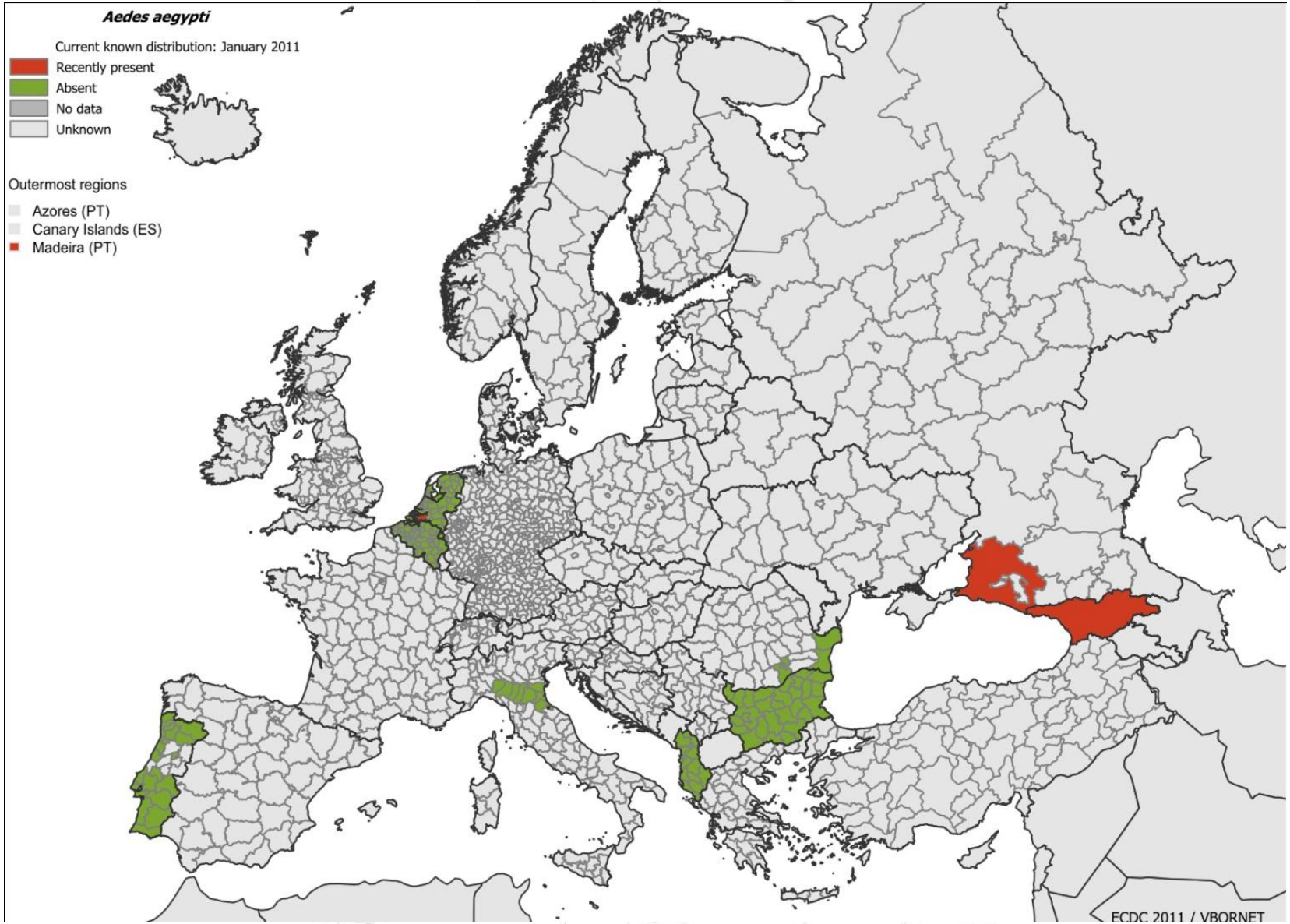
    -*Culex modestus*

- Updates are online: http://ecdc.europa.eu/en/activities/diseaseprogrammes/emerging_and_vector_borne_diseases/Pages/VBORNET_maps.aspx

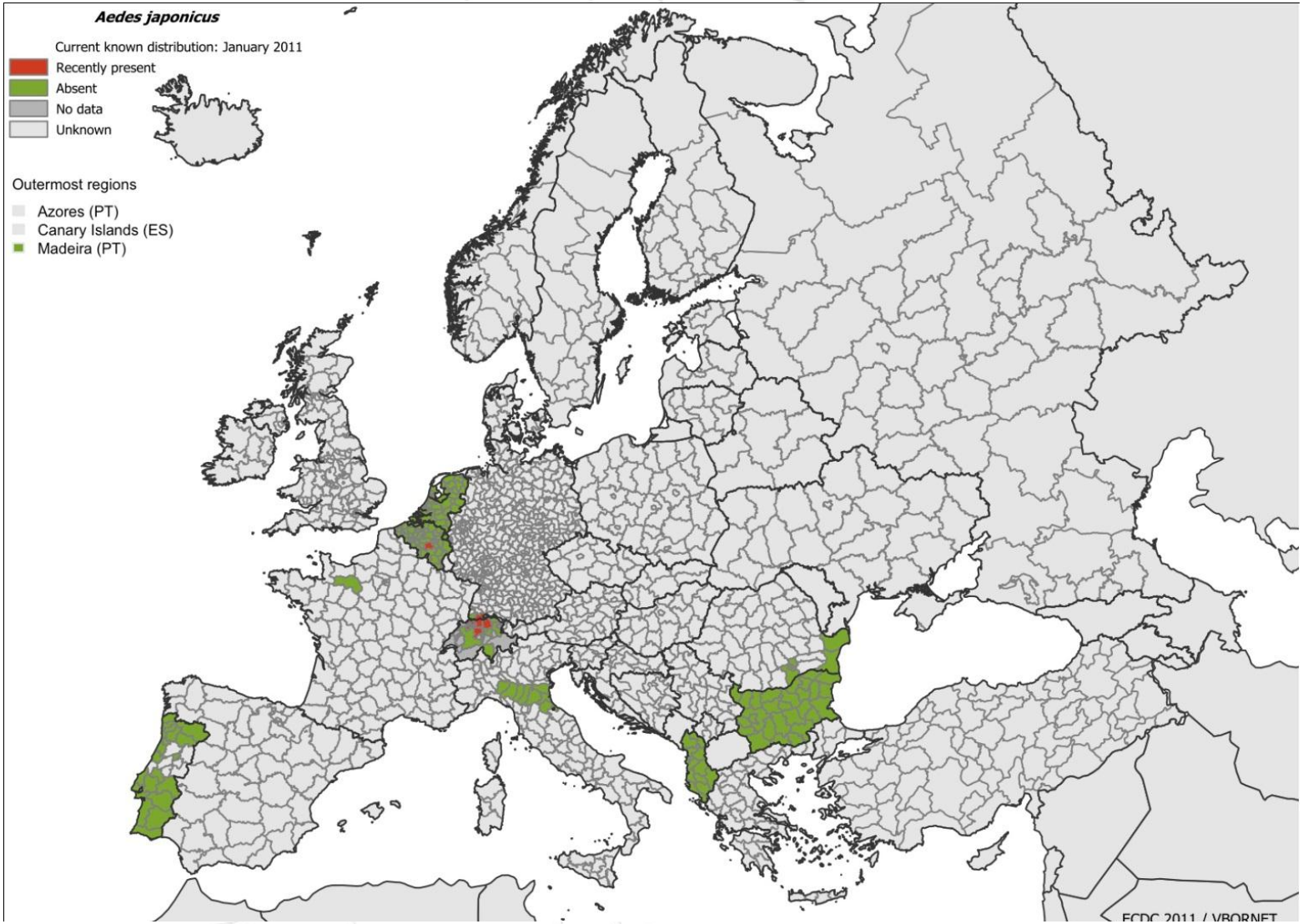
stribution Nuts3



Aedes aegypti distribution Nuts3



Aedes japonicus distribution Nuts3



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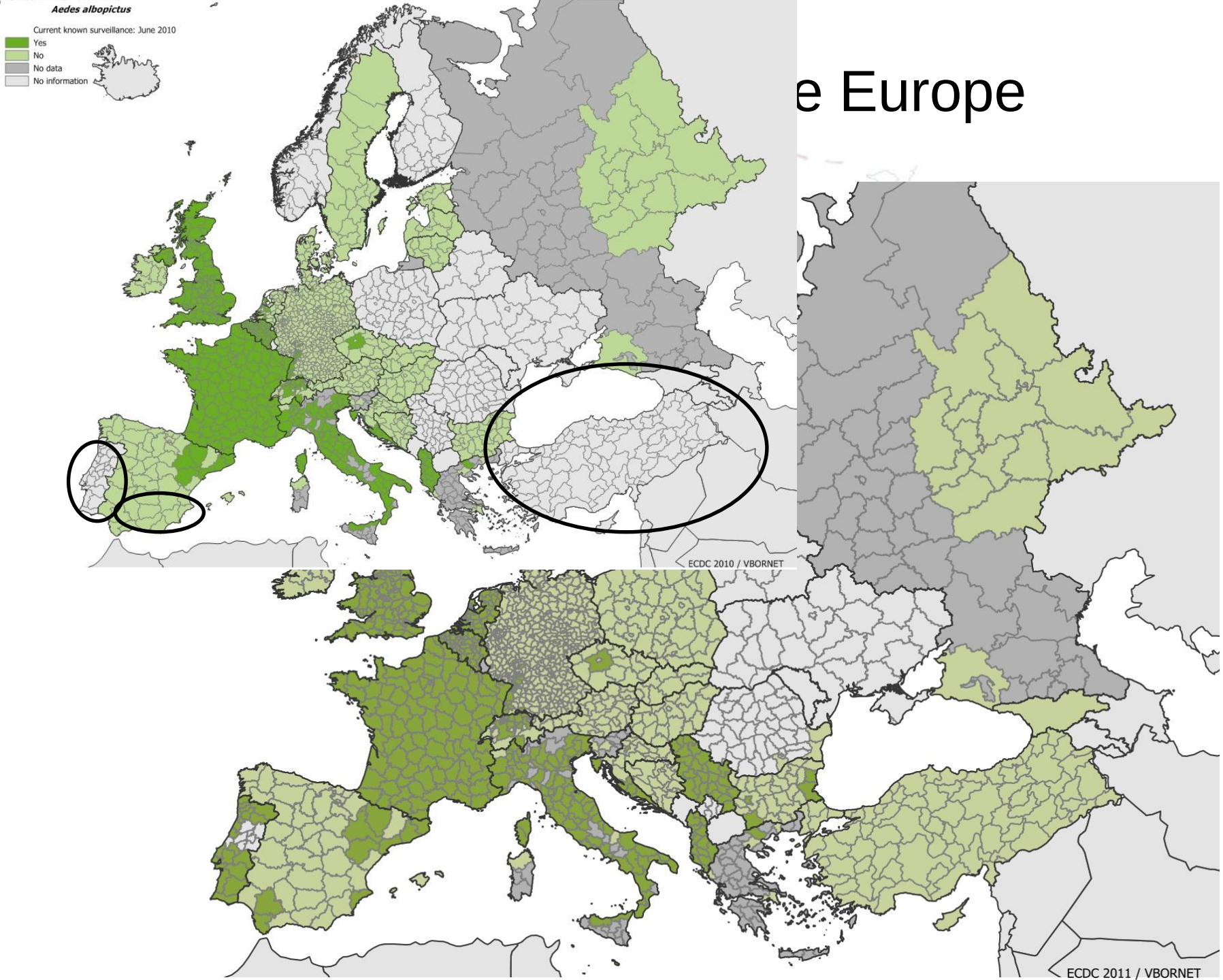
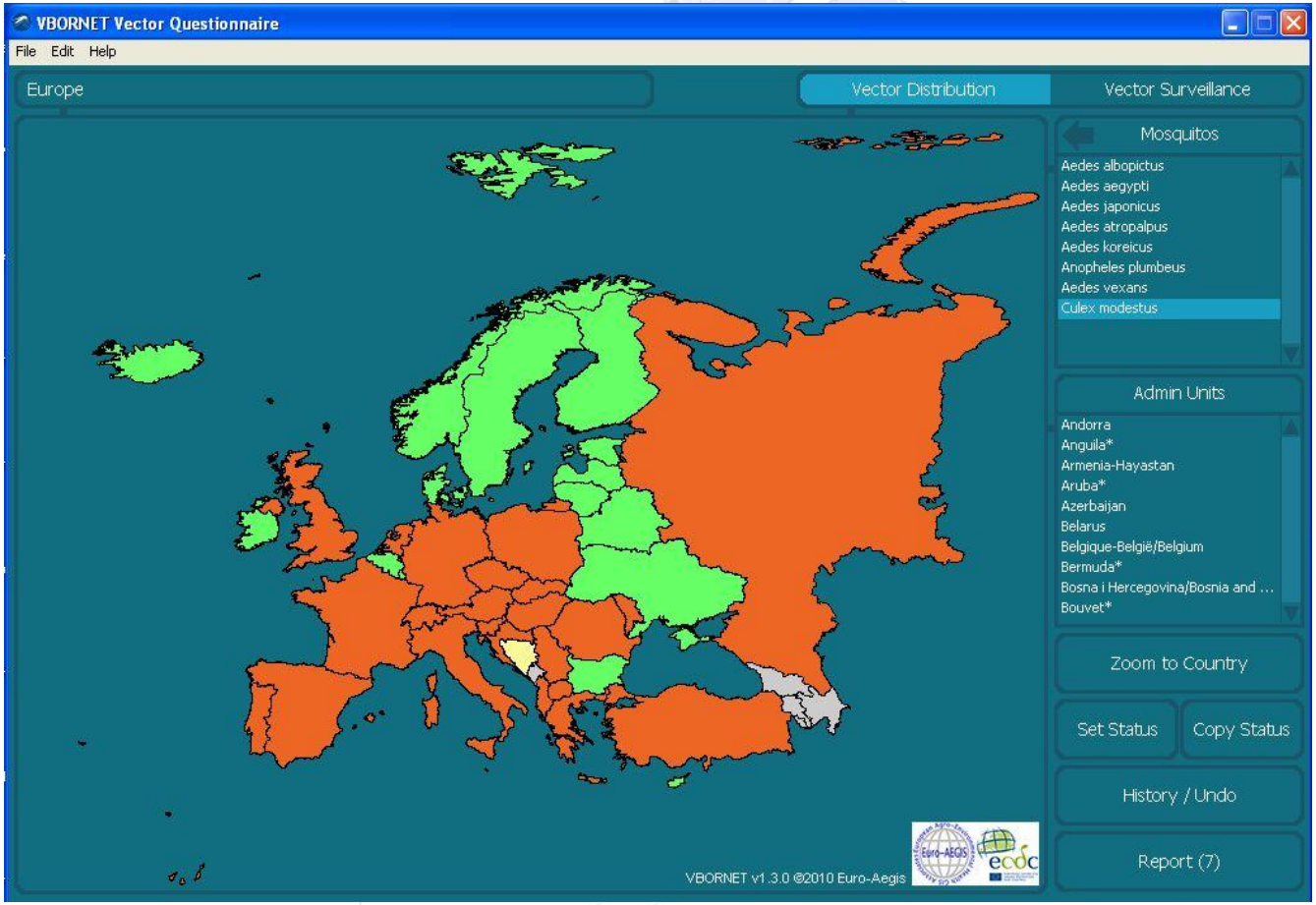

Aedes albopictus
Current known surveillance: June 2010
Yes
No
No data
No information
ECDC 2010 / VBORNET
ECDC 2011 / VBORNET

Perspectives

- Validation in progress
- Distribution maps are under construction of
  - *Aedes koreicus* Nuts 3
  - *Aedes atropalpus* Nuts 3
  - *Aedes vexans* Nuts 0
  - *Anopheles plumbeus* Nuts 0
  - *Culex modestus* Nuts 0
    - (literature & field data = compiled)
  - All mosquito species of interest added to tool
- Mosquito experts identified & contacted
- Surveillance maps specific for each invasive species + nuisance species?

Perspectives

- Gaps & updates needed as well as input from specific regions



Ticks

Ticks year 1

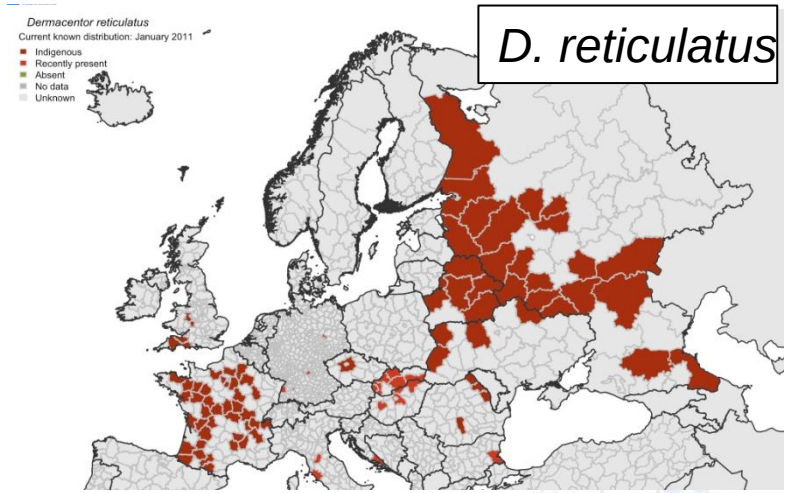
- Ornithodoros genus (Mediterranean basin)
  - Human Tick-borne relapsing fever cases (31) + vector data (466 records)
  - Gaps + lacking absence data
- Historical database (Morel 1969)
  - *Dermacentor marginatus*, *Dermacentor reticulates*, *Hyalomma marginatum marginatum* and *Rhipicephalus sanguineus*
  - 1426 records (early 1900)
  - Lack of recent data + countries
- *Ixodes ricinus*
  - Set up database

Ticks year 2 objectives

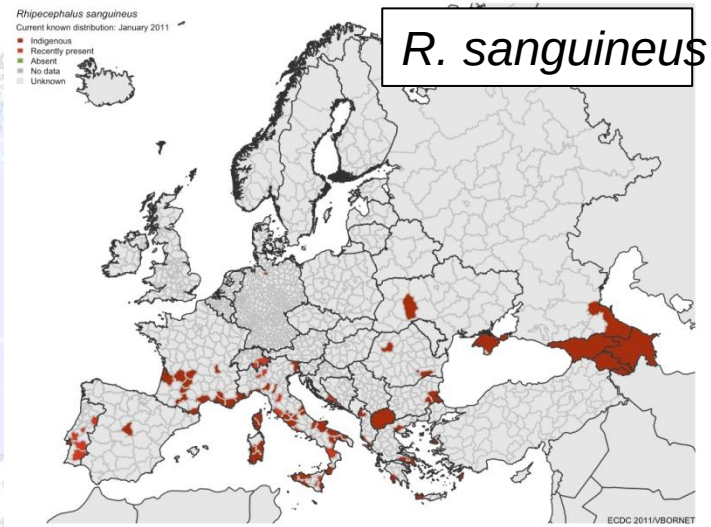
- Update historical dataset
  - Literature & expert
- Focus on *Ixodes ricinus*
- Link to other projects like “EDEN-ext” and “ATP emergence”

Historical distribution maps to be updated

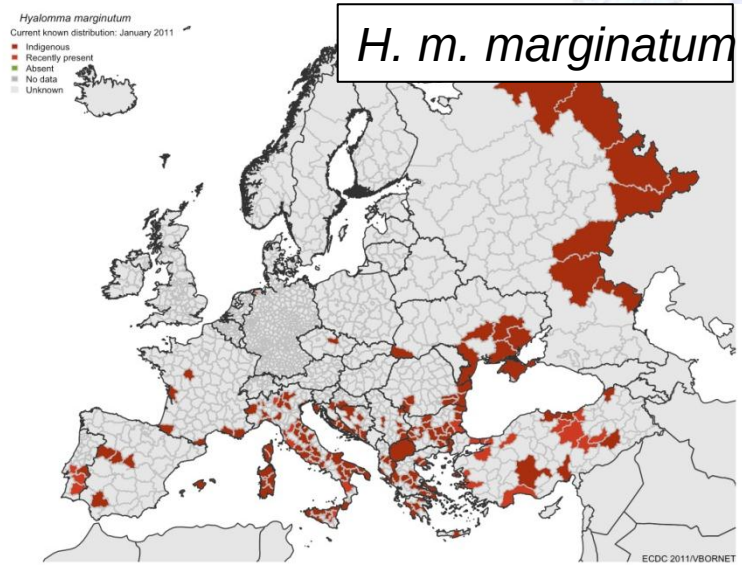
(from Morel's manuscript)



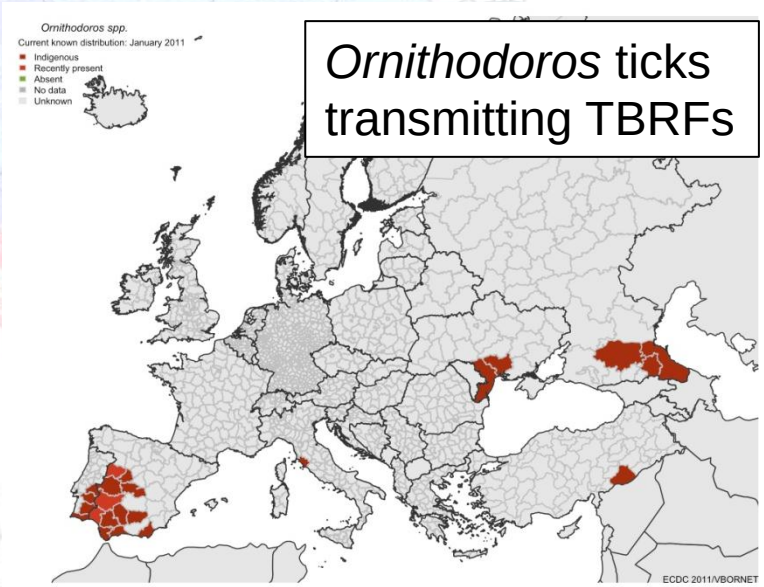
D. reticulatus



R. sanguineus



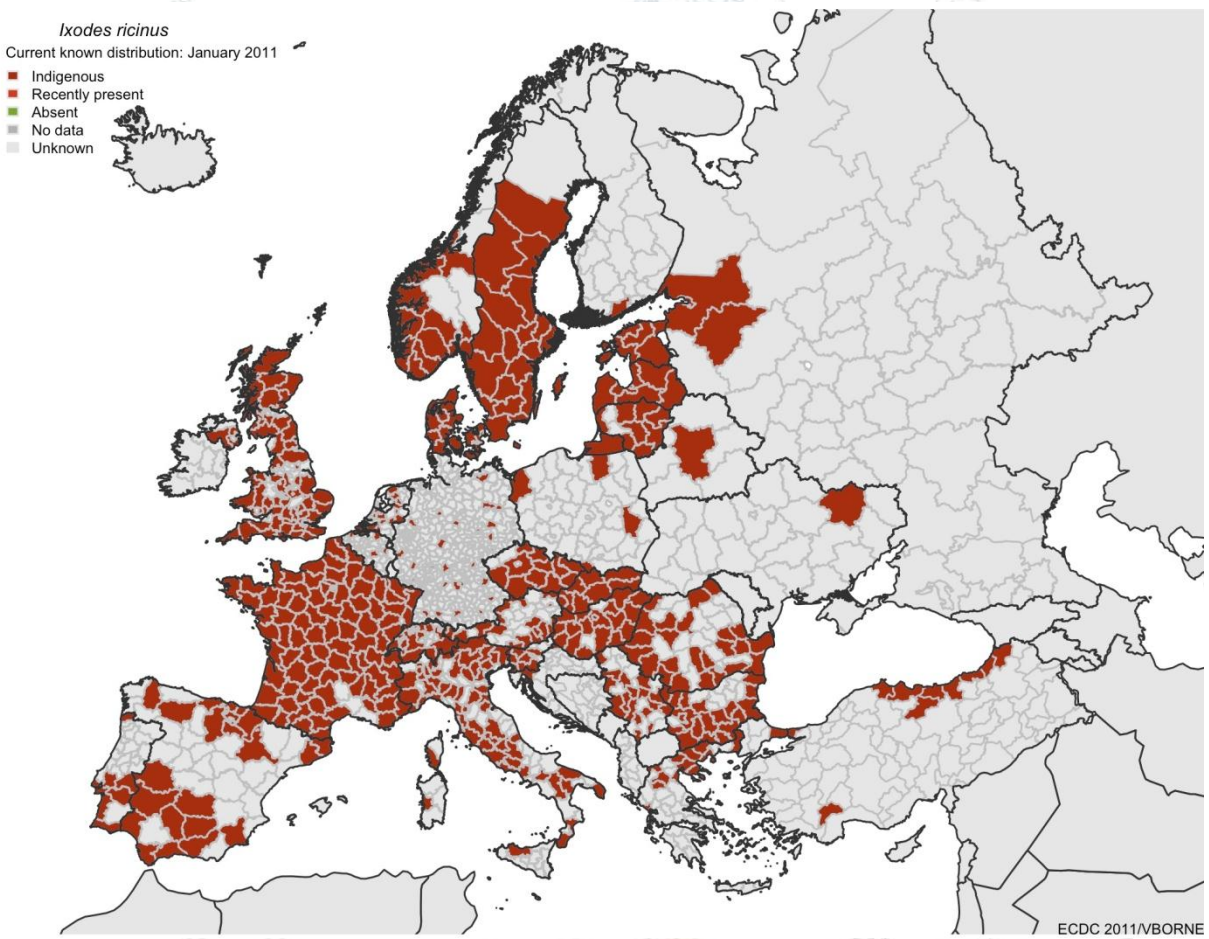
H. m. marginatum



Ornithodoros ticks transmitting TBRFs

Ixodes ricinus (from **EFSA** sources)

(Lyme disease, TBE, Francisella tularensis, rickettsia…)



Still waiting for data from the EDEN project

Confirmation of presence/absence at distribution limits

- Preliminary prediction model of suitable habitats for *Hyalomma marginatum marginatum* in the Mediterranean Basin
  - historical presence data
  - corresponding climate variables

→ Results in September 2011

Integration of other tick data

From research projects:

EDENext will produce presence and abundance data for *I. ricinus* and *H. m. marginatum*
→ *Participants accepted to deliver their data but maybe with a publishing delay*

ATP Emergence will produce presence data for *Hyalomma* ticks in Mediterranean Basin
→ *Laurence Vial (coordinator) engaged to provide these data if needed*

From tick experts:

Tick experts have been contacted and some of them answered they were interested to take part to the Vbornet network. However, none have provided tick distribution data by themselves.

Updates???

Perspectives

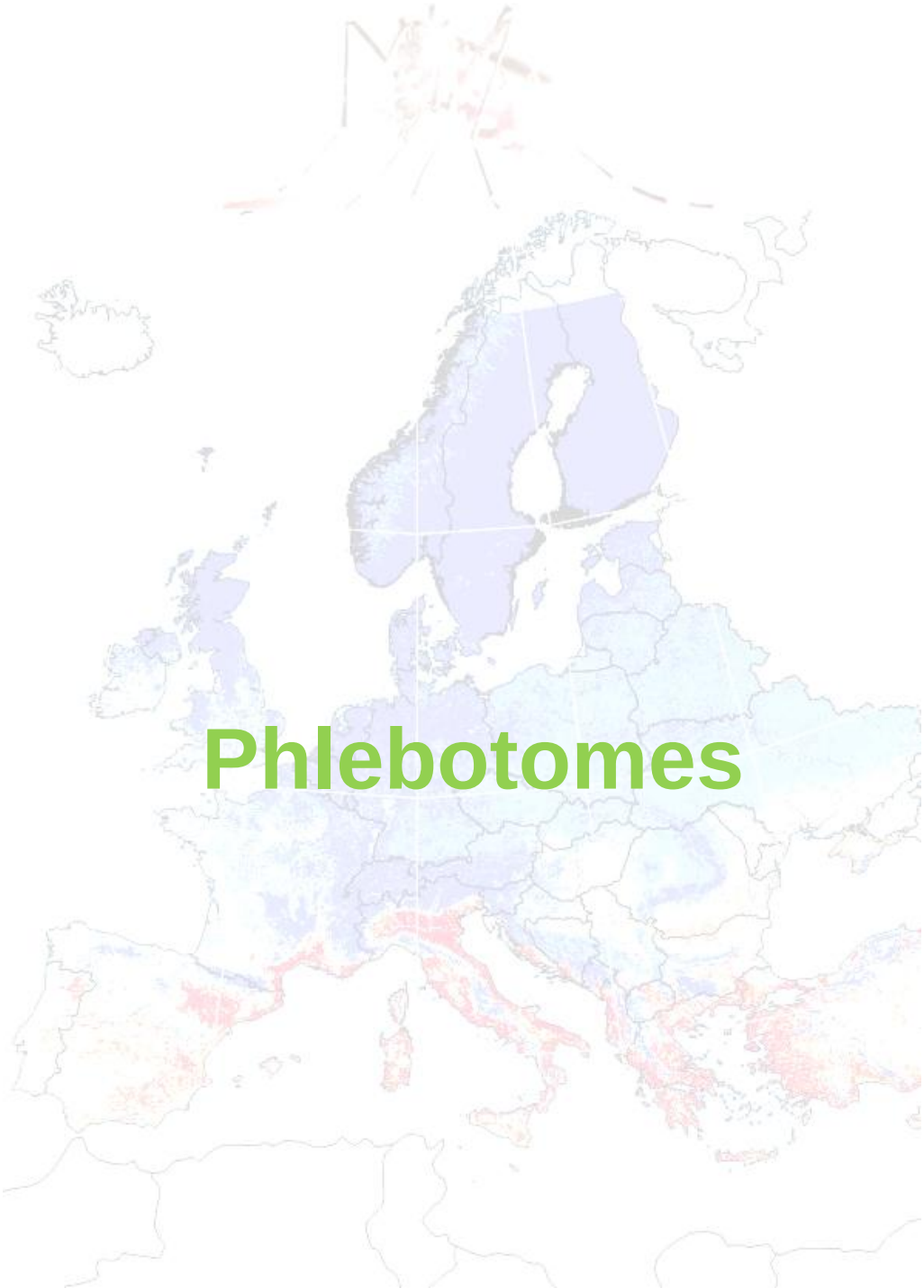
- Validation in progress

- Historical maps
  - *I. ricinus :* adding EDEN's data +data recently found in the Morel's archives
  - Updates with tick expert data

- Identify gaps and ambiguities.

- Predicting suitable habitat envelope (distribution limits for each tick species using presence models)

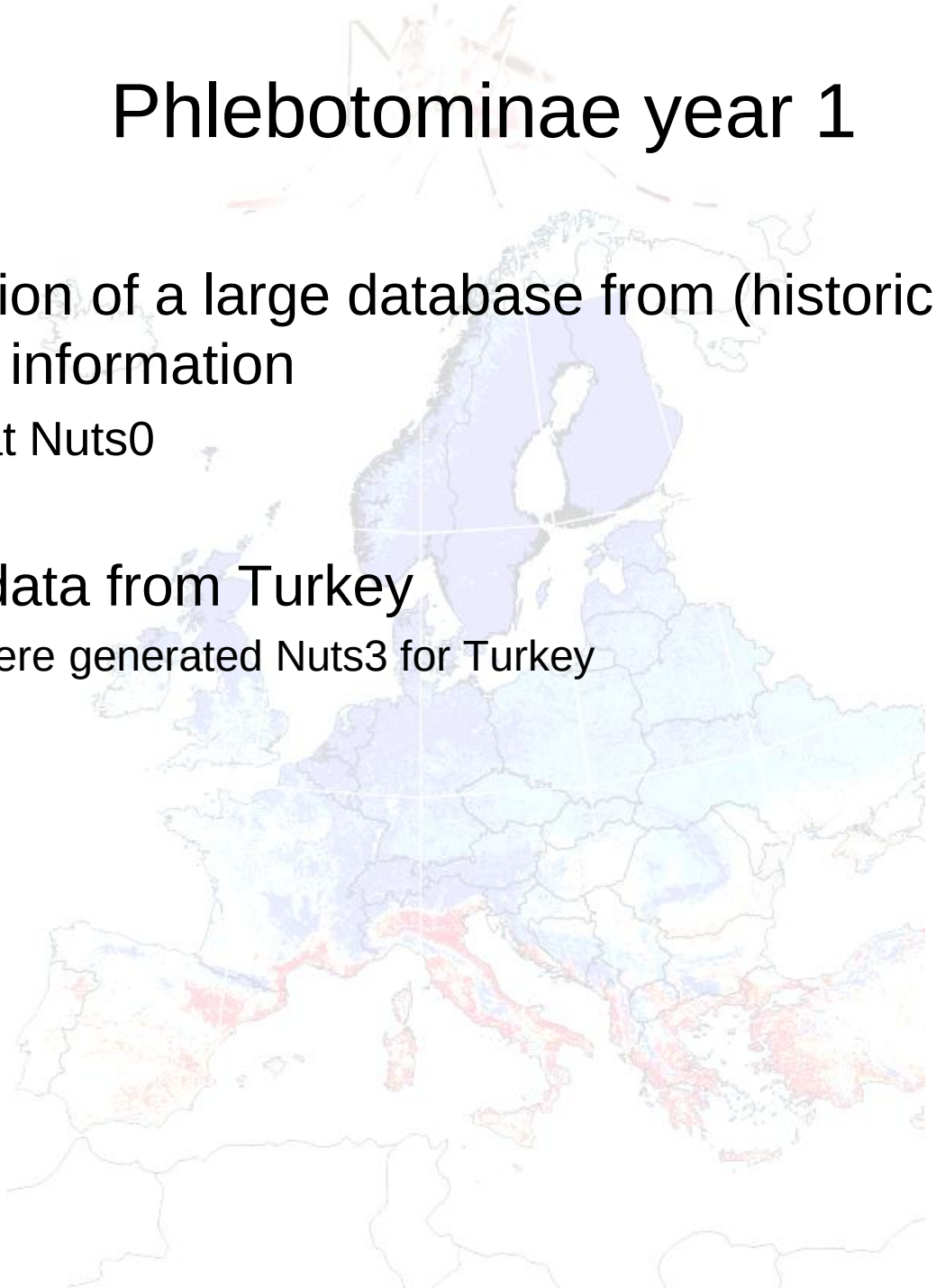
- Scheming the tick network (making first propositions function & update network)



Phlebotomes

Phlebotominae year 1

- Compilation of a large database from (historical) literature information
  - Maps at Nuts0
- Current data from Turkey
  - Maps were generated Nuts3 for Turkey



Phlebotominae year 2 objectives

- Historical database: further completed + refined
- Emphasis on
  - *Phlebotomus alexandri*
  - *Phlebotomus mascitii*
- Expand expert list

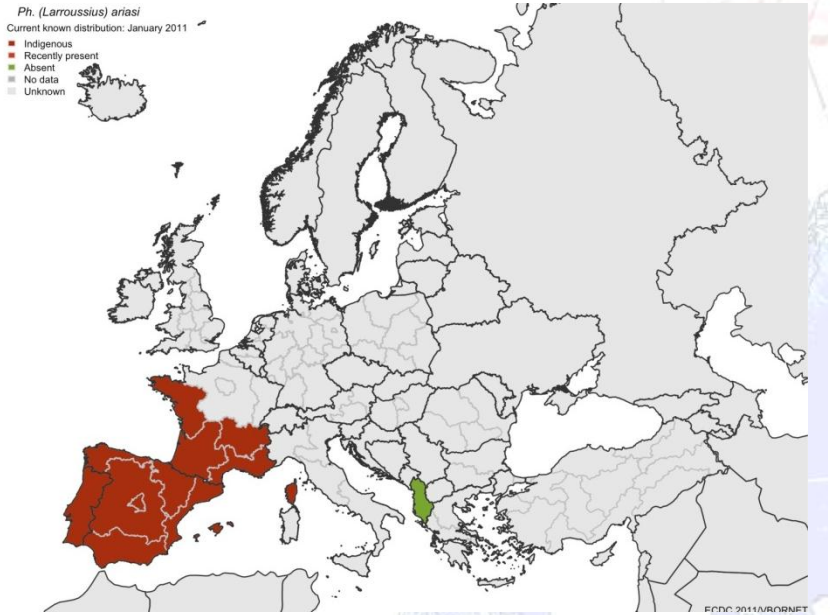
Phlebotominae year 2

- First version of distribution maps generated but Nuts2 & 3 need more validation!

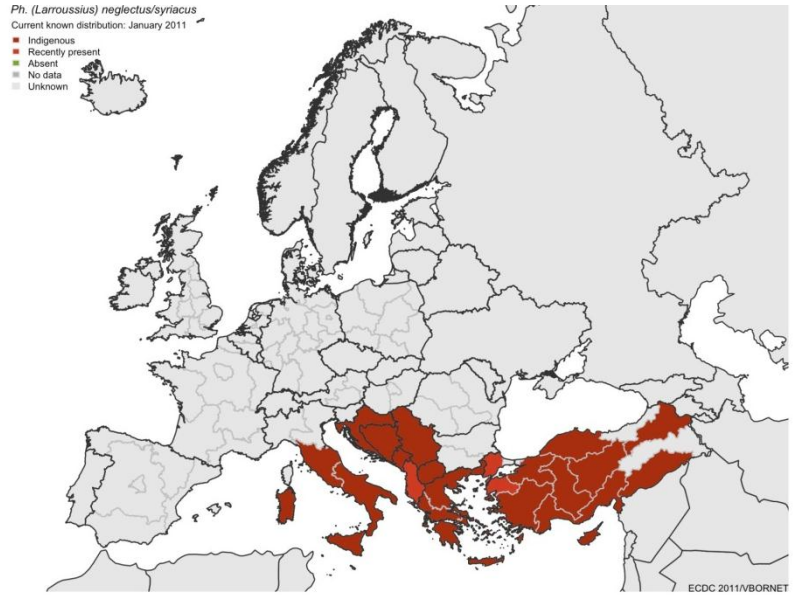
- Nuts0 & 1:
  - *Phlebotomus ariasi*
  - *Phlebotomus neglectus*
  - *Phlebotomus papatasi*
  - *Phlebotomus perifiliewi*
  - *Phlebotomus perniciosus*
  - *Phlebotomus sergenti*
  - *Phlebotomus similis*
  - *Phlebotomus tobbi*

- Data of *Phlebotomus alexandri* and *Phlebotomus mascitii* almost completely entered!

Phlebotomus ariasi

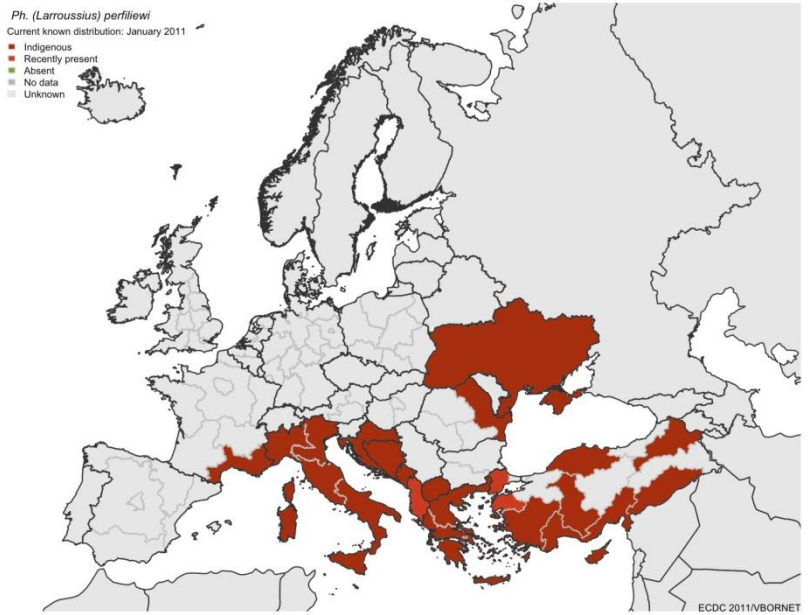


Phlebotomus neglectus

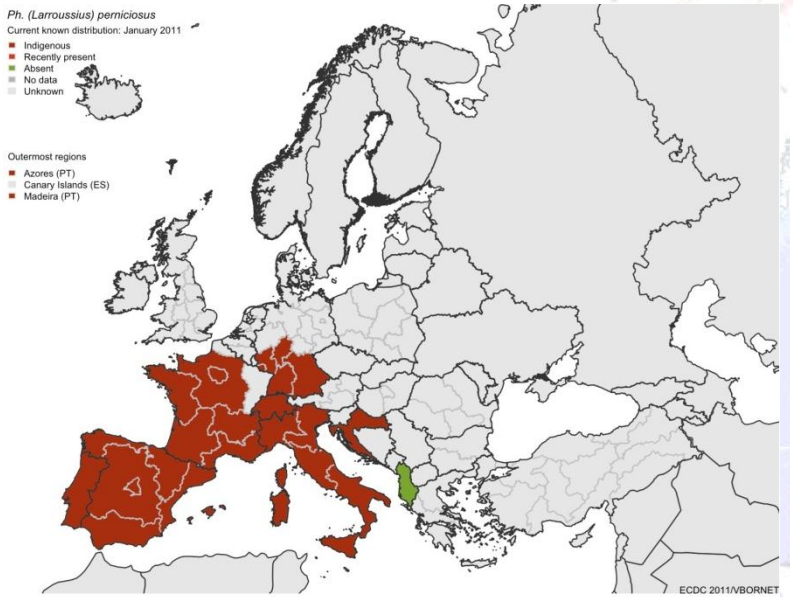


Phlebotomus papatasi

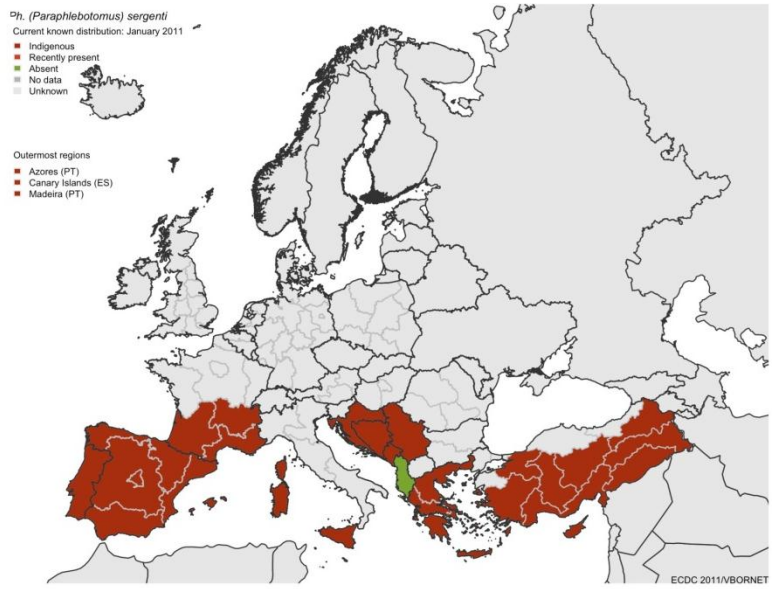
Phlebotomus perifiliewi



Phlebotomus perniciosus

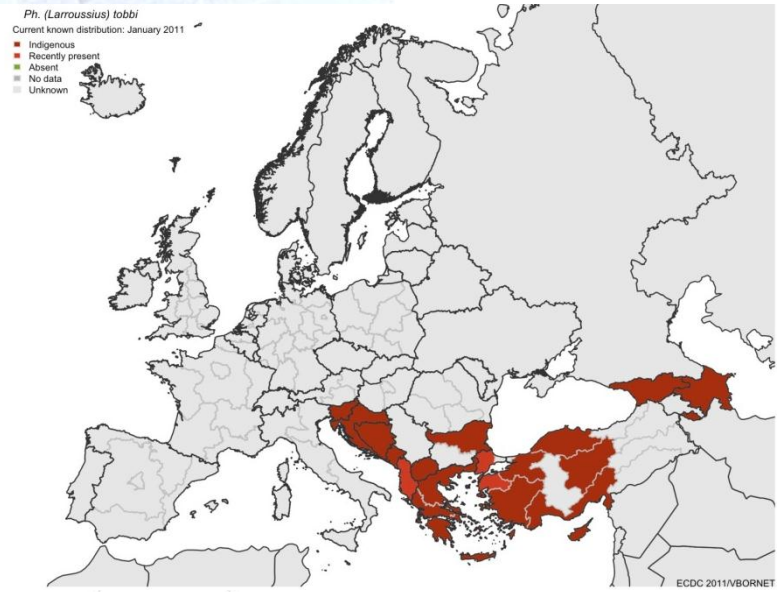


Phelbotomus sergenti



Phlebotomus similis

Phlebotomus tobbi



Perspectives

- Validation in progress!
  - Nuts2&3
- (Historical) database = further updated
  - Literature search
  - Many non-english papers
- Data from Edenext expected
- Distribution maps are under construction of
  - *Phlebotomus alexandri*
  - *Phlebotomus mascitii*

} Data has been entered

Other arthropods

Other Arthropods year 1

- Fleas:
  - Main flea species involved in infectious disease transmission to humans:
    - ubiquitous cat flea *Ctenocephalides felis*
    - ubiquitous rat flea *Xenopsylla cheopis*
- Blackflies & biting midges:
  - Nuisance problems
  - Control programmes
  - No transmission to humans
- Emerging zoonosis or arthroponosis
  - e.g. *Phortica* spp. (Drosophillidae)

Other Arthropods

- No surveillance data exists
- Only scarce distribution data is available
- Scientific literature search
- Overview given for all known records for the vector-borne diseases they transmit (in case of lice, louse and flies) and/or of distribution of the vector (in case of flies transmitting myasis)

Other arthropods year 2 objectives

- Data needs to be included into database
- Focus on
  - *Phortica* sp. (+ parasite *Thelazia callipaeda*)
  - *Wohlfahrtia magnifica* (+ bacteria *Wohlfahrtiimonas*)
- Emphasis on human habitation, behaviour and hygiene (PH-WP4?)

Under construction

Global Perspectives

- Find more experts willing to contribute
- Data can be entered by consortium if needed/wanted
- Find national databases
- Find information for specific regions (lit or field)
- Link with national and international projects
- Availability of the data
- Availability of the maps