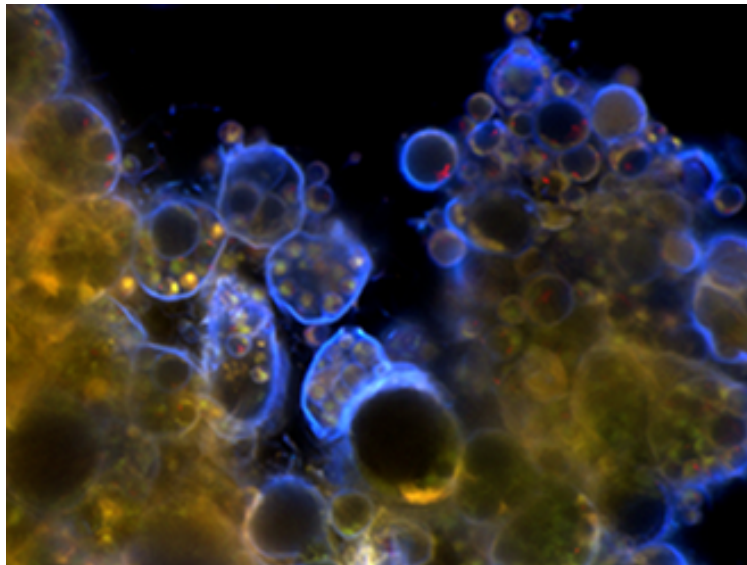


# *RACE*: Risk Assessment of Chytridiomycosis to European amphibians



BiodivERsA call for research projects on biodiversity: linking scientific advancement to policy and practice

First project leaders workshop

Lisbon, 21 & 22 September 2009

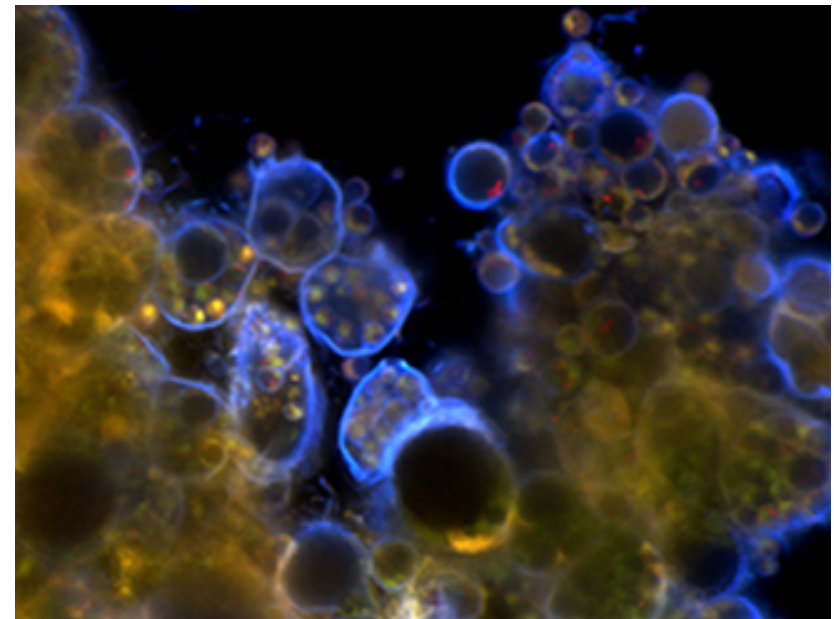
# Extinction rates in amphibians are higher than for other classes of vertebrates



## Key Threatening Processes

- Habitat loss
- Overharvesting
- Invasive species
- Agrochemical toxins
- **Pathogens?**

*Batrachochytrium dendrobatidis (Bd)*

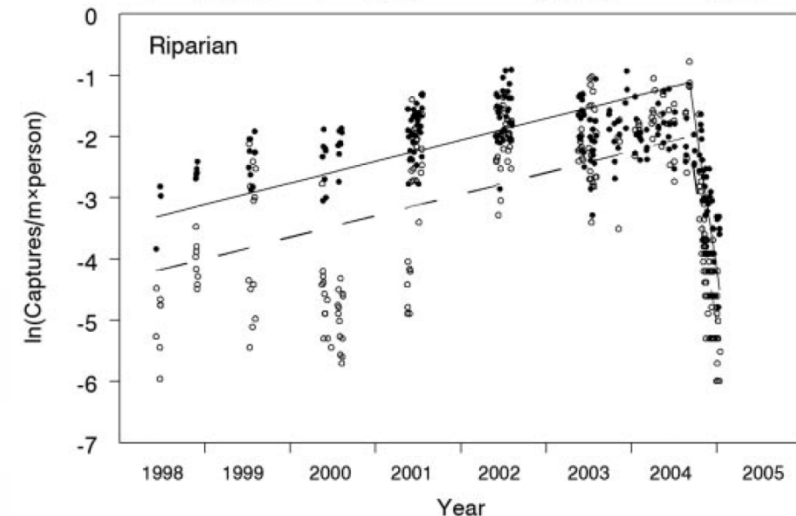
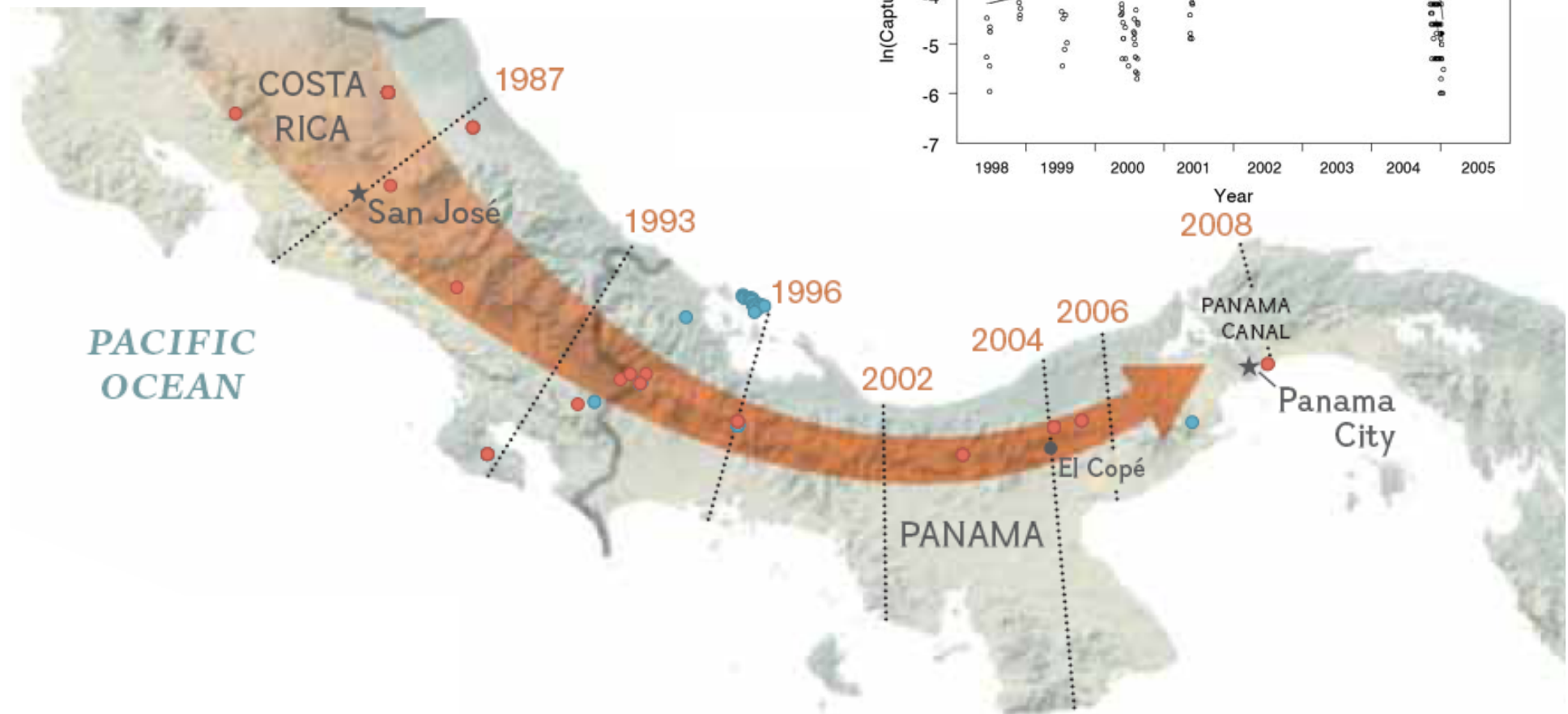


BiodivERsA call for research projects on biodiversity: linking scientific advancement to policy and practice

First project leaders workshop

Lisbon, 21 & 22 September 2009

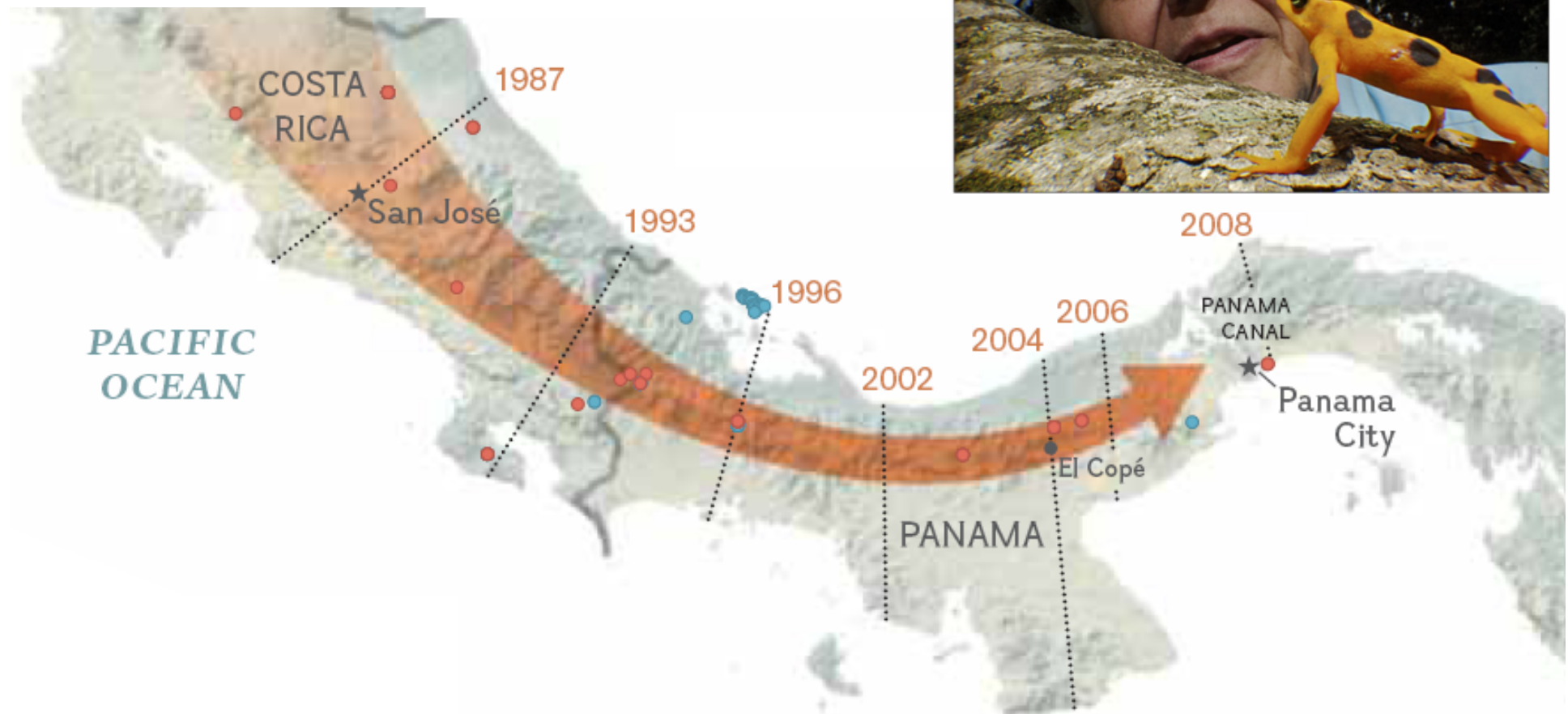
# 'Bd on the march' through central America 1987-2008





# 'Bd on the march' through central America 1987-2008

Last wave of the golden frog



# *Bd* discovered in Europe in 1999

Peñalara Natural Park, Spain



BiodivERsA call for research projects on biodiversity: linking scientific advancement to policy and practice

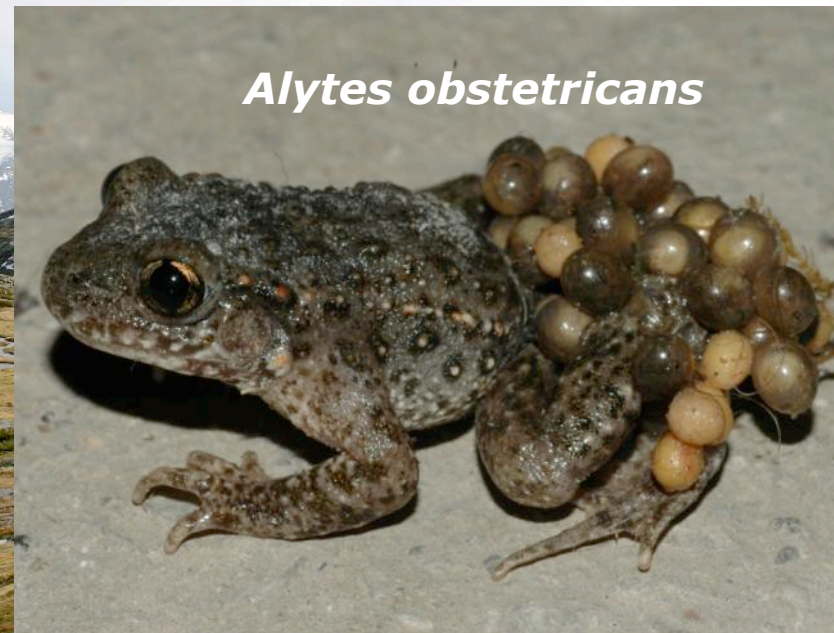
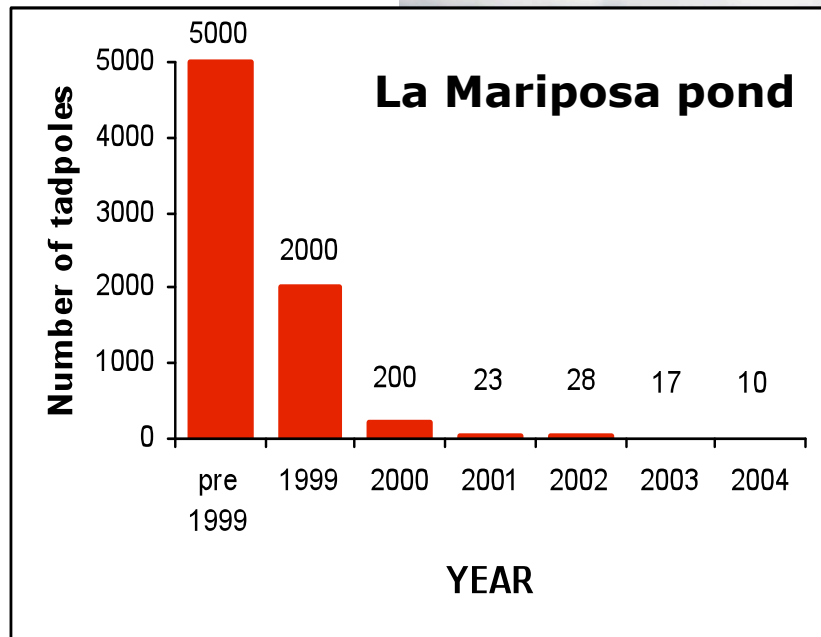
First project leaders workshop

Lisbon, 21 & 22 September 2009



# *Bd* discovered in Europe in 1999

Peñalara Natural Park, Spain

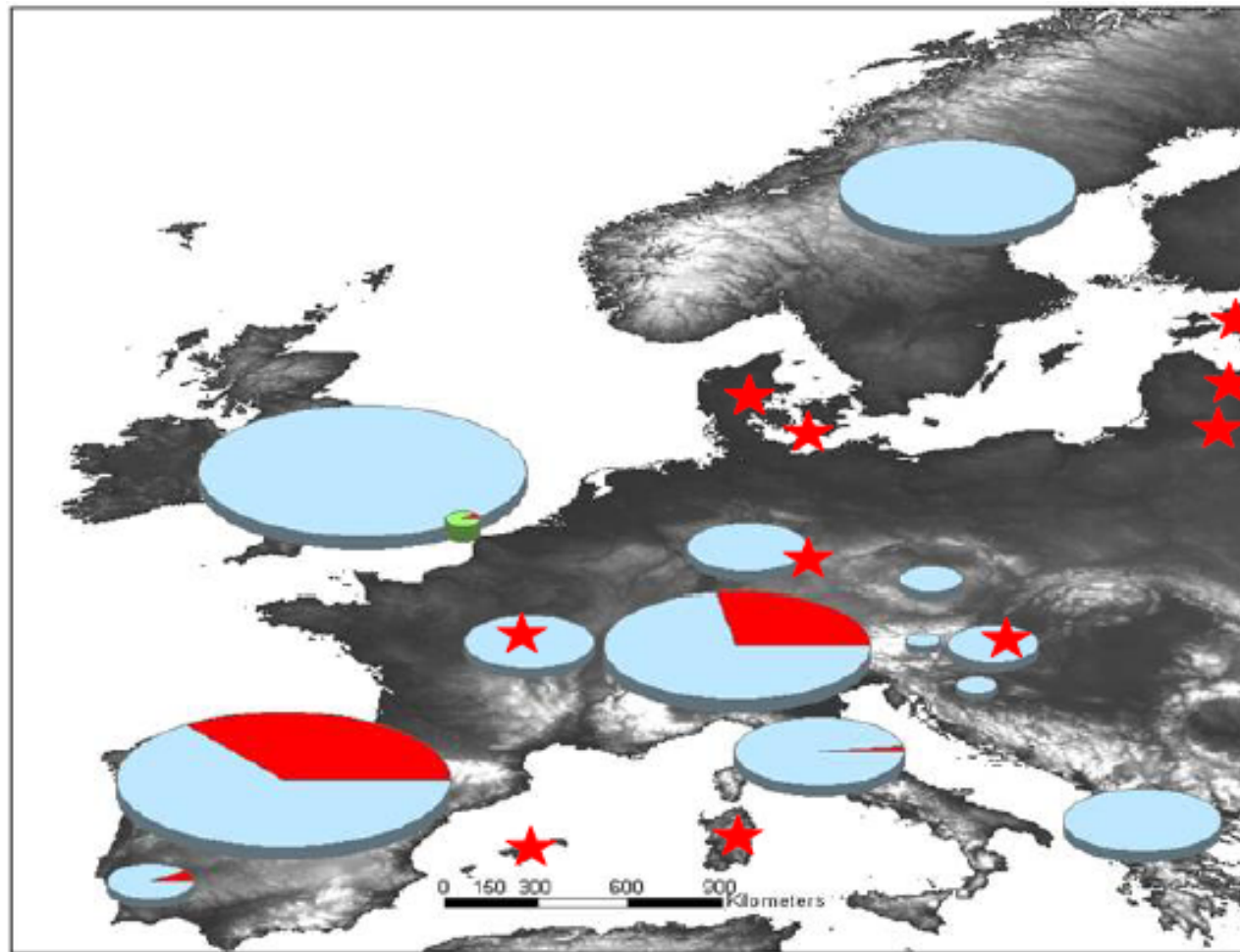


BiodivERsA call for research projects on biodiversity: linking scientific advancement to policy and practice

First project leaders workshop

Lisbon, 21 & 22 September 2009

# *Bd* is widespread across Europe



BiodivERsA call for research projects on biodiversity: linking scientific advancement to policy and practice

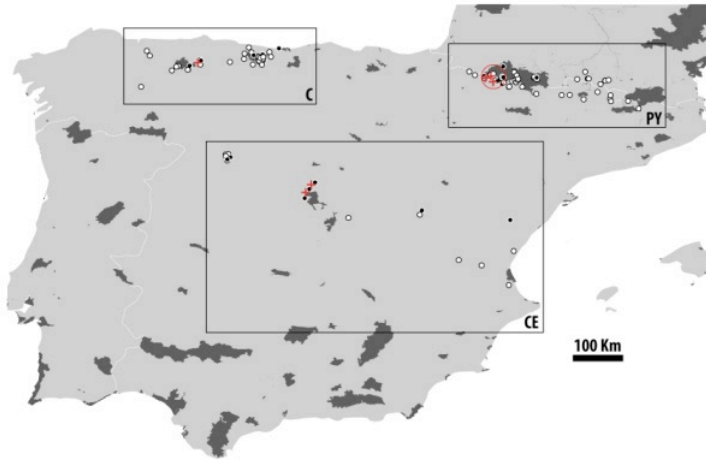
First project leaders workshop

Lisbon, 21 & 22 September 2009

# *Bd* is widespread across Europe



- Surveys of *Ao* across Iberia have shown that *Bd* infects 32/126 (25%) of surveyed populations



BiodivERsA call for research projects on biodiversity: linking scientific advancement to policy and practice

First project leaders workshop

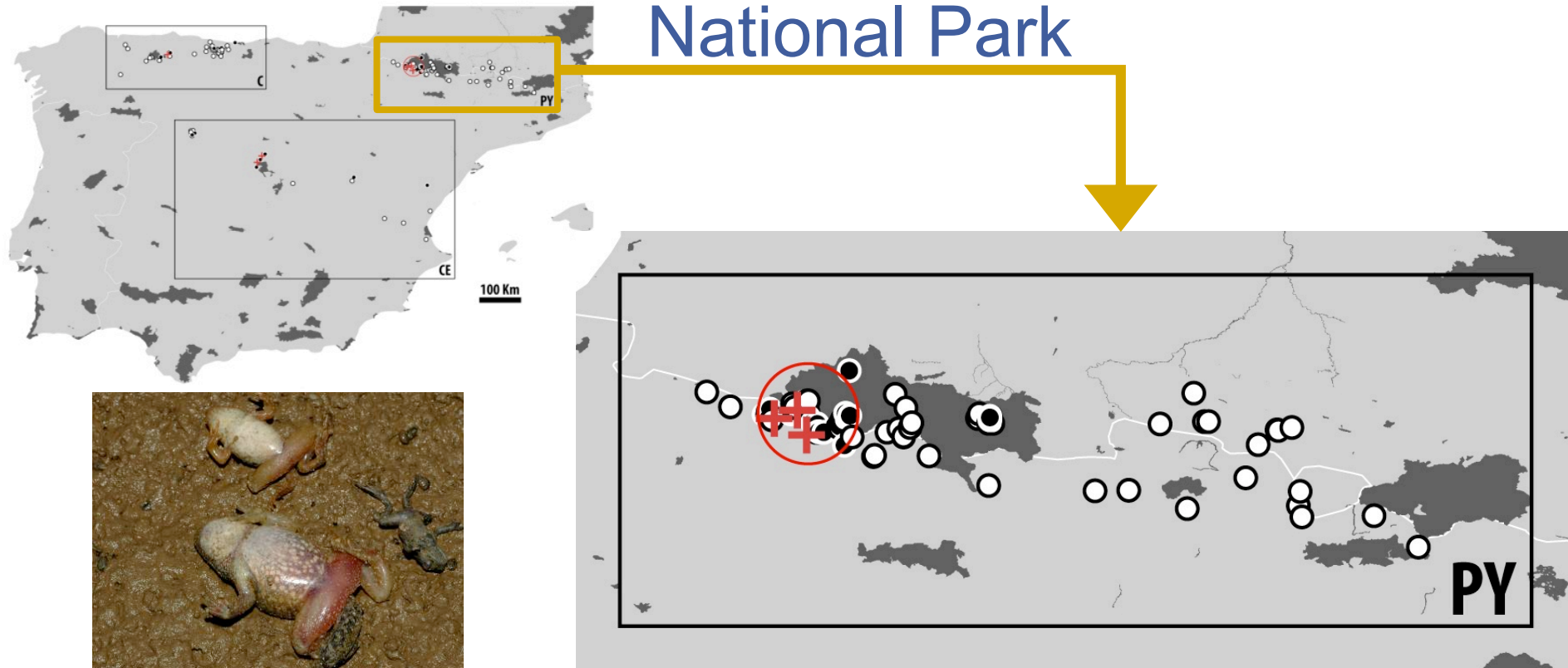
Lisbon, 21 & 22 September 2009



# *Bd* is widespread across Europe



- *Bd* is clustered in the west of the Pyrenees National Park



BiodivERsA call for research projects on biodiversity: linking scientific advancement to policy and practice

First project leaders workshop

Lisbon, 21 & 22 September 2009

*Bd* is widespread across Europe **but**



- *Bd* has not achieved an equilibrium and is still spreading
- *Bd* infects 31% of European amphibian species
  - Nearly threatened 3/14
  - Vulnerable 2/11
  - Endangered 1/7 (*E. platycephalus*, Sardinia)
  - Species of concern 6/42



BiodivERsA call for research projects on biodiversity: linking scientific advancement to policy and practice

First project leaders workshop

Lisbon, 21 & 22 September 2009

# Key Objectives of *RACE*

- Develop core *RACE* labs for surveillance: facilitate and train labs from non-*RACE* countries & groups
- Rollout networked surveillance tools (*Bd*-maps and *EpiCollect*)
- Identify natural and anthropogenic drivers of chytridiomycosis
- Assess the risk that *Bd* presents to European amphibians
- Develop a European Threat Abatement Plan (*ETAP*)



BiodivERsA call for research projects on biodiversity: linking scientific advancement to policy and practice

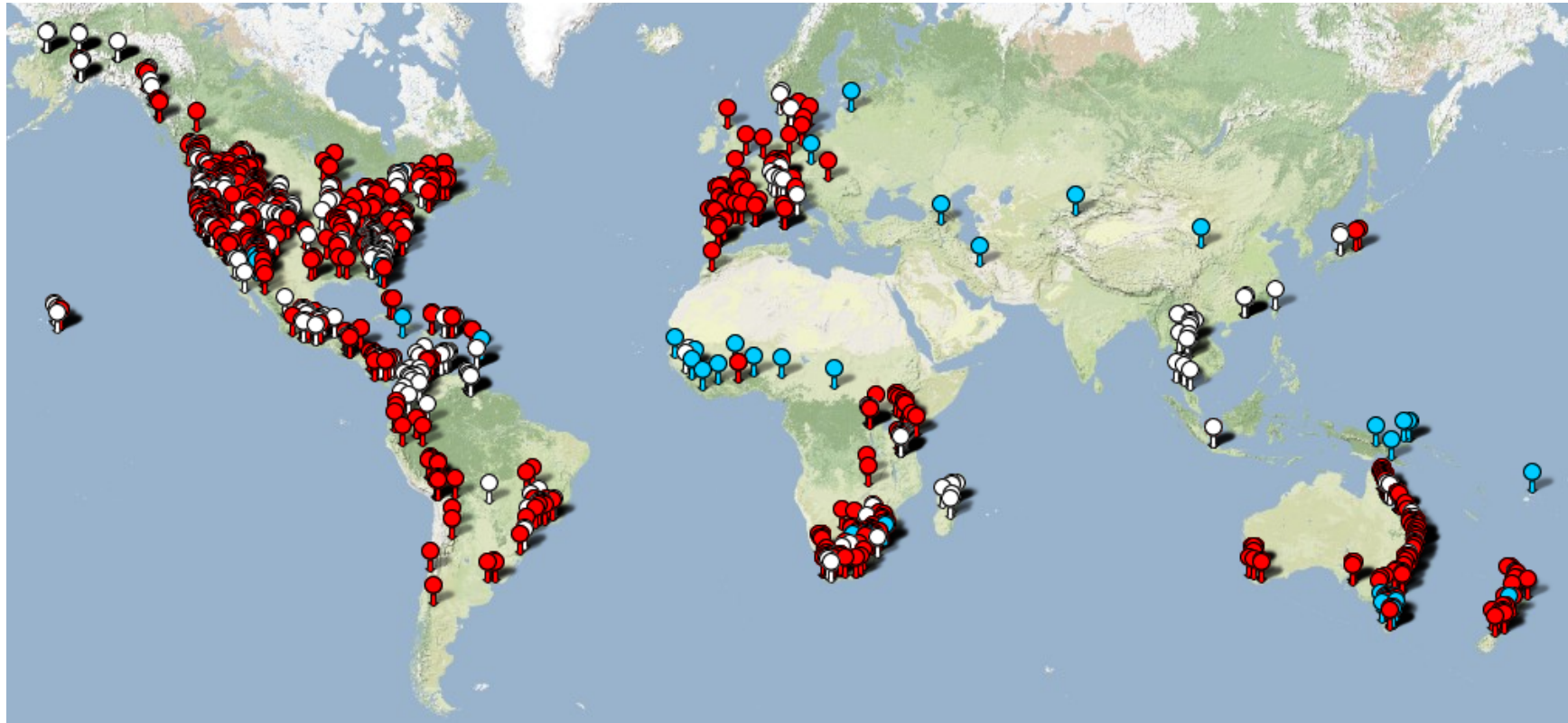
First project leaders workshop

Lisbon, 21 & 22 September 2009



# Key Deliverables of *RACE*

- Regional online *Bd* distribution maps



BiodivERsA call for research projects on biodiversity: linking scientific advancement to policy and practice

First project leaders workshop

Lisbon, 21 & 22 September 2009

# Key Deliverables of *RACE*

- Regional online *Bd* distribution maps

OPEN ACCESS Freely available online

PLoS one

## EpiCollect: Linking Smartphones to Web Applications for Epidemiology, Ecology and Community Data Collection

David M. Aanensen<sup>1\*</sup>, Derek M. Huntley<sup>2</sup>, Edward J. Feil<sup>3</sup>, Fada'a al-Own<sup>3</sup>, Brian G. Spratt<sup>1</sup>



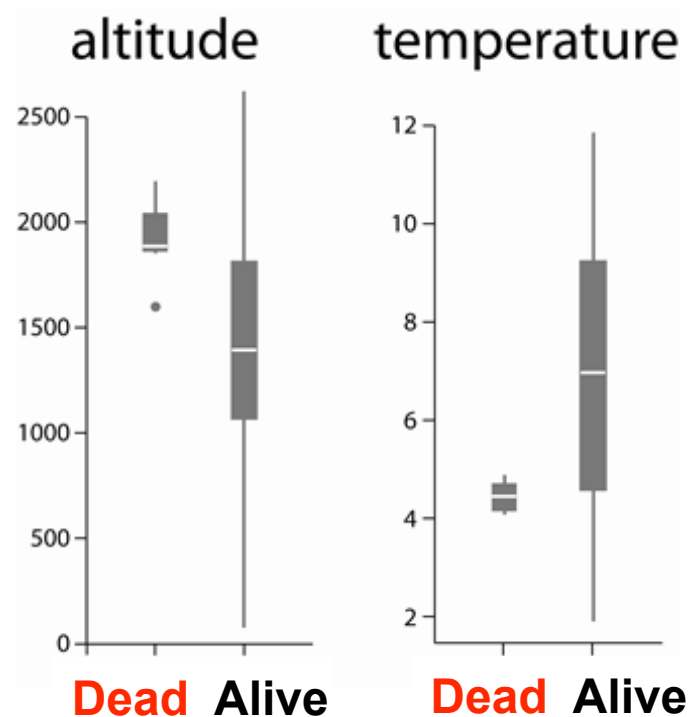
BiodivERsA call for research projects on biodiversity: linking scientific advancement to policy and practice

First project leaders workshop

Lisbon, 21 & 22 September 2009

# Key Deliverables of *RACE*

- Identification of environmental drivers of disease



BiodivERsA call for research projects on biodiversity: linking scientific advancement to policy and practice

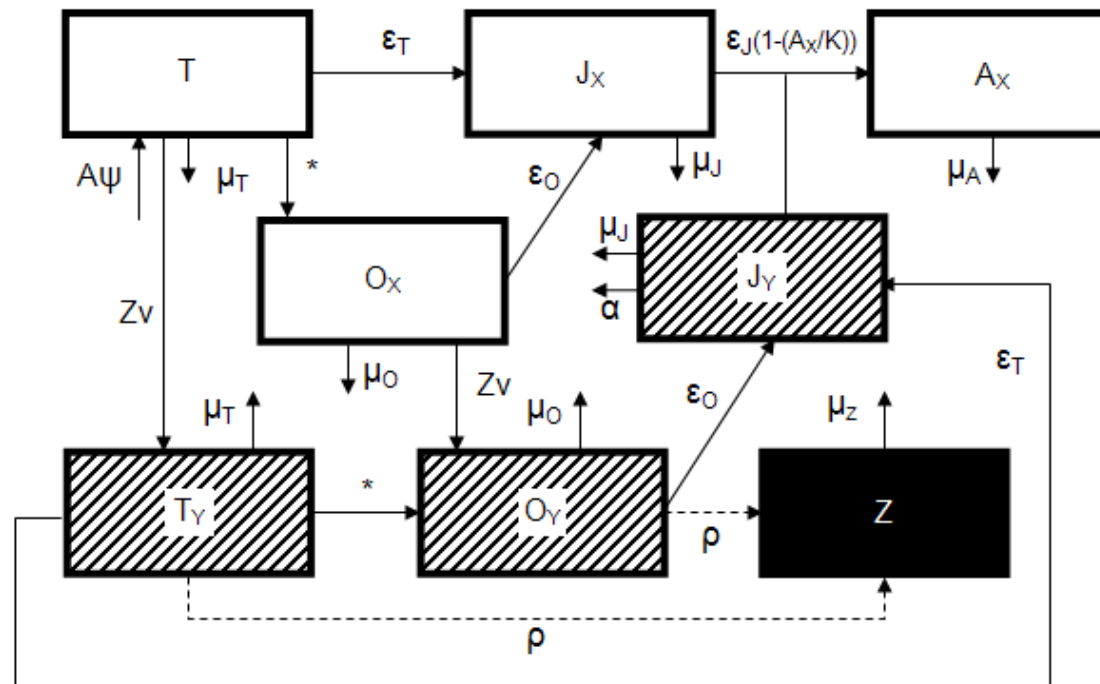
First project leaders workshop

Lisbon, 21 & 22 September 2009



# Key Deliverables of *RACE*

- Identification of environmental drivers of disease
- Prediction of site-specific dynamics using modelling



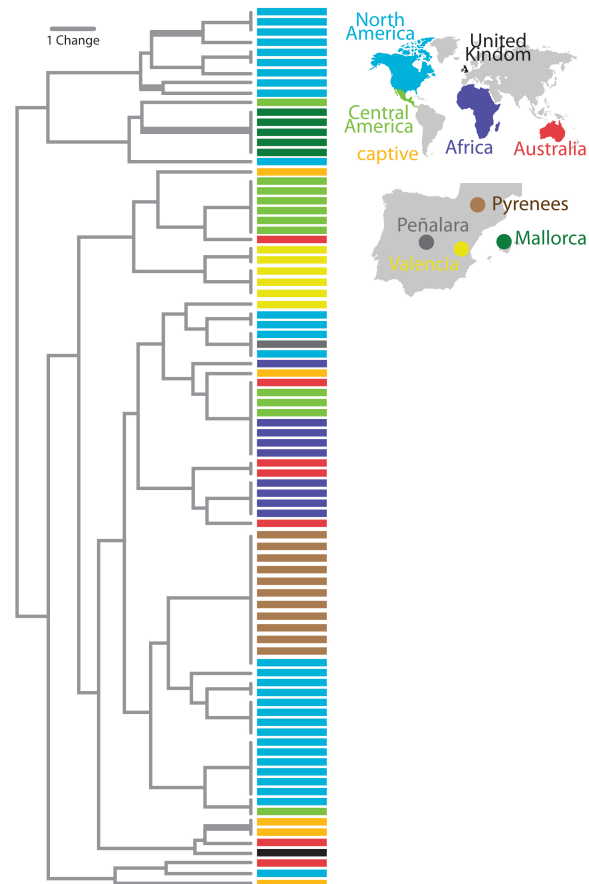
BiodivERsA call for research projects on biodiversity: linking scientific advancement to policy and practice

First project leaders workshop

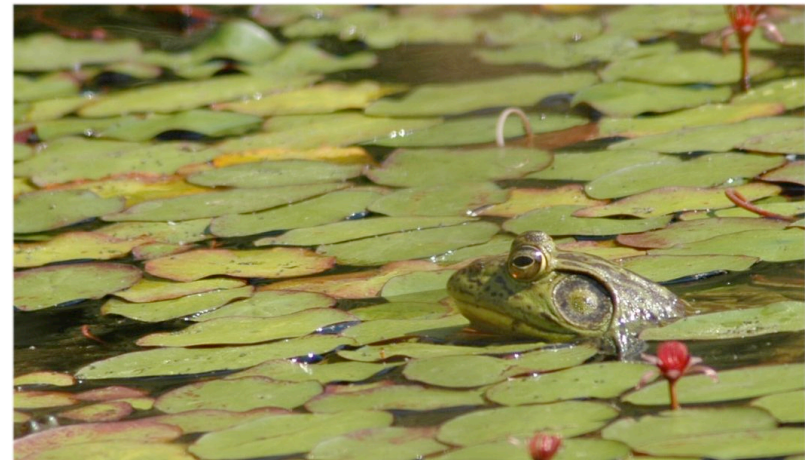
Lisbon, 21 & 22 September 2009

# Key Deliverables of *RACE*

- Identification of environmental drivers of disease
- Prediction of site-specific dynamics using modelling
- Assessment of routes of introduction *via* invasive species

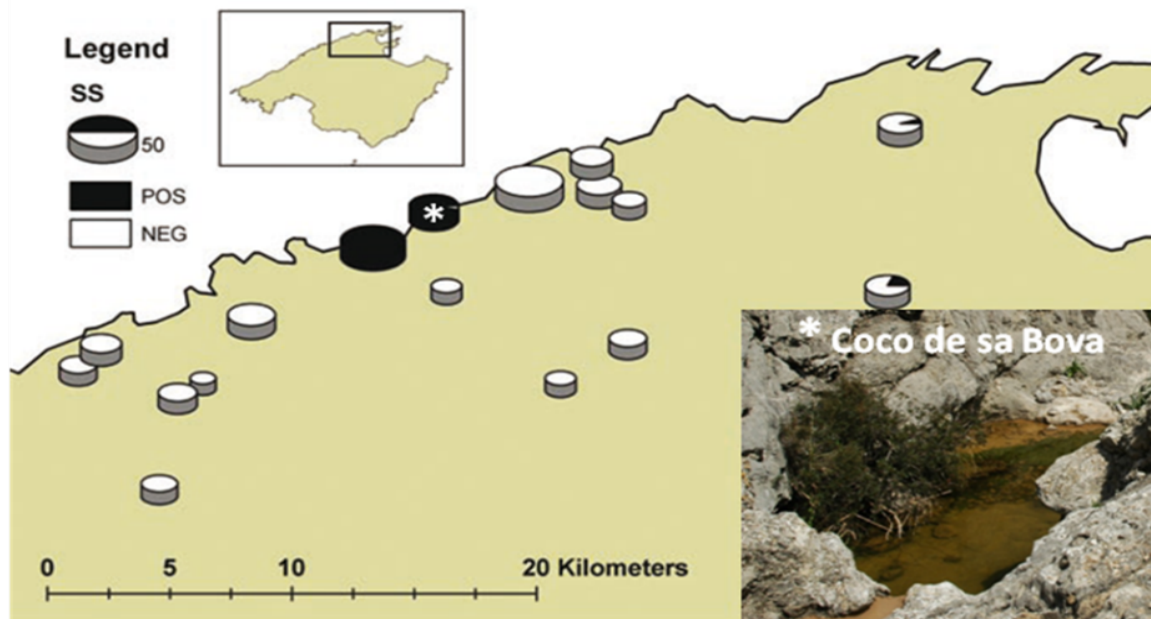


North American Bullfrogs



# Key Deliverables of *RACE*

- Identification of environmental drivers of disease
- Prediction of site-specific dynamics using modelling
- Assessment of routes of introduction *via* invasive species
- Development and dissemination of mitigation protocols





# Key Deliverables of *RACE*

- Identification of environmental drivers of disease
- Prediction of site-specific dynamics using modelling
- Assessment of routes of introduction *via* invasive species
- Development and dissemination of mitigation protocols
- Development and dissemination of a European Threat abatement plan (*ETAP*)



BiodivERsA call for research projects on biodiversity: linking scientific advancement to policy and practice

First project leaders workshop

Lisbon, 21 & 22 September 2009

# Policy Relevance of *RACE*

- We need to understand how this new threat will effect 2010 Biodiversity targets
- Because the threat is widespread, we need a common platform for managing information flows. **Epicollect** and **Bd-maps**
- Major stakeholders are being identified and integrated
  - **Regional.** Conservation authorities. eg Pyrenean Natl. Park
  - **Government.** UK Amphibian Health Advisory Committee
  - **Pan-government.** World Organisation for animal health (OIE), EU



# Project Outputs of *RACE*

- *Bd*-maps will be developed as a core-site for data distribution
  - Protocols, field and laboratory techniques
  - Mitigation protocols
  - Country-specific lead laboratories and contacts
  - Species-specific data on susceptibility to infection
- Model outputs for risk assessments incorporating environmental/anthropogenic drivers online
- *ETAP*



BiodivERsA call for research projects on biodiversity: linking scientific advancement to policy and practice

First project leaders workshop

Lisbon, 21 & 22 September 2009



# ETAP



- Our major policy recommendations
  - To prevent *Bd* negative areas becoming *Bd* positive
  - To decrease the impact of infection in infected species
    - **Prevent spread** 'Anthropogenic drivers'. Biocontrol necessary?
    - **Promote recovery** Risk assessment. Innovative captive breeding (Peñalara)
    - **Control infection** Environmental mitigation (Mallorca)
    - **Share information** Innovative informatics
    - **Coordinate management** Networked laboratories & standardised protocols/information fields



BiodivERsA call for research projects on biodiversity: linking scientific advancement to policy and practice

First project leaders workshop

Lisbon, 21 & 22 September 2009

# THANKS!



- *RACE UK*

- Fisher, Garner, Aanensen, Spratt, Cunningham, Bielby, Clare, Farrer, Doddington

- *RACE France*

- Schmeller, Loyau, Clobert, Miaud, DeJean, Millery Pompanon

- *RACE Spain*

- Bosch

- *RACE Germany*

- Henle, Neßhöver

- *RACE Switzerland*

- Schmidt, Buskirk, Tobler
- Vandzinskaite



BiodivERsA call for research projects on biodiversity: linking scientific advancement to policy and practice

First project leaders workshop

Lisbon, 21 & 22 September 2009