

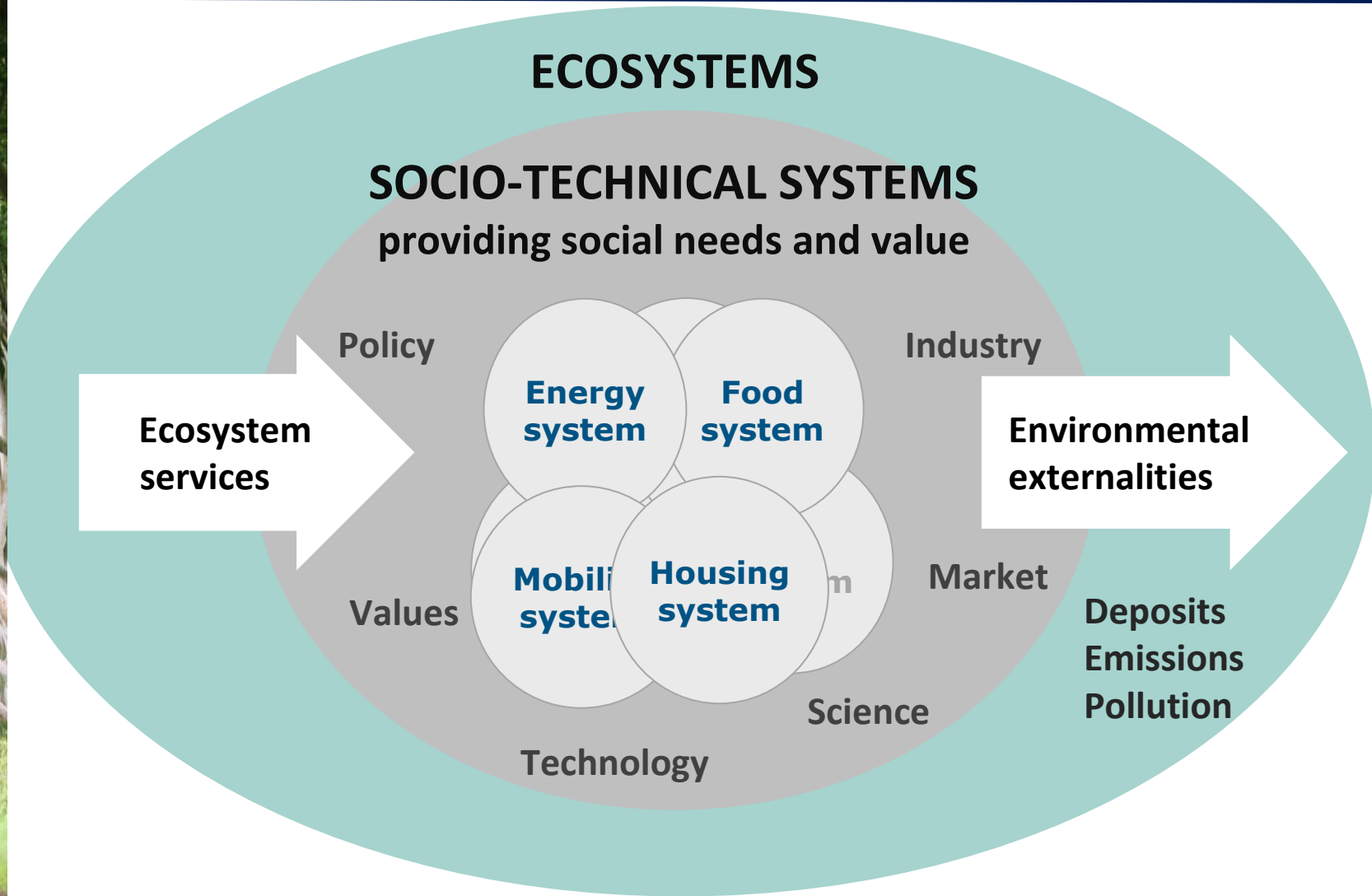
# Enhancing Europe's natural capital benefit to human health and climate change

Ronan Uhel –Natural Systems & Sustainability  
European Environment Agency

Biodiversity and Health in the Face of Climate Change  
Challenges, opportunities and evidence gaps  
27-29 June 2017, Bonn/Germany



# Living well, *within* environmental limits



Cities have an important role to play in the shift to fundamentally sustainable systems of production and consumption

# WHO definition of health

**“A state of complete physical, mental, and social well being, and not merely the absence of disease or infirmity”**

WHO Constitution, 1946

# Health and social benefits from natural capital

- Improved air quality & health benefits
- Noise and human health
- Improved climatic conditions – mitigating heat stress
- Healthier lifestyles
- Outdoor recreation and physical activity
- More pleasant, peaceful and less stressful environment
- Opportunities for employment





# Growing evidence base on inter-linkages...



The Health and Social Benefits of Nature and Biodiversity Protection

Patrick ten Brink  
Konar Mutaoglu  
Jean-Pierre Schweitzer  
Marianne Kettunen  
Clare Twigger-Ross  
Jonathan Baker  
Yoline Kuipers  
Manon Emonts  
Liisa Tyrvaänen  
Teppo Hujala  
Ann Ojala

Final Report  
28 April 2016

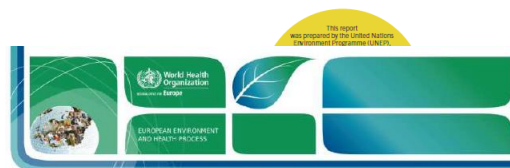


**Connecting Global Priorities:  
Biodiversity and Human Health**  
*A State of Knowledge Review*



## HEALTHY ENVIRONMENT, HEALTHY PEOPLE

Thematic report  
Ministerial policy review session  
Second session of the United Nations Environment Assembly  
of the United Nations Environment Programme  
Nairobi, 23–27 May 2016



## Urban Green Space Interventions and Health

*A review of impacts and effectiveness*



EEA Report | No 32/2016

European water policies and human health  
Combining reported environmental information

ISSN 1977-8449



EEA Report | No 1/2017

Climate change, impacts and vulnerability in Europe 2016  
An indicator-based report

ISSN 1977-8449



European Environment Agency 

# Policy Context – EU commitment (7<sup>th</sup> EAP)



‘In 2050, we **live well**, within the planet's **ecological limits**.

Our prosperity and **healthy environment** stem from an innovative, circular economy where nothing is wasted and where **natural resources are managed sustainably**, and **biodiversity is protected, valued and restored** in ways that enhance our **society's resilience**. Our low-carbon growth has long been decoupled from resource use, setting the pace for a global **safe and sustainable society**.’



# Inter-linkages: natural capital and health & well-being

## Inter-linkages at different levels:

### 1) Common pressures

- E.g. climate change, air pollution, chemical contamination of water

### 2) Systemic inter-linkages

- Many inter-linkages in the food system, where dietary changes can both improve health and reduce pressures on natural capital

### 3) Nature protection and green infrastructure/nature-based solutions

- Nature can help us respond to health and well-being challenges (e.g. air pollution, heat stress, noise, low physical activity, flood mitigation)



# 1) Common pressures (instances)

## Climate change

### Impacts on human health and well-being

Heat island effects in urban areas

Distribution of disease vectors

Distribution of allergenic plants

Damage to health infrastructure

Floods

Forest fires

### Impacts on natural capital

Stressor on ecosystems

Shifts in distribution of species

Changes in phenology

Ocean sea surface T, oxygen content

## Air pollution

### Impacts on human health and well-being

PM<sub>2.5</sub> concentrations responsible for about 467 000 premature deaths

Nitrogen dioxide- 71 000 premature deaths

Ozone – 17 000 premature deaths

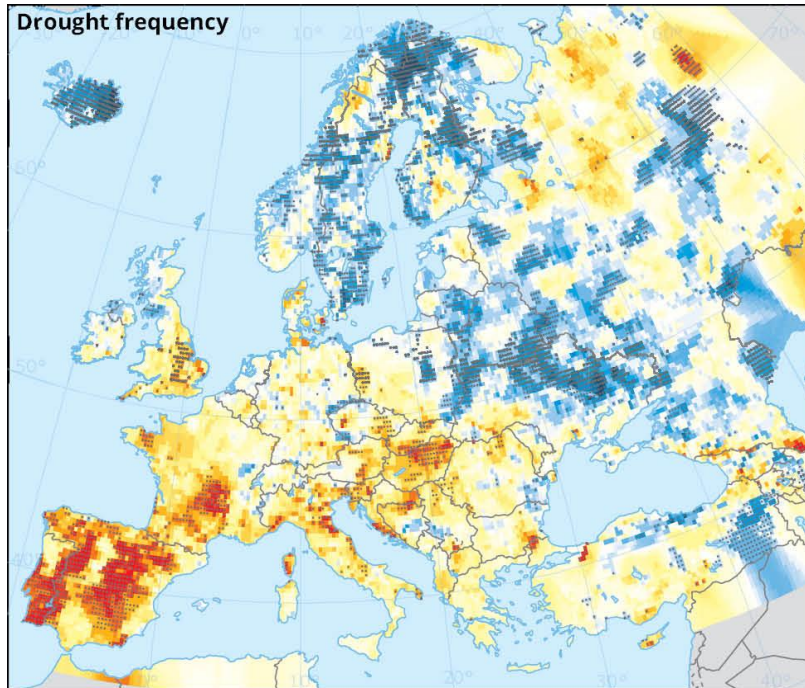
### Impacts on natural capital

Acidification of soil, lakes and rivers

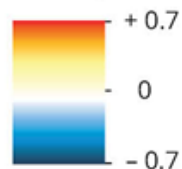
Eutrophication leading to changes in species diversity and to invasions of new species

# Meteorological droughts are increasing in southern Europe

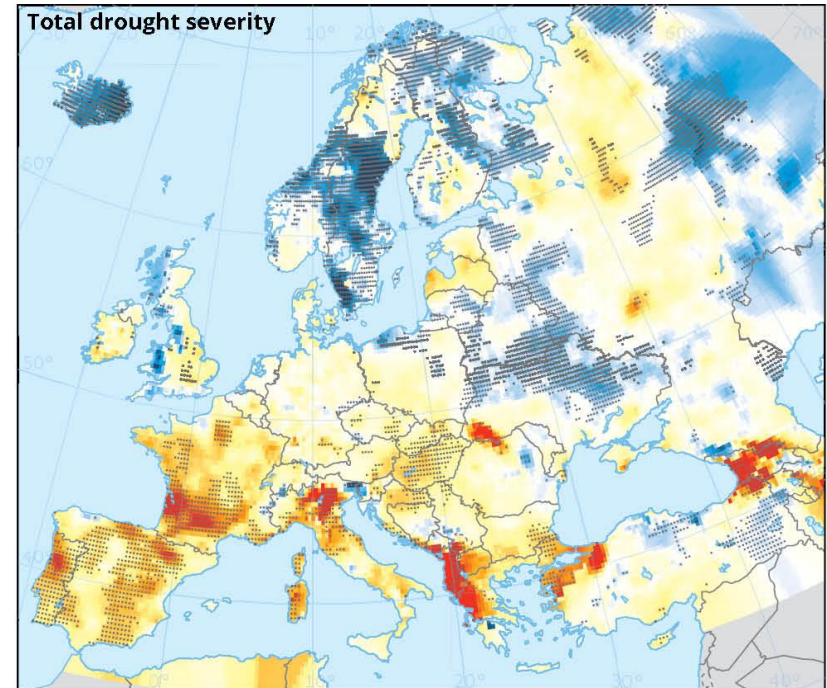
**Drought frequency**  
(trend for 1950–2012)



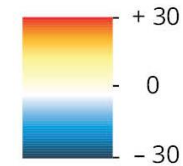
Drought frequency  
(events/decade)



**Drought severity**  
(trend for 1950–2012)



Total drought severity  
(score/decade)



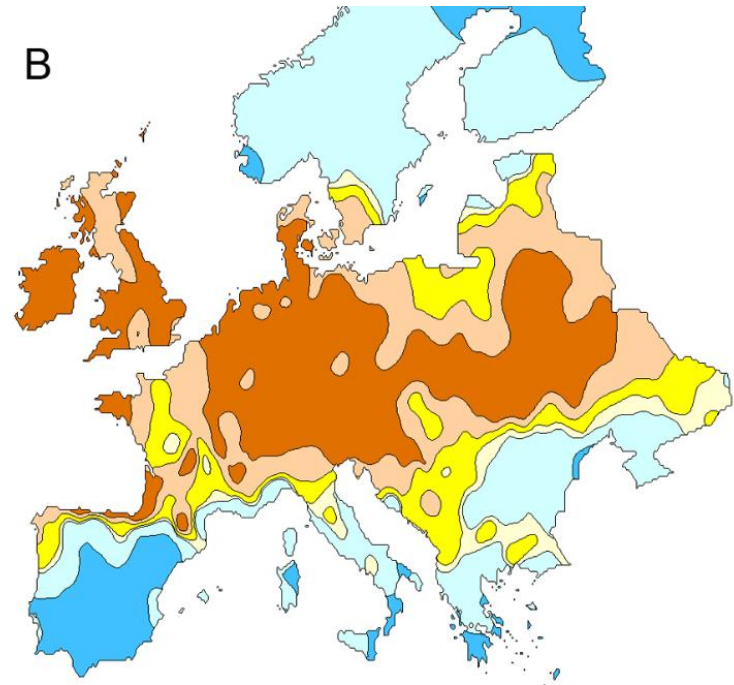
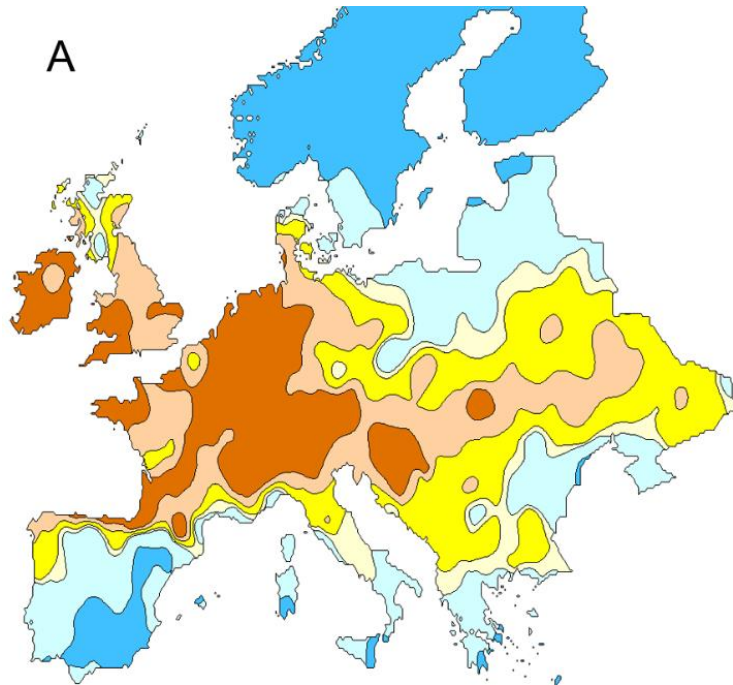
Source:  
JRC (2016)

# Invasive species and allergen

Distribution of *Ambrosia artemisiifolia* in Europe under climate change

A) near future (2010-2030)

B) long-term future (2050 -2070)



According climatic suitability:

- **Highly unsuitable to unsuitable**
- **Unlikely**
- **Established to well established**



## 2) Systemic inter-linkages - healthy diet

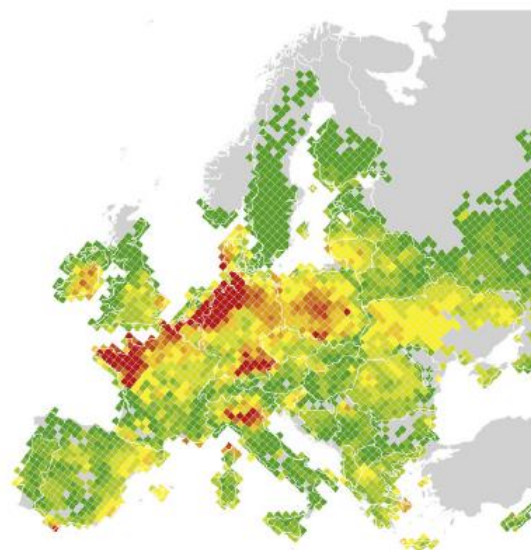
### The potential effect of alternative diet to reduce

- health risks
- pressures on natural capital

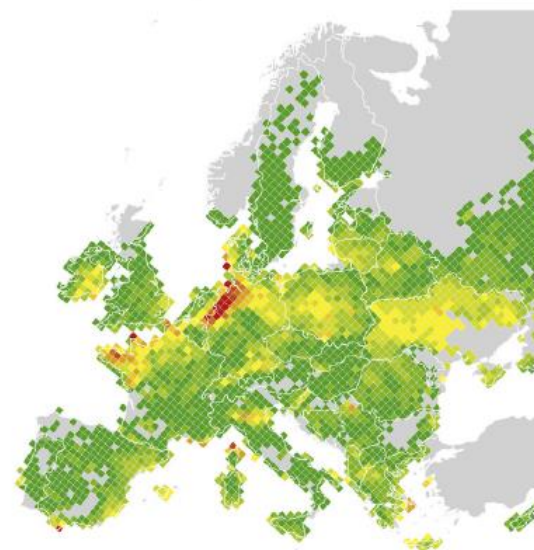
Halving the consumption of meat, dairy products and eggs in the EU would:

- Reduce N emissions with 40%
- Reduce GHG emissions with 25-40%
- Reduce cropland use (with 23%) for food production

Reference, 2009



Alternative diet (minus 50% meat and dairy)



Equivalents nitrogen per hectare and year

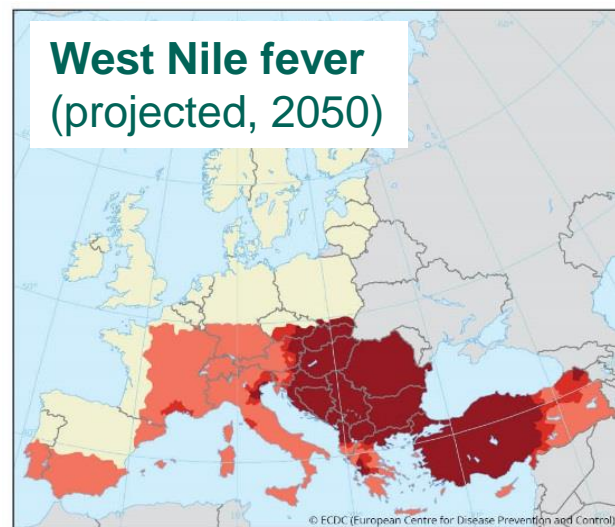
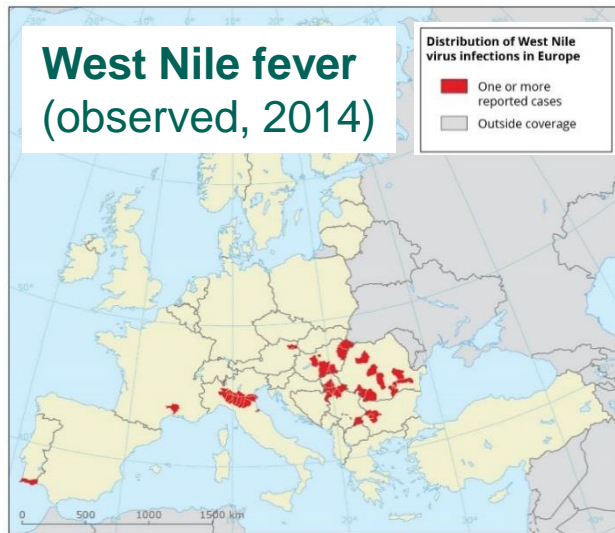
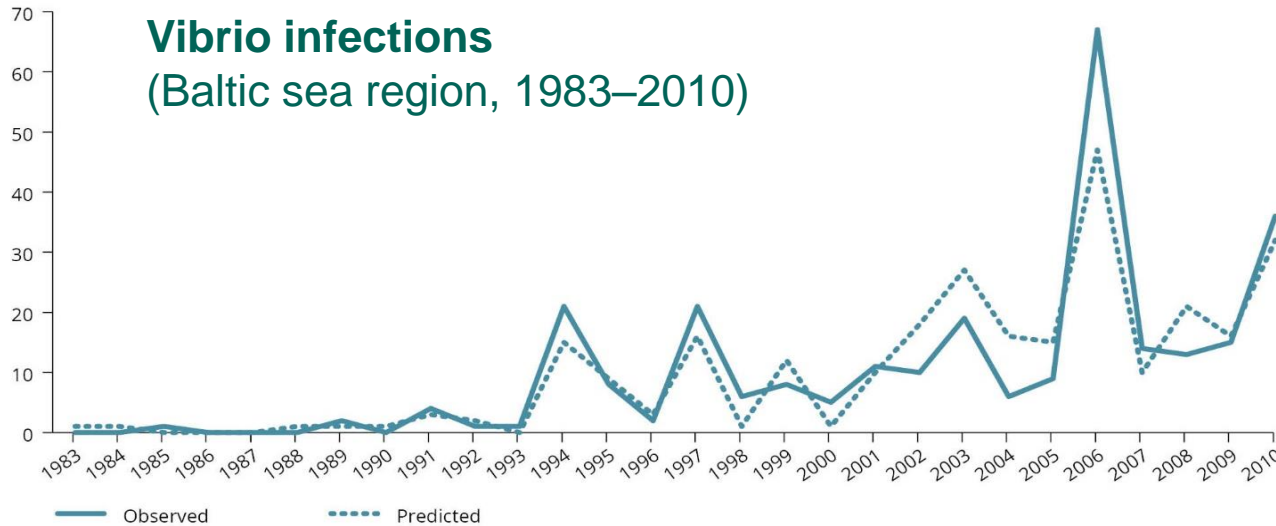


H. Westhoek et al 2014. Food choices, health and environment: Effects of cutting Europe's meat and dairy intake. Global Environmental Change





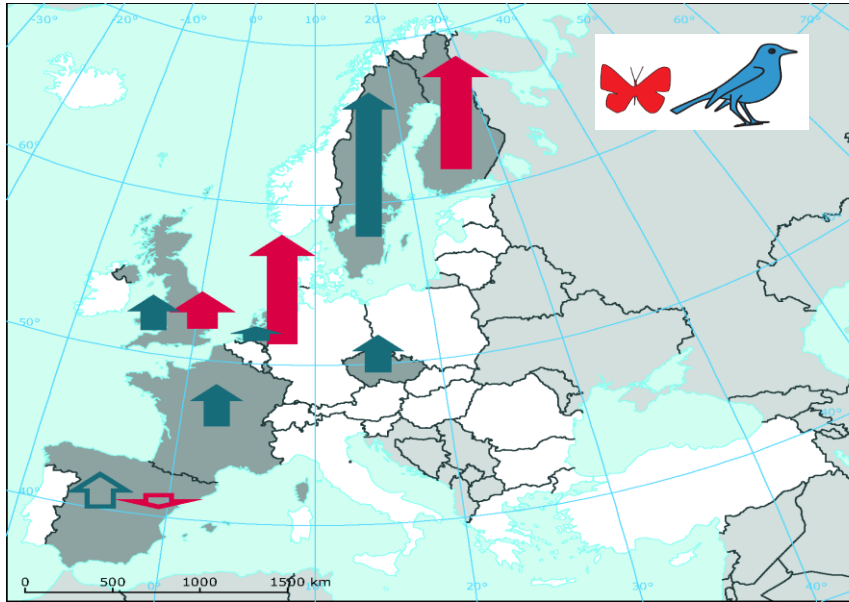
# Climate change is facilitating the spread of infectious diseases



Source: ECDC  
(Semenza et al. 2014)

# Ecosystems are changing in response to climate change – but most species cannot follow the pace of climate change

## Change in bird and butterfly communities (community temperature index, 1990–2008)



**9490 bird communities:**

37 km „northward“ on average

**2130 butterfly communities:**

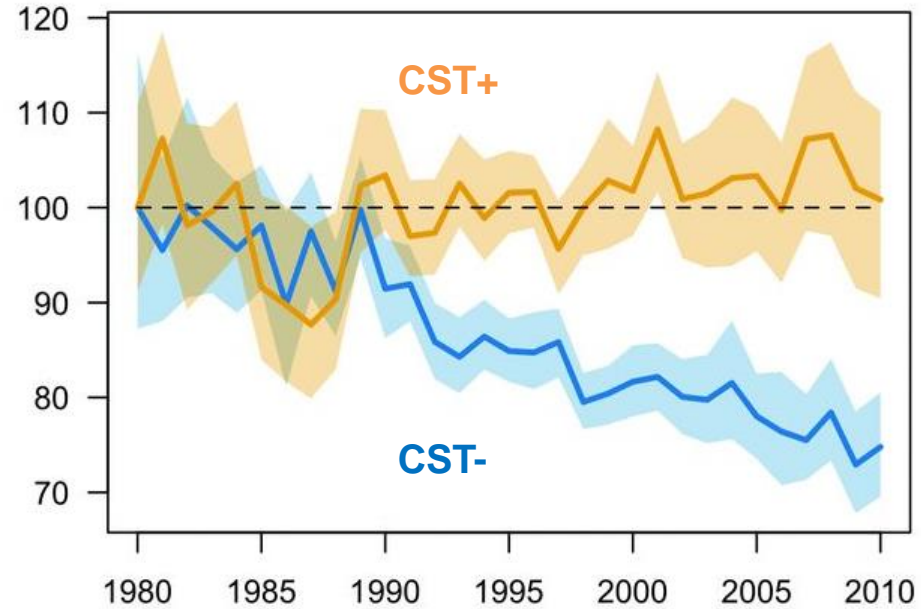
114 km „northward“ on average

**Climate zones:**

250 km northward

Source:  
Devictor et al. (2012)

## Abundance of bird species in Europe (1980–2010)

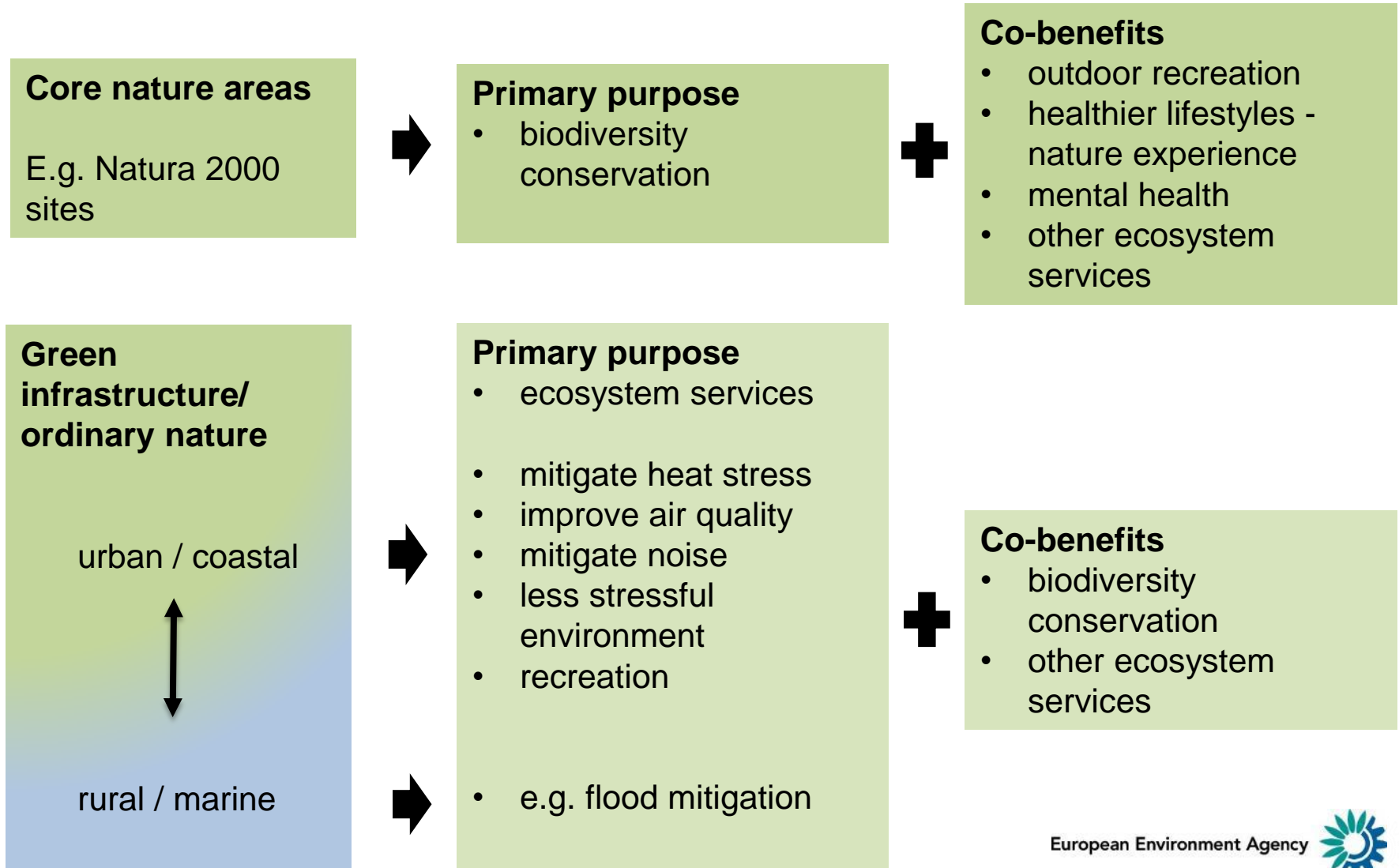


**CST+:** Species expected to respond *positively* to regional climate change → **no trend**

**CST-:** Species expected to respond *negatively* to regional climate change → **declining trend**

Source:  
Stephens et al. (2016)

# 3) Nature protection and green infrastructure



# Heat and health...

EEA Report | No 26/2016



## Rivers and lakes in European cities Past and future challenges

ISSN 1977-8449



...up to water management –  
restoration of water bodies



*Cool down...*

...air TREE  
concept!

**Viva Madrid?**





## *...TREE in cities...*

Up to 10° C difference between peri-urban and central areas

100 m<sup>2</sup> of trees help reduce T by 1° C

Green surfaces 10° C cooler than artificial ones

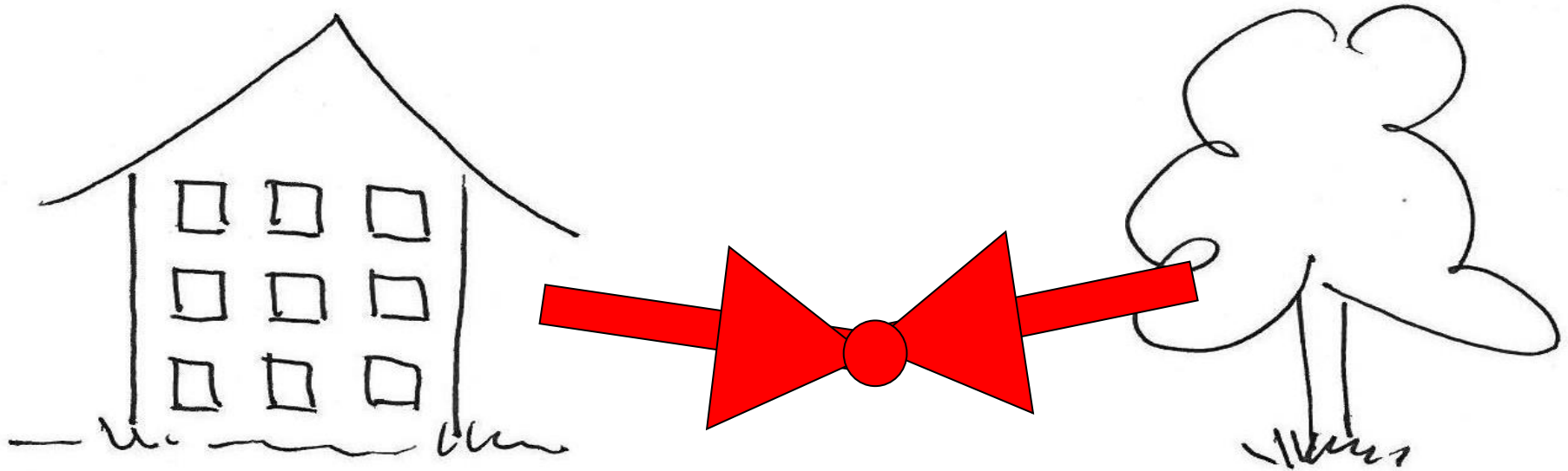
**...there is much more to it...multi-functionality.**



Consider emotional intelligence and values as well



# Urban & Nature



- Work more progressively with nature – a strong ‘urban’ agenda
- Integrated urban design –quality of life...
- Greening cities makes them more liveable and at the same time generate win-win solutions – a pleasant environment at lower costs
- It is about pushing forward the nature-based solutions



# Transitions: “something to the rescue!”

## Persistent problems demand fundamental solutions

- Regular policy offers no solutions
- Market creation and commodification is not a solution
- Incremental institutionalism is not sufficient

## → **Transitions**

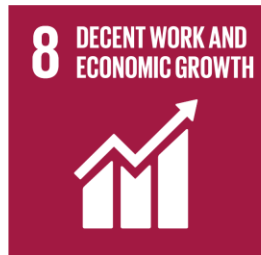
= fundamental shifts in the systems that fulfill societal needs, through profound changes in *dominant* structures, practices, technologies, policies, lifestyles, thinking ...

# In search of policy coherence and cohesion



## SUSTAINABLE DEVELOPMENT GOALS

17 GOALS TO TRANSFORM OUR WORLD



# Thank you!



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