



# Living with climate change: Managing nature reserves for new weather

**Dr Olly Watts**



giving  
nature  
a home



Partnership for  
nature and people

# Our protected areas are changing

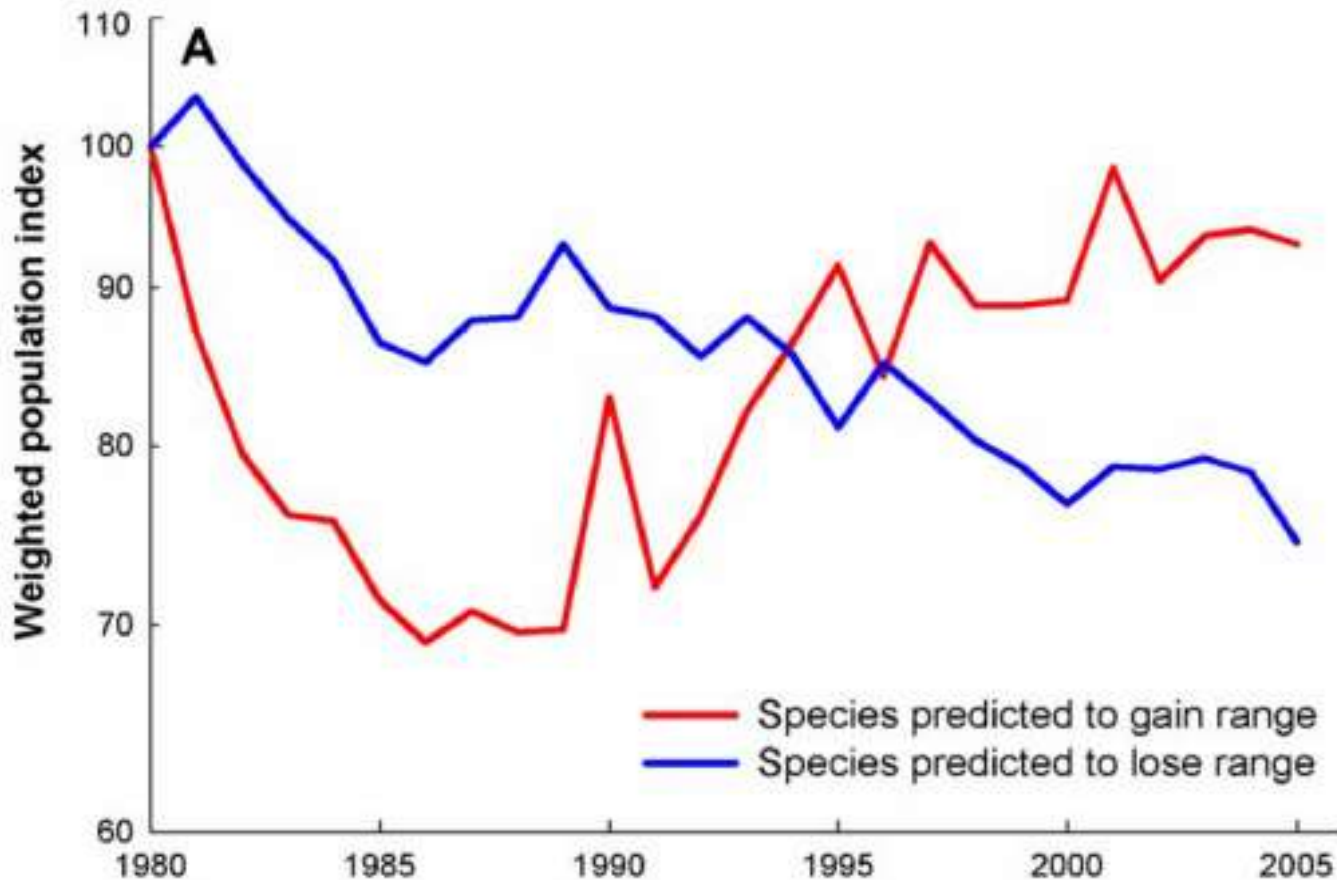
Natura 2000



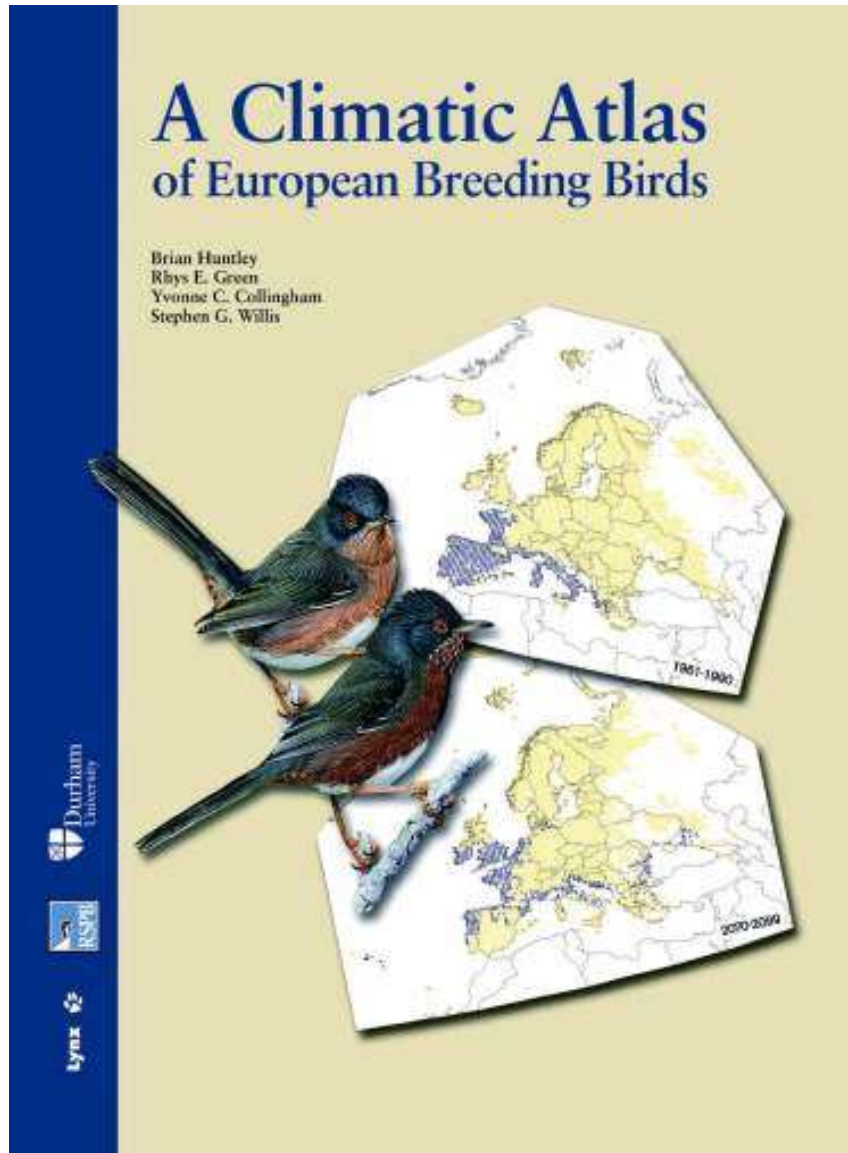
giving  
nature  
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# Birds are responding across Europe

Recent research shows similar patterns in North America



# Assessing future change: climate envelope modelling for Europe's birds

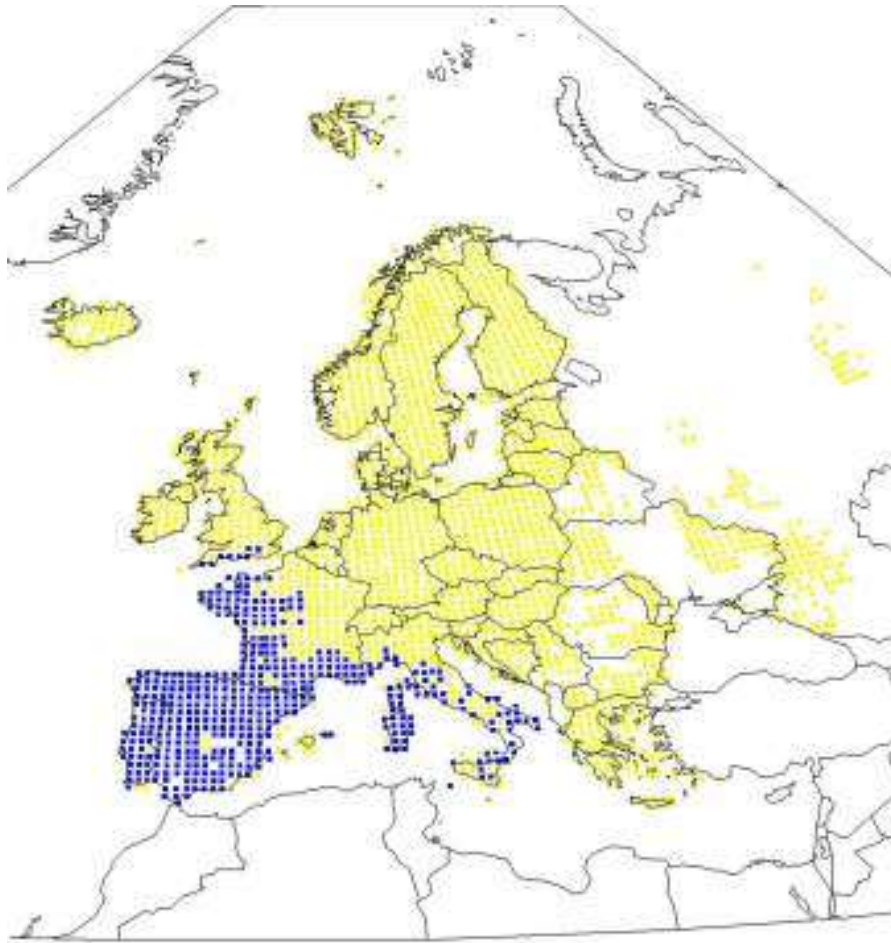


- For 3°C global mean temperature rise:
  - Average range shift 550 km north-east
  - 40% range overlap
  - 20% range contraction

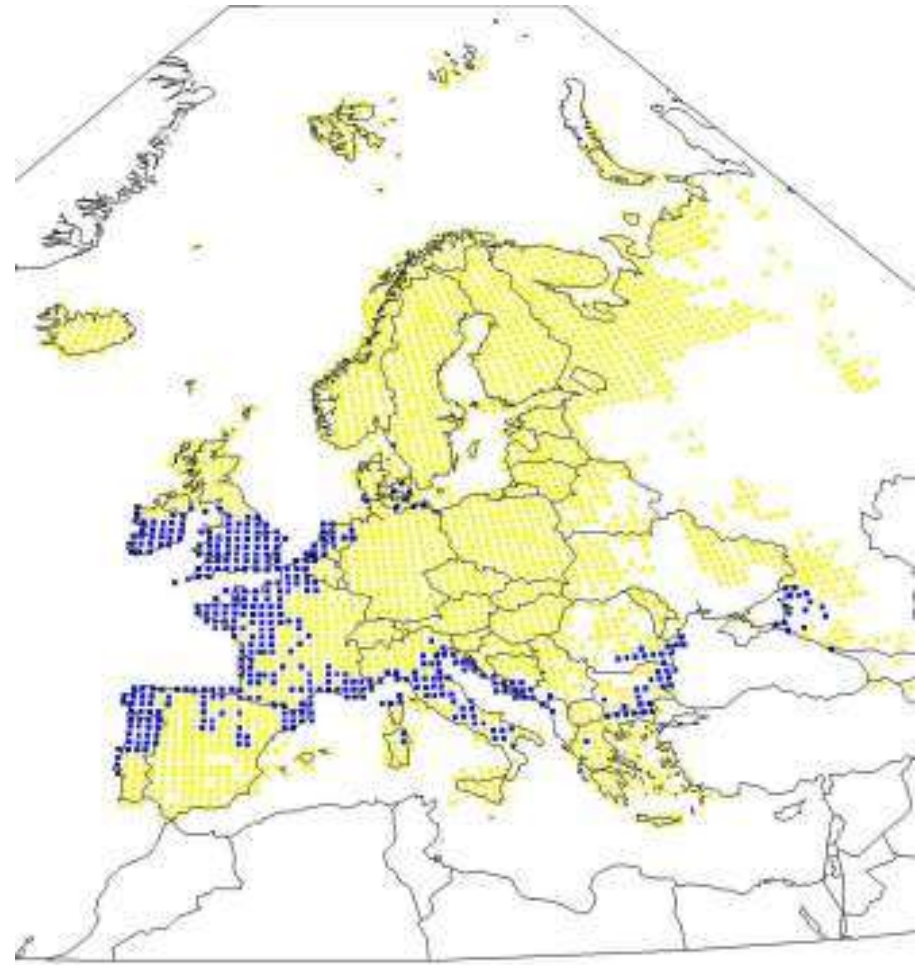


# Dartford warbler

Current distribution

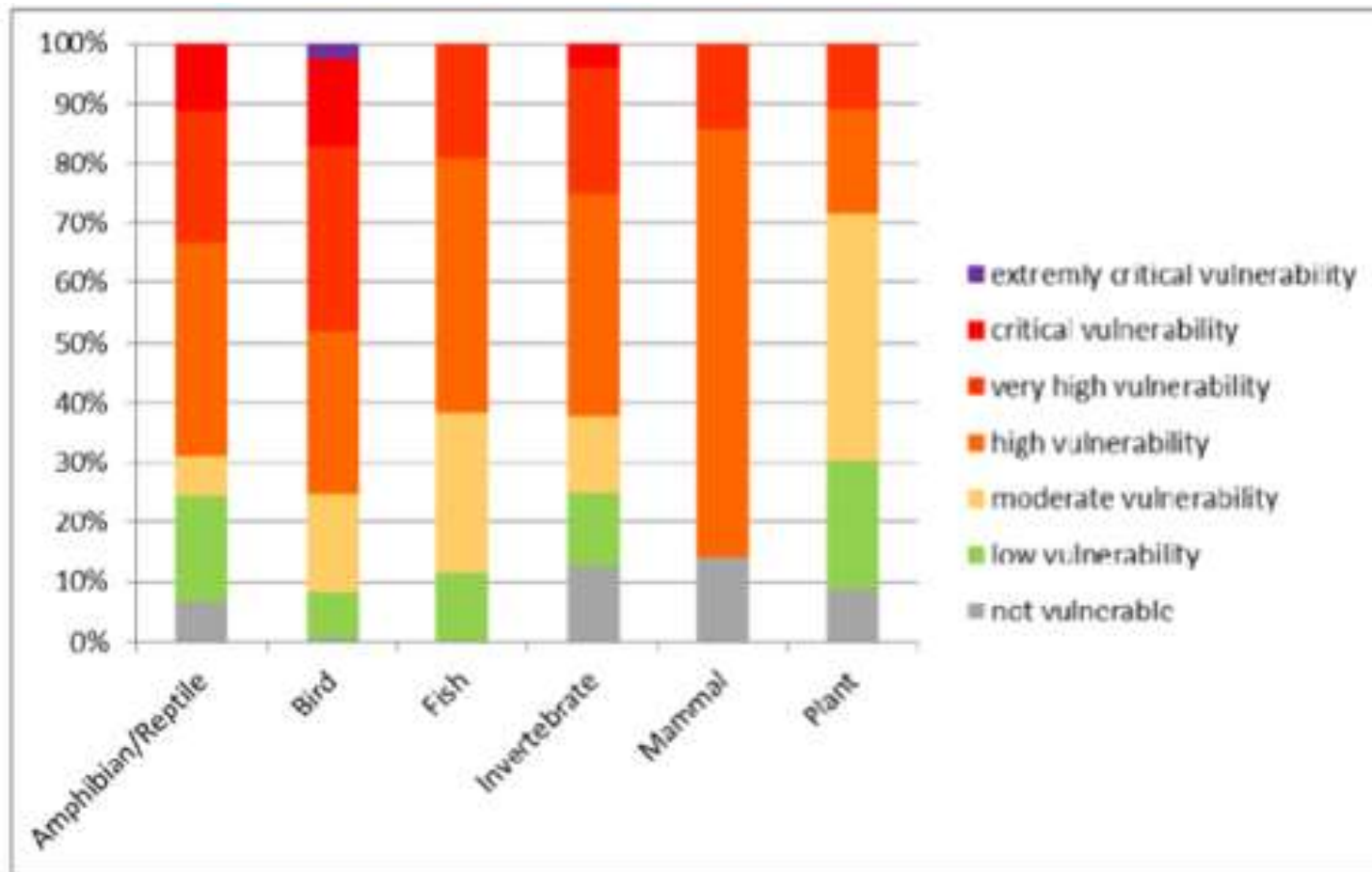


Climate envelope at 3 Celsius



# Nature sites are vulnerable to climate change

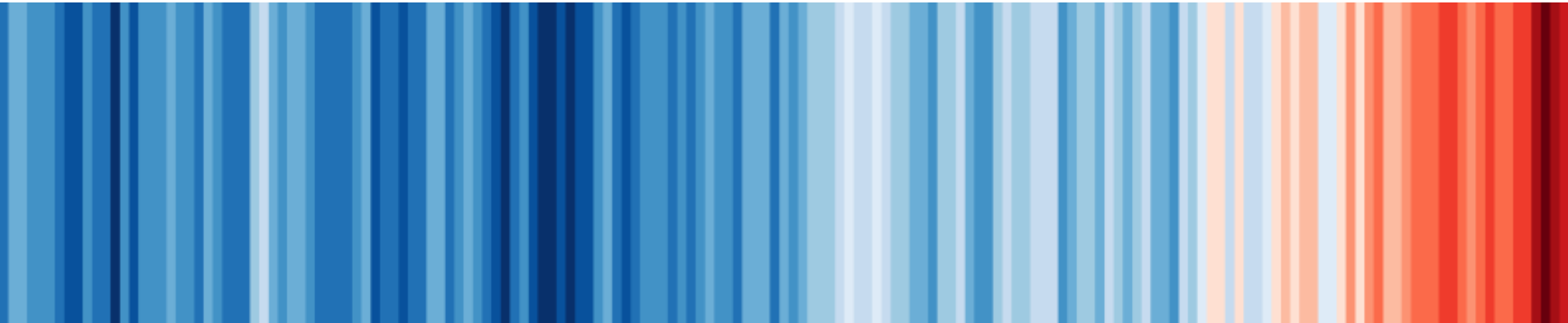
## Natura 2000 sites vulnerability for one pressure resulting from climate change



EU guidelines on  
climate change and  
Natura 2000, Fig 13

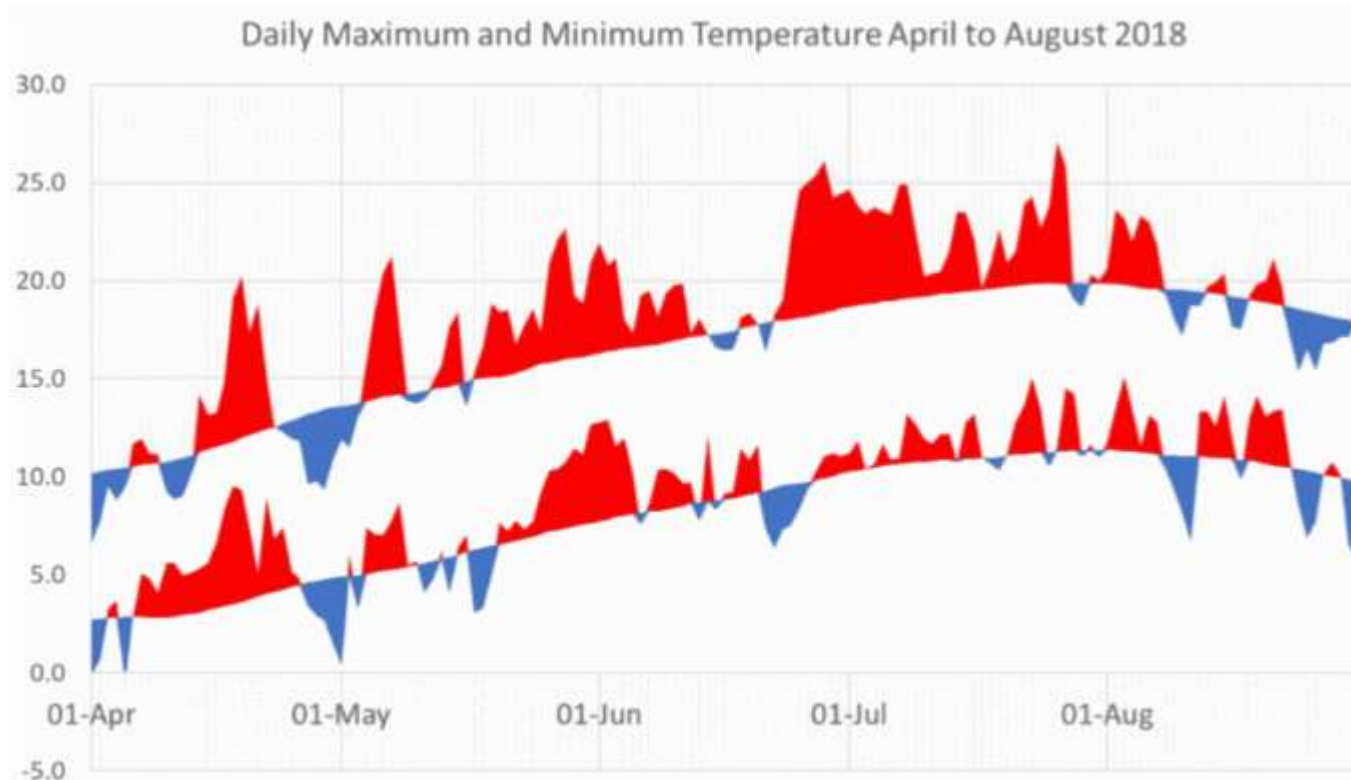
# Warming stripes 1850-2018

Increased warming apparent in last three decades



Climate Lab visualisation of WMO global average temperature dataset

# UK 2018 summer the norm by 2050

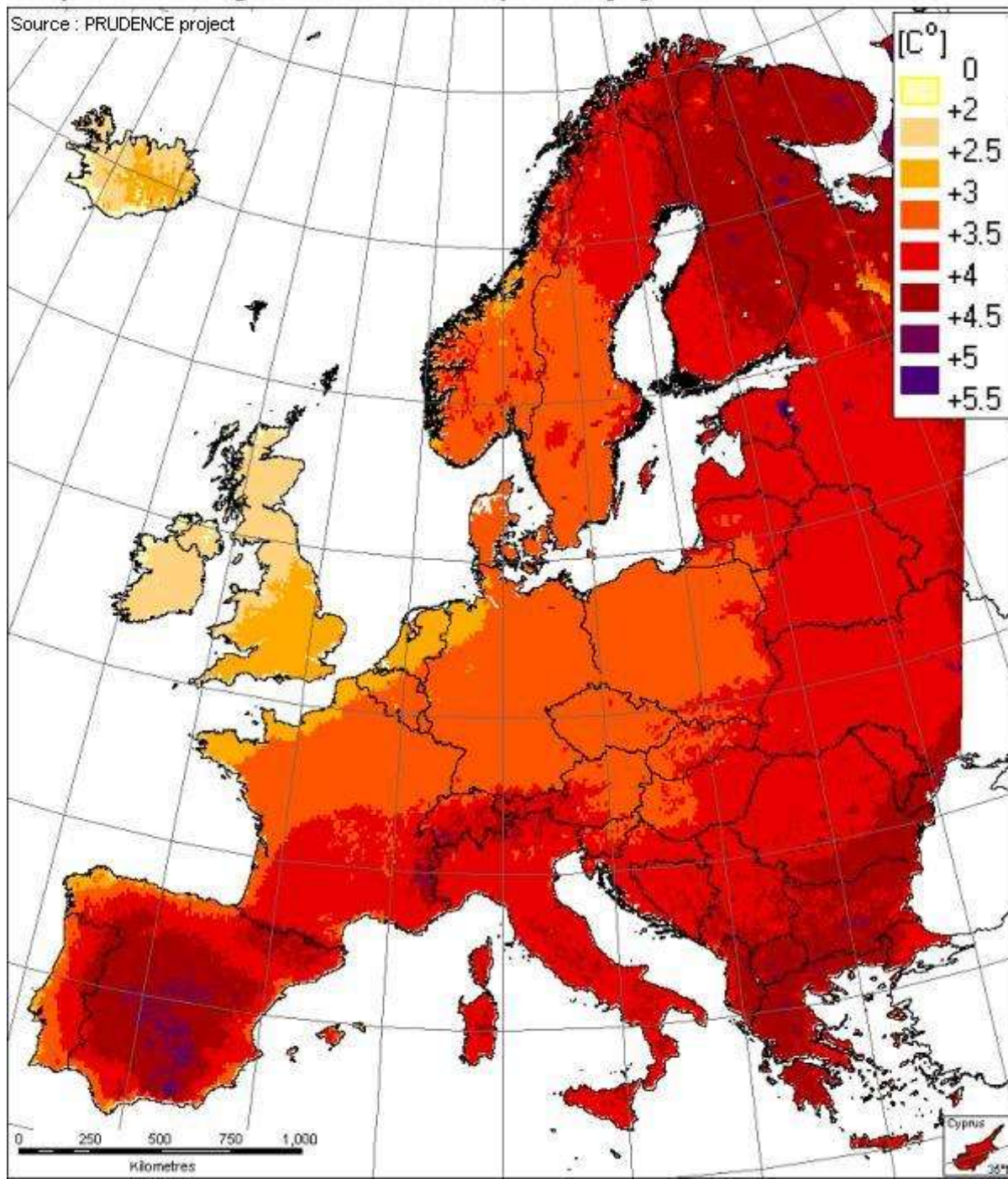


- Anomalies from 1981-2010 average
- Joint hottest year with 2006; top five 1976, 1995, 2003
- Record: 38.7°C on 25 July 2019 Cambridge Botanic Gardens



# Temperature: change in mean annual temperature [C°]

Source : PRUDENCE project



**SRES A2 scenario**

**Medium - High**

**2070-2100**

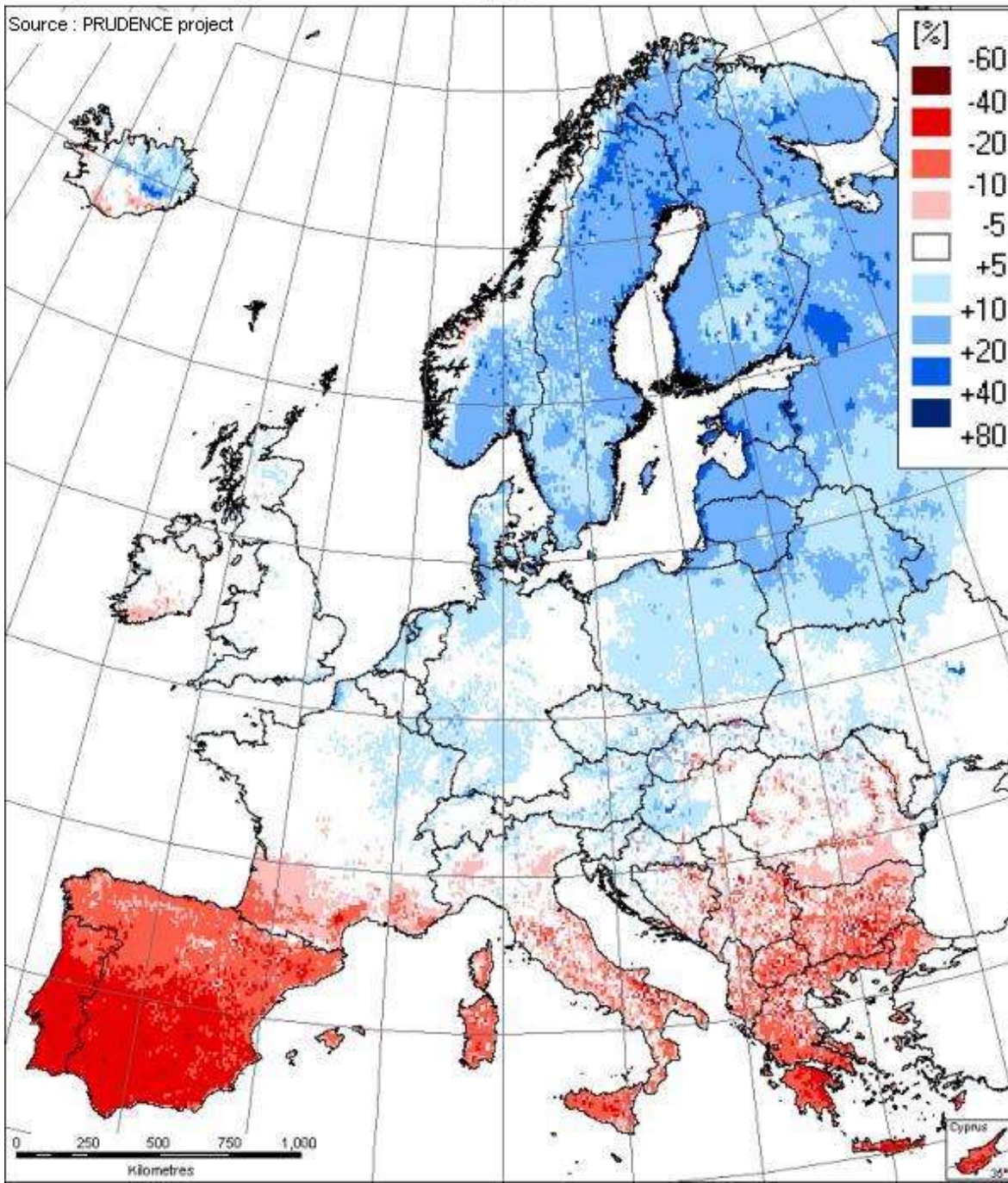
**3.3°C global increase**

**Approx 700 ppm CO<sub>2</sub>**

**UK Met Office PRUDENCE**

## Precipitation: change in annual amount [%]

Source : PRUDENCE project

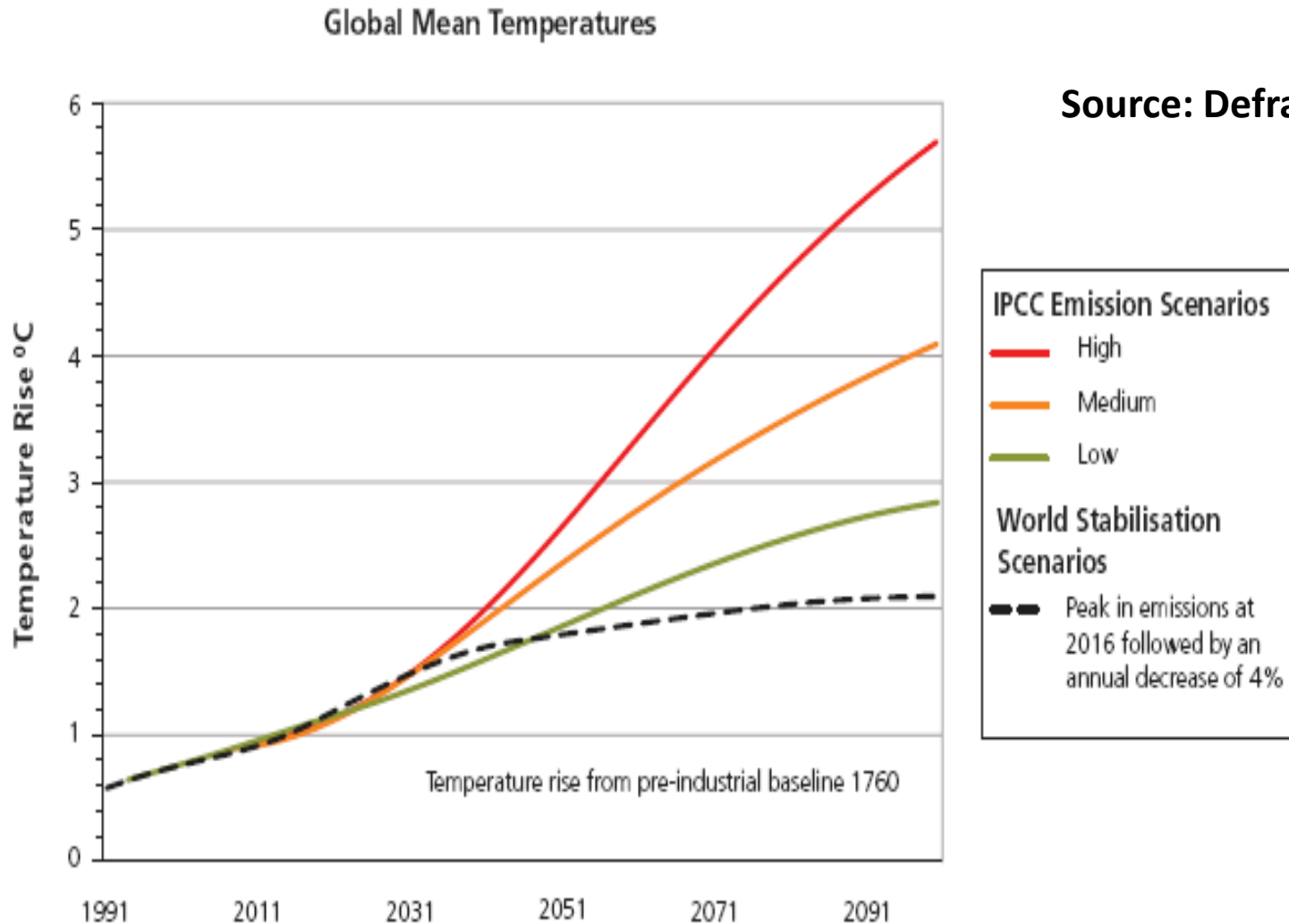


**SRES A2 scenario  
Medium - High  
2070-2100  
3.3°C global increase  
Approx 700 ppm CO<sub>2</sub>**

**Met Office PRUDENCE**



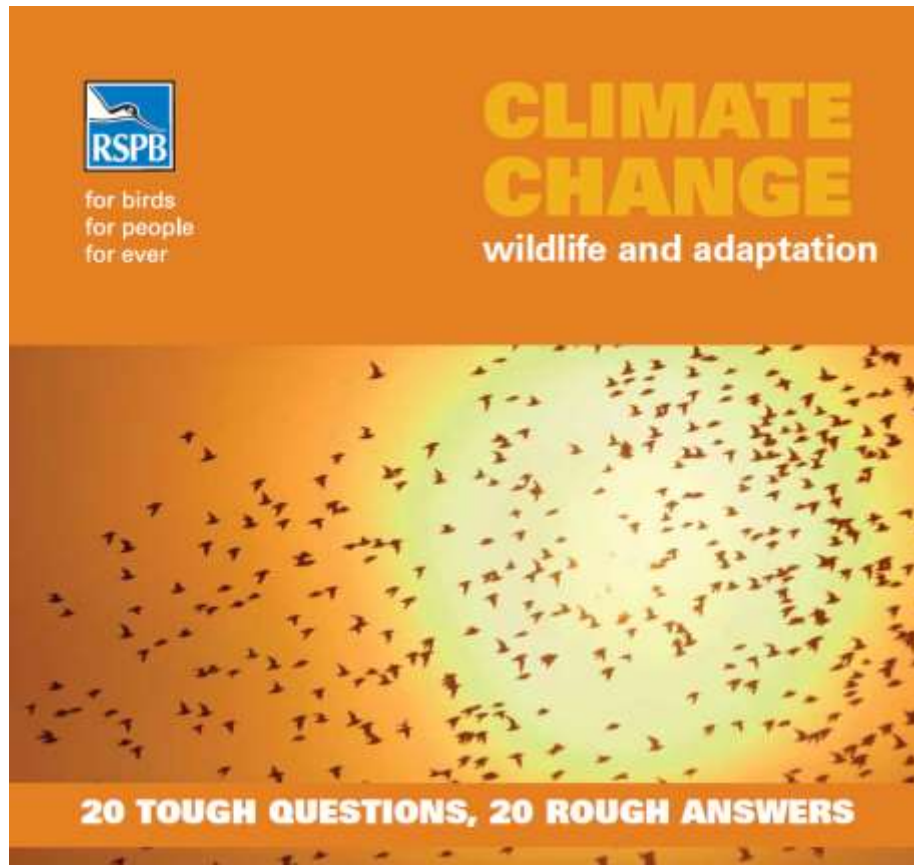
# Two degrees is close - a milestone on the trajectory of climate change



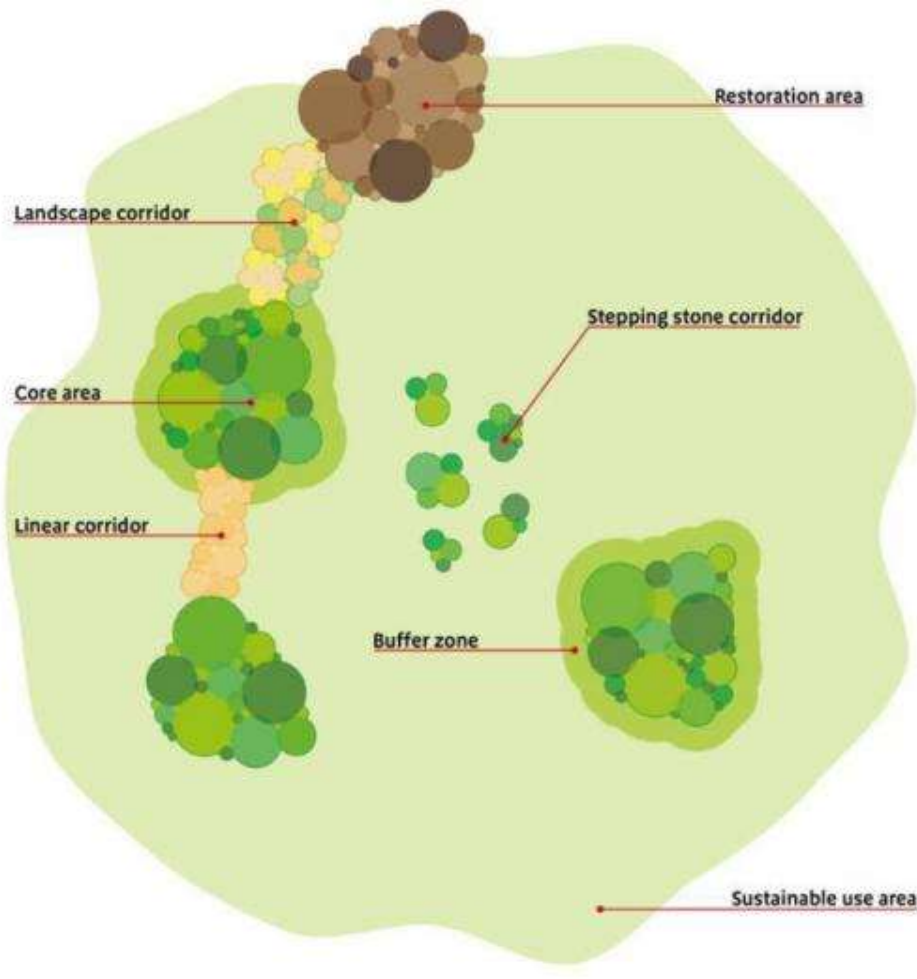
Source: Defra (UK) 2009

# Need to adapt: but how?

- Build resilience – ***against*** climate change
- Accommodate to change – ***with*** climate change
- Nature recovery → nature renovation, future nature



# Lawton's nature sites principles



- **Bigger**
- **Better**
- **More**
- **More connected**



# Even wider scope for migratory species



# Four key RSPB nature reserves actions

**Manage existing sites well  
& extend them**



**Defend coastal sites until sufficient  
replacement habitat has been created**



**Create new areas of habitat**

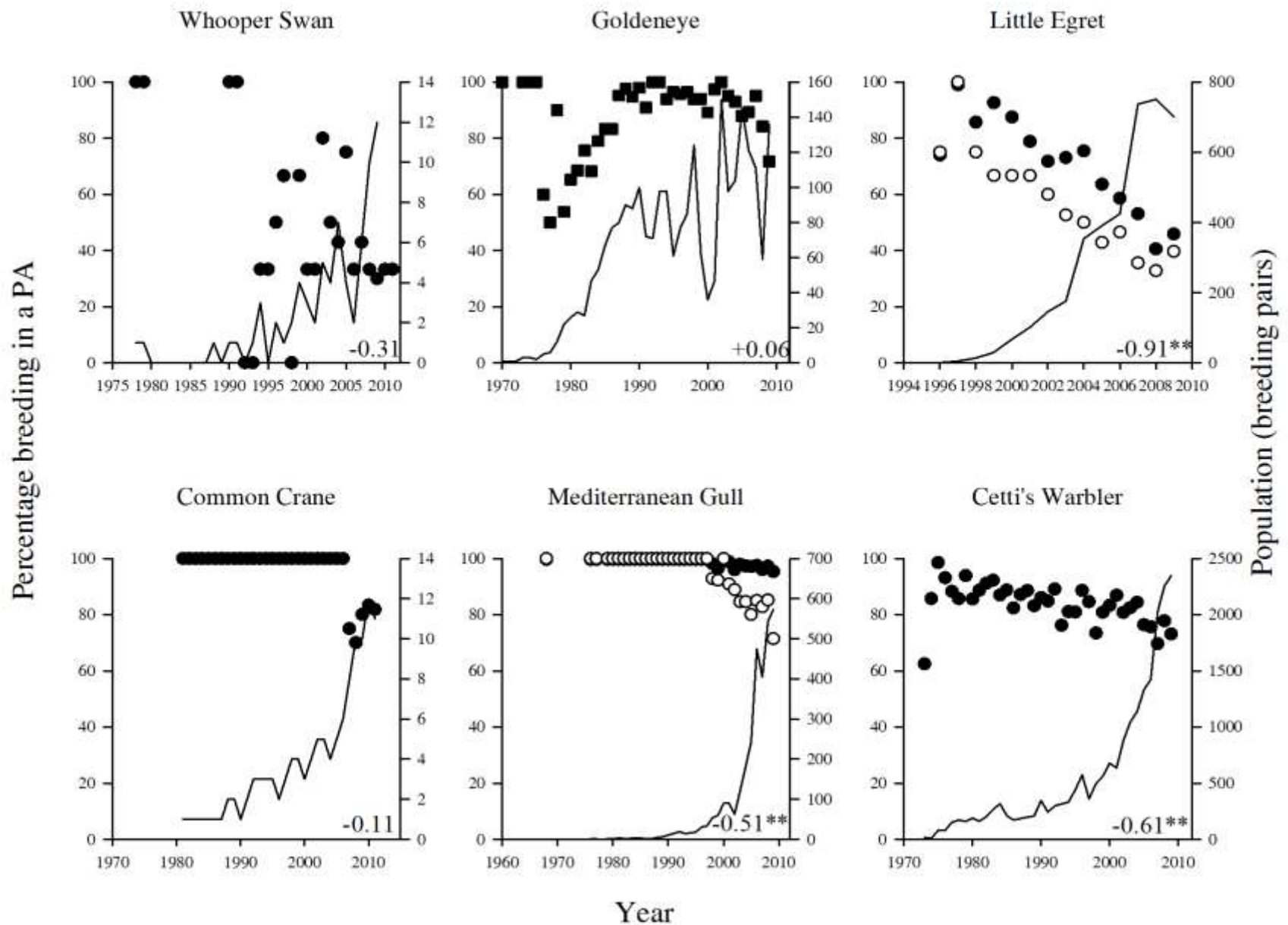
**Translocate some immobile spp**



# Welcoming different species



# Birds use protected areas to shift range



# Some species need more help

**Translocation for poor dispersal, poor habitat connection**





# Planning on different timescales

## **Short lead-in time/ short-term impacts**

e.g. grazing management, vegetation cutting, annual control of water levels



## **Long lead-in time/long-term impacts**

eg habitat creation, woodland management, ensuring long-term water supply, sea defences



# Increase habitat heterogeneity





# Microhabitat and microclimate diversity

## S-shaped butterfly bank at Winterbourne Down





**Extend patch size  
and increase  
connectivity**

**Long term strategic  
planning around  
Minsmere**



# Action now for future climate conditions

## Woodland planting at higher altitude at Abernethy





# Changing land use changes conservation response

New habitat areas at Ouse Washes next to former sites



Cambridgeshire  
County Council

# Innovative, more flexible site infrastructure

## Sea wall replaced by spillway at Havergate Island



# Coastal realignment to protect freshwater nature reserves

**Freshwater nature reserve protected by new saltmarsh at Titchwell**





# Habitat creation in safe places

**Reedbed creation at Lakenheath Fen to replace vulnerable coastal sites for bitterns**



# Flexible water management – small scale

**Retaining some wetland scrape areas in dry summers at Pulborough Brooks, allowing others to dry out**





# Flexible water management – medium scale

**Reedbed created primarily for water storage at  
Otmoor wet grassland reserve**



# Flexible water management – large scale

**Three separate hydrological compartments at Frampton Marsh allow flexible water control**





# Large scale future vision for nature

## Wetland creation in Somerset





# Large scale future vision for nature and people

## Coastal habitat creation aids flood management at Wallasea Island



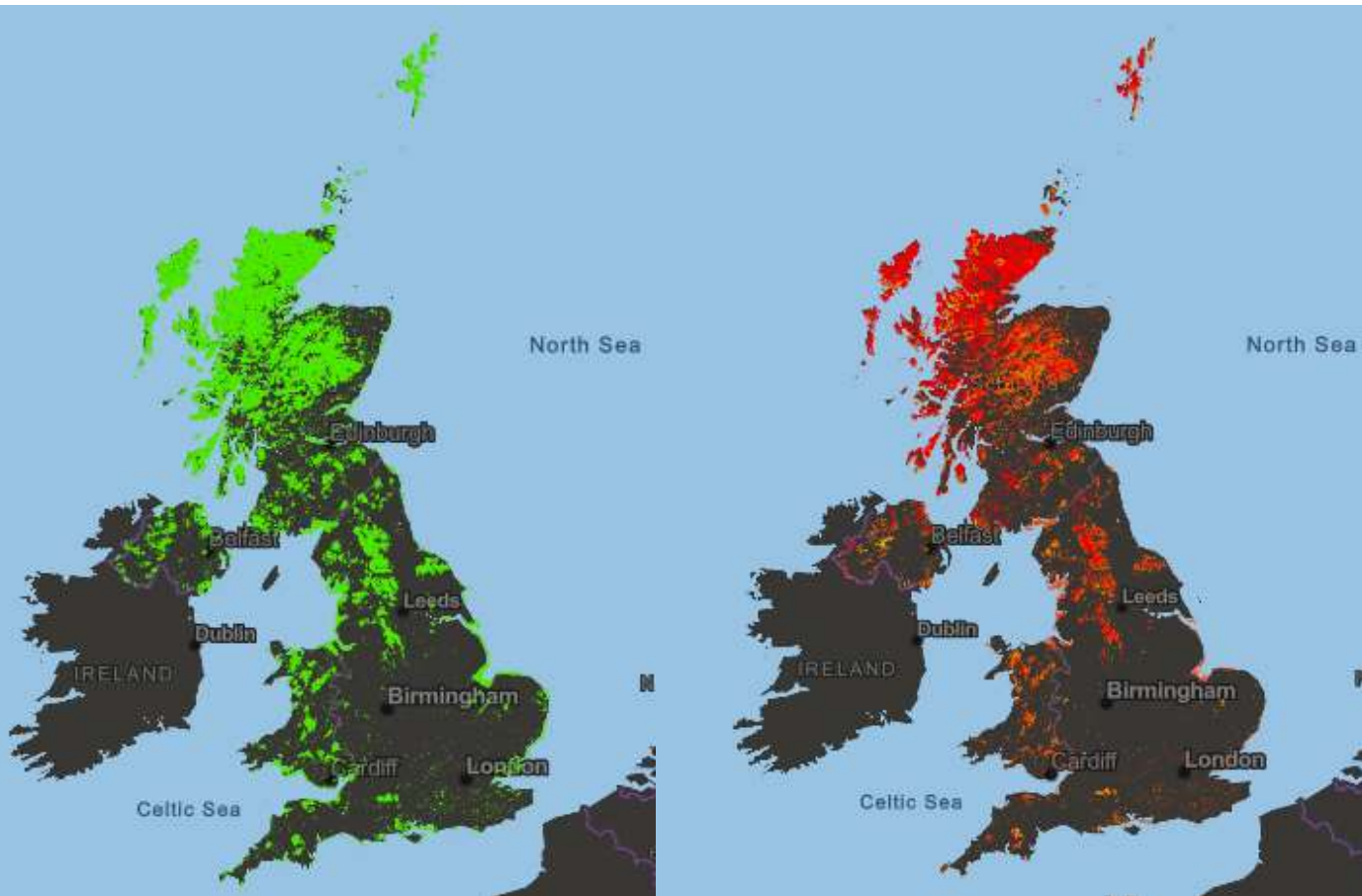
# Nature based solutions help people adapt

**Coastal community protection benefits birds at Medmerry**



# Nature based climate mitigation

## Carbon mapping the UK's nature rich areas





# Nature based solutions at the heart of society's response to climate change



Climate Change Act 2008



# Taking things forward

- Critical time – action *now*
- Trajectory of change - 2 degree Celsius milestone
- Nature recovery towards future nature
- Landscapes changing for nature and for people
  - Nature based solutions and integration across landscapes



# All is possible!

- Thank you  
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SKOLSTREJK  
FÖR  
KLIMATET