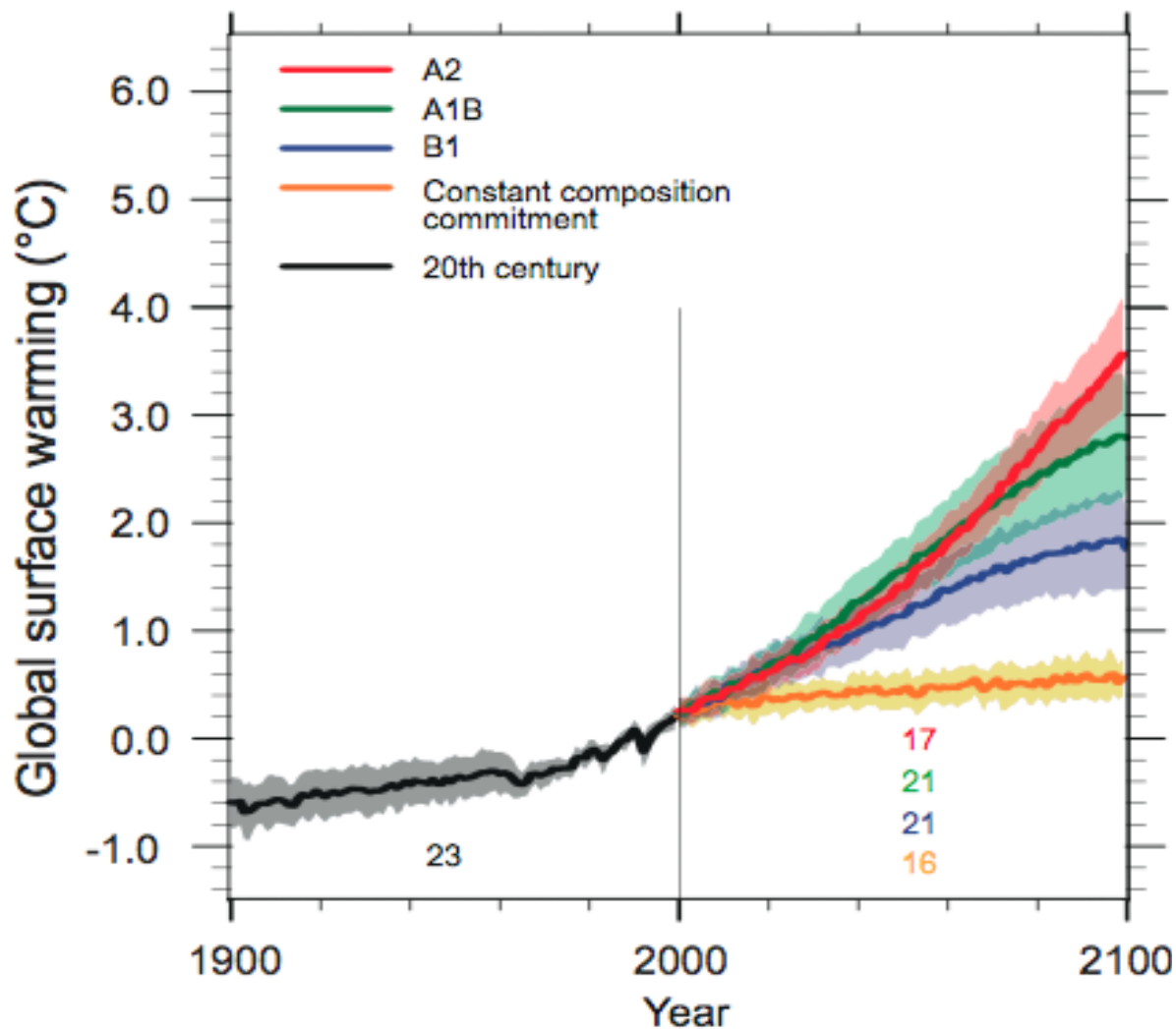


Climate Change: Risks and opportunities for biodiversity offsetting projects

Mike Morecroft

Global projections of future climate change



UKCP09 Summer 2080's (medium scenario)

Warmer by up to 4.2°C (2.2 to 6.8°C)

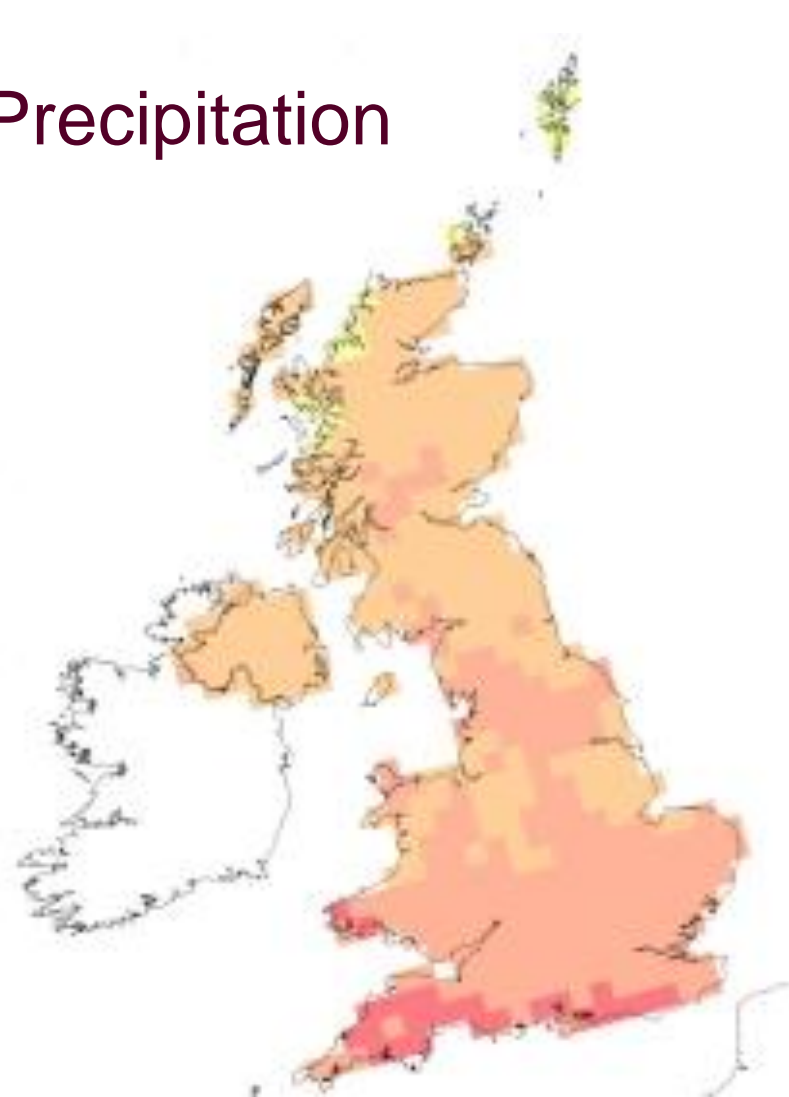
Drier by up to 40%

NATURAL
ENGLAND

Temperature



Precipitation





Projections vary with time, emissions scenario, model parameters

but consistent patterns:

- Warmer
- Drier Summers
- Wetter Winters
- More extremes (e.g. drought, flood)
- Regional Differences (biggest effects S)

Direct impacts on biodiversity

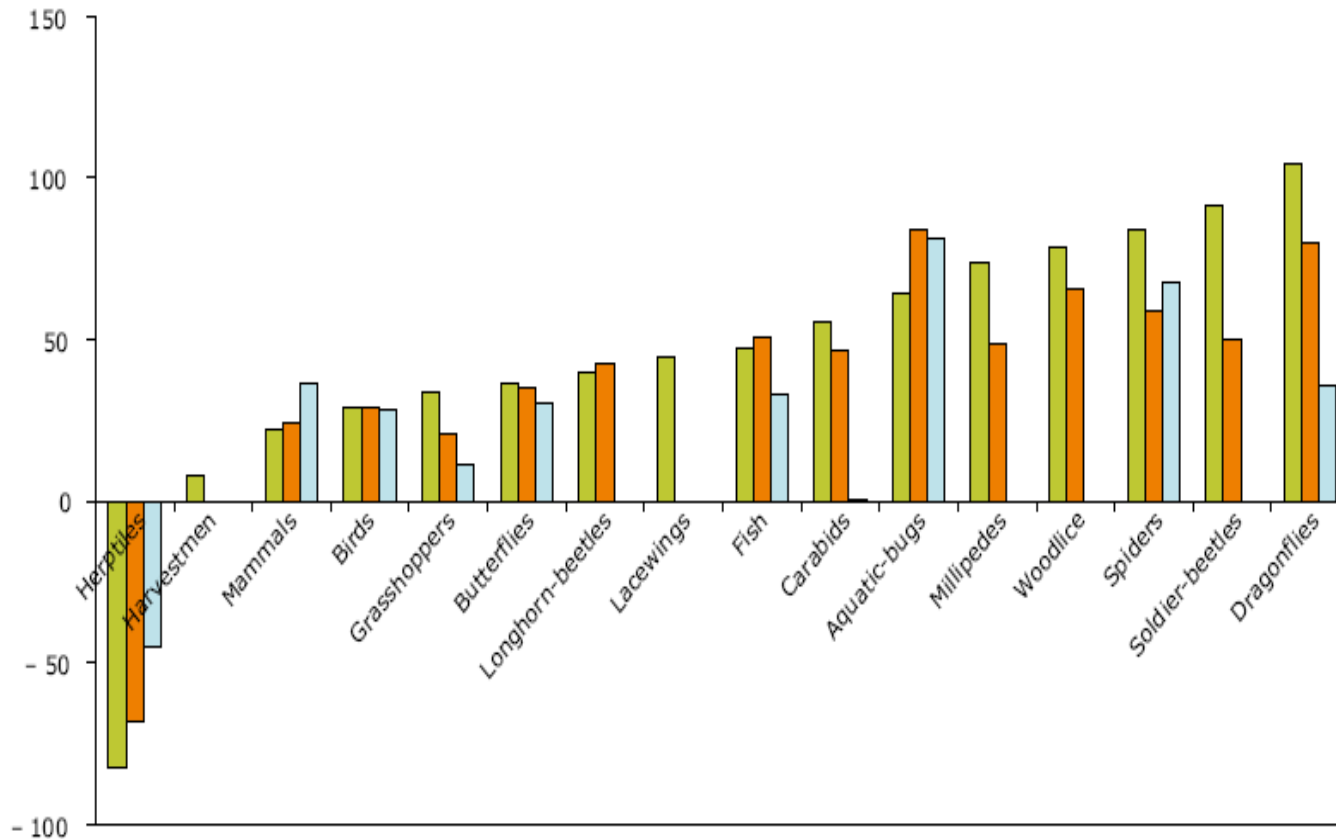


- Distributions shift to higher latitudes and altitudes
 - Different rates of movement
 - Invasives vs. non-natives

Are species starting to move?



Shift northwards km

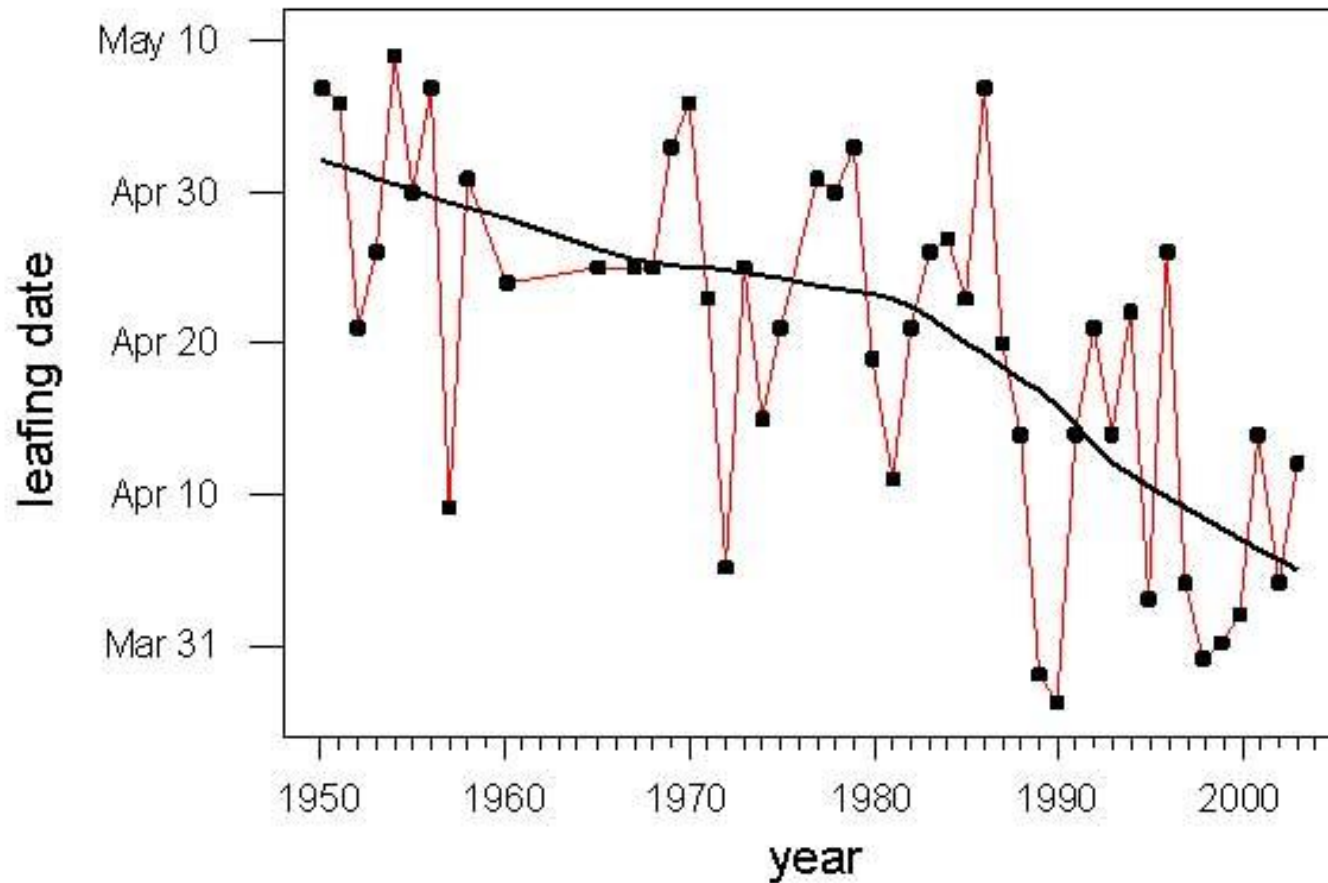


Direct impacts on biodiversity



- Distributions shift to higher latitudes and altitudes
 - Different rates of movement
 - Invasives vs. non-natives
- Changing phenology

Oak leafing, Surrey, 1950-2003



Direct impacts on biodiversity



- Distributions shift to higher latitudes and altitudes
 - Different rates of movement
 - Invasives vs. non-natives
- Changing phenology
- Disrupted synchrony
- Novel communities
- Effects of extreme events
- Coastal erosion
- Changing ecosystem processes (e.g. River flow)

Indirect effects of climate change



Changing markets, policy and experience lead to changes in

- agriculture
- forestry
- catchment management
- Carbon management
- Renewable energy

Etc!

Minimising climate change

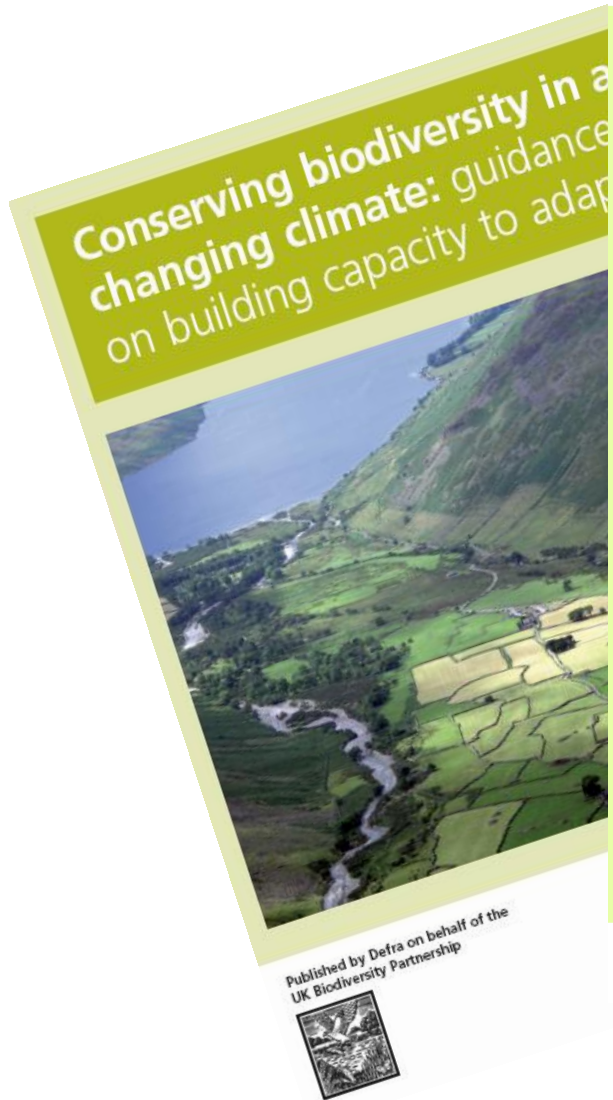


Mitigation and Adaptation



Dealing with the consequences

Adaptation for conservation



Adaptation for conservation

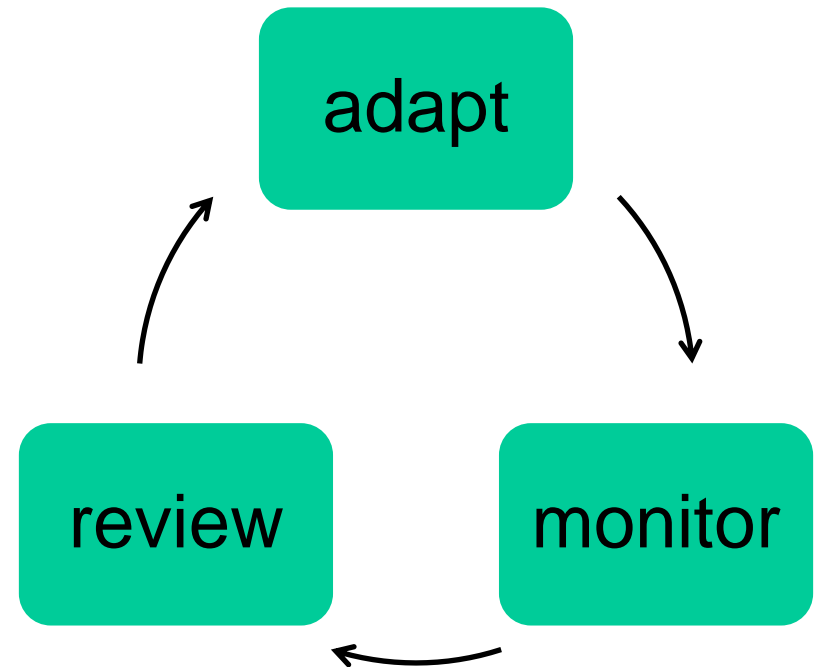


- Protect current species, habitats and sites
- Build resilience
 - e.g. Larger / more heterogeneous areas; habitat networks?*
- Accommodate change
 - e.g. Managed realignment; new species*
- Integrate across partners and sectors
- Develop knowledge and plan strategically

Coping with uncertainty



- No regrets measures
- Adaptive management approach
- Monitoring and research



Risks for biodiversity offsetting



- Species may not be viable in current locations
- Invasive species / new pests / diseases
- Habitats on the coast may be lost
- Pressure on water resources in S
- Pressure to increase production in some areas

Pressure points

- Species at S range margins (northern montane)
- Drought sensitive systems
- Coasts
- New habitats – harder to establish than maintain?

Opportunities for biodiversity offsetting



Potential source of funding to do something different!

- Enlarge / buffer sites
- Increase heterogeneity
- Develop networks
- Accept new species
- Assist colonisation
- Aim to support biodiversity at national / international level
- Enhance ecosystem function

Challenges



- How to evaluate like-for-like
- How bold to be
- Managing expectations (sites may change but still be valuable)
- The need to monitor and evaluate

Conclusions



- Don't try to recreate the past
- See the big picture of biodiversity
- Beware of obvious risks (coastal, montane, drought sensitive)
- Look for positive opportunities
- We will need to learn from experience