Climate Change, Nature and Us

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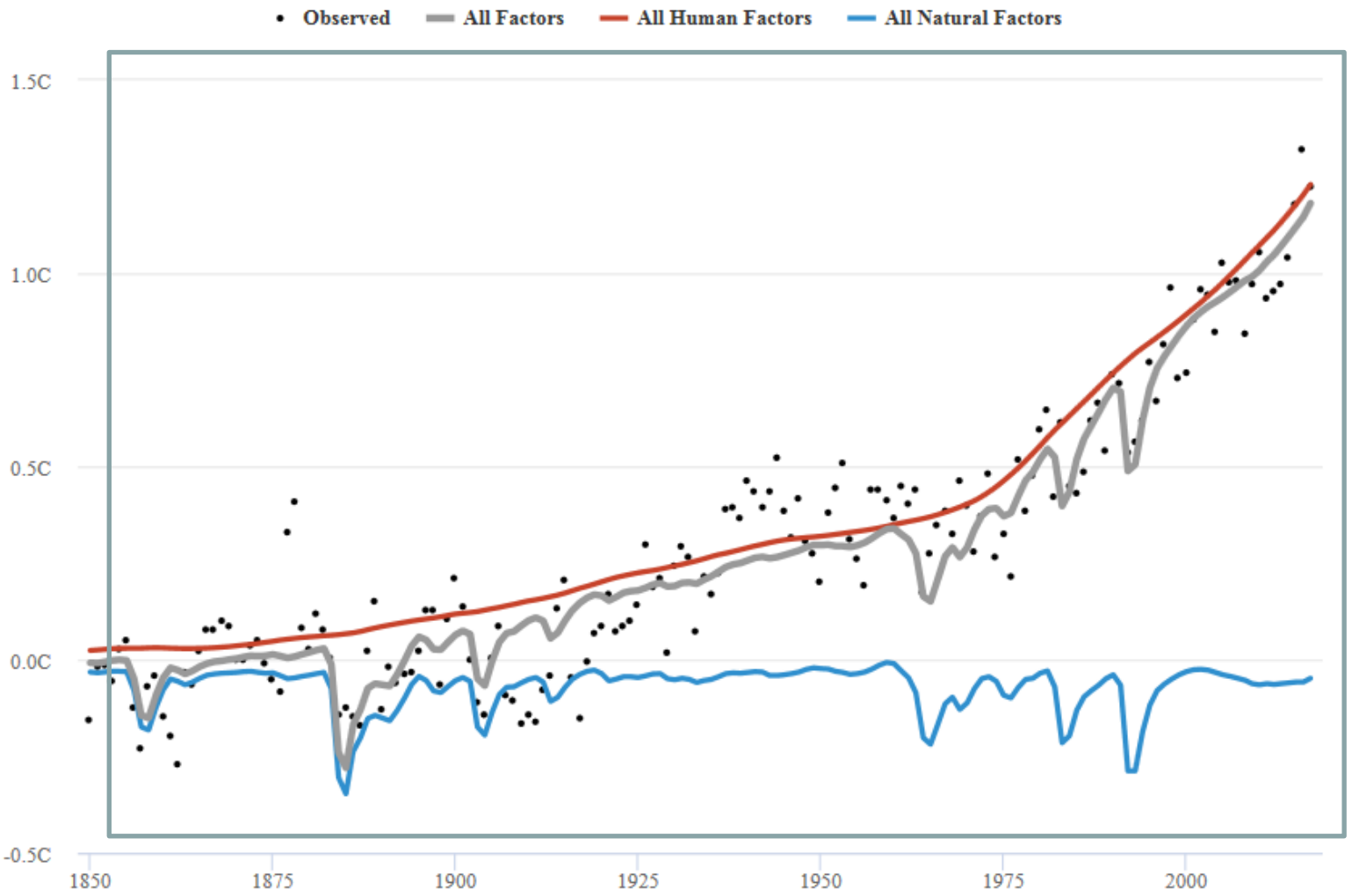
JRI

NATURAL ENGLAND

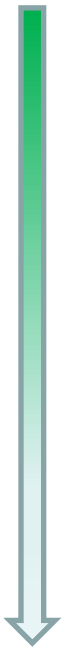
Comparing actual temperature trend with modelled of human and natural factors



Carbon Brief (2017) CB

What we are increasingly having to deal with

- Warmer temperatures
- Drier summers
- Wetter winters
- Heavier rainfall during storms
- Increased risk of drought, flood and wildfire
- Increased coastal erosion and saline intrusion
- New pests and diseases
- Changing world markets
- Changing policy responses



direct

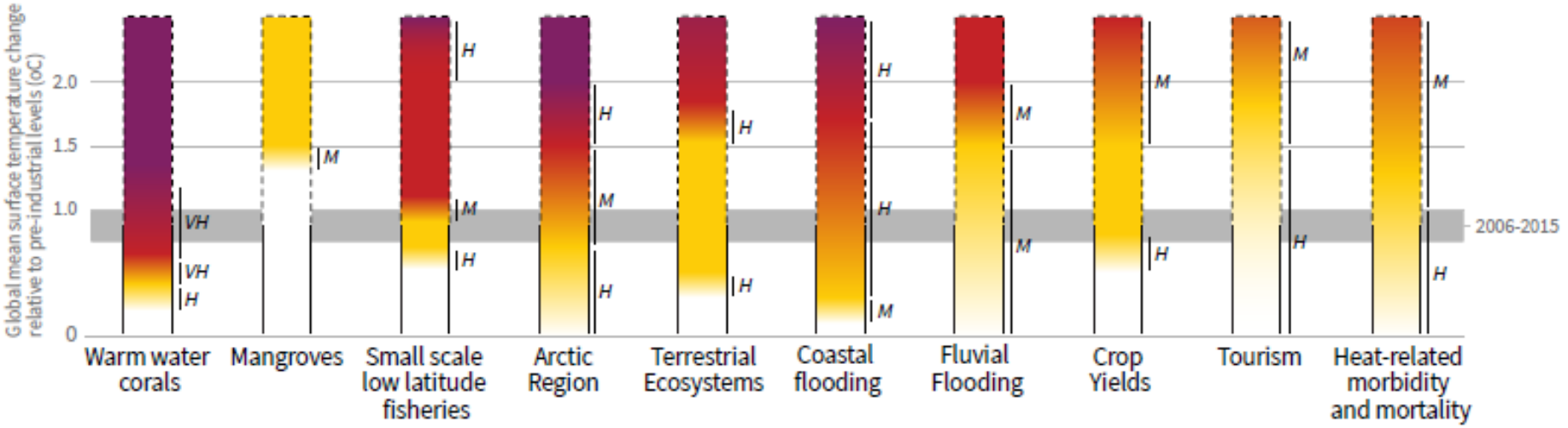
indirect

- Increased uncertainty

Global risks to species and ecosystems

Mass coral bleaching continues to be a major stress on coral on the Great Barrier Reef. Image: Chris Jones

Impacts and risks for selected natural, managed and human systems



Confidence level for transition: *L*=Low, *M*=Medium, *H*=High and *VH*=Very high

IPCC (2017) SR1.5 Report

Even half a degree matters….

	1.5º	2º
Species losing >50% current climatic range		
Insects	6%	18%
Plants	8%	16%
Vertebrates	4%	8%
Land area changing biome	4%	18%

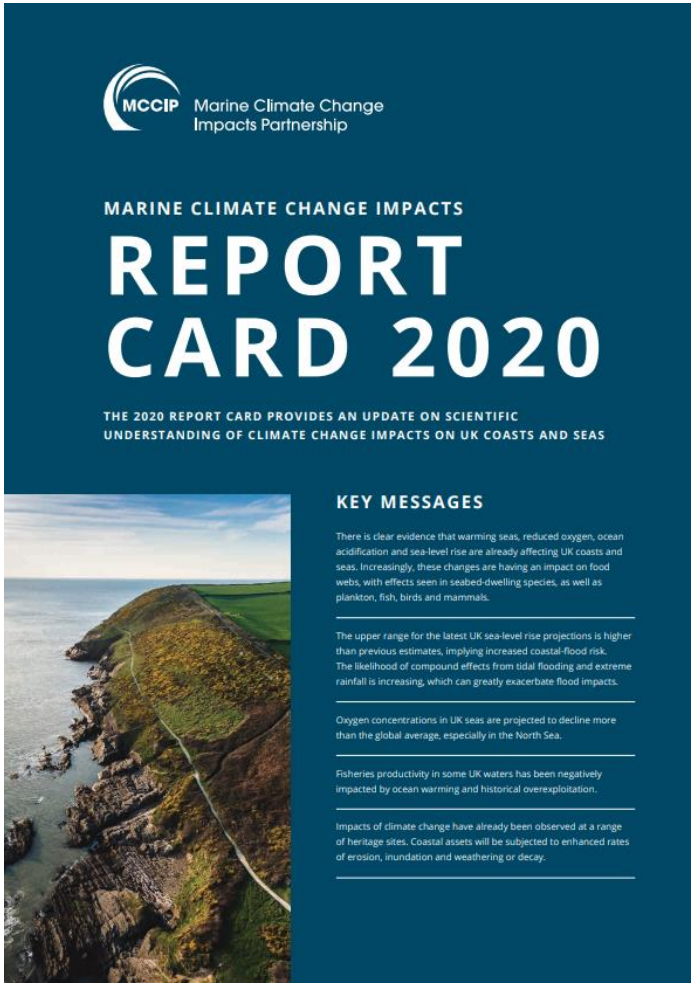
IPCC 2018

There is strong evidence that climate change is affecting UK biodiversity

- Species moving northwards
- Earlier spring events
- Changing populations, communities & habitats
- Interactions with other pressures e.g drainage, fragmentation
- Extreme event impacts e.g. droughts, heatwaves

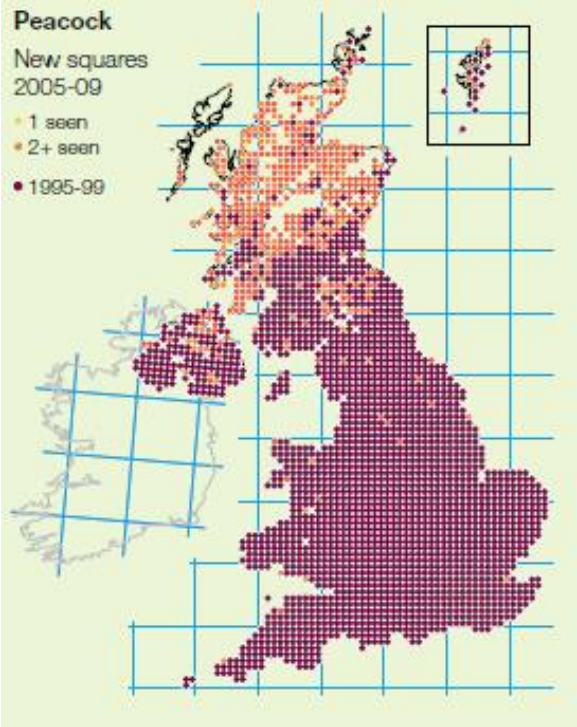
Morecroft & Speakman (2015; eds.) *UK Biodiversity Climate Change Impacts Report Card*

Marine Impacts



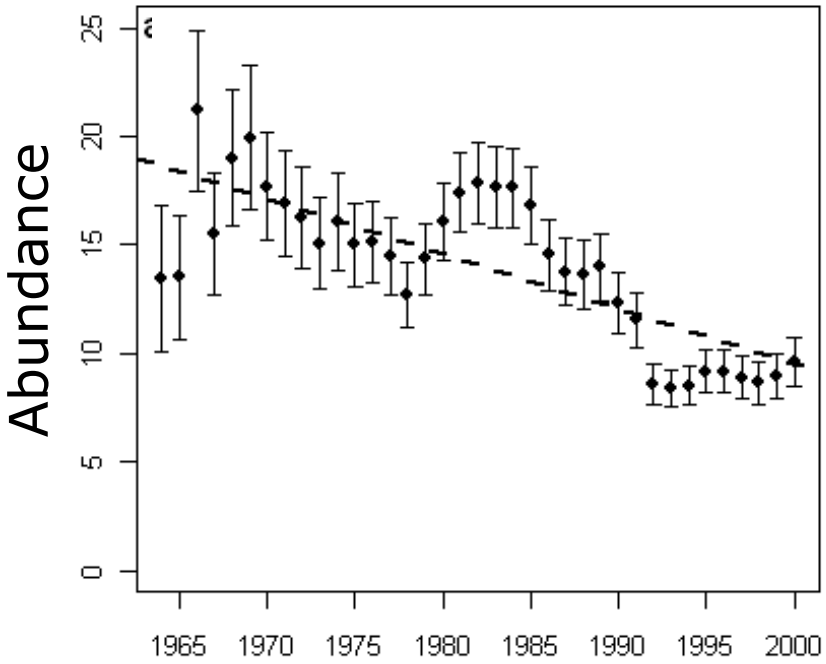
- Clear evidence of warming seas, reduced oxygen, acidification and sea-level rise
- Impact on food webs: seabed species, plankton, fish, birds and mammals.
- Increasing coastal-flood risk.
- Oxygen concentrations in UK seas are projected to decline Negative effects on fisheries
- Impacts on coastal heritage sites.

Species are moving north: winners and losers



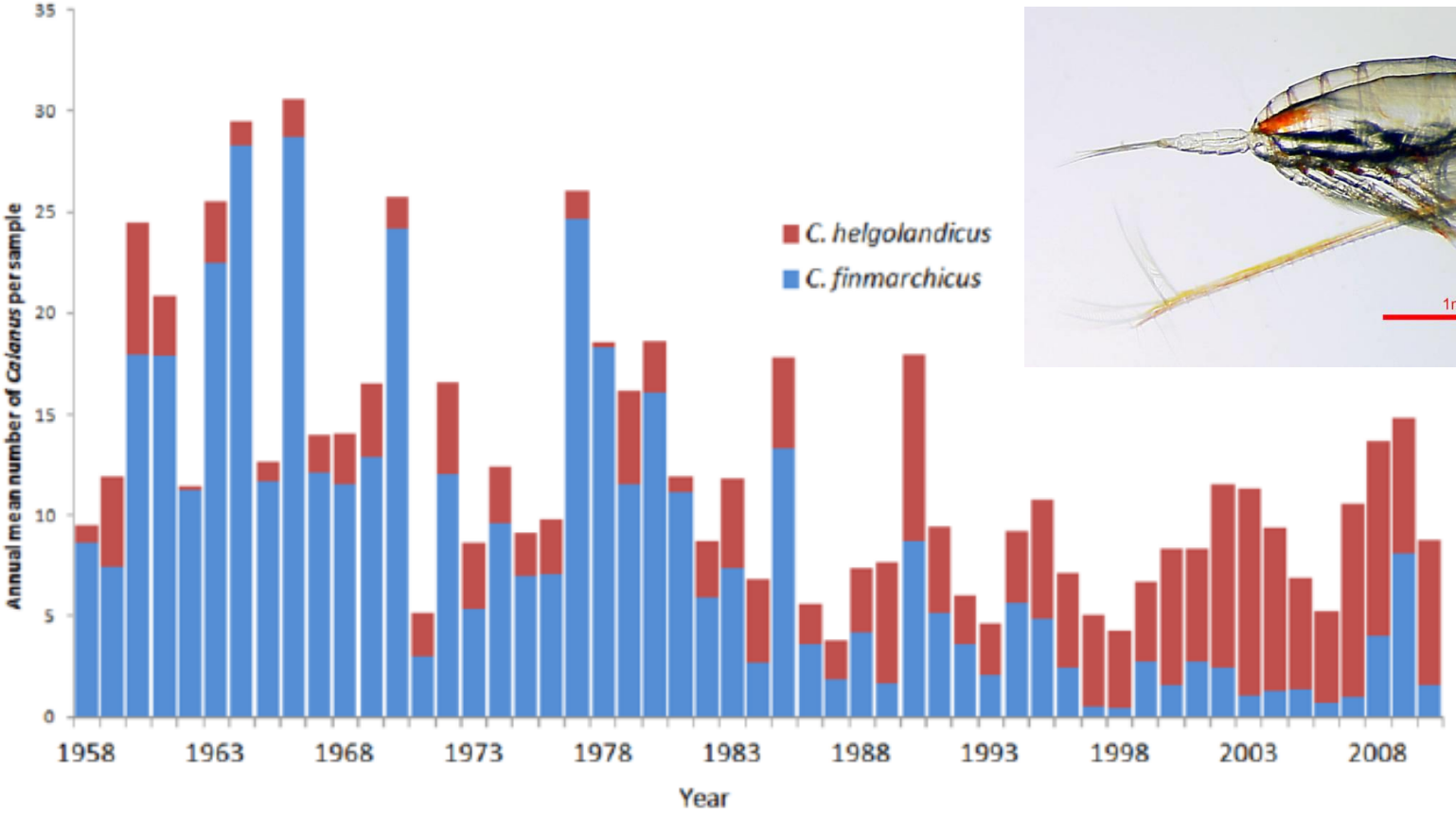
Biological communities are changing

Cold adapted bird species have declined in the UK



Oliver et al., 2017

Plankton Communities are changing



Source: Sir Alister Hardy Foundation for Ocean Science (SAHFOS)

Salthouse shingle ridge following 2013/14 winter

Some habitats are particularly vulnerable to climate change; the risks are clearest for montane, wetland and coastal

Risks to biodiversity features on NNRs from climate change

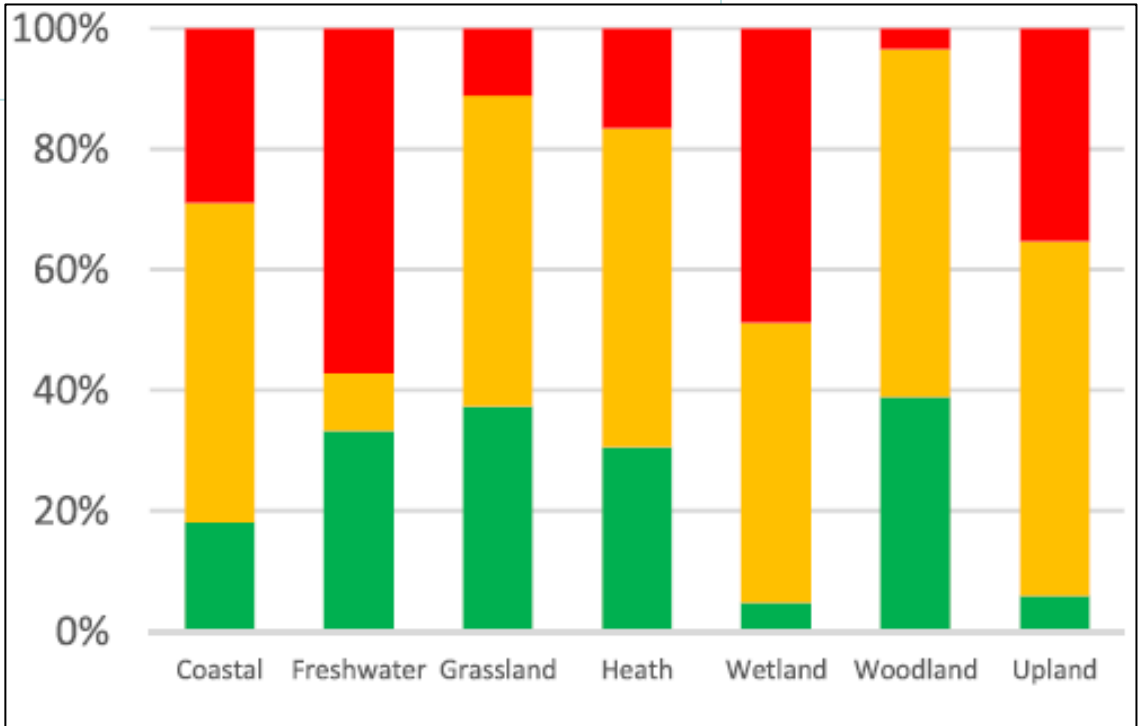
Contents lists available at ScienceDirect

Biological Conservation

journal homepage: www.elsevier.com/locate/biocon

Climate change vulnerability and the state of adaptation on England's National Nature Reserves☆

Simon J. Duffield *, Ben Le Bas, Michael D. Morecroft



The response – What can we do?

Responding to Climate Change

Mitigation

Tackling the causes

- Reducing emissions
- Sequestering carbon

Adaptation

Dealing with effects

- Reducing vulnerability
- Adjusting to change

Building Resilience & reducing vulnerability

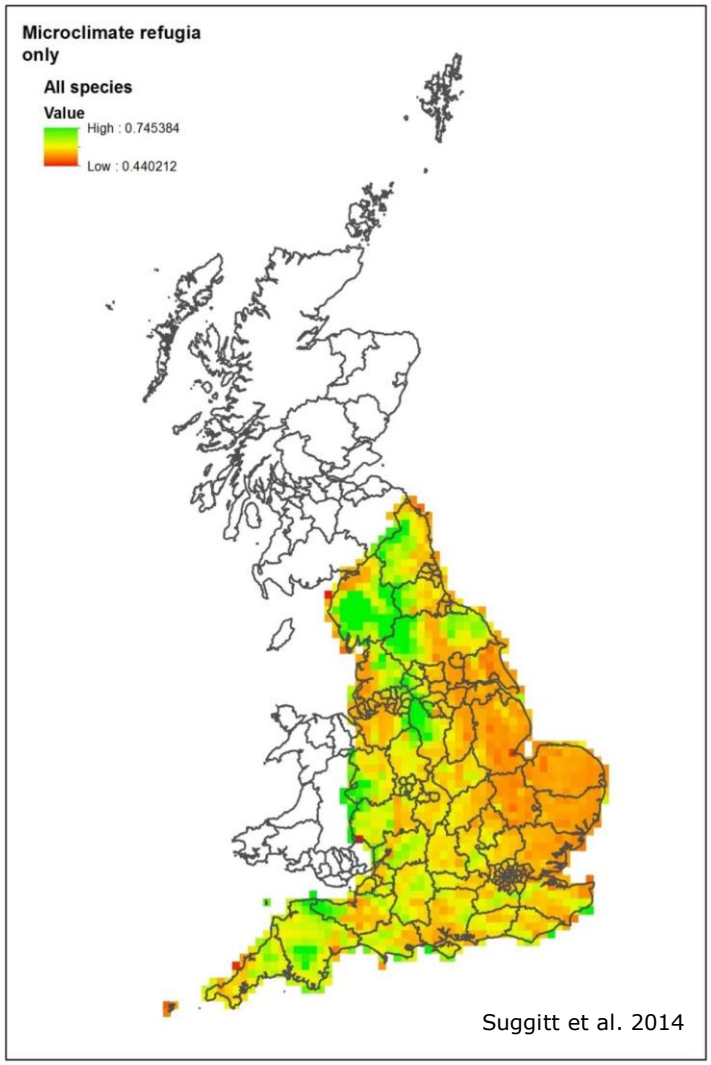
- Bigger, better, more, joined habitats
- Restoring ecosystem processes
- Reduce climate change threats
- Reducing other pressures

Morecroft *et al.* (2012) *Journal of Applied Ecology*

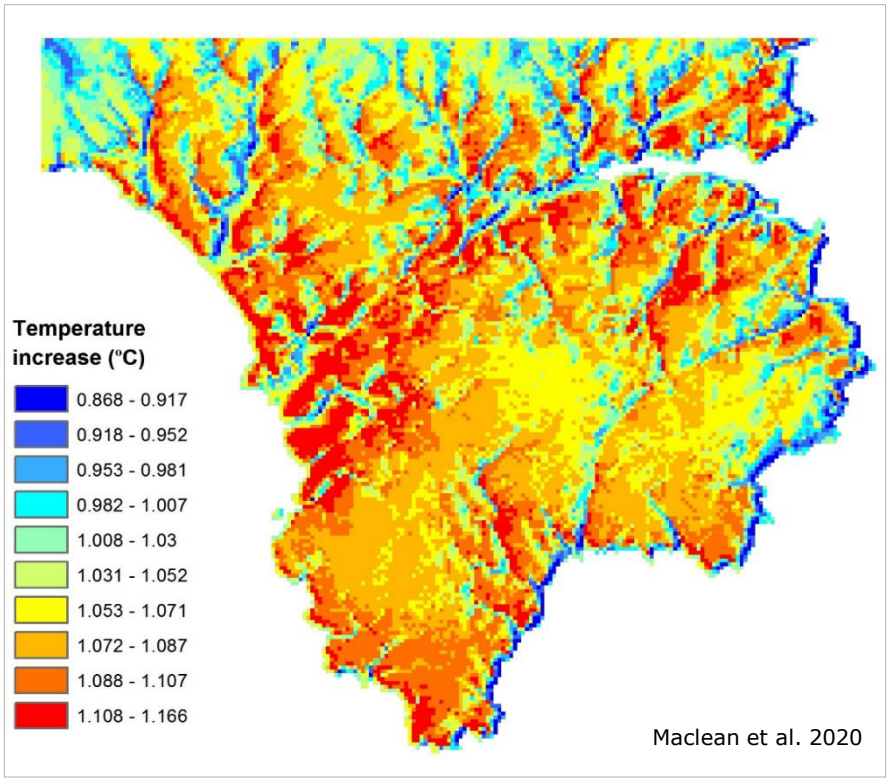
Address climate change specific threats

Calthorpe Broad

Identification and protection of climate refugia



Suggitt et al. 2014



Maclean et al. 2020

Managing Change

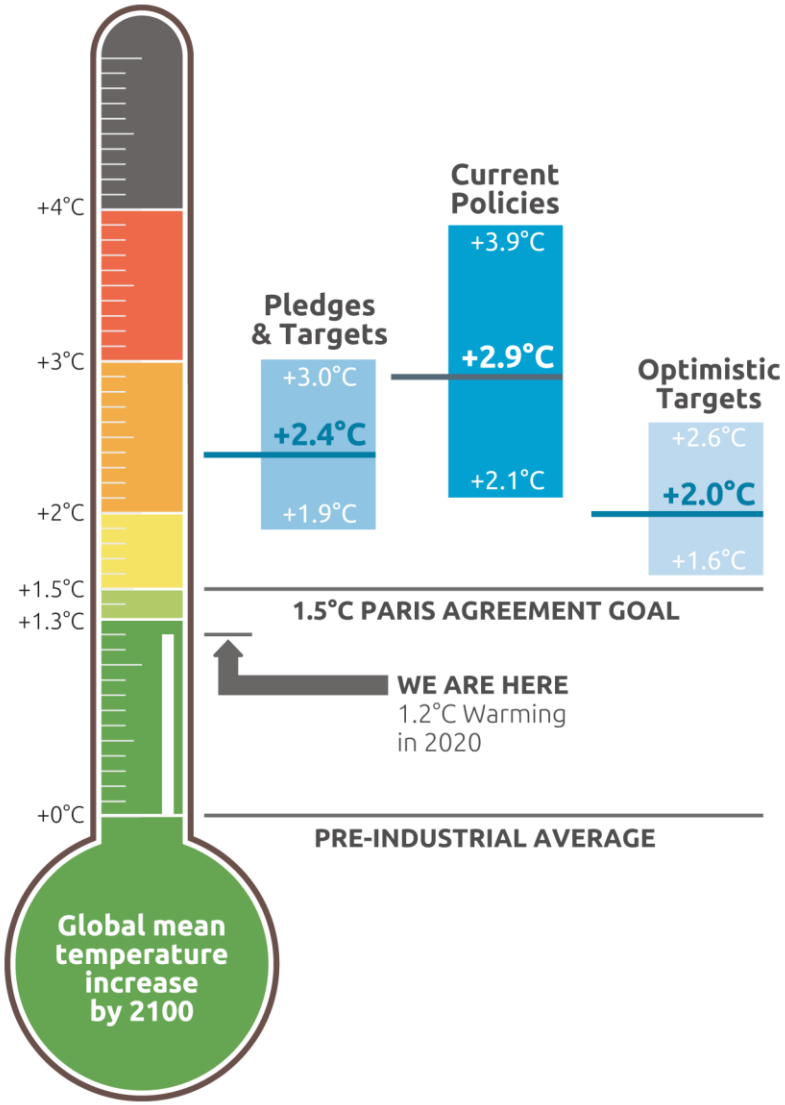
- Managed realignment
- Flexibility in operations
- Changing conservation objectives to manage for different species and habitats
- Welcoming ‘near native’ colonisations
- Increased landscape permeability to allow species to move
- Species translocation

Translocation trial - *Flavocetraria nivalis*

UNFCCC Paris Agreement

Hold the increase in the global average temperature to well below 2˚ C above pre-industrial levels and pursuing efforts to limit it to 1.5˚ C

How are we doing so far?



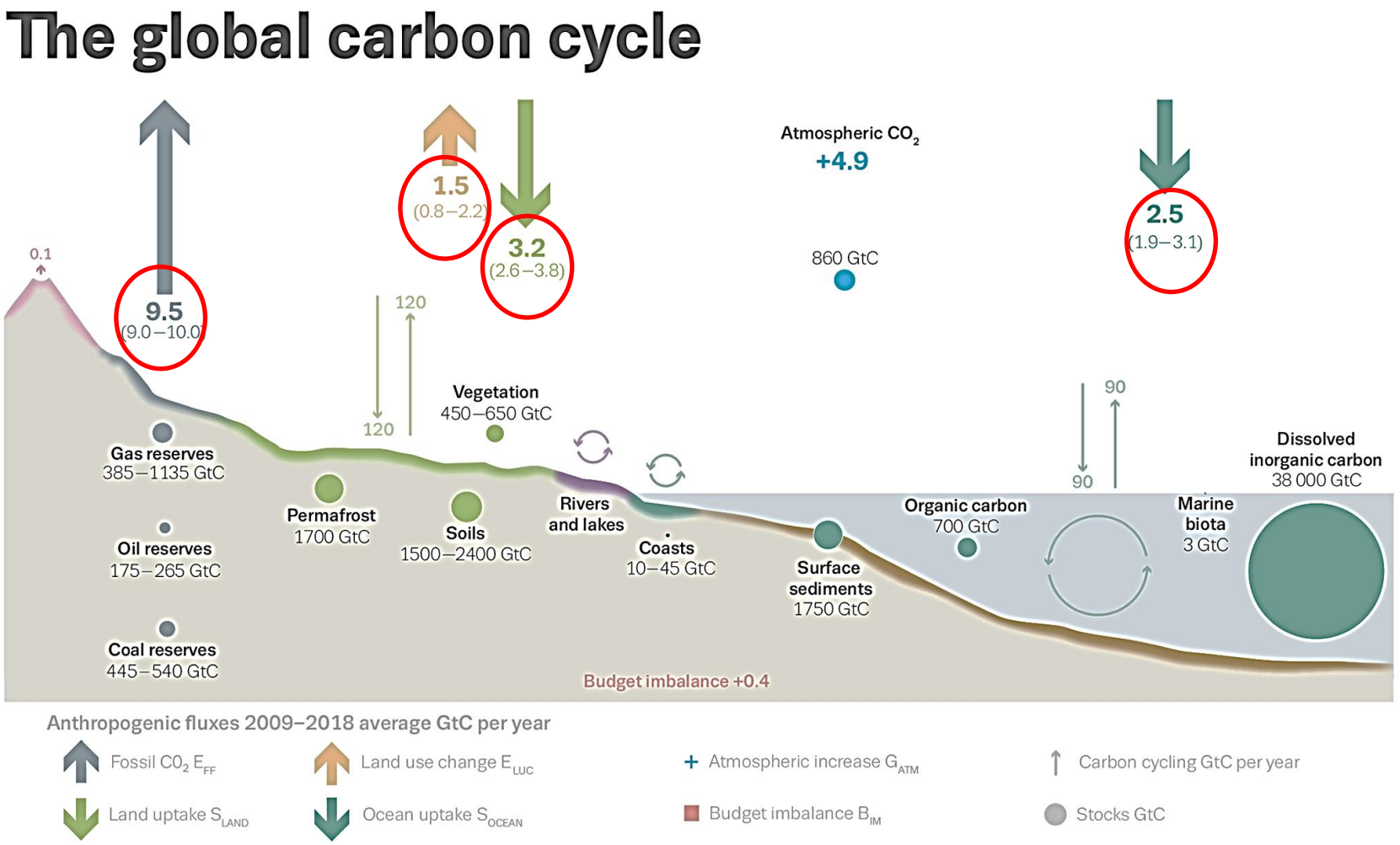
Climate Action Tracker

CAT warming projections

Global temperature increase by 2100

May 2021 Update

Ecosystems and emissions



Friedlingstein et al. (2019)

Restoring nature is part of the solution……

Bolton Fell Moss: Photo: Olly Watts

Examples of Nature Based solutions for climate change mitigation (Net Zero)

Climate change mitigation in the farmed environment

Better soil management

Bioenergy

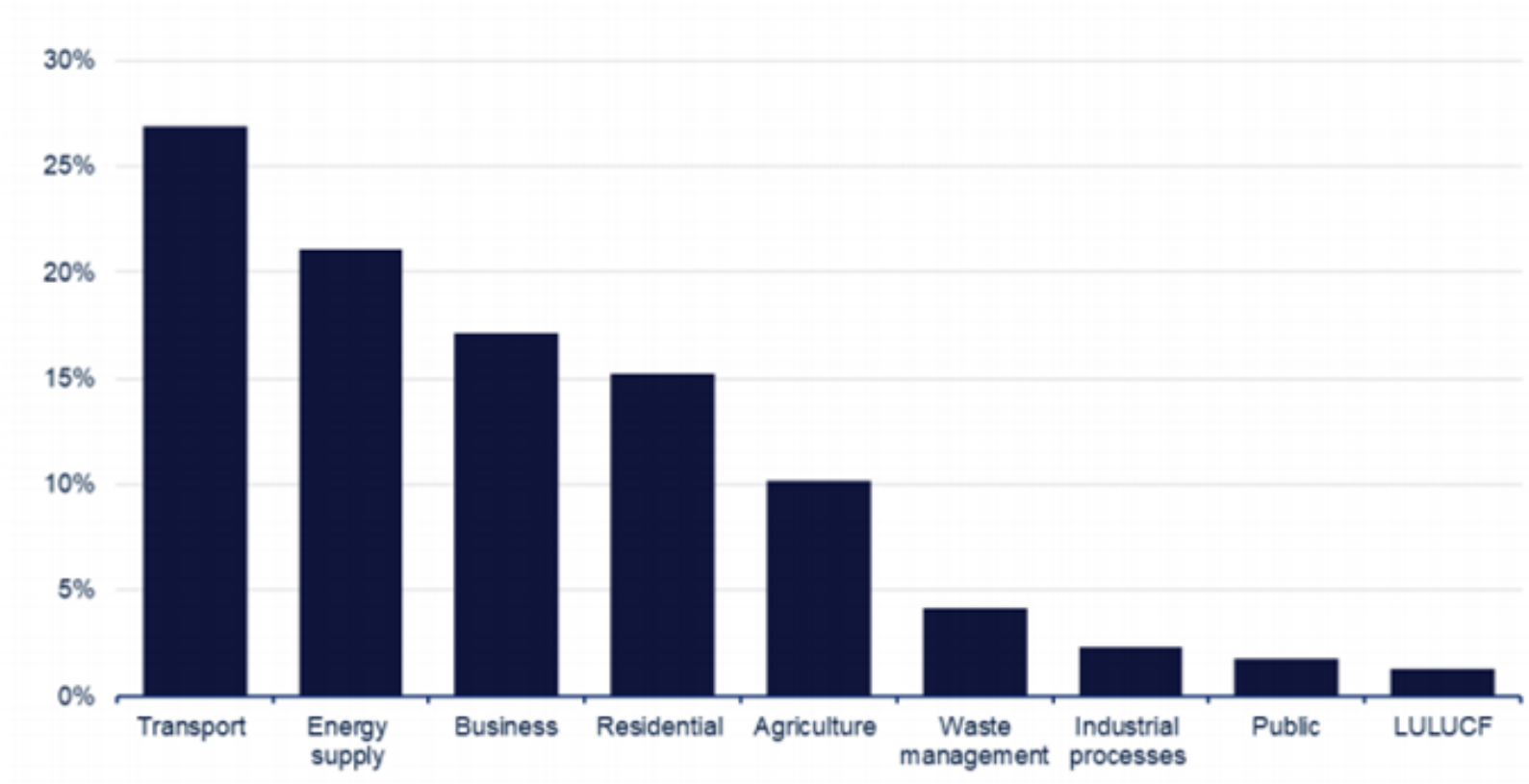

Reduced operational emissions


Reduced livestock emissions

Nature based solutions for climate change adaptation

Agriculture and land use emissions in context

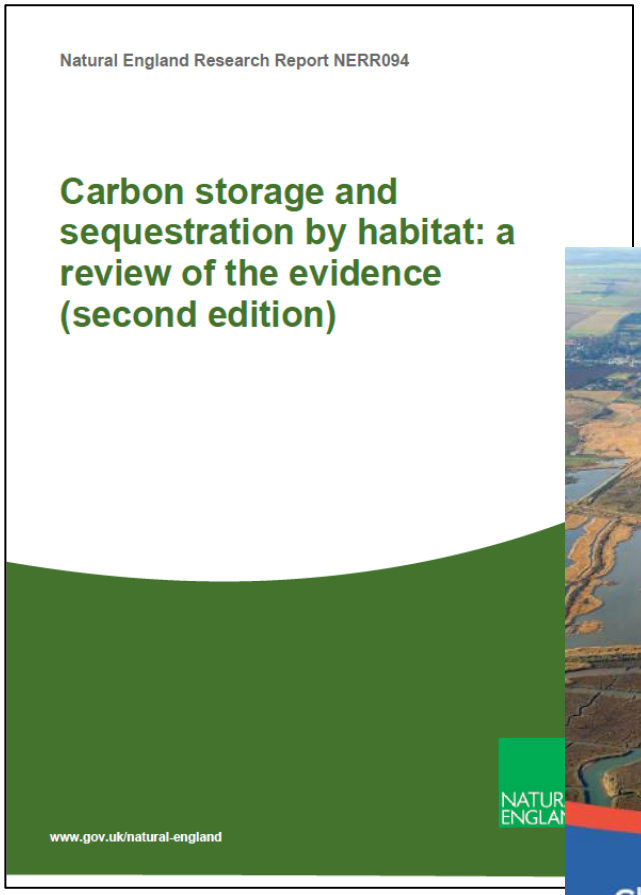
Figure 4: Territorial UK greenhouse gas emissions by NC sector, 2019 (%)

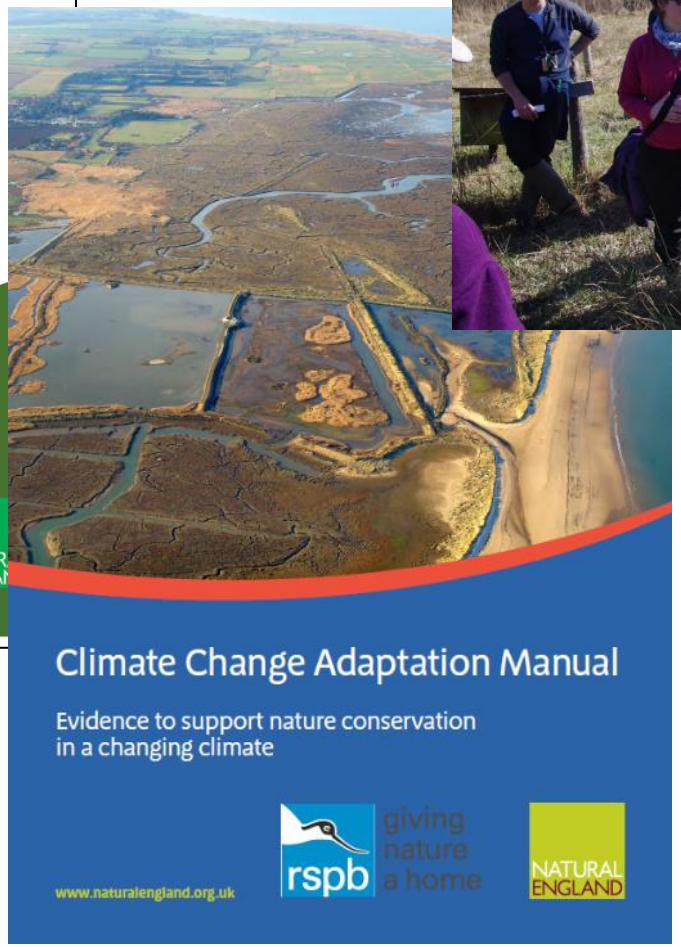


Source: Table 1.2, Final UK greenhouse gas emissions national statistics 1990-2019 Excel data tables

Note: LULUCF is land use, land use change and forestry.

Science → advice → action





Peatland Restoration

Cors Fochno Photo: Natural Resources Wales

Moors for the Future

Forest creation for adaptation and mitigation

Church and community involvement

ECO CHURCH
AN A ROCHA UK PROJECT

Conclusions

- Climate Change is here and now
- Risks will increase in future
- Species, habitats and ecosystems are vulnerable
- We can reduce vulnerability
- Some ongoing change is inevitable
- Restoring nature can help to reduce net greenhouse gas emissions and help people adapt to climate change
- Eliminating fossil fuels is still essential
- Everyone needs to play their part