

The background of the slide features a hazy, wide-angle photograph of a city skyline, likely New York City, viewed from across a body of water. In the foreground, there are out-of-focus green plants with small pink and yellow flowers. The text is overlaid on this image.

# **The ecological breakdown: the *good*, the *bad* and the *ugly***

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consultant

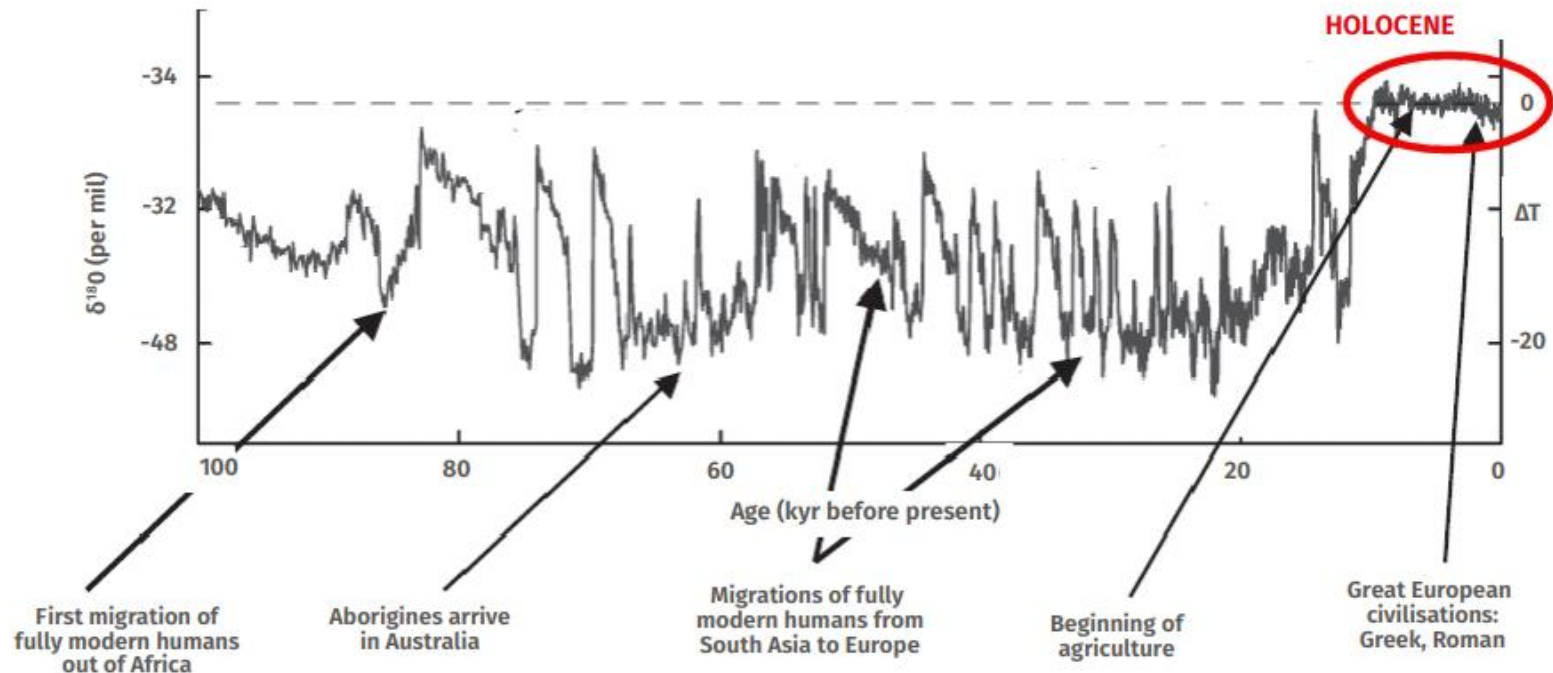
# Doom and gloom





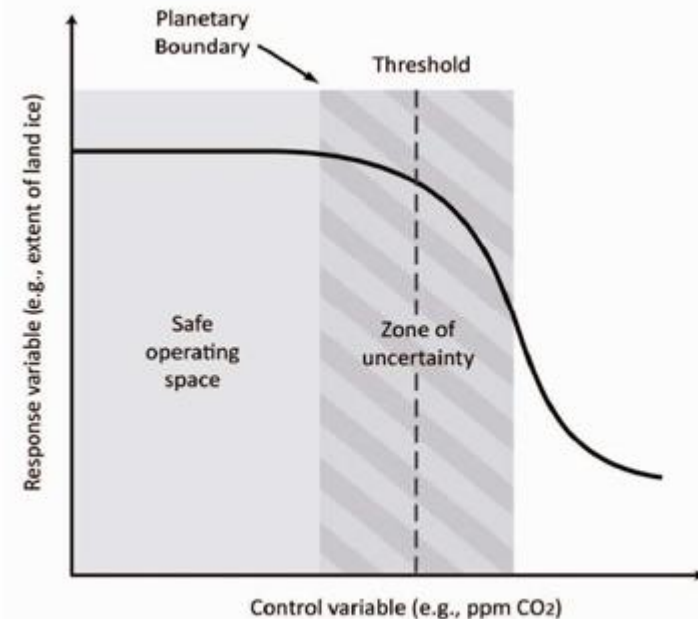
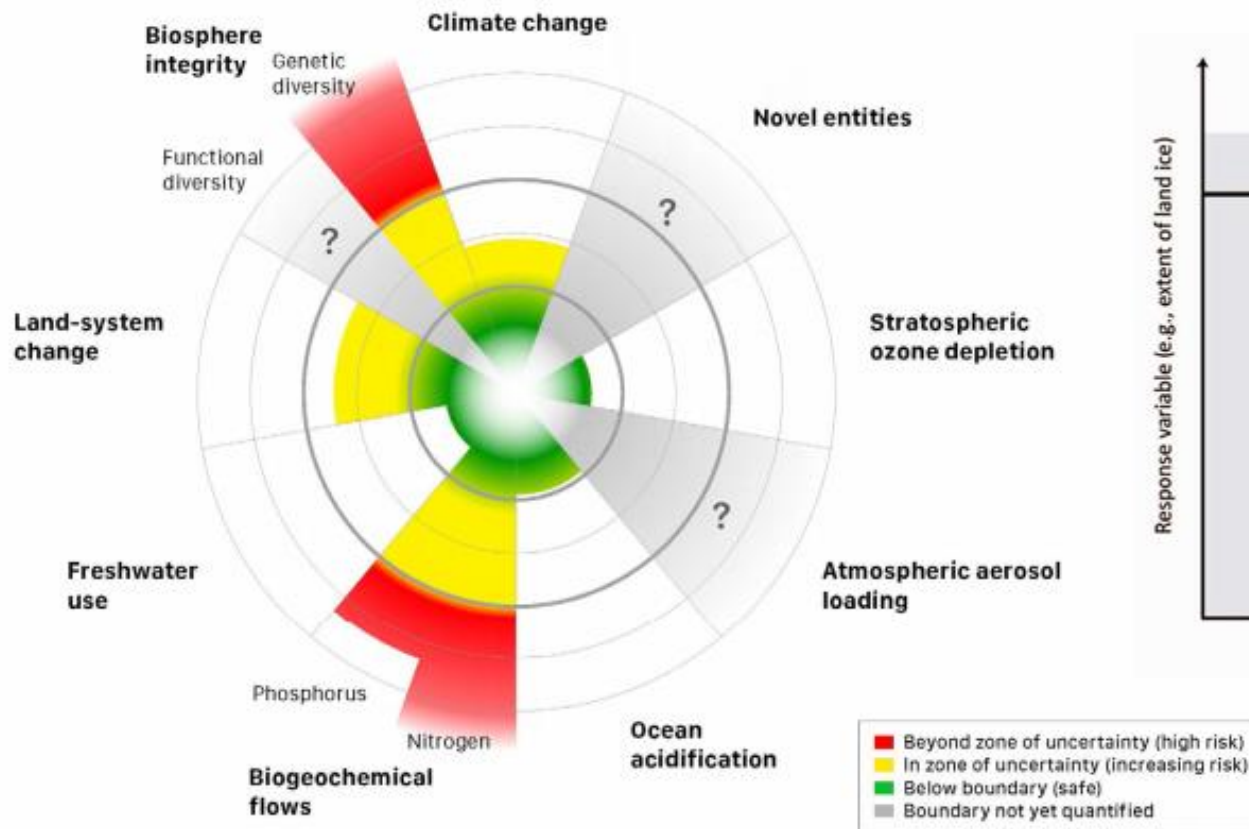
# 11,700 years of stability

Delta-O-18 (an indicator of temperature) over the previous 100,000 years. The stable Holocene epoch occurred over the last 11,700 years.



Source: Rockström et al 2009, adapted from Young and Steffen 2009

# And now...



Source: Steffen et al 2015, modified from Rockström et al 2009

## Quantifying the state of nine natural systems

# Biosphere integrity

## The “6<sup>th</sup> Mass Extinction”

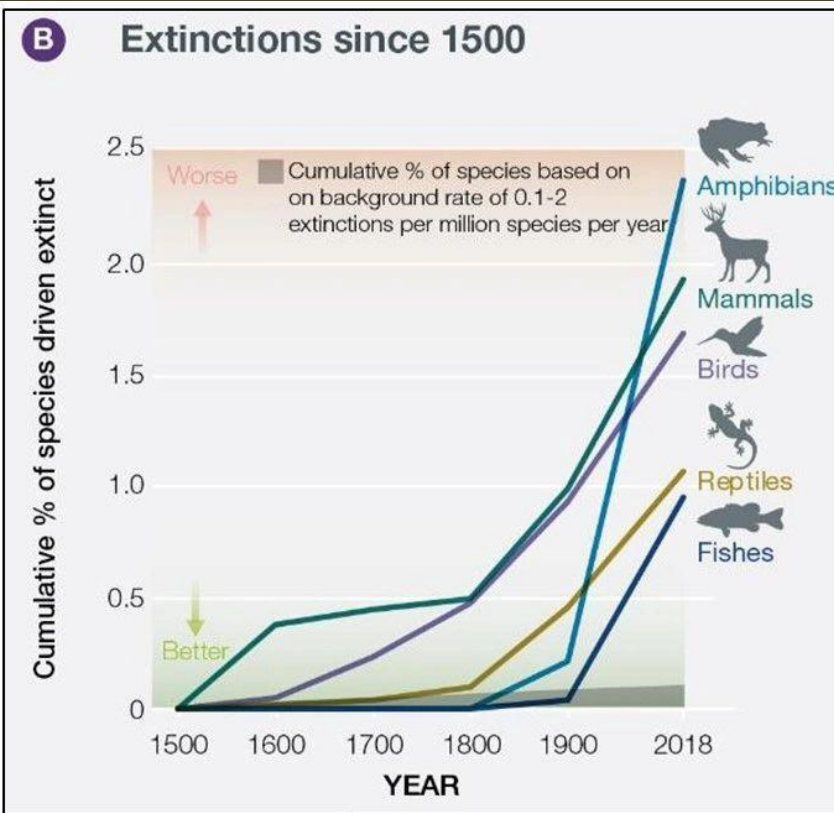


Figure 3 (B) - Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services

- Up to 58,000 species lost each year
- Vertebrate populations have declined by 60 per cent between 1970–2014
- 40% of insect species are declining

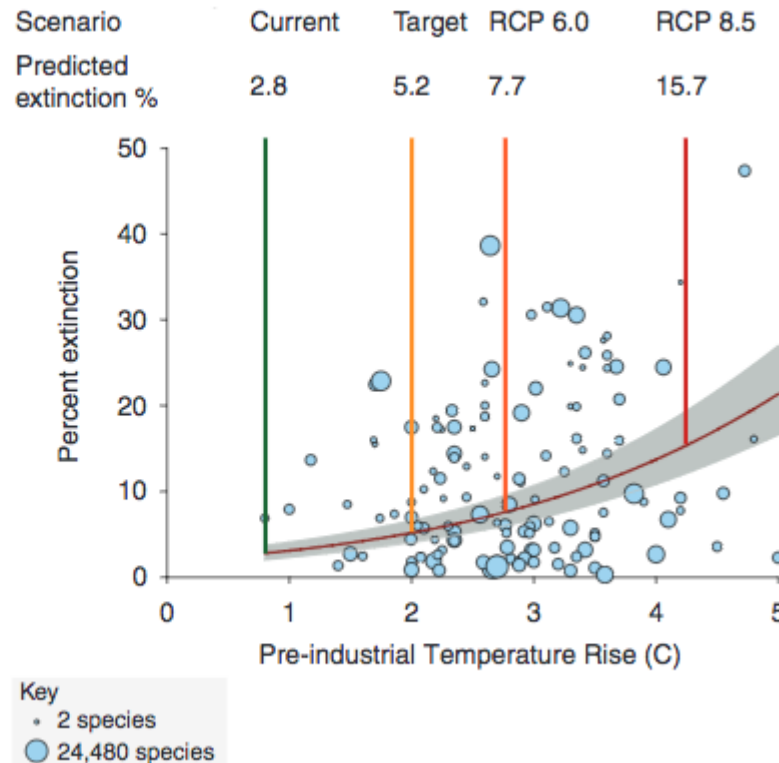
A dramatic reduction in genetic diversity available to withstand change

# Biosphere integrity

Environmental change is increasing in **scale** and **in speed**

**Fig. 2. Predicted extinction risks from climate change accelerate with global temperature rise.** The gray band indicates 95% CIs.

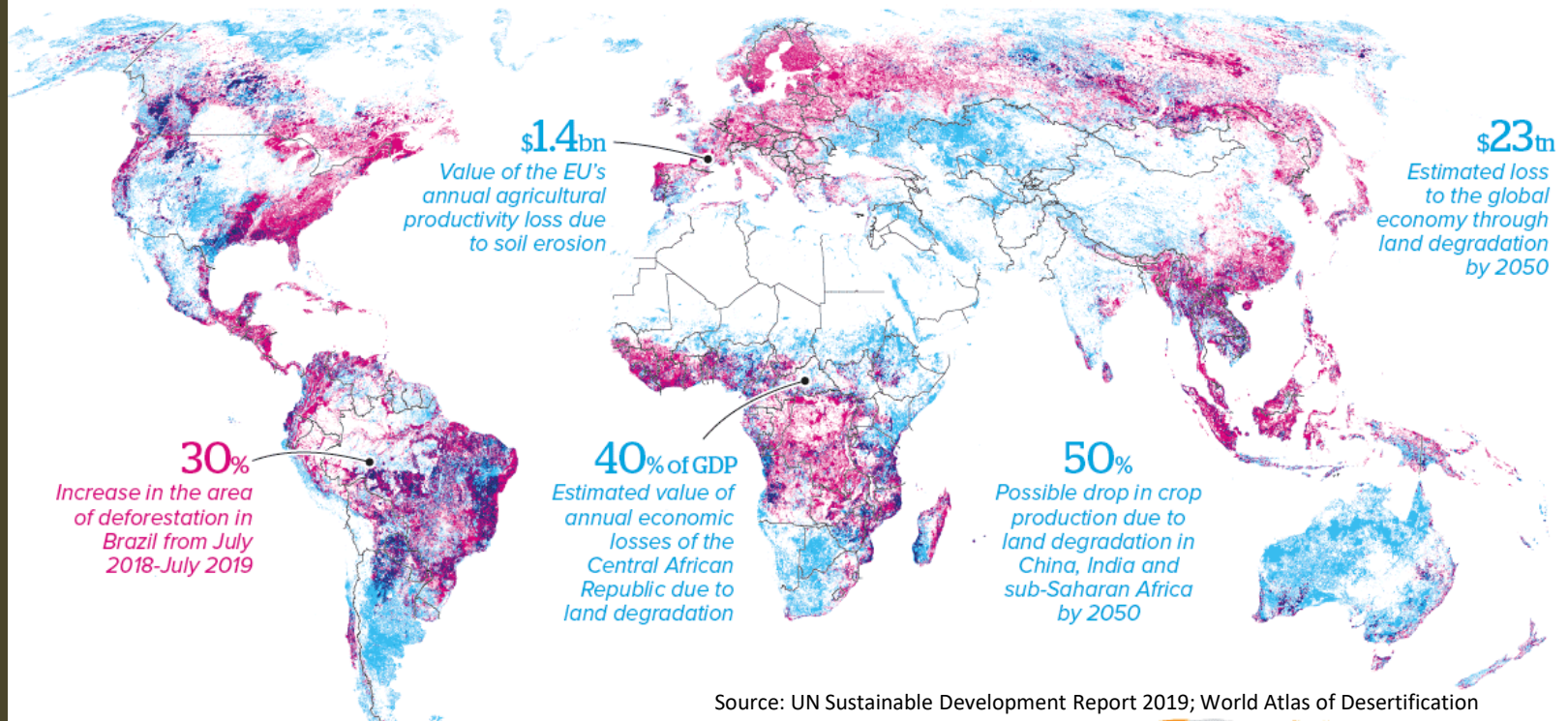
Preindustrial rise was calculated by using standard methods (27). Circles indicate posterior means with area proportional to  $\log_{10}$  sample size (bottom left, key). Extinction risks for four scenarios are provided: the current postindustrial temperature rise of 0.8°C (5), the policy target of 2°C, and RCPs 6.0 and 8.5.



# Land use

Over 75% of the world's land is degraded to some degree; an area of forest the size of Greece is lost every year

Deforestation and land degradation ● Decline in tree cover since 2000 ● Severe / moderate decline in land productivity (1999-2013)

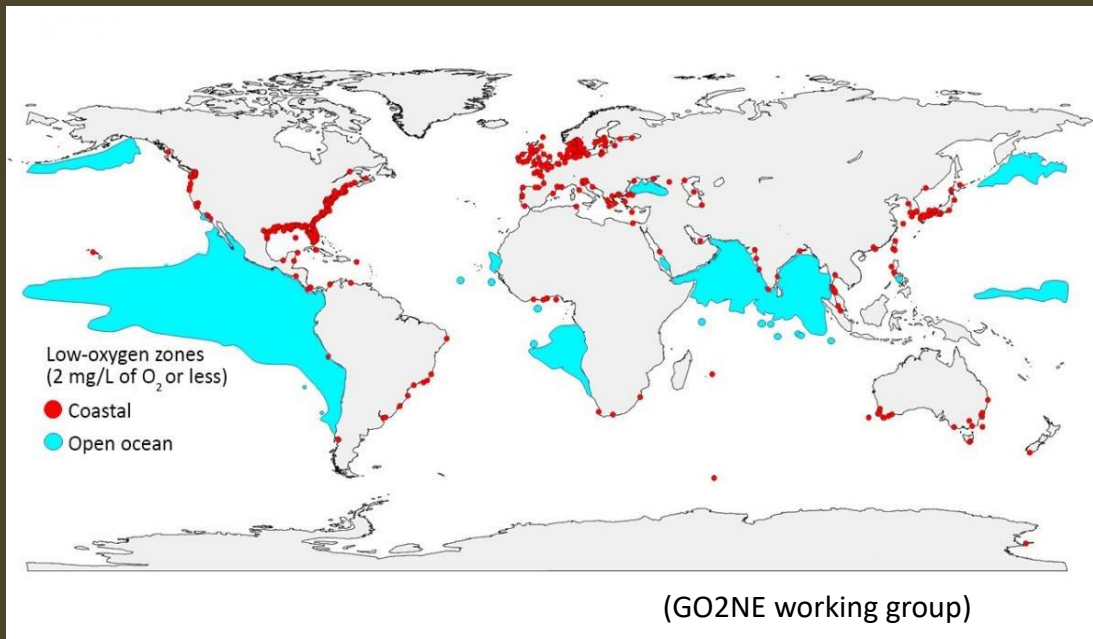


Topsoil is being lost 10 to 40 times faster than it is being replenished by natural processes

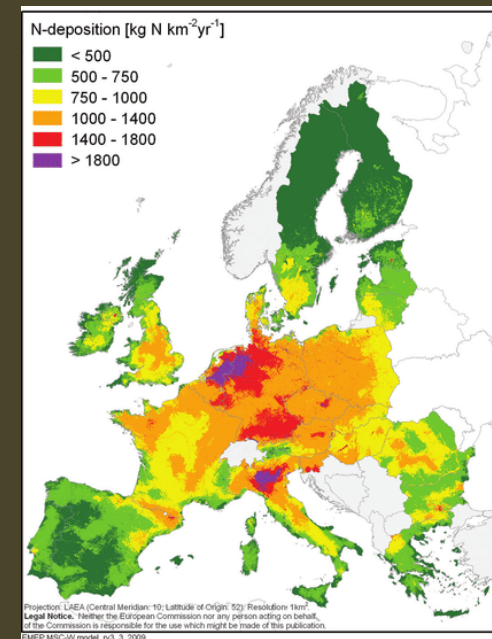


# Chemical flows

- **Phosphorus & nitrogen** run-off from fertiliser use ends up in the sea, reducing the availability of oxygen
- On land, **nitrogen deposition** can decrease the diversity of plants, lichens and mosses



“Dead zones” have quadrupled since 1950, now covering an area the size of the UK

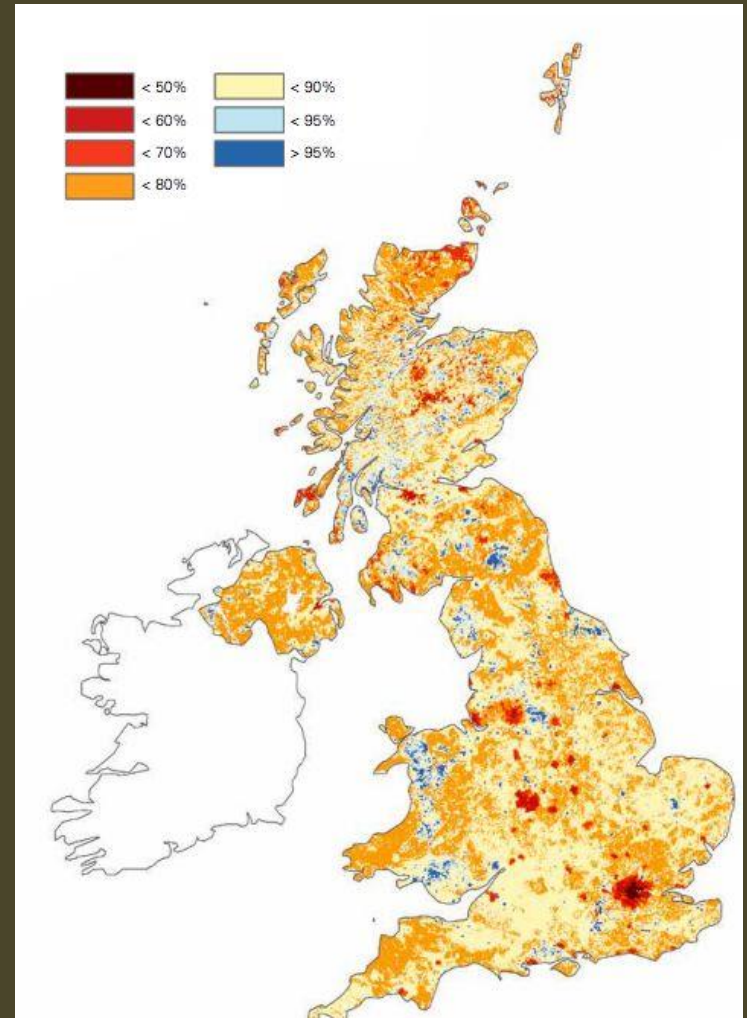


Nitrogen deposition in Europe



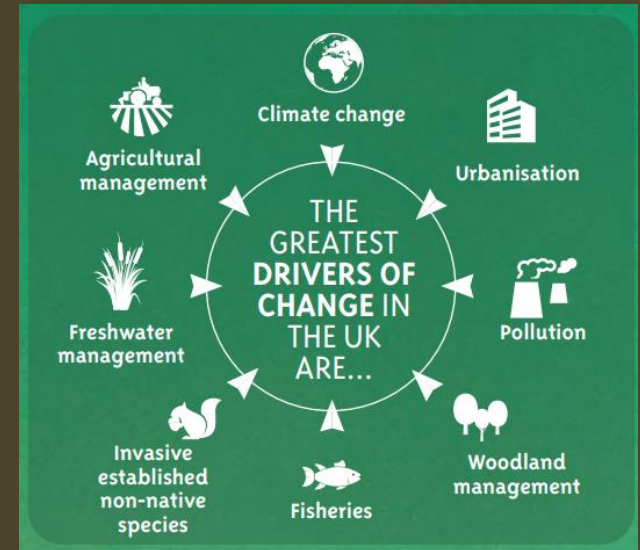
# The situation of the UK

*“One of the most nature-depleted countries in the world”, ranked 189 out of 218 countries for biodiversity intactness*



# The situation of the UK

- **One in seven species** threatened with extinction
- 41% of **species** studied have experienced decline since 1970
- 17 per cent of **arable land** shows signs of erosion (Environment Agency 2004; SSLRC 2000)



State of Nature, 2019

## THE UK'S BIODIVERSITY IS DECLINING



**15%**

of species are threatened with **extinction** from Great Britain



**133**

of 8431 assessed have already become extinct from Great Britain

### SINCE 1970...

More species have seen their **populations decrease** than increase:

**41%**

have decreased

**33%**

little change

**26%**

have increased

We have seen big changes in where the UK's wildlife is found:

**27%**

found in fewer places

**52%**

little change

**21%**

found in more places

# Consequences of the ecological breakdown

The impacts will be felt at local and global level:

- extreme weather disrupting infrastructure & impacting health
- loss of insect biodiversity & soil degradation threatening food supply
- displaced populations causing political unrest

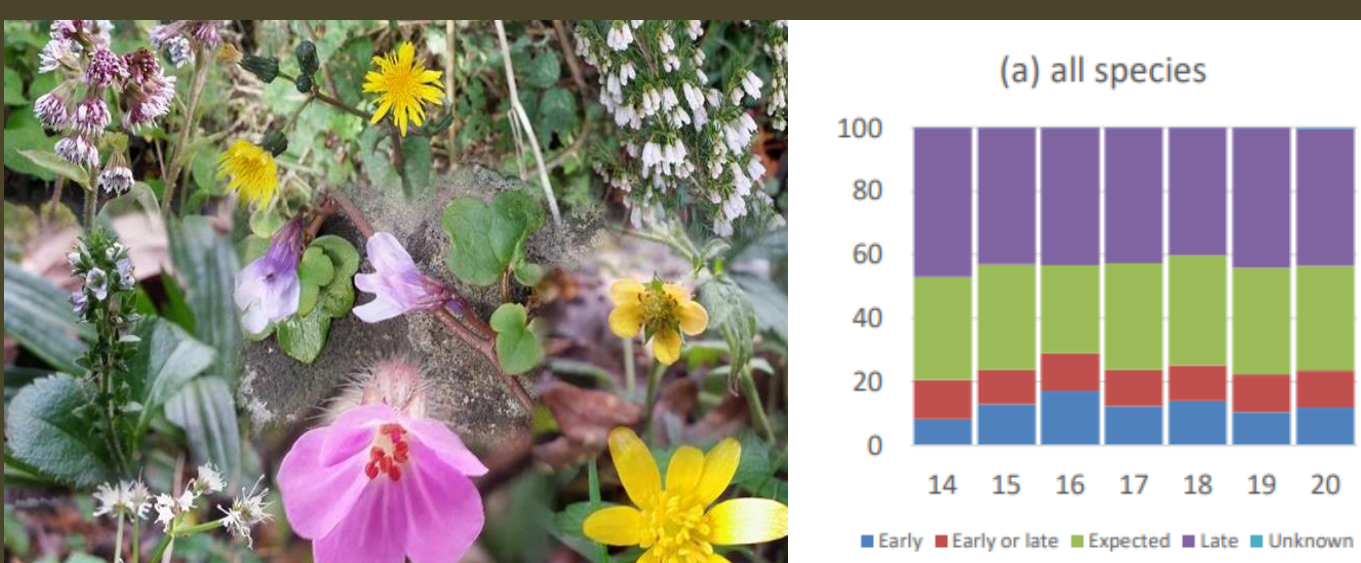
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# Impacts are already felt on biodiversity in the UK

- Shift in geographical and time range
- New migratory species arriving from the continent
- Drought is affecting the growth rate of trees





# Are we doomed?

## **eco-anxiety**

(n.) a feeling of worry, nervousness, or unease triggered by an awareness of the ecological threats facing the earth due to climate change.

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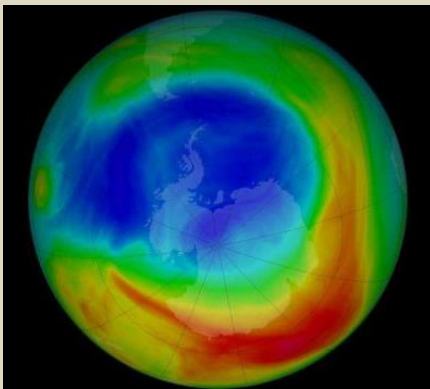
⌘•Proof of Impact

# Hope

Can environmental change be reversed at all?

The hole in the **ozone layer**, which filters UV radiations was dramatically reduced in size thanks to the Montreal Protocol (1987) which banned the production of chlorofluorocarbons

On a smaller scale, **rewilding** has proved effective in creating habitat for threatened species, increasing population size and chances of survival – see for example the purple emperor butterfly at Knepp Castle, Sussex



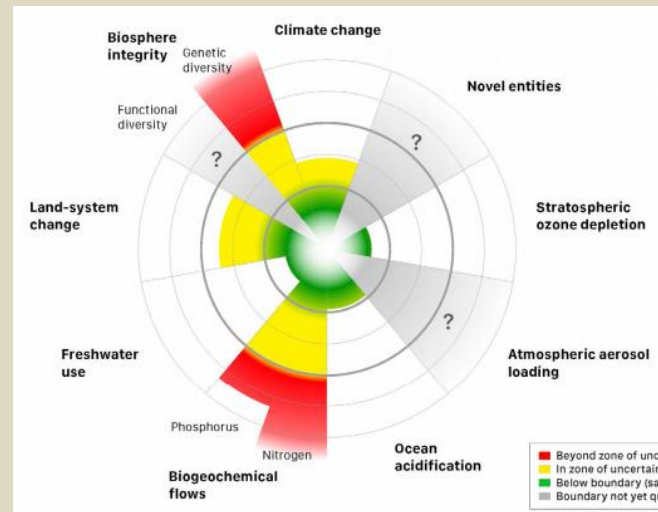
# Can the horticultural industry help cope with environmental change?

...or is it part of the problem?

- peat use is still widespread
- it often relies on imported plants, which could carry pests or diseases
- introduced plants may become invasive
- the transport of plants by land/air bears significant carbon costs
- plants are not always selected with biodiversity in mind
- growing often requires single-use plastics, large quantities of electricity, water, pesticides and fertilisers
- poor plant selection, “fast plant fashion” can lead to waste



# Horticulture could in fact contribute to reversal at several levels



- Biosphere integrity
- Biochemical flows
- Land-system change
- Freshwater use



# Promoting a healthy use of land



maggie moran 🌱💚🌱  
@maggiem30026514

Another 'garden transformation' from my fb feed.  
Comments include 'Mint' 'Looks fab' 'What a  
transformation' 'Cracking job'

[#AustraliaBurning](#), we are [#flooding](#), there is an  
[#InsectApocalypse](#) & still we continue to normalise  
[#ecocide](#) @GeorgeMonbiot @LukePollard  
[#ClimateEmergency](#)



9:58 AM · Jan 10, 2020 · [Twitter Web App](#)



# Working with nature





# Adopting sustainable practices



# Sourcing plants with care

## Replanting Britain: 'It's about the right tree in the right place'

Less than £1 per person a year is spent on planting English trees, but past mistakes loom large

● Please donate to our appeal [here](#)



▲ Avenue of lime trees at Marbury Country Park: native broadleaf woodlands are preferred. Photograph: John Hopkins/Alamy

Annexe 3 – fiches synthétiques par espèce (cahier séparé)

MICOCOULIER OCCIDENTAL, *CELTIS OCCIDENTALIS*

FAMILLE : Cannabaceae  
TAILLE : 25 m  
DESCRIPTION GÉNÉRALE :

Arbre à l'écorce grise et liégeuse, et à l'aspect tortueux.  
Feuilles caduques, ovales dentées, rappelant l'ortie.  
Allochtone.

FLORAISON :  
J F M A M J J A S O N D



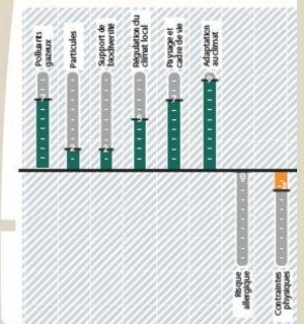
ÉCOLOGIE :  
Besoin en lumière : +++  
Supporte la chaleur : ++  
Continental : -  
Supporte un air sec : +  
Supporte un sol pauvre : ++

FACTEURS LIMITANTS  
Liés au contexte urbain :  
Supporte un sol compact :   
Supporte un sol sec :

ADAPTATION AU CLIMAT MESSIN, DANS LE CONTEXTE DU CHANGEMENT CLIMATIQUE :

Le micocoulier occidental est adapté aux sols secs, compacts et pauvres ; il supporte bien les fortes chaleurs, et assez bien le froid. Il est donc bien adapté à l'évolution du climat local.

**ATOUTS**  
Espèce parfaitement adaptée au climat urbain : résistante à la chaleur et à la sécheresse comme au froid.  
 **LIMITES**  
Son feuillage le rend moins intéressant que le Micocoulier de Provence, pour ce qui concerne la régulation du climat et la fixation des particules.



metz Metz Métropole Cerema

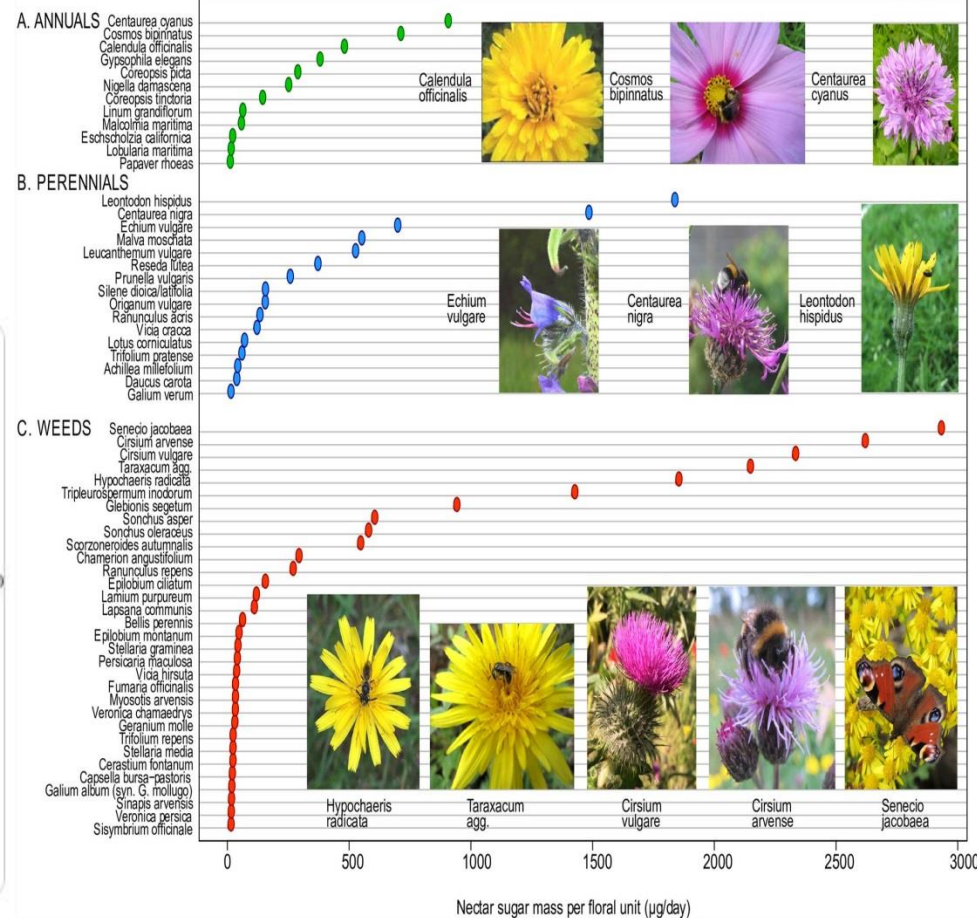
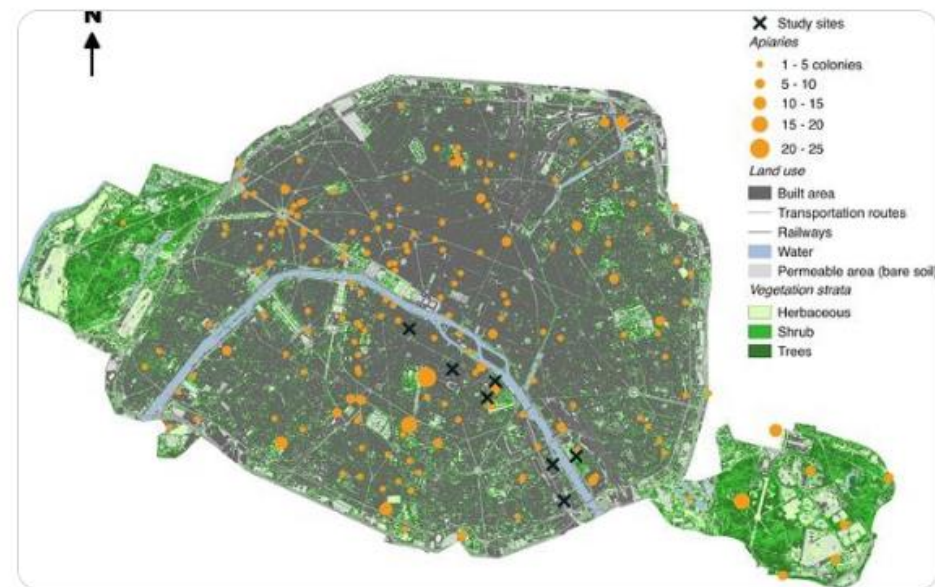
Conception graphique ACURIA



# Learning from science

## And rethinking some practices...

Research from Paris by Isabelle Jajoz found wild bee abundance was reduced within 500m of urban apiaries due to impacts of high density honey bee colonies. In central London you're never more than 500m from a rooftop apiary so makes you wonder how that affects our wild pollinators.



A soft-focus photograph of a meadow. In the foreground, several purple orchids with delicate, light-colored petals are in bloom. To their left and scattered in the background are bright yellow buttercup flowers. The grass is a vibrant green, and the overall scene is bathed in a gentle, diffused light, creating a peaceful and natural atmosphere.

Thank you