

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

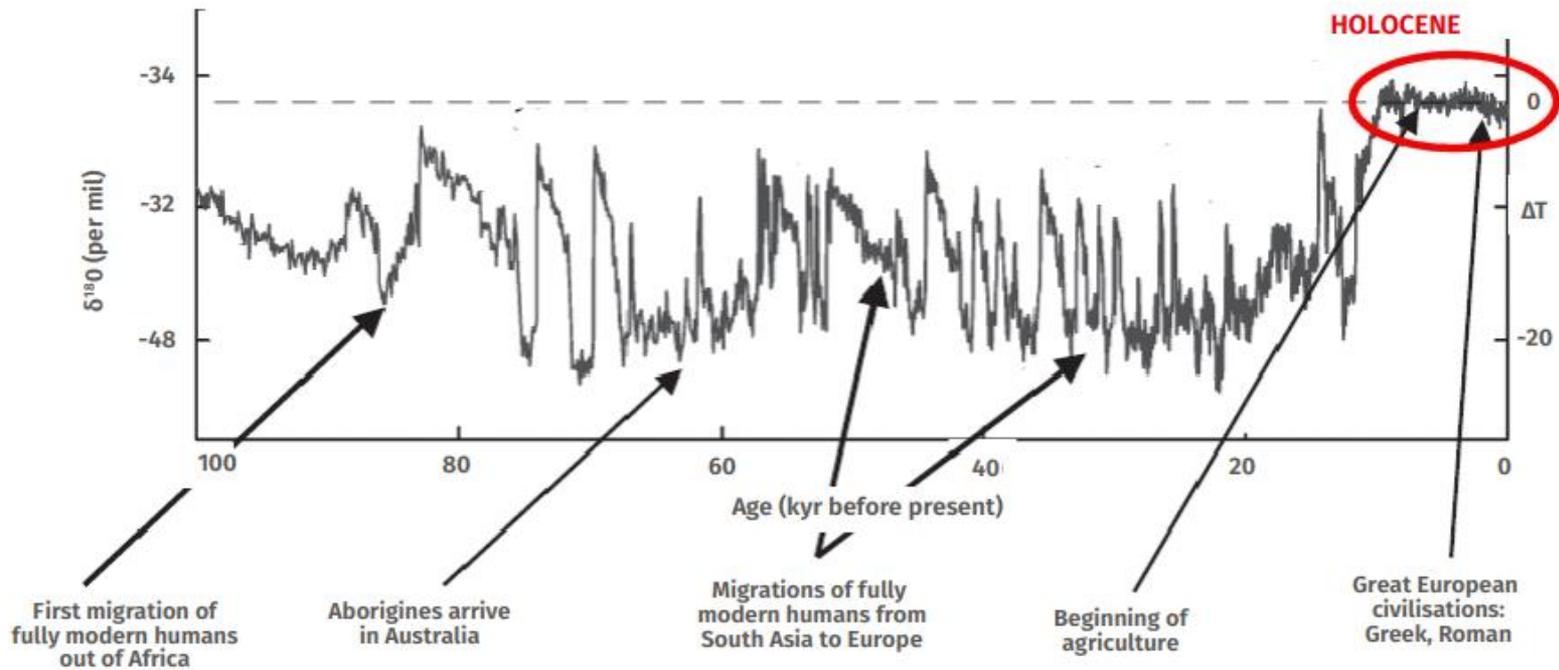
Sophie Leguil BSc MSc FLS
Independent botanist & horticultural
consultant

Doom and gloom



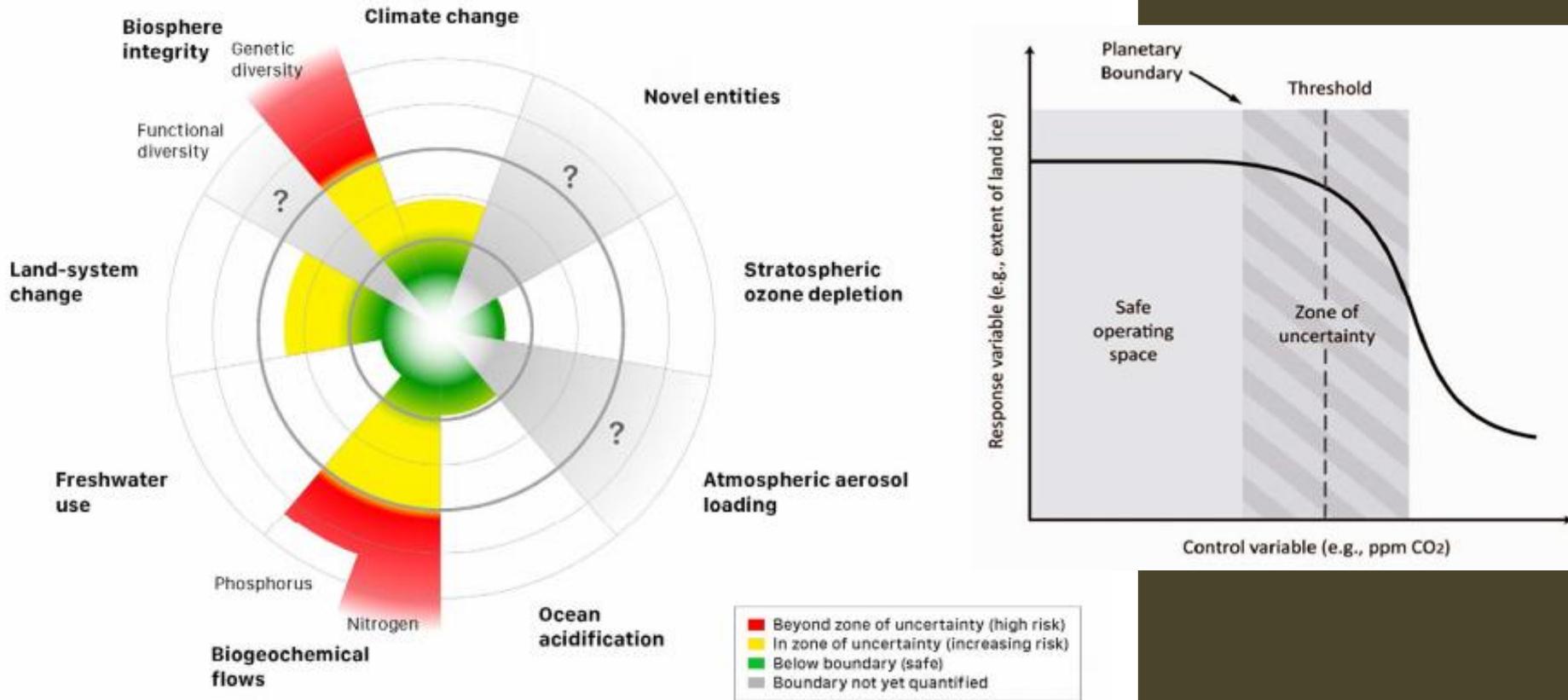
11,700 years of stability

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 “6th Mass Extinction”

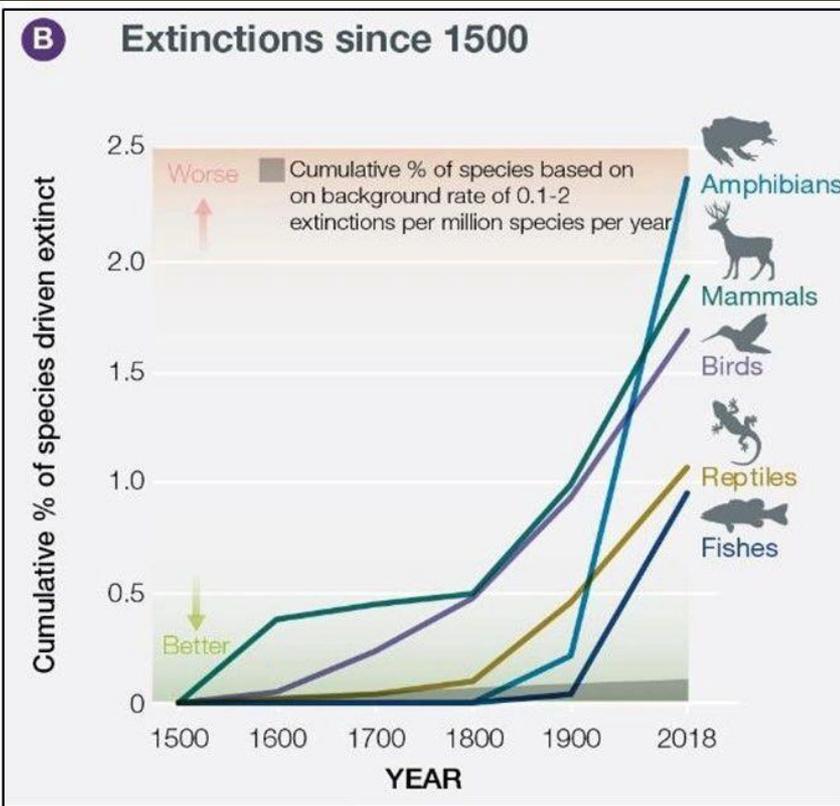


Figure 3 (B) - Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services

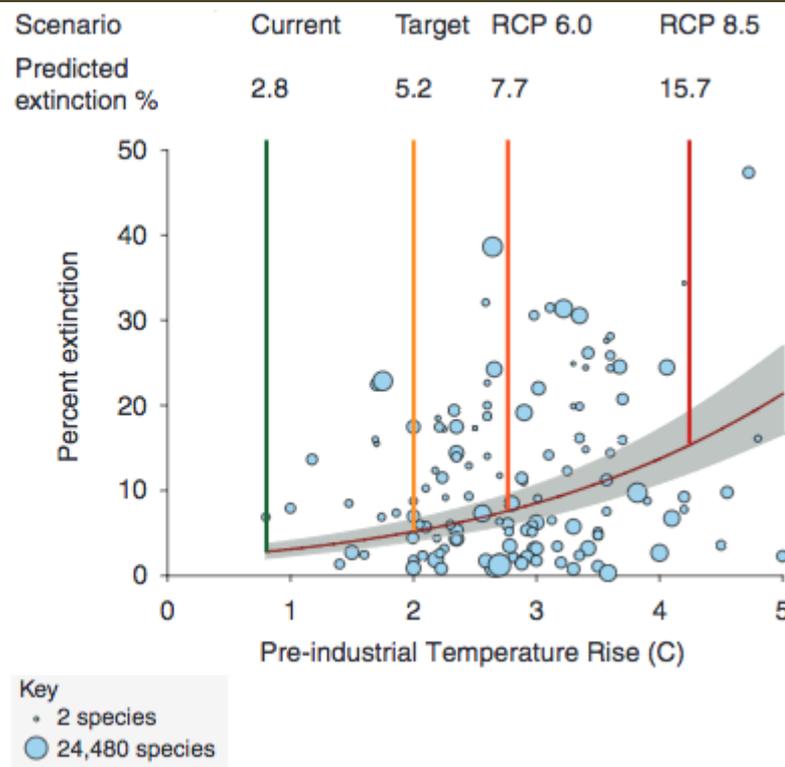
- Up to 58,000 species lost each year
- Vertebrate populations have declined by 60 per cent between 1970–2014
- 40% of insect species are declining

A dramatic reduction in genetic diversity available to withstand change

Biosphere integrity

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

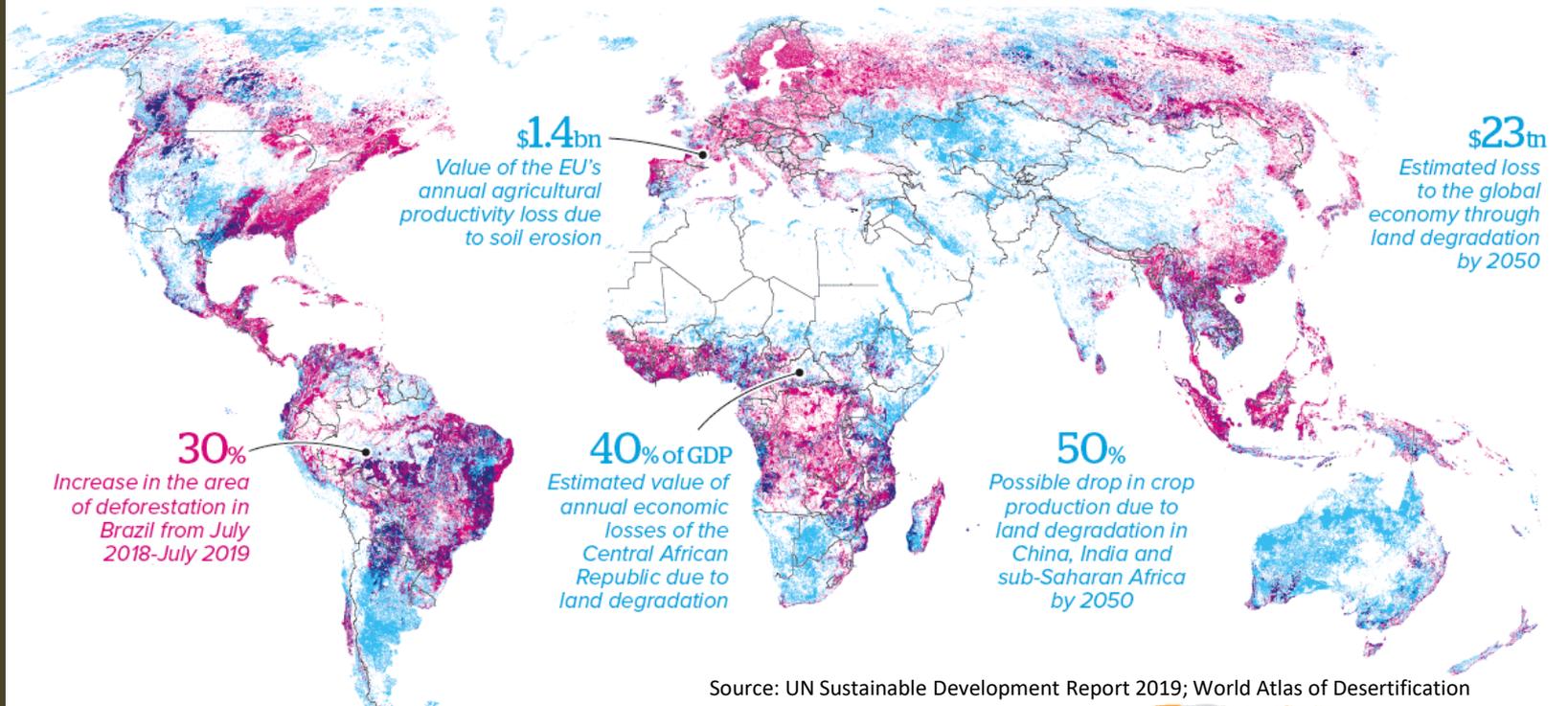
Fig. 2. Predicted extinction risks from climate change accelerate with global temperature rise. The gray band indicates 95% CIs. Preindustrial rise was calculated by using standard methods (27). Circles indicate posterior means with area proportional to \log_{10} sample size (bottom left, key). Extinction 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

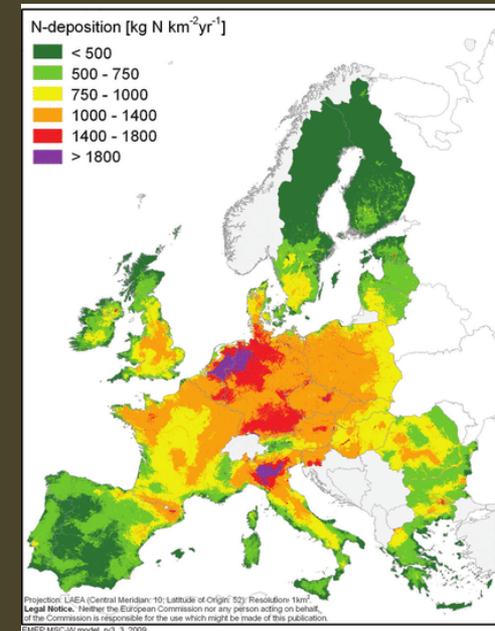
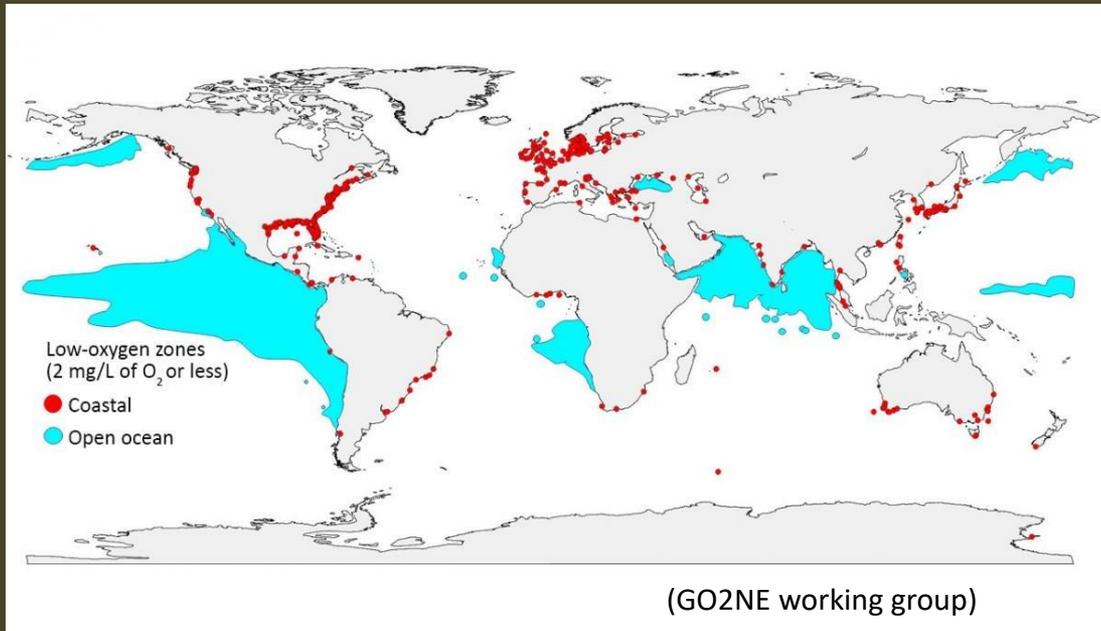
Deforestation and land degradation ● Decline in tree cover since 2000 ● Severe / moderate decline in land productivity (1999-2013)



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

Chemical flows

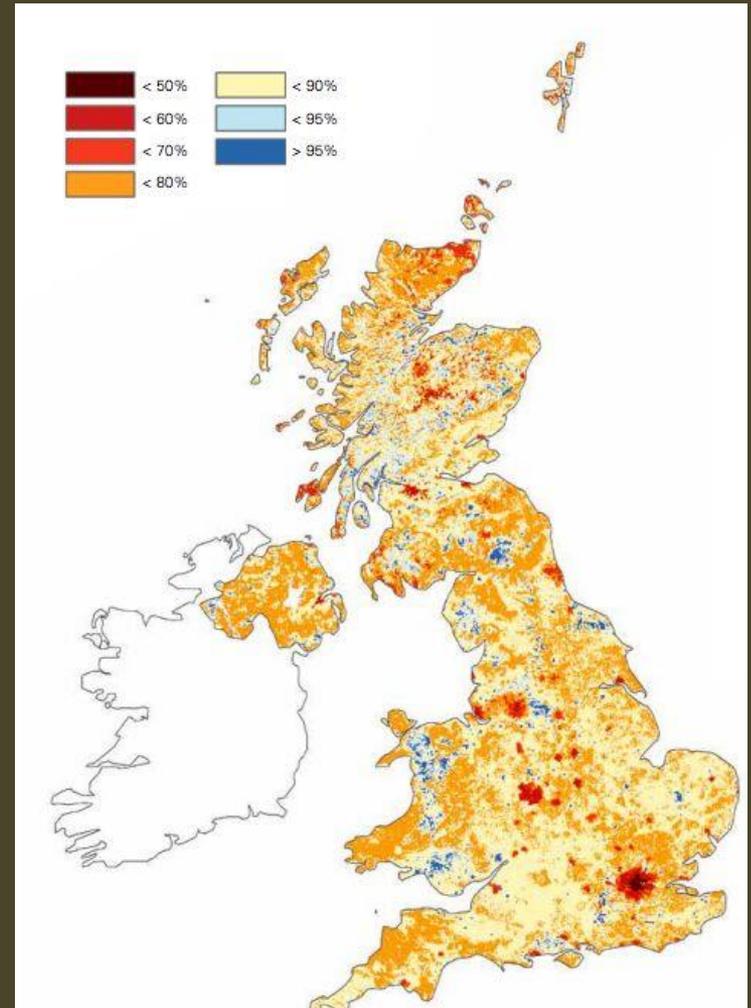
- **Phosphorus & nitrogen** run-off from fertiliser use ends up in the sea, reducing the availability of oxygen
- On land, **nitrogen deposition** can decrease the diversity of plants, lichens and mosses



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

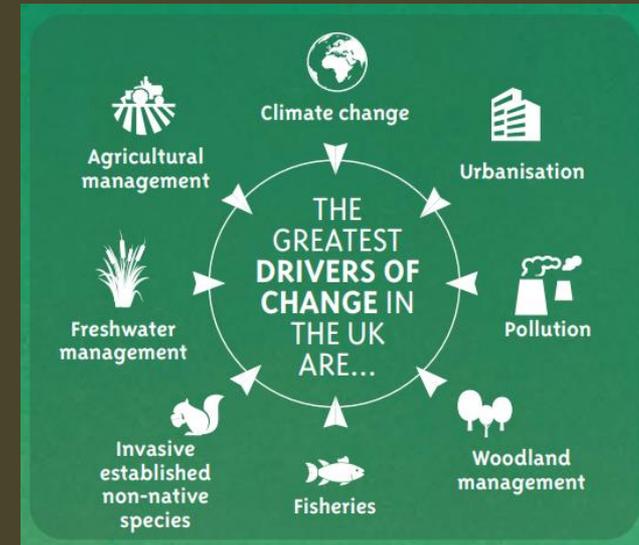
The situation of the UK

“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:

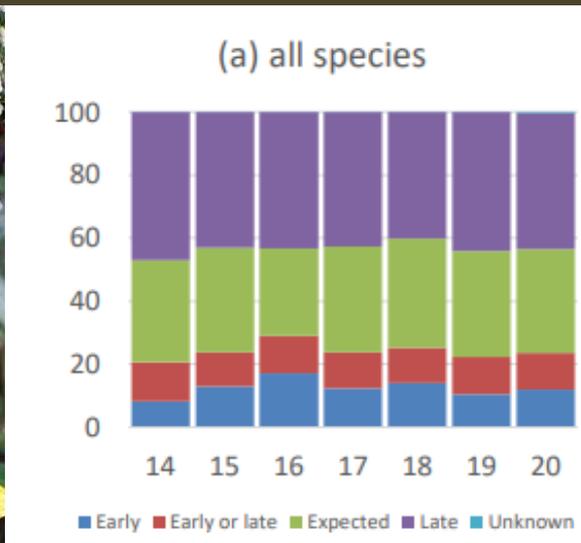
- extreme weather disrupting infrastructure & impacting health
- loss of insect biodiversity & soil degradation threatening food supply
- displaced populations causing political unrest

...



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.

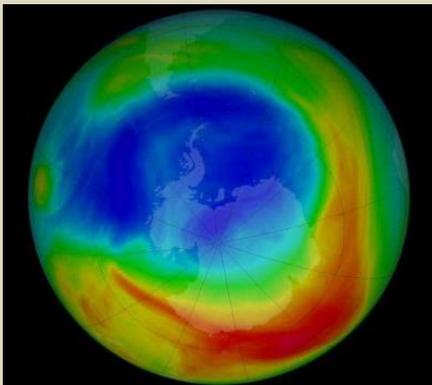
«•Proof of Impact

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



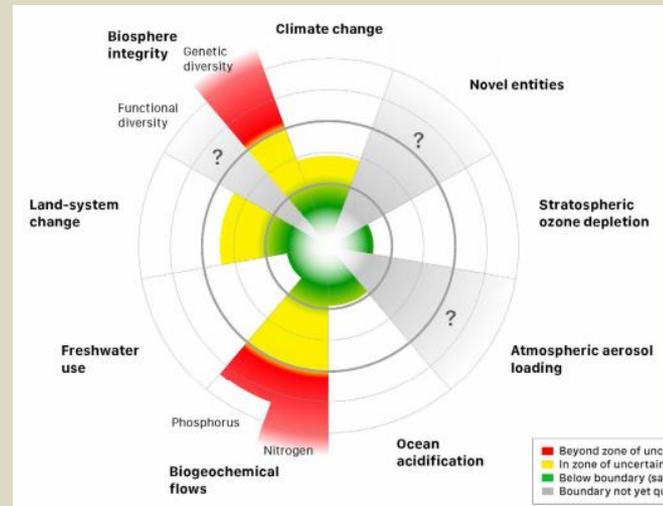
Can the horticultural industry help cope with environmental change?

...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 un air sec : +
Supporte la chaleur : ++ Supporte un sol pauvre : ++
Continental : -

FACTEURS LIMITANTS

Liés au contexte urbain :

Supporte un sol compact :
Supporte un sol sec :

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

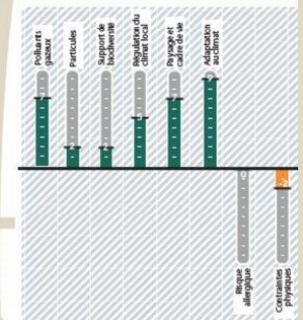
Le micocoulier occidental est adapté aux sols secs, compacts et pauvres ; il supporte bien les fortes chaleurs, et assez bien le froid. Il est donc bien adapté à l'évolution du climat local.

😊 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.



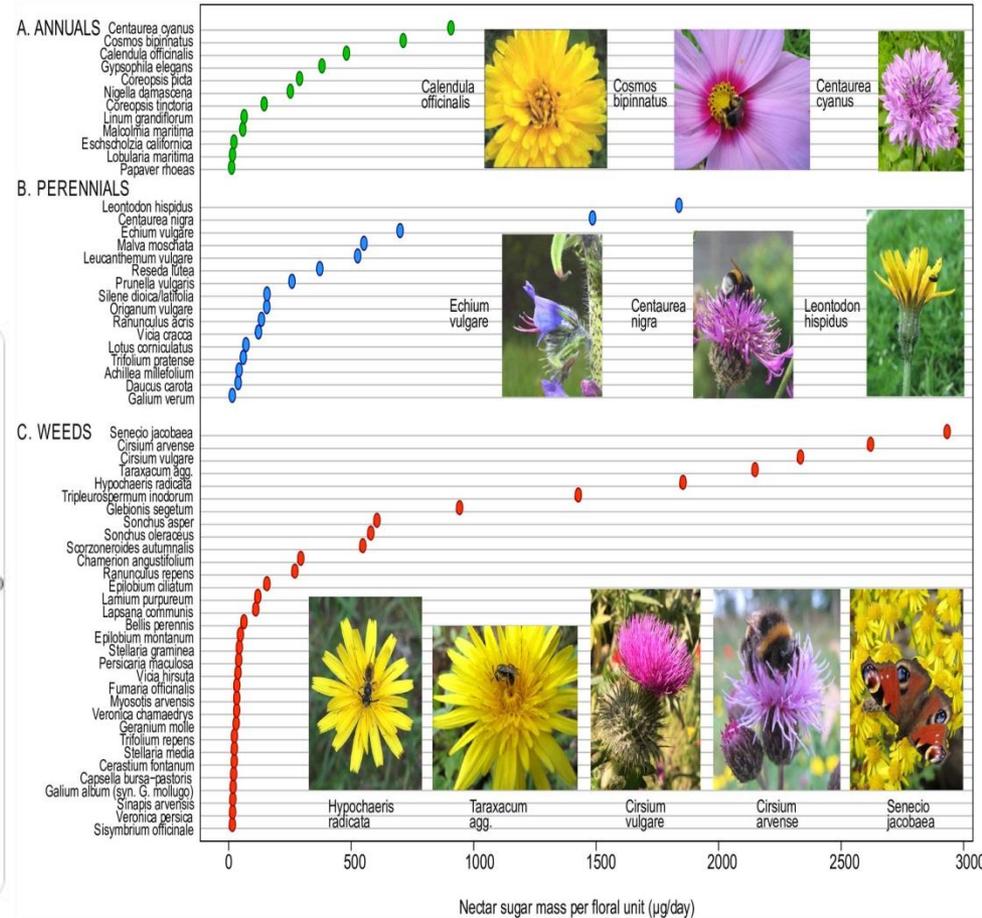
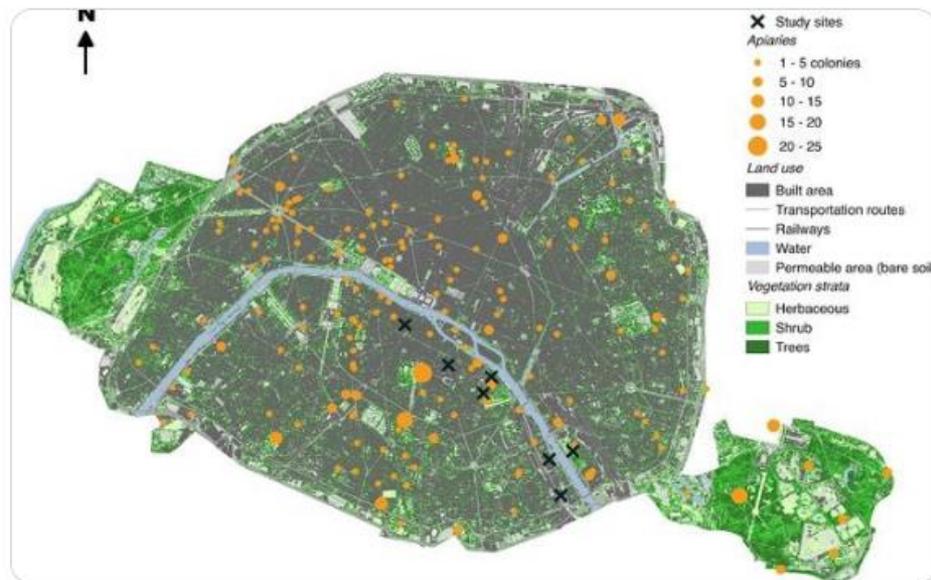
Conception graphique



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 never more than 500m from a rooftop apiary so makes you wonder how that effects our wild pollinators.



A soft-focus photograph of a meadow. In the foreground, several tall, thin green grass blades are visible. A cluster of purple orchids with delicate, light-colored petals is the central focus. To the left and scattered in the background are several bright yellow buttercup flowers. The overall scene is peaceful and natural, with a gentle, slightly hazy atmosphere.

Thank you