

Childhood

- A country you can never revisit
 - in my case this is literally true
- Kenya
 - for several decades, highest population growth rate in world (11-yr doubling)
 - then: a huge wilderness with some settlements
 - now: settlements with essentially no wilderness

why conserve biodiversity?

- Rik has told you the answer
- Which leaves me free
 - to be elliptical
 - Allan: "a few diversions..."
 - Me: mostly off-road
 - to be provocative
 - (which is very much out of character)

Why conserve biodiversity?

Because we have
some mammals over
from things

so let's save trees and birds
and maybe a protected area
over there somewhere

**WRONG
ANSWER
Nil points**

the answer lies here...



...it's all about an
adaptable hominid

adaptable hominid...

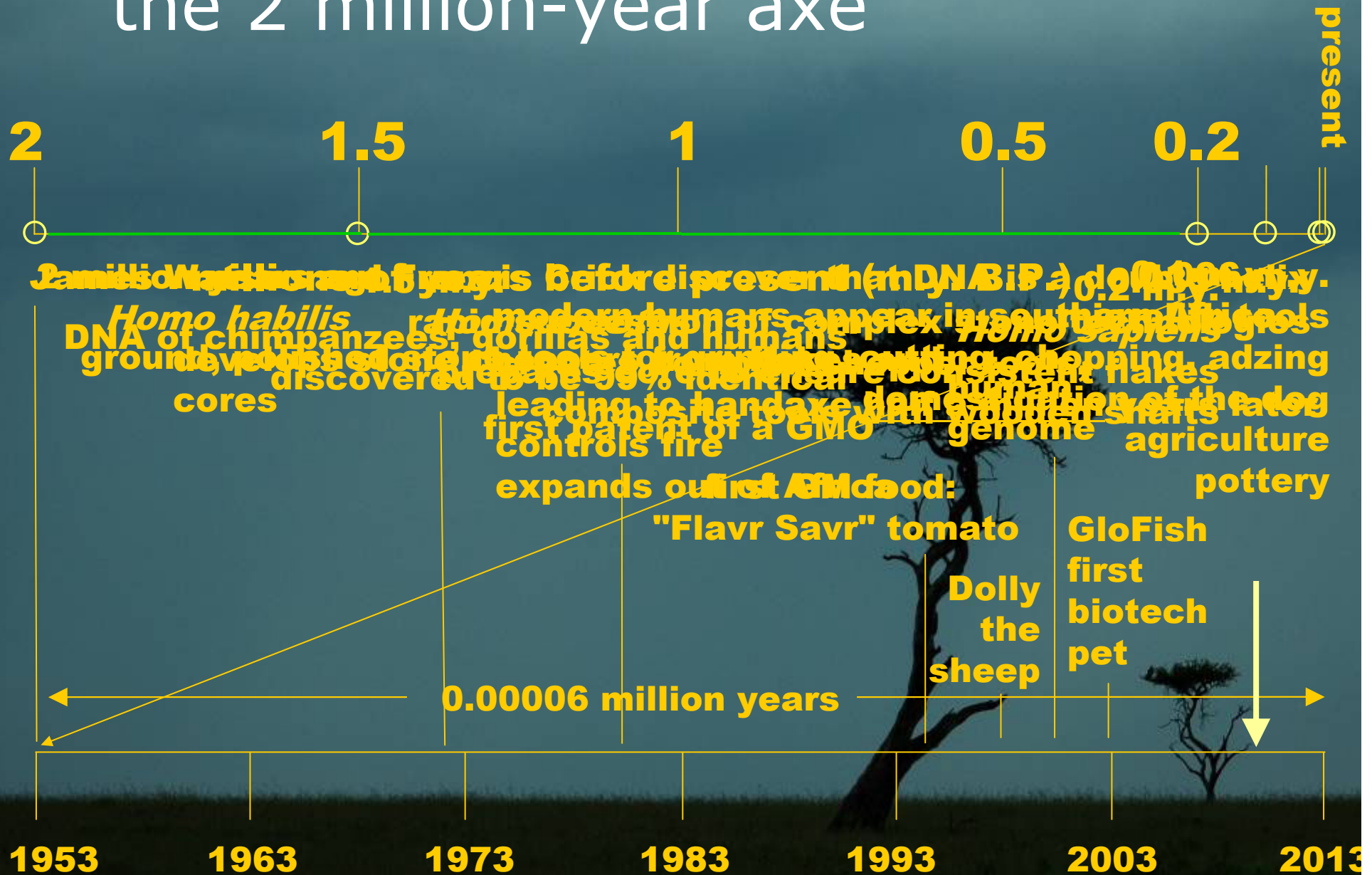
- aware of, and part of, living world
- observant, thoughtful, well-organized
- competitive, efficient, systematic
- social, capable of teaching + learning
- capable of complex conscious design

developed something entirely new...

technology

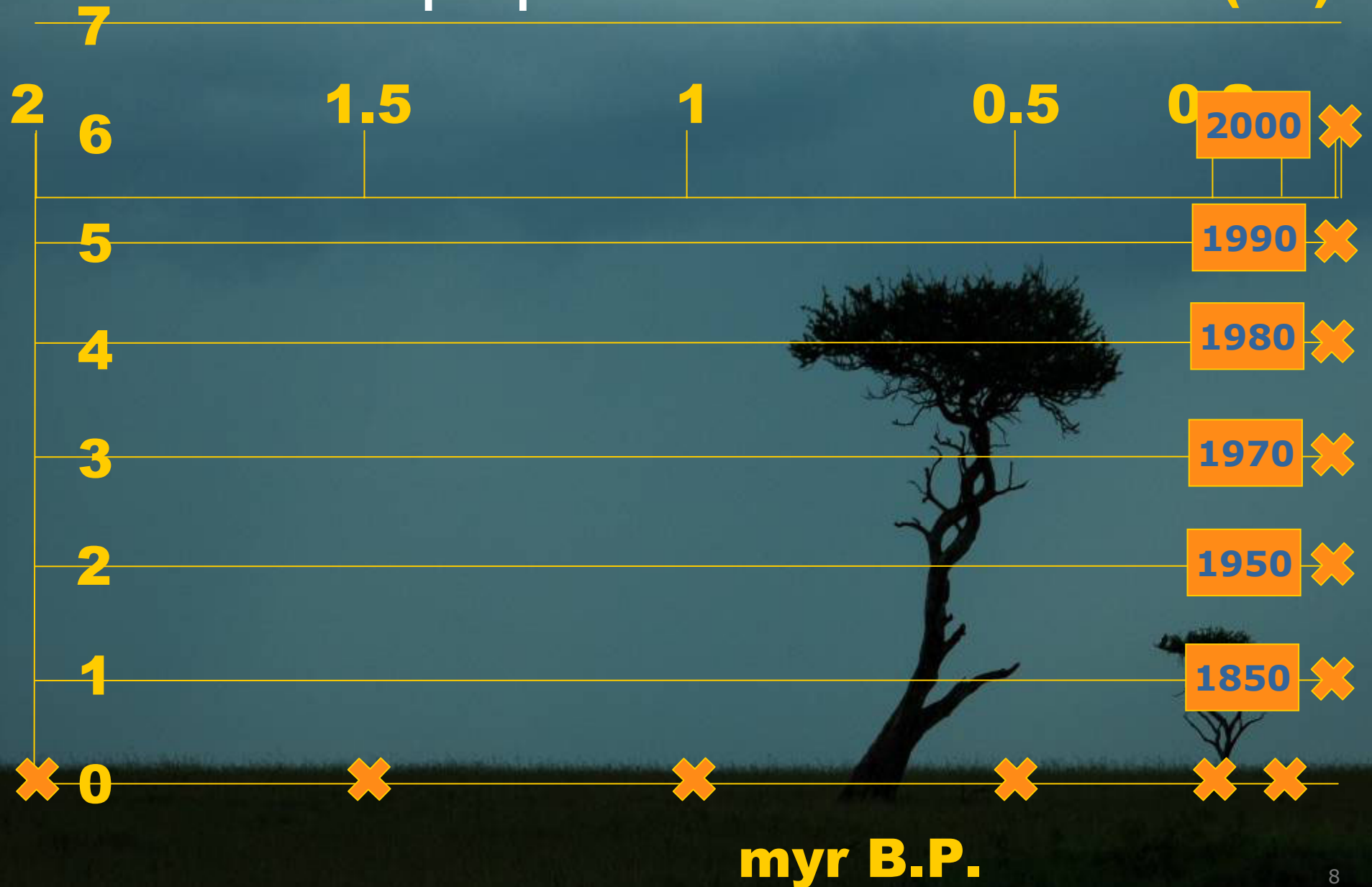
- **Stone tools**
- **Bone tools**
- **Leather tools**
- **Wooden tools**
- **Fire**
- **Dogs**
- **Animal husbandry**
- **Agriculture**

the 2 million-year axe

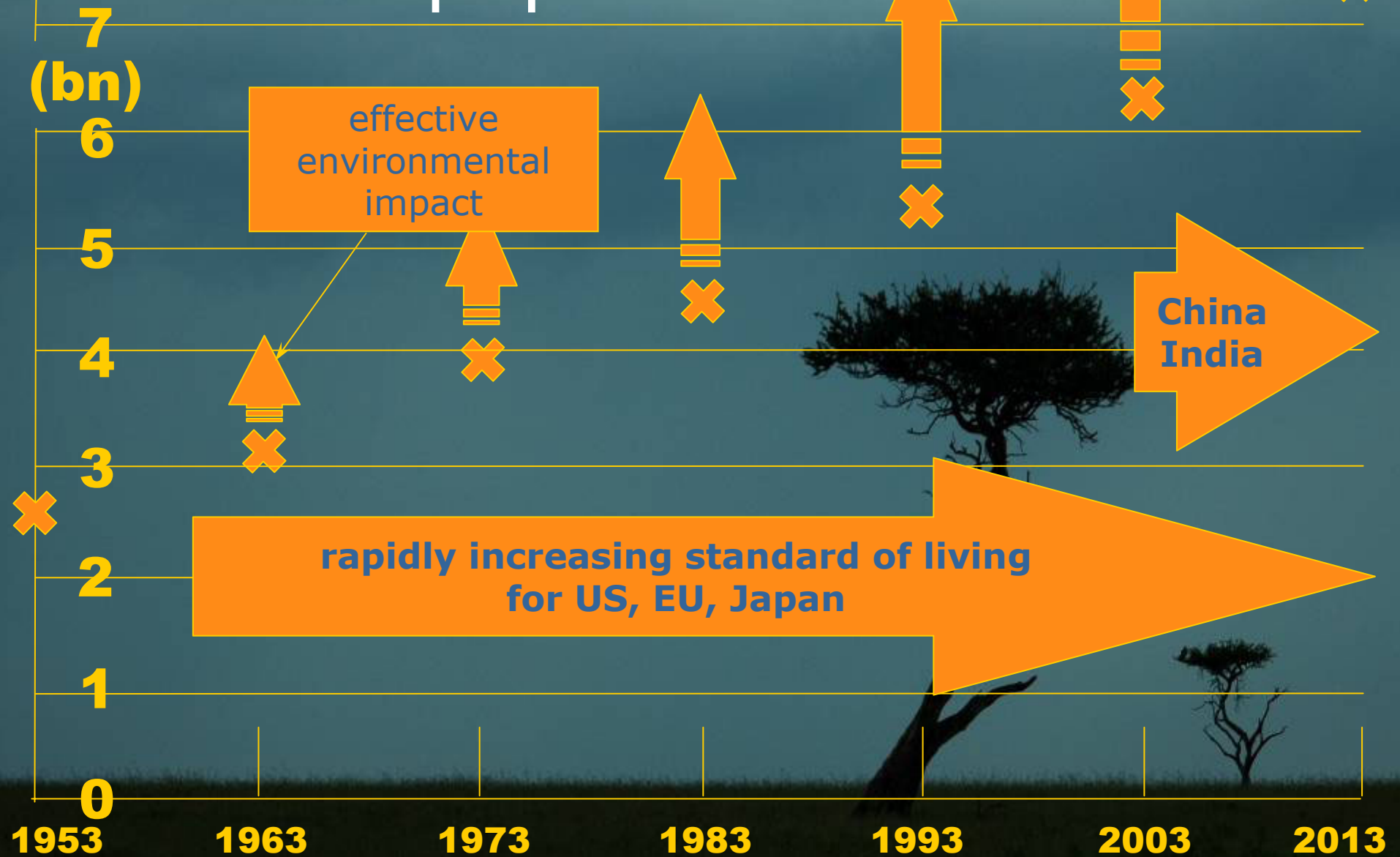


Human population size

(bn)

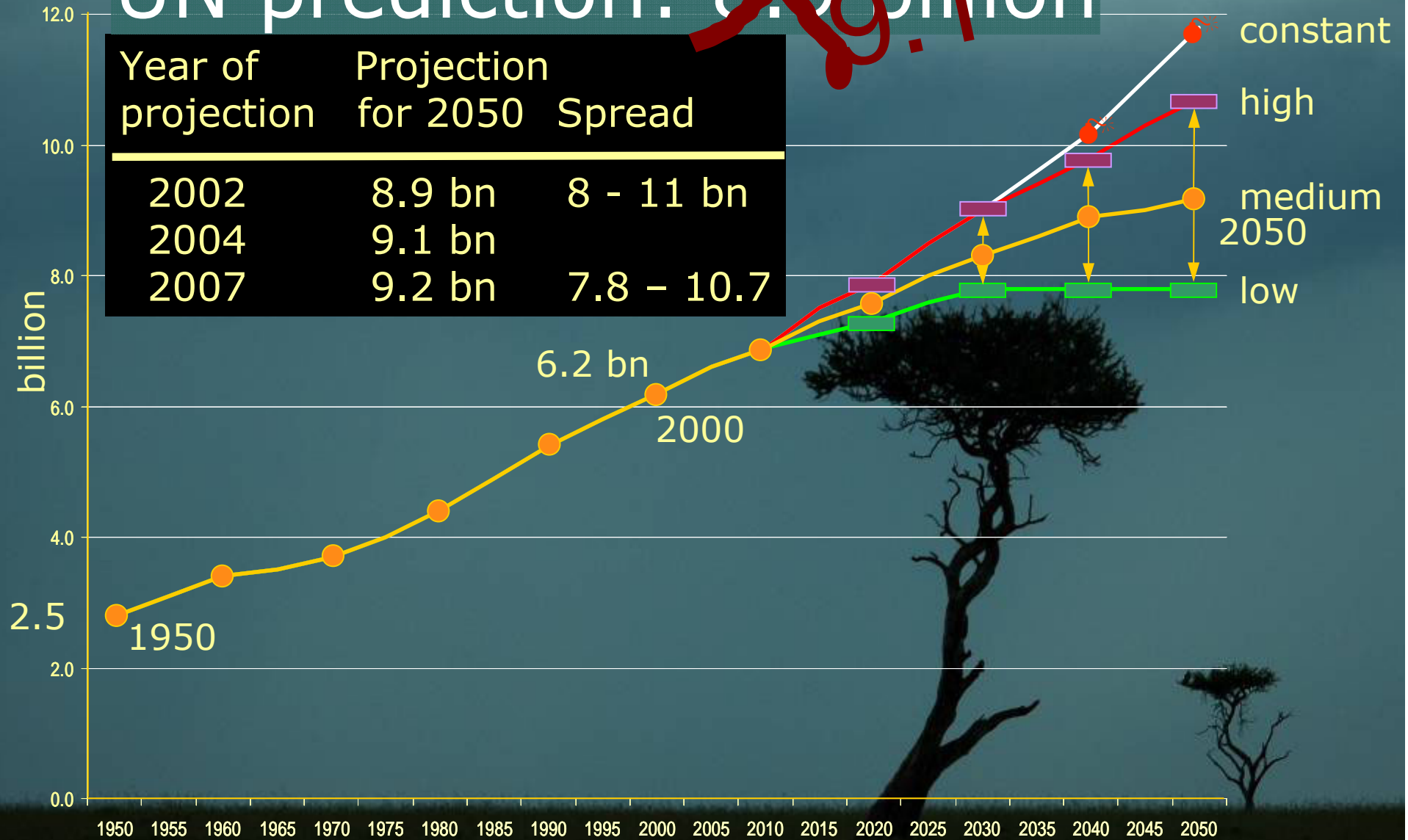


Human population size

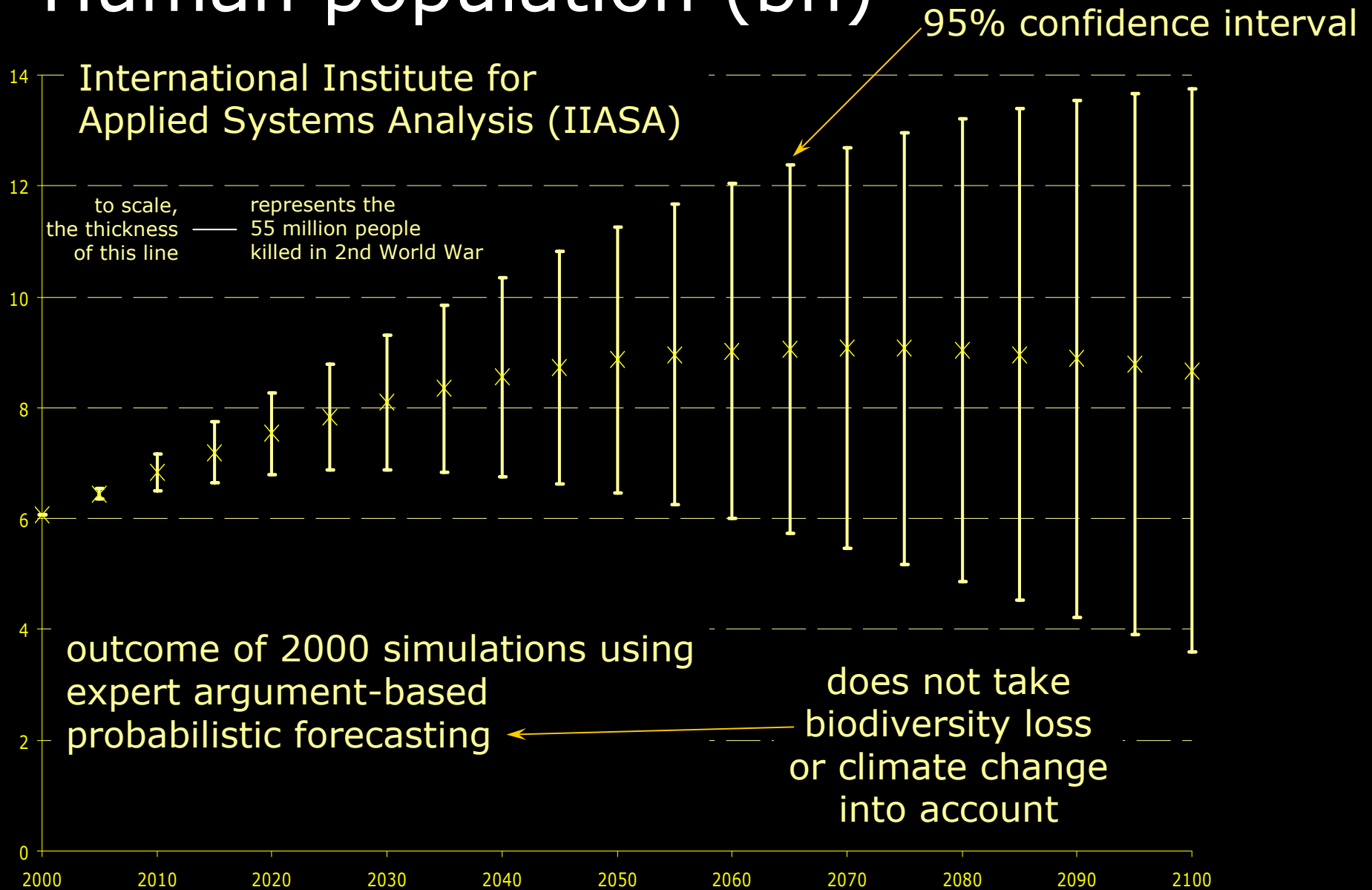


UN prediction: ~~8.9~~ 9.1 billion

Year of projection	Projection for 2050	Spread
2002	8.9 bn	8 - 11 bn
2004	9.1 bn	
2007	9.2 bn	7.8 - 10.7



Human population (bn)



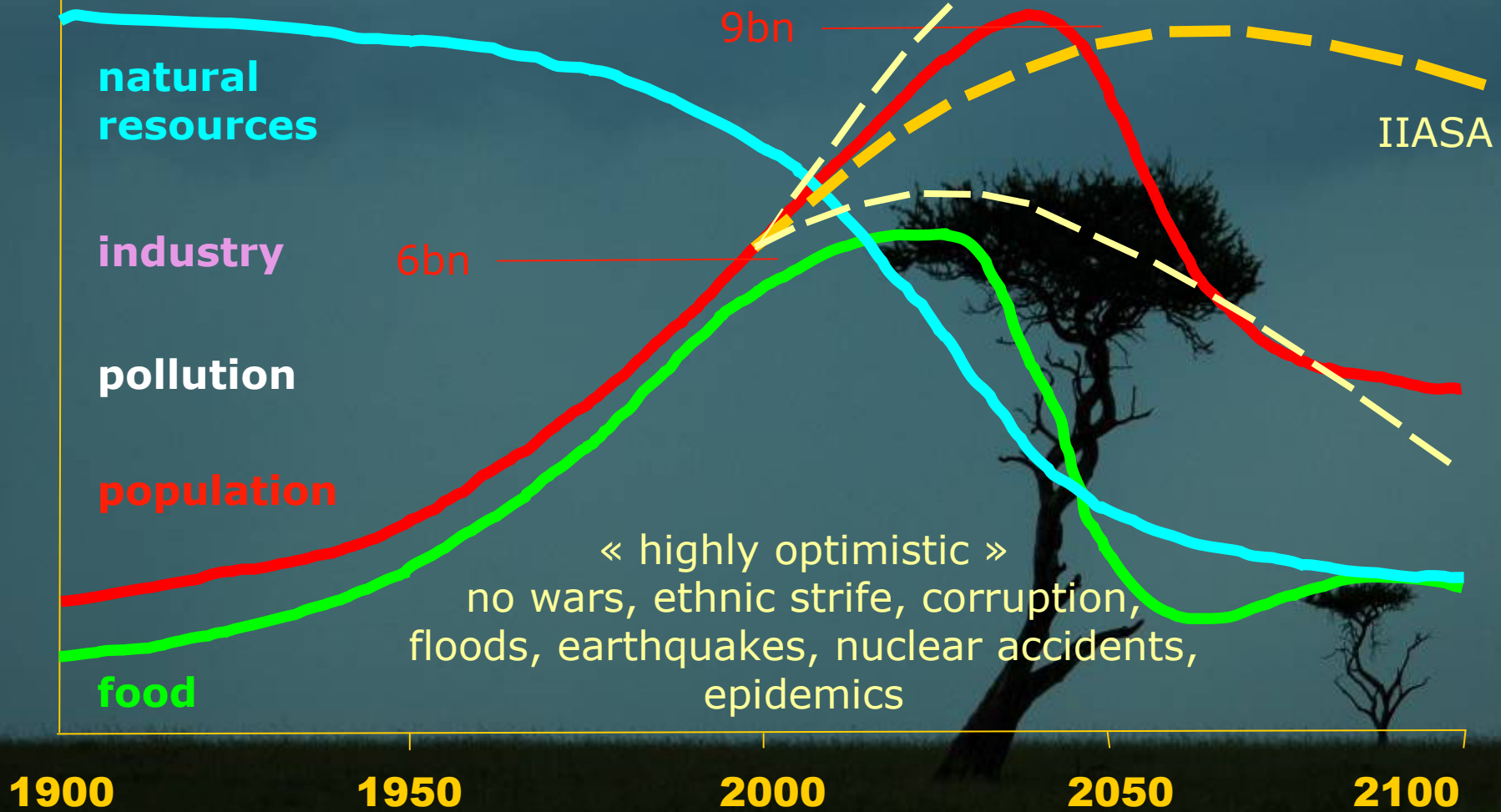
Distribution of humans



Limits to Growth

Beyond the Limits:
Confronting Global Collapse,
Envisioning a Sustainable Future
Meadows, Meadows, Randers (1993)

Limits to Growth: The 30-Year Update



Human population

- more mouths
- and more bodies
- and more expensive minds
- doesn't matter if humans are somehow 'decoupling' from the environment

decouple

- separate or diverge from an existing connection, correlation or dependency between elements
- so that there is little or no feedback or transfer of energy or materials between them

Julian Simon

Senior Fellow
at the Cato Institute

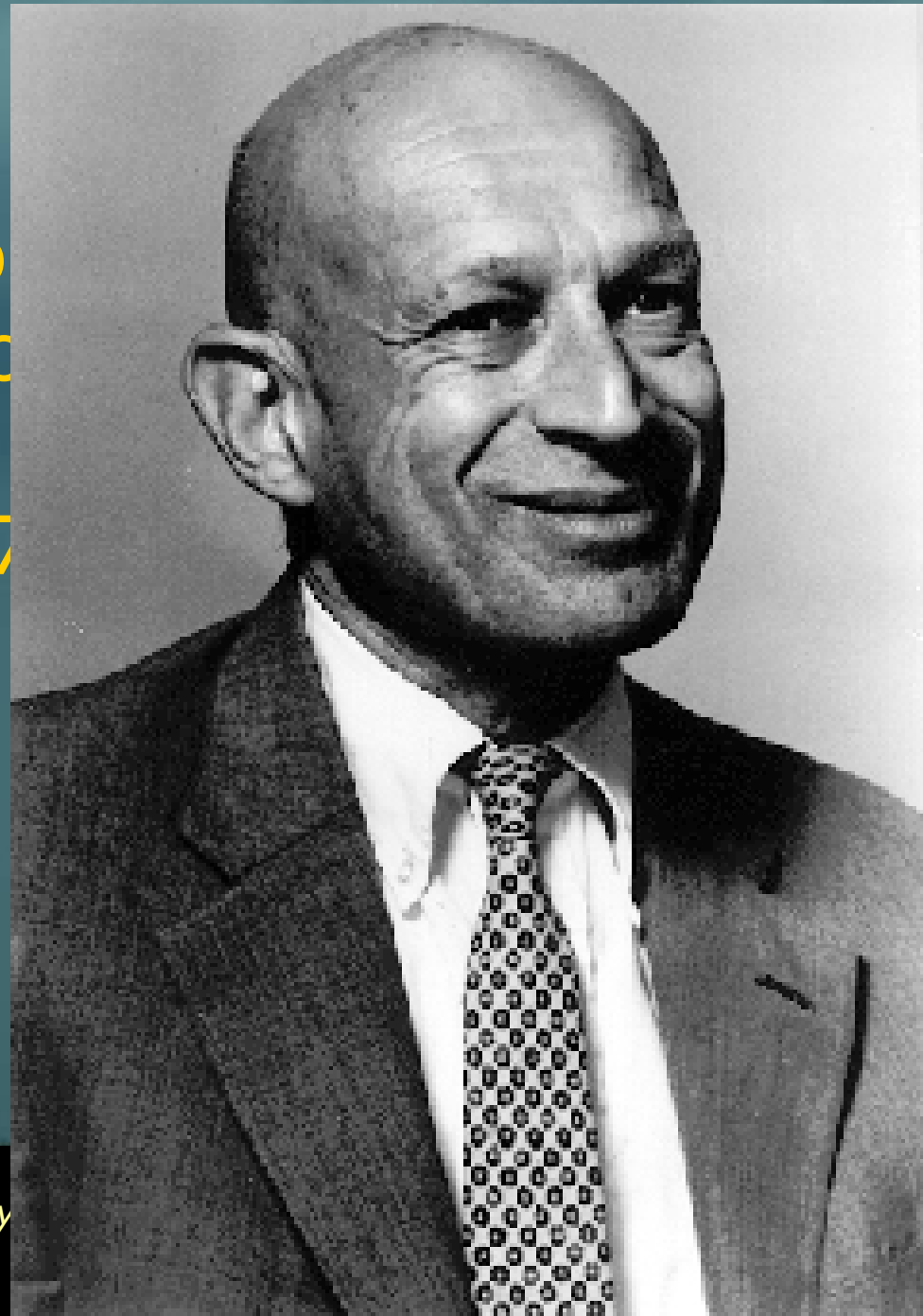
Professor of
Business Administration
at the
University of Maryland

Spiritual mentor of
Bjørn Lomborg



The

ity: Steadily



poly
on

1995
js.html



Julian Simon: arch-decoupler

- We have in our hands ... the technology to feed, clothe, and supply energy to an ever-growing population for the next 7 billion years.
 - Presumably off-planet
 - Presumably only trivially “ever-growing”

A brief demonstration

- Exponential growth
 - if growth rate
 - is proportional to population size
 - remains constant
 - population size doubles at steady intervals
- algae in a lake



1

2

3





4





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6





7





8





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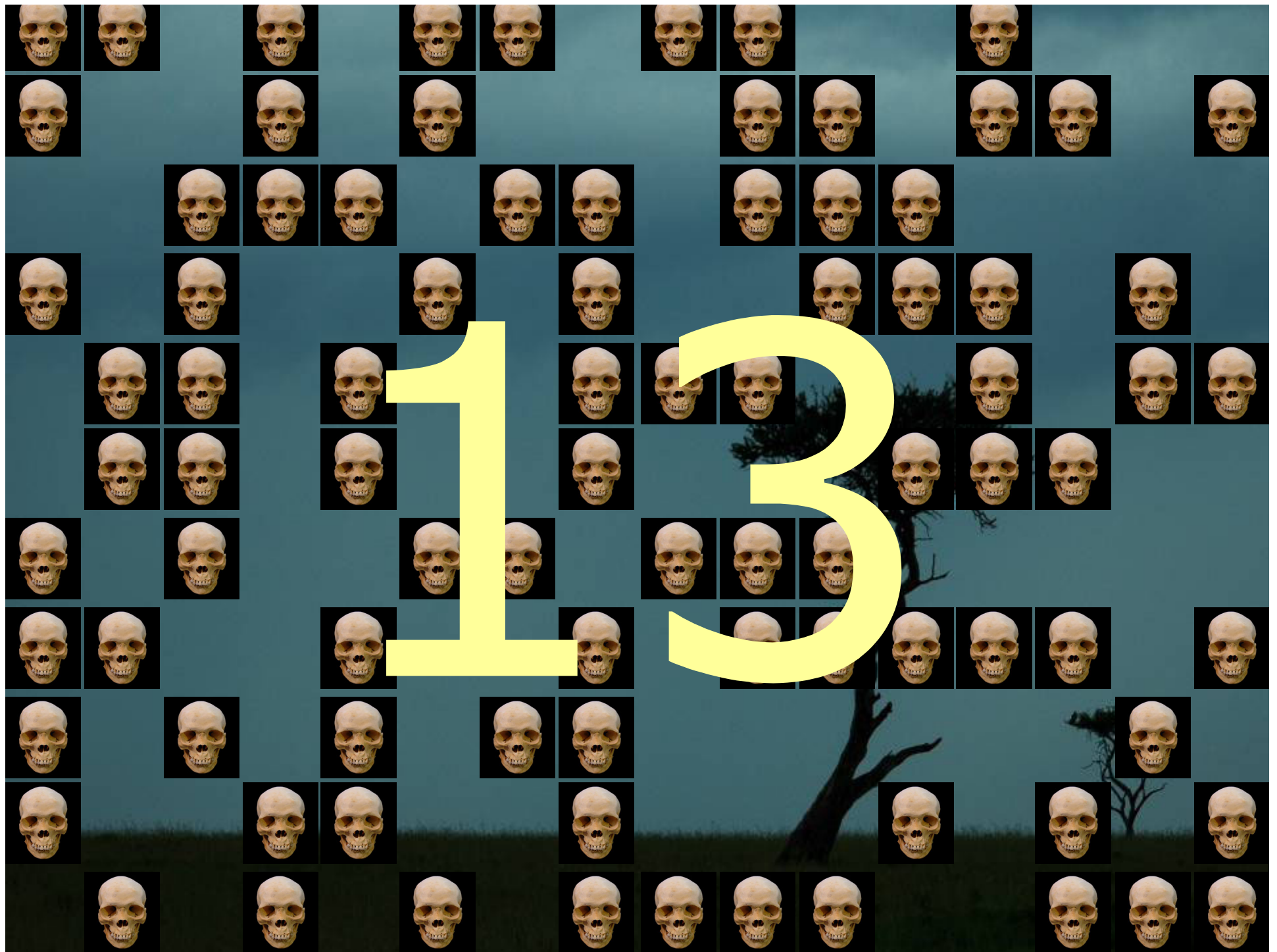


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So... where were we?

Ah! Yes...

**We have in our hands ...
the technology to feed, clothe,
and supply energy
to an ever-growing population
for the next 7 billion years.**

everything's all right really

- Qualify every noun with "sustainable" and you create a sustainable society
- Living off the interest is sustainable
- Eating into the capital is not
 - Fossil fuels will last for a tiny fraction of human existence
- Is it OK to eat into someone else's capital?

we change our planet by...

- Producing and consuming without concern for sustainability
 - Hunting more quickly than nature can replace
 - Harvesting more quickly than nature can provide
- Changing habitats, disrupting ecosystems
- Breaking up habitat or joining habitats that were separate
- Changing what genes are available
- Introducing species from other places
 - Making everywhere biologically similar
 - Giving opportunities to non-indigenous invasive organisms
- Giving opportunities for new and re-emergent diseases
- Encouraging loss of soil
- Polluting air, soil, water
- Exporting damage elsewhere
- Provoking climate change

Loss of species
Loss of key functional groups
(such as pollinators)

Loss of nature's capacity
to look after us

main drivers of loss

all these drivers are anthropogenic

**biodiversity loss is
caused by human activities**

**by them over there, of course
but also by you and me**

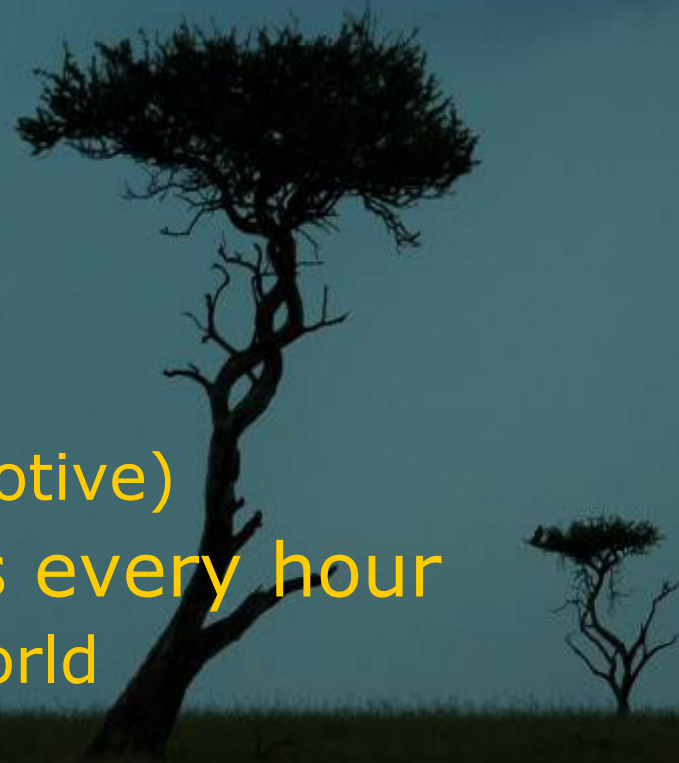
As Allan said this morning,

- "...man is the one single driver of biodiversity change..."



what causes these things?

- Nobody wants ecological disaster
- Most people behave legally
- Billions of us need to
 - Eat
 - Stay warm
 - Find shelter
 - Dispose of waste
- Many of us want to
 - Get richer (the profit motive)
- Billions of legal actions every hour
 - Nibbling away at our world



He might act thus for the shallowest of reasons; for a reason which is not worth mentioning; for the reason that, always, and everywhere, and no matter what his station, man loves to act as he *likes*, and not necessarily as reason and self-interest would have him do.

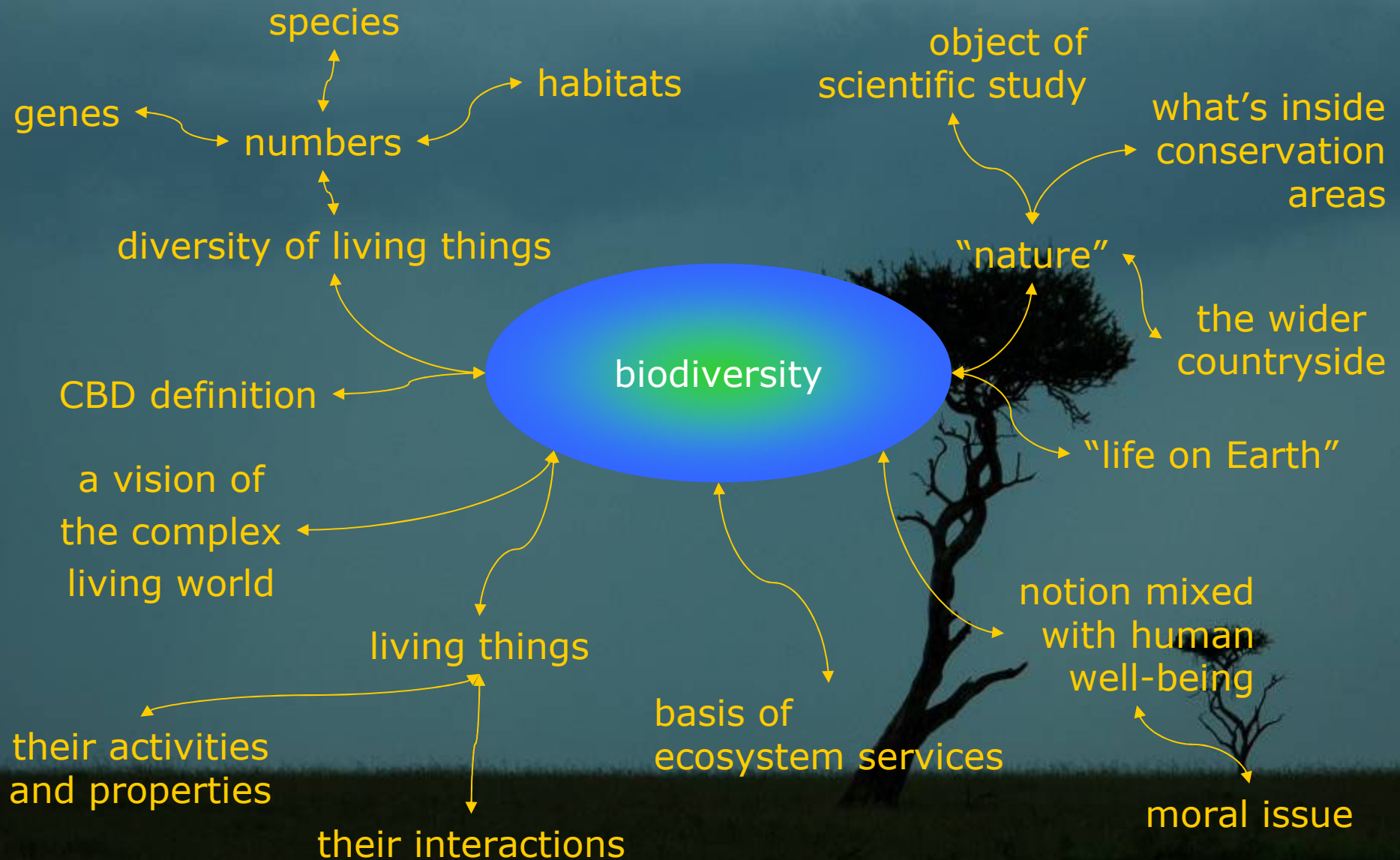


Y&P

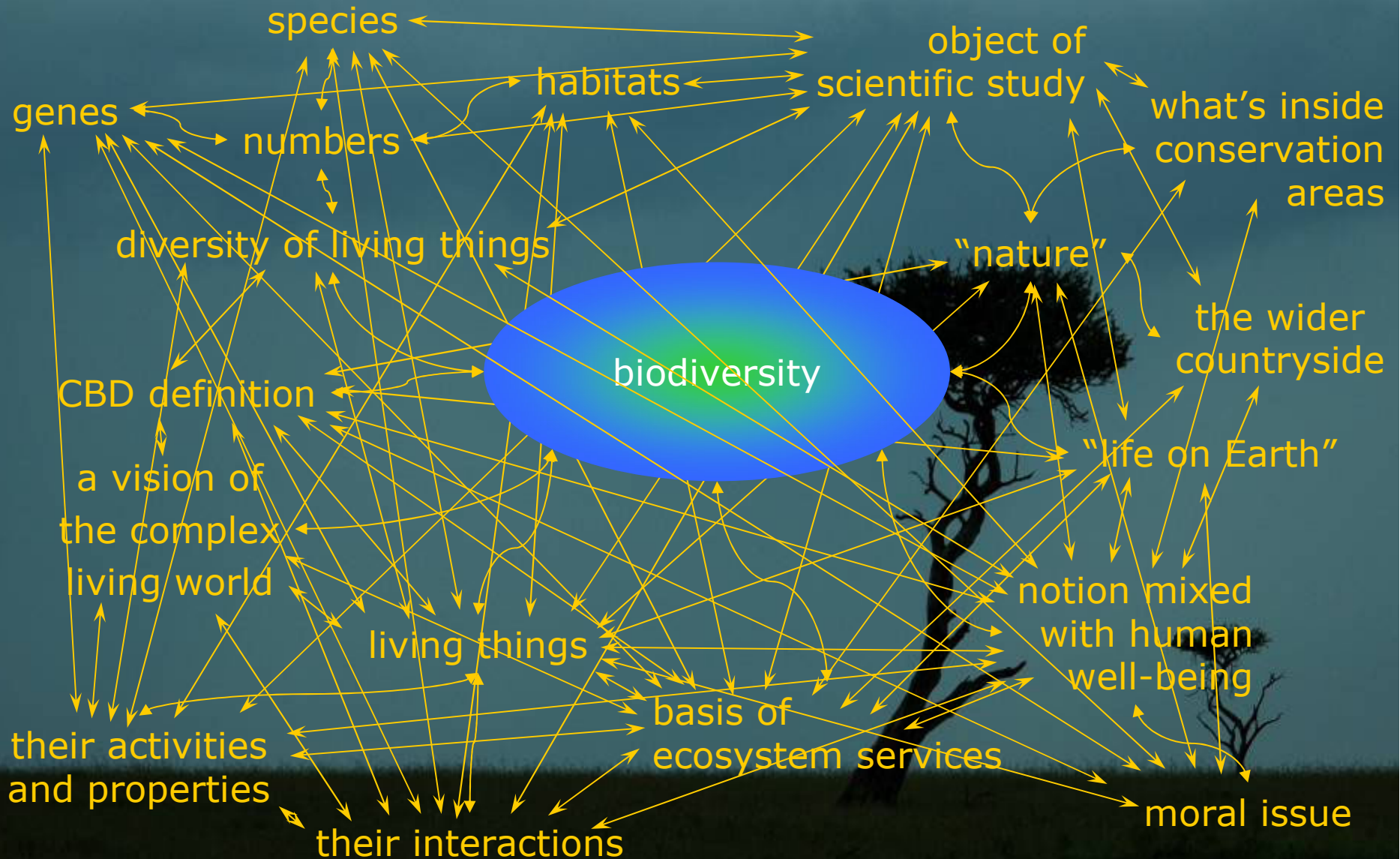
why conserve biodiversity?

- The answer depends what you mean by “biodiversity”
 - The “bio-” bit
 - Or the “-diversity” bit
 - Or the whole elusive concept
 - A so-called *boundary object*

but what is biodiversity?



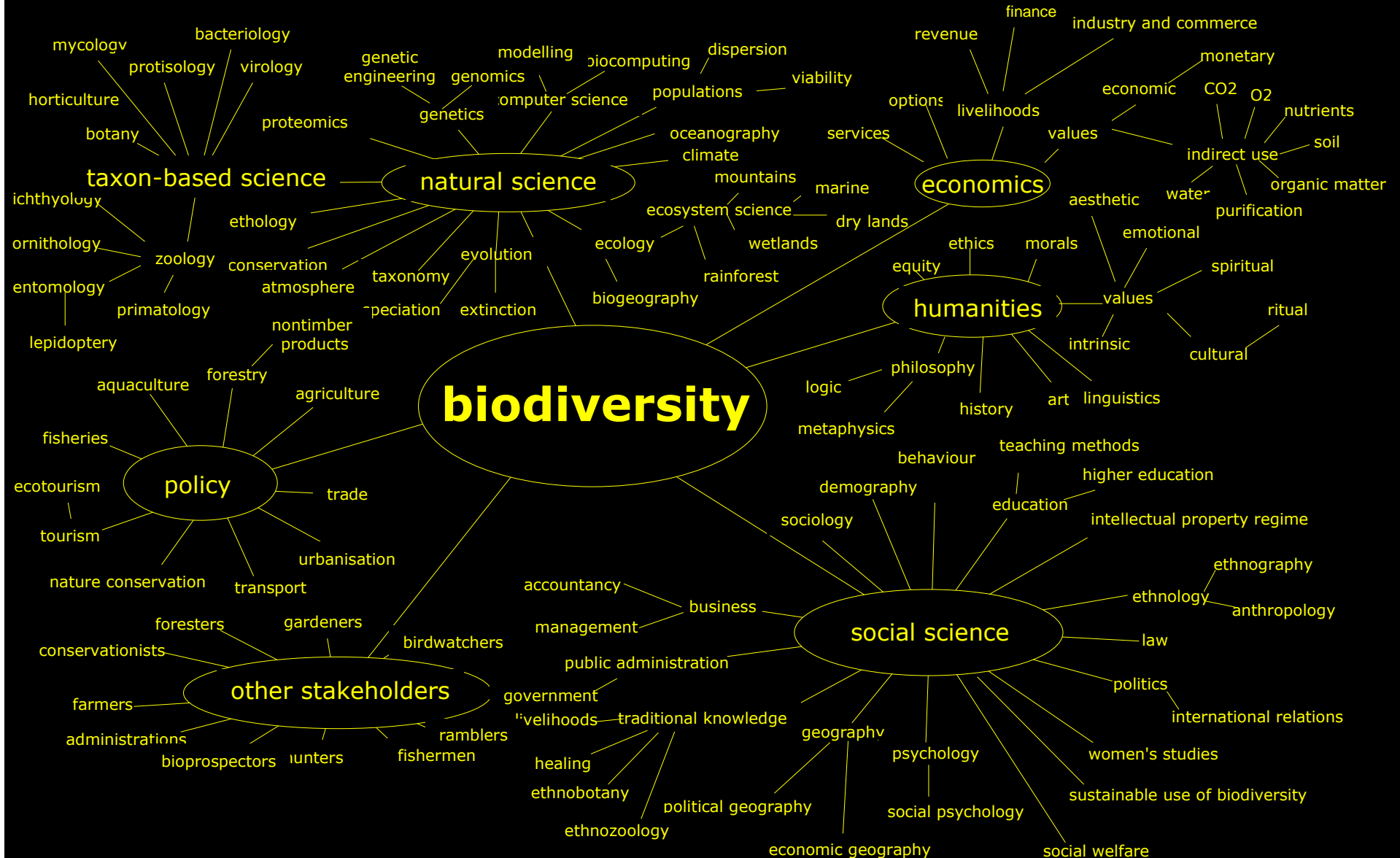
but what is biodiversity?



boundary object

- a concept shared by different groups, whose details differ from group to group
- biodiversity goes beyond CBD definition
 - far reaching, ambiguous set of
 - ideas, beliefs, feelings, objects, relationships between objects, documents and vocabulary
 - allows people from different backgrounds and perspectives to co-operate on the “same thing”
- it's a waste of effort to try to find *one* definition of biodiversity
 - it's a characteristic of a boundary object that we all understand it differently.

biodiversity is about...



What is "Nature's purpose"?

- survival of DNA sequences
 - not group welfare
 - uncoordinated scramble for selfish gain
 - genes survive or vanish
 - in the company of other genes
 - alleles survive or vanish in that same company
- An ecosystem is not a "system"
 - no aim, no purpose, no target, no threshold
 - temporary, dynamic assemblage
 - interacting populations
 - survival of DNA sequences
 - in a context of other DNA sequences
- purpose of nature: survival of DNA
- utility function of biodiversity: survival of DNA

what is biodiversity for?

- Humans see purpose everywhere
 - Tools, art, machines, buildings... designed for a purpose
 - Not just “what is it?” but “why is it, what does it do, what is it for?”
- Nature has no purpose, is indifferent
 - biodiversity is not “for” anything
 - biodiversity is the current status of the continuing selection of genes
 - “why” is a metaphorical question

what is biodiversity good for?

- Completely different question from “what is biodiversity for?”
 - could equally well ask, “who is biodiversity good for?”
 - “good” implies a beneficiary
 - subtext: “for humans”
- Morally questionable question?
 - Anthropocentric vision of nature
 - implies that humans have rights...
 - ...and responsibilities

the “bio- bit”...

- Gives us
 - oxygen, food, fibre, medicine, fuel
- Ensures that
 - water and air are pure, plants are pollinated, seed are dispersed, pest and disease controlled
- Helps to
 - dispose of waste, recycle nutrients, regulate floods, absorb carbon, regulate climate

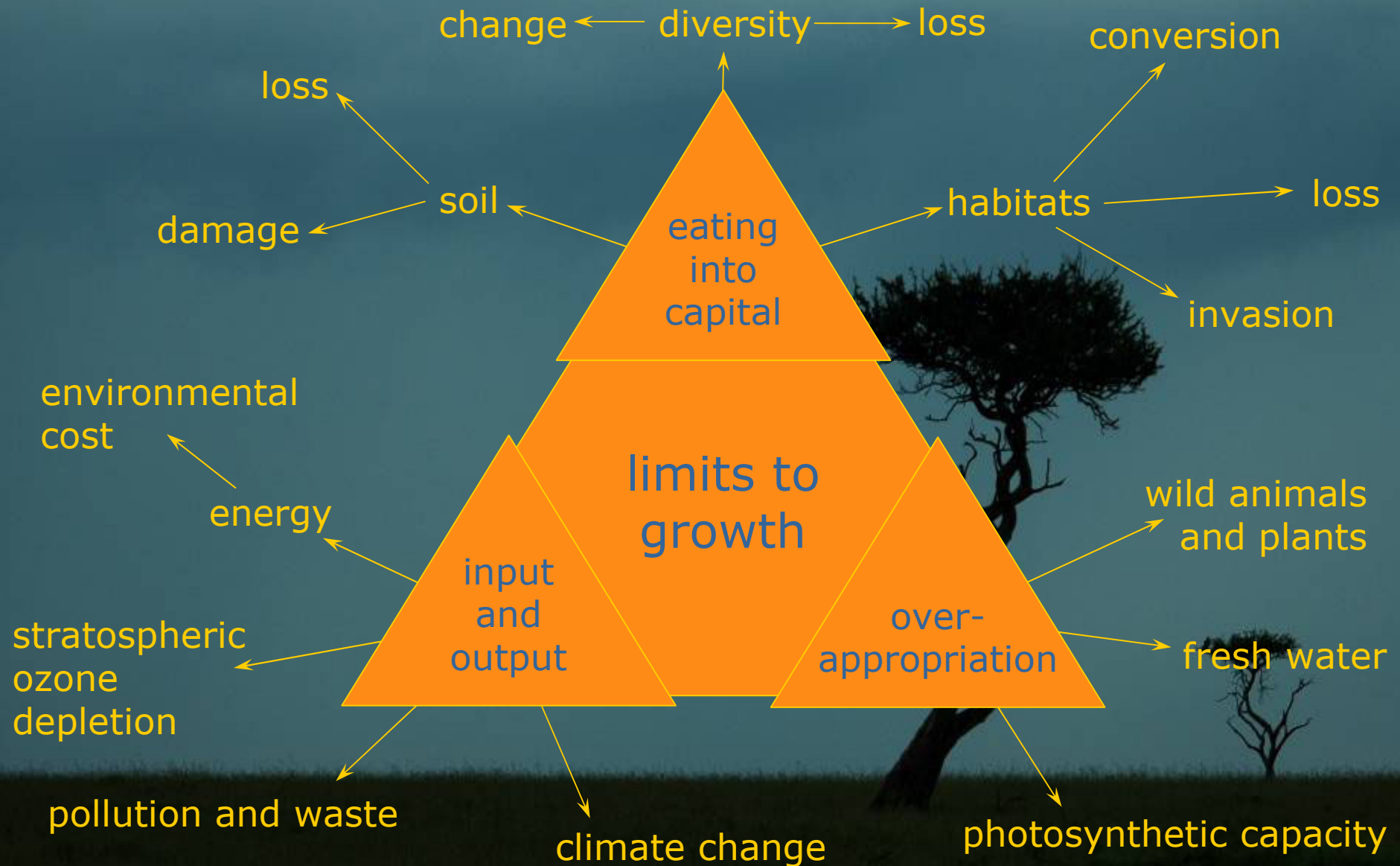
the “-diversity bit”...

- Allows us to be human, giving us
 - inspiration, recreation, well-being, discovery
- Provides options for the future
 - choice for future generations, buffer against the unexpected

implications

- Conservation of biodiversity
 - necessary but not sufficient
- Sustainable use of components of biological diversity
 - vital to human survival
- Equitable access to benefits arising from the use of biodiversity
 - a means to an end

human responsibility



Sustainable use

- Appropriation and consumption of resources
- In whatever way is most likely
- to increase the probability of
 - long-term
 - human
 - survival
 - health
 - well-being



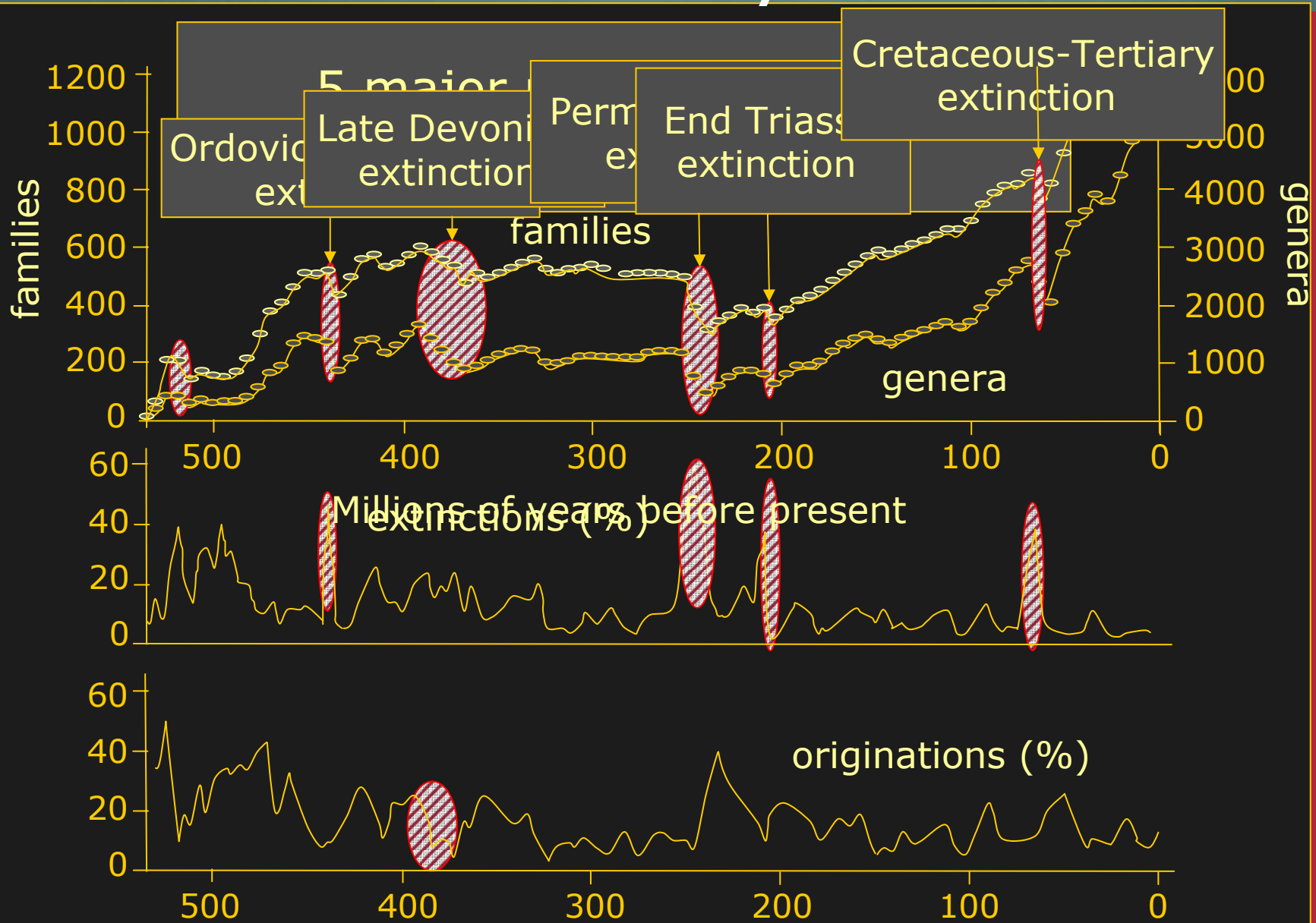
the answer lies here

Kirchner, J. W. & Weil, A.

**Delayed biological recovery
from extinctions
throughout the fossil record**

Nature 404, 177 (2000)

taxonomic diversity



rapid loss of life on Earth

- Holocene extinction event
 - 6th global extinction in 450 million years (m.y.)
- each wipes out 50 to 95% of species
 - last one, 65 m.y. ago, removed dinosaurs
 - will we survive our own Holocene extinction?
- takes 10 to 20 m.y. to restore diversity

biodiversity: is not the issue

- we will (perhaps) not sterilise the planet
- please come back in 25 m.y.
 - no humans
 - few of the species, or genera, or families (or even orders?) the same as they are now
 - probably just as biologically diverse as today
- biodiversity horizons
 - in 25 million years, my beliefs will be irrelevant
- human horizons
 - are not 25 million years in the future
 - are at a human scale
- it matters what you and I believe and do

biodiversity issue

- intrinsically linked with human well being and basic societal needs
 - individuals interact locally and globally
- complex & difficult to grasp
 - scale-dependency with almost every facet
 - dependency on historical path (path-dependent effects)
 - effects not necessarily in proportion to cause
 - communication issue
- change
 - involves interacting species (and genes, and ecosystems)
 - often smooth not radical - not visible on an everyday basis
 - some phase transitions probable
 - non-equilibrium bifurcations
 - some evidence of power-law relationships
 - some evidence of self-organised criticality
- of what we know, what is contingent, what robust?

“Just replace the resource”

- Usually easier to get things right in the first place
- “breakthroughs” mostly just break
- Switching to new resource is often costly and slow

“the problem is distribution”

(of energy or food)

- It costs money to distribute
 - who is willing to subsidise permanently?
- Investment follows the money
 - biotech crops are for rich countries

Why conserve biodiversity?

- Loss of biodiversity tends to reduce sustainable standard of living
 - A standard of living may be sustainable for a small low-demand population but not for a large, high-demand one
 - environmental footprint
 - growth of footprint increases rate of loss
 - The higher the standard of living we wish to sustain, the more urgent it is to stop population growth.
- to halt biodiversity loss we must reduce rate of growth of footprint to below zero
 - but that's not enough in itself





Decision, knowledge, action

- We gain knowledge more slowly than we lose biodiversity
 - Lack of knowledge is not a good reason for inaction
- Many major environmental lessons came from bad decisions
 - Not to decide is usually a bad decision
- We rarely know exactly what the consequences of a decision will be
 - The chief cause of problems is solutions (Eric Sevareid)
- When we see it'll soon need fixing, act as wisely as possible using what we know or can guess
 - Nothing is more terrible than ignorance in action
(Johann Wolfgang von Goethe)

the big question

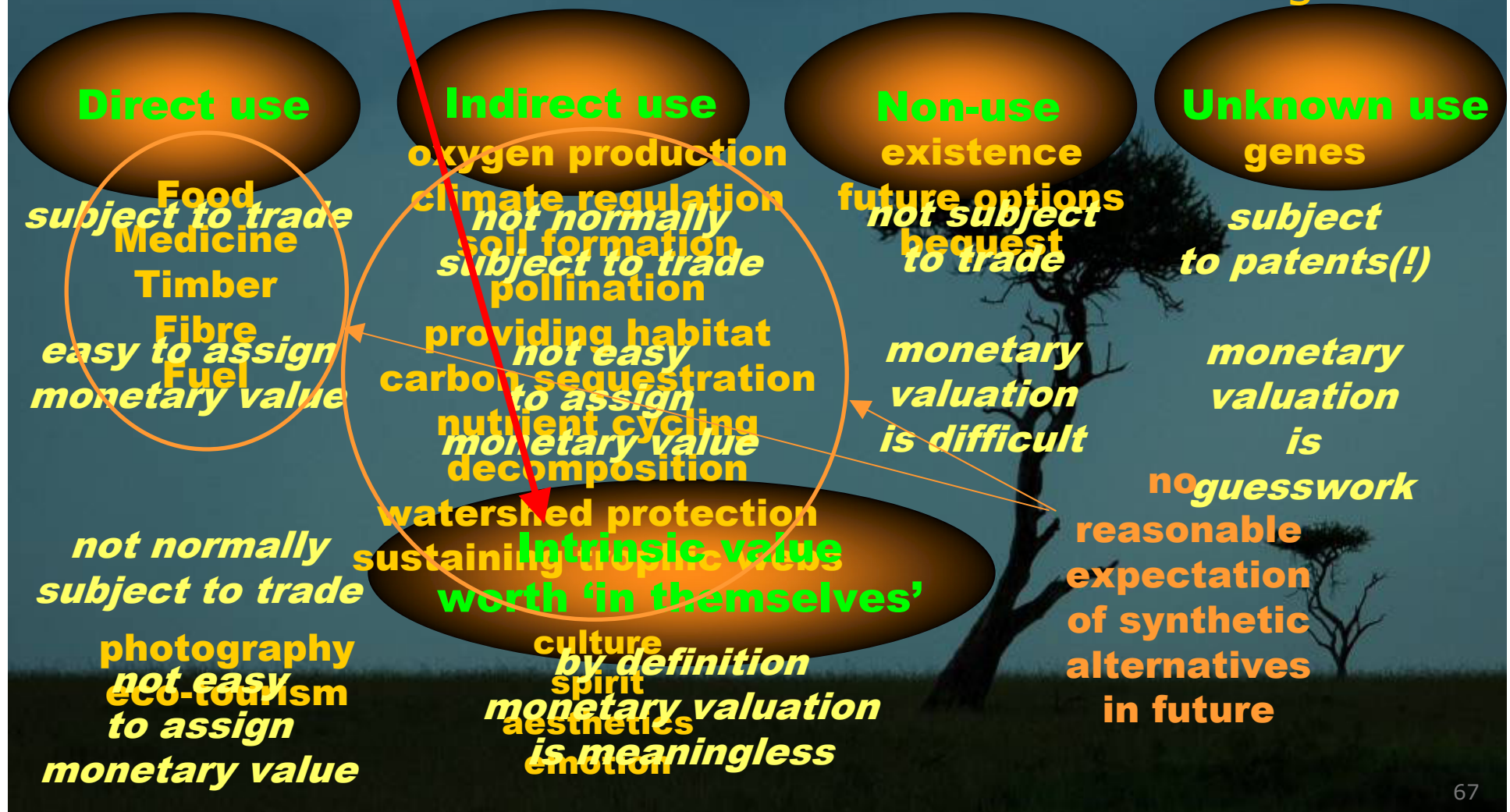
- which components of biodiversity
 - can we afford to lose?
 - must we keep?
- what future quality of life
 - ☺ would we like for ourselves?
 - ☹ can we accept for our descendants?
 - 😞 lets our species just about survive?

Julian Simon: arch-decoupler

- Technology exists now to produce in  quantities just about all the products made by nature – foodstuffs, oil, even pearls and diamonds – and make them  than the cost of gathering them in their natural state.

repairing biodiversity

- Only humans assign values
- Most values are related to human well-being



biodiversity is about people

- we should conserve biodiversity because it concerns humans
 - biodiversity doesn't need humans
 - humans need biodiversity
 - utility
 - stewardship and inheritance
 - morality
 - intrinsic value of life
- "our knowledge of the consequences of the loss of biodiversity is poor"
 - a sustainable future for us depends on sustaining some components or aspects of biodiversity
 - which ones?
 - is it enough just to establish protected areas?
 - is it enough only to conserve species of economic interest?

Tikopia: anthropogenic diversity

As you approach Tikopia from the sea, it seems covered with tall, multi-storied, original rainforest, like that of uninhabited Pacific islands.

Only when you land and go among the trees do you realise that the island is devoted to food production... an orchard whose tallest trees are native or introduced species producing edible nuts or fruit or other useful products.

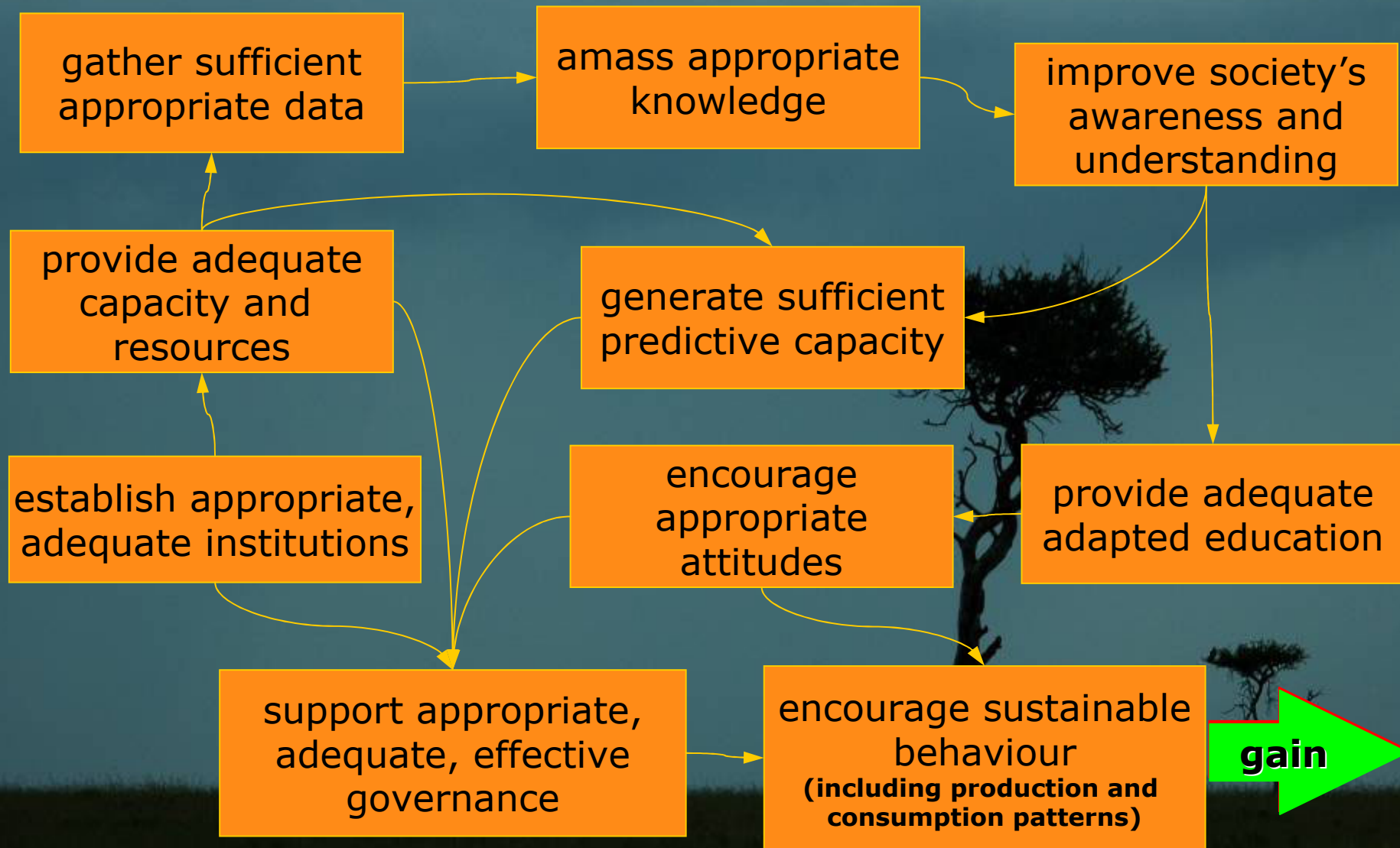
All the smaller trees in the middle story are also useful.

The under-story is a garden for growing food plants.

This whole multi-story orchard mimics a rainforest, but all its plants are edible or otherwise useful.

Adapted from Diamond J. (2005) *Collapse. How societies choose to fail or survive.* p 288

what can we do?



why conserve biodiversity?

