EXPLODAPEDIA

Welcome to *Explodapedia*, the indispensable guide to everything you need to know!
This series is packed with in-depth knowledge you can trust; it gives you the tools you need to understand the science behind the wonders of our world. Read on to learn how nature can heal our wounded planet in *Rewild* . . .

'I am in love with this book! It's joyful, fascinating, galvanising, beautifully written, accessible . . . it's an eye-opener and I can't wait to share it with all the children I know, and their parents.'
Isabella Tree, author & conservationist

'Imbued with hope, humour and joy. This is a book that needs to be read by every school kid, everywhere, and their parents.'
Lee Schofield, author & ecologist

'*Rewild* is truly magical . . . Young or old, people are going to love this book.' **Ben Goldsmith, author & environmentalist**

'A must-read for all young people who are interested in the concept of rewilding and nature recovery.' **Derek Gow, author**

'*Rewild* gives you a real sense of how connected and rich the diversity of life is, as well as how it's in peril . . . This book will inspire and inform the next generation.'
Leif Bersweden, writer, botanist, science communicator

BM: To Beda. Thank you for rewilding our lives.
May your generation – and those to come – find ways
to thrive amid a wilder future. x

MA: For Connor and Spencer, finally released into the wild.

EXPLODAPEDIA

REWILD

Can Nature Heal Our World?

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Italic type is used in *Explodapedia* to highlight words that are defined in the glossary when they first appear, to show quoted material and the names of published works. Bold type is used for emphasis.

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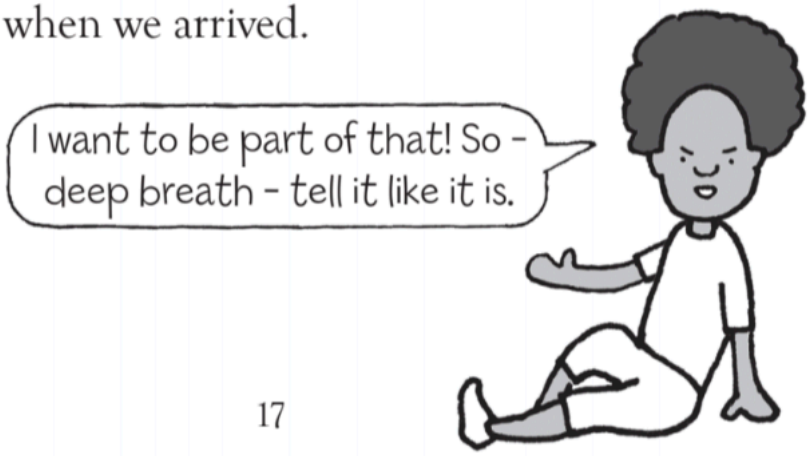
The Animal that Thought It Ruled the World

How We Got into this Mess

Rewilding is all about healing our damaged world by boosting the biodiversity and *abundance* of its living species. But, before we can find out how the solutions work, we need to understand the problems. This chapter's not going to be an easy read, but stick with it, because knowing all the challenges the world is facing actually gives us an amazing opportunity. If we can welcome enough of the wild back into our landscapes, our oceans and our day-to-day lives, we'll be the first generation of humans ever to have **attempted** to leave the planet in a better state than it was when we arrived.



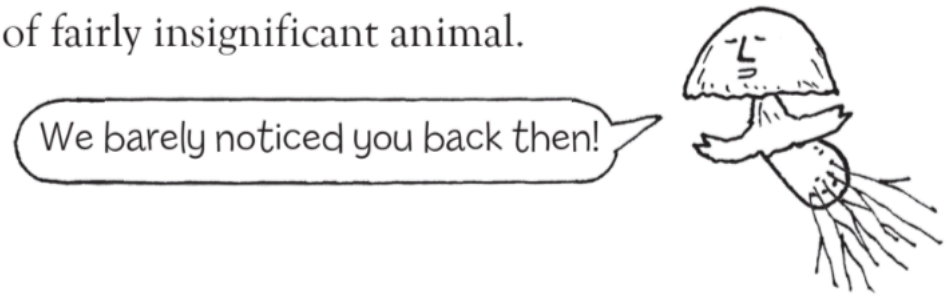
The Relentless Rise of the Human

In 2021, builders on a new housing estate near Plymouth, south-west England, unearthed a hidden cave. Inside were the remains of woolly mammoths, reindeer, wolves, hyenas and woolly rhinoceroses – animals that are either long extinct, or haven't lived in Britain for centuries. These bones give us a way of seeing Britain as it must have been around 40,000 years ago, during the last Ice Age.

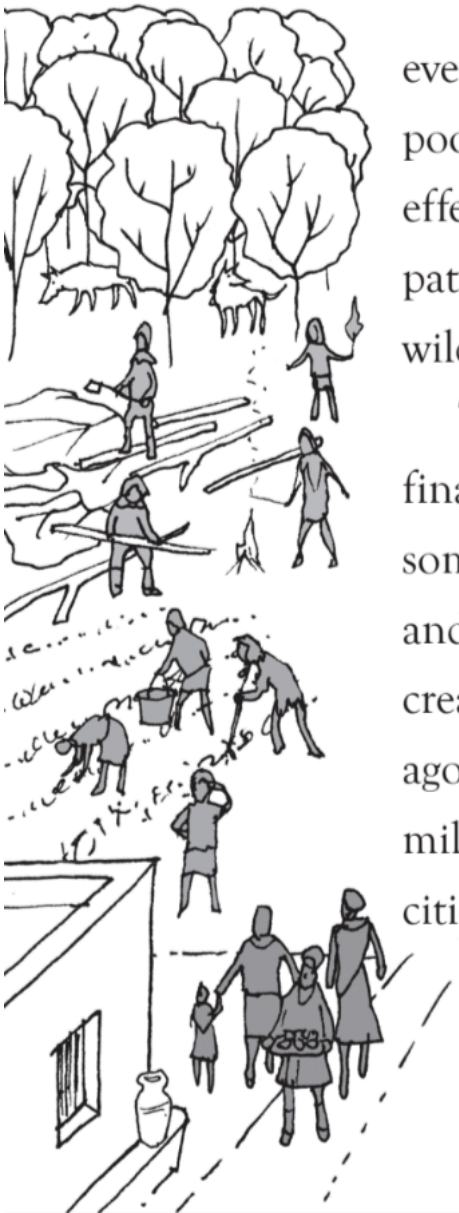
A human jawbone found in a nearby cave shows that during the same period, modern humans (i.e. *Homo sapiens*) were reaching Britain for the very first time. By that point our species had already existed for about 250,000 years, but for most of that time our ancestors had all lived in Africa. So, 40,000 years ago, intrepid bands of *hunter-gatherers* were on the move, gradually occupying the rest of the world.

Compared with the way you live today, life was unrecognizably different for your ancestors 1,500 generations ago. On every continent, temperatures were typically five or six degrees Celsius **colder** than today's, and ice, up to a mile thick, covered huge parts of the globe. As sliding glaciers scoured the rocks, they stirred up clouds of rock dust that dimmed the sun and fell in drifts across the wintry landscapes.

In short, life was tough. And humans were just another kind of fairly insignificant animal.



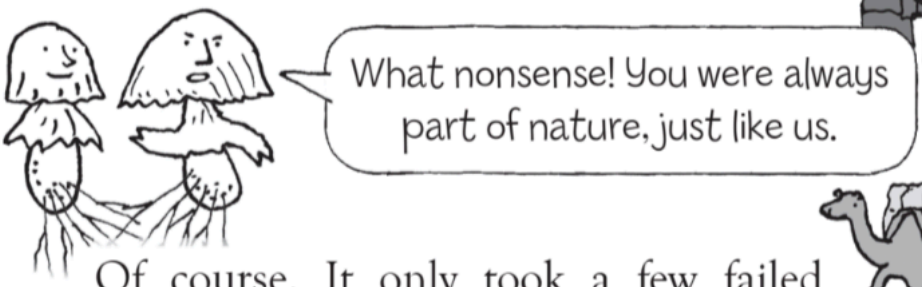
Exactly. It was a far wilder age, and your human ancestors would never have doubted that they were **part of nature**. At any moment, a blizzard, a *cave lion* or even a small infected cut could have brought life to an abrupt end. As a result, the human population of the entire planet was about the same as that of a large town today.



But, against the odds, humans clung on and, eventually, the population started to grow. By pooling ideas, controlling fire and inventing more effective tools and weapons, they began to clear patches of forest and have a bigger impact on the wildlife around them.

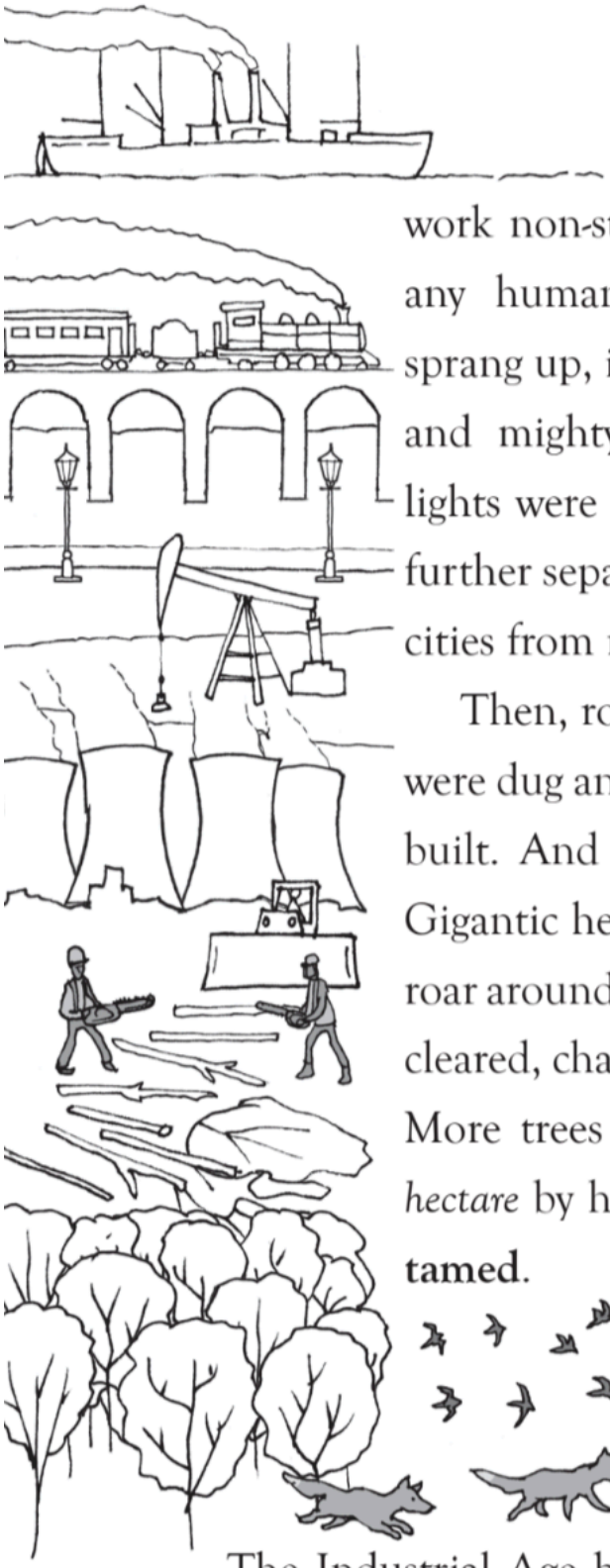
Then, around 11,000 years ago, the Ice Age finally ended. As the climate became less harsh, some groups of people started to farm, burning and hacking their way through more forest to create their fields. Eventually, around 9,000 years ago, the global population swelled to around 10 million (the same as Portugal today), and the first cities appeared.

Over the centuries, humans built towering pyramids and mighty castles; they formed religions; fought wars; used sailing ships, carts, camels and mules to shift themselves and their goods from place to place, while their horses and oxen ploughed up ever more land. As our ancestors' knowledge grew, a dangerous new idea started to spread: that human beings were **separate** from the rest of nature.



Of course. It only took a few failed harvests or a deadly disease to remind people that they were still at nature's mercy – during the 1300s a disease pandemic known as the Black Death killed around 25% of all people alive at the time.

Despite regular setbacks, the human population managed to keep growing, slowly but surely. Then, around 250 years ago, everything suddenly started to speed up as we entered the Industrial Age. Newly invented coal-powered steam engines could



work non-stop, 24/7, with far more power than any human or other animal. Huge factories sprang up, iron railways snaked across continents and mighty steamships plied the oceans. Gas lights were soon illuminating streets and homes, further separating the human world of towns and cities from nature.

Then, roughly 150 years ago, the first oil wells were dug and the first electric power stations were built. And the pace of change got **even faster**. Gigantic herds of cars, ships and planes began to roar around the globe. Tractors hauled, bulldozers cleared, chainsaws hacked. More roads were built. More trees were felled. More fish netted. And, *hectare* by hectare, more and more wild land was **tamed**.

The Industrial Age brought all sorts of benefits for many humans. With more food and medicines available, people started living longer, healthier lives. As they spent less time shivering, hiding from predators and growing their own food, more and more people started to believe that they had a right to take whatever they wanted from the natural world. And they

didn't think twice about dumping their waste all over it.

At this point most people didn't just start to see themselves as separate from nature, they began to think they could **control** nature, that they were in **charge** of it.

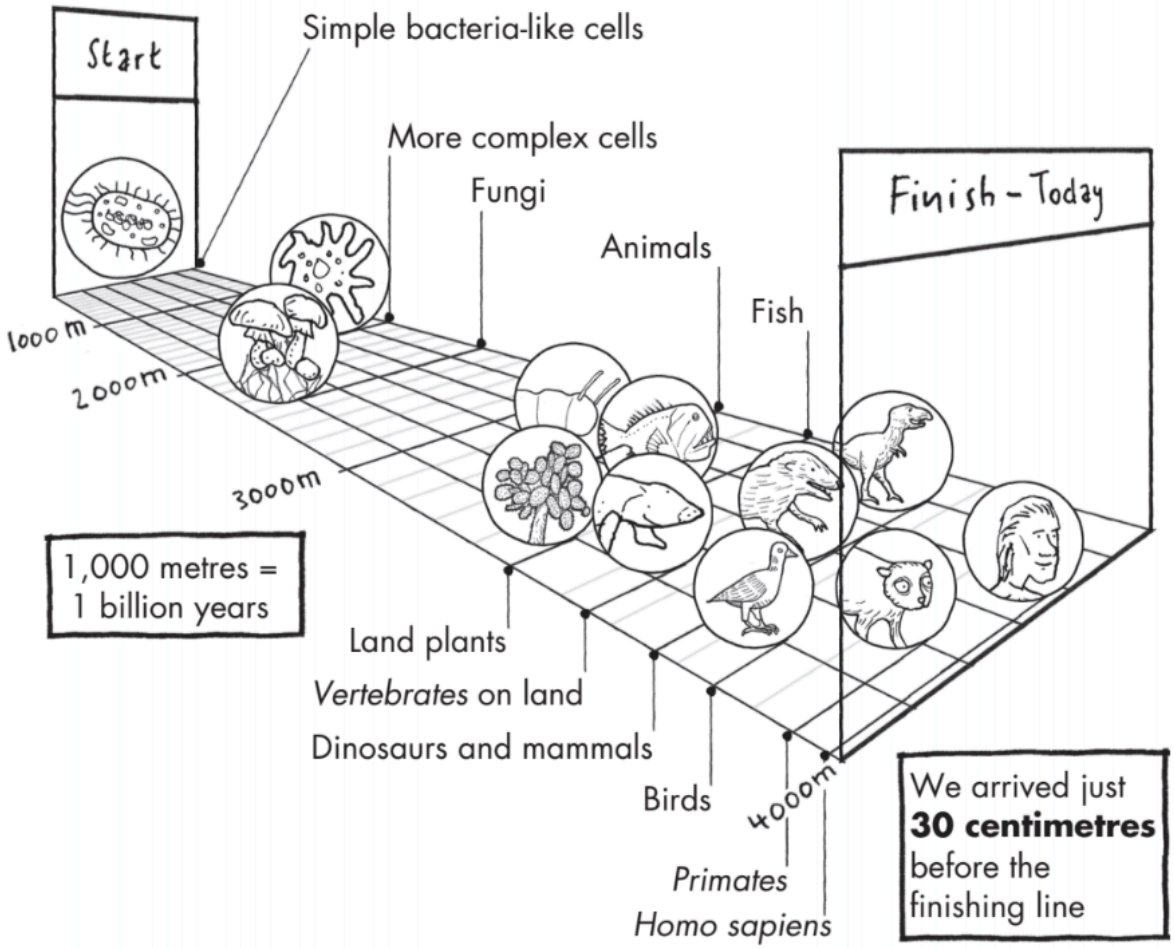
And in some ways, we humans really have taken charge . . .

Welcome to the *Anthropocene*

In 2020 scientists worked out that all the human-made things in the world – i.e. all houses, supermarkets, electricity pylons, motorways, umbrellas, chopsticks, used nappies, books, iPhones, fake lawns, inflatable unicorns and everything else – are now heavier than the combined weight of **all the world's living things** – including every single blade of grass, tree, whale, fish, worm, parrot, cow, octopus, ant and bacteria. In other words, we've strewn our stuff all over the globe.

Our impact on the planet has become so massive that scientists call the current period of Earth's history the *Anthropocene epoch* – which is Greek for 'the new age of the humans'.

True. Life has existed on Earth for about four billion years. Our species, *Homo sapiens*, has been here for 'just' 300,000 years. To see how recent that is, imagine life's entire history as a 4,000 metre running race, with new species joining in once they evolve on Earth:



The Industrial Age played out during the final **quarter millimetre** of the race

That's why having a geological epoch named after us isn't anything to be proud of. Over the last two centuries our population has **exploded** to over eight billion (a two million per cent rise since the Ice Age). And it's still rising. During this time, our frantic activity has sparked both the biodiversity crisis **and** the climate crisis.

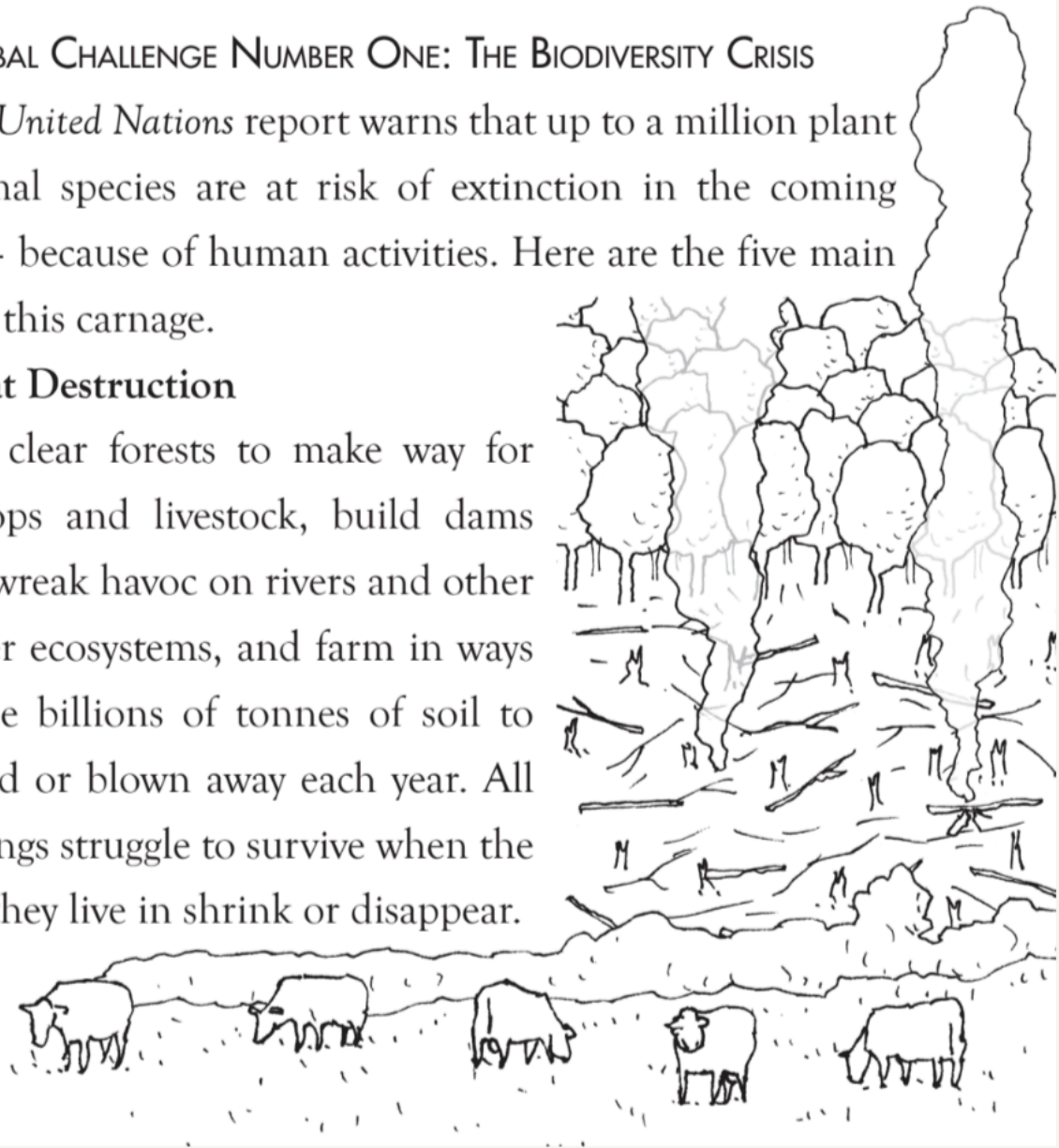
Before we can work out how exactly rewilding can fix things, we should take a closer look at how they got broken. Be prepared – this won't be pretty. Here's a crash course on the main causes of the **two biggest challenges** facing the world during the Anthropocene.

Global Challenge Number One: The Biodiversity Crisis

A recent *United Nations* report warns that up to a million plant and animal species are at risk of extinction in the coming decades – because of human activities. Here are the five main causes of this carnage.

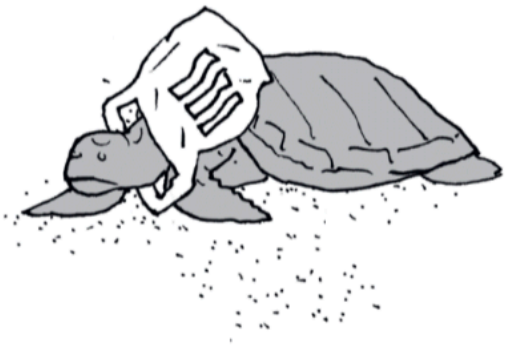
1. **Habitat Destruction**

Humans clear forests to make way for more crops and livestock, build dams that can wreak havoc on rivers and other freshwater ecosystems, and farm in ways that cause billions of tonnes of soil to be washed or blown away each year. All living things struggle to survive when the habitats they live in shrink or disappear.



2. **Pollution**

Pollution from human activities now affects **every** ecosystem on Earth. For example, the *fertilizers* farmers spread on their fields can create *dead zones* in rivers, lakes and seas (see p. 84), and *pesticides* are one of the main reasons insect numbers are plummeting around the world (see p. 124). Plastic waste that ends up in the oceans can have devastating effects on all kinds of marine life.



3. ***Invasive Species*** **and Diseases**

As people and goods criss-cross the planet like never before, other living things often travel with us – accidentally and intentionally. These can become invasive species that grow out of control, causing problems for local wildlife, for example:

- Water hyacinths from South America now grow in at least 50 other countries. They can form a thick green layer that stops sunlight and oxygen reaching other water creatures.

- A fungus that spread around the world on the skins of exported tropical frogs has become the **most deadly disease** ever discovered – at least for *amphibians*. So far, it has driven over 90 species to extinction.

• Even your pet cat (originally from the Middle East) is an invasive predator. Scientists estimate that pet cats threaten over 400 species of bird, mammal and reptile globally.

4. **(Too much) Fishing and Hunting**

For most of our history, hunting, trapping and fishing have been vital for our survival. But today there are **billions** of us. And catching wild animals is not a sustainable way to feed everyone.

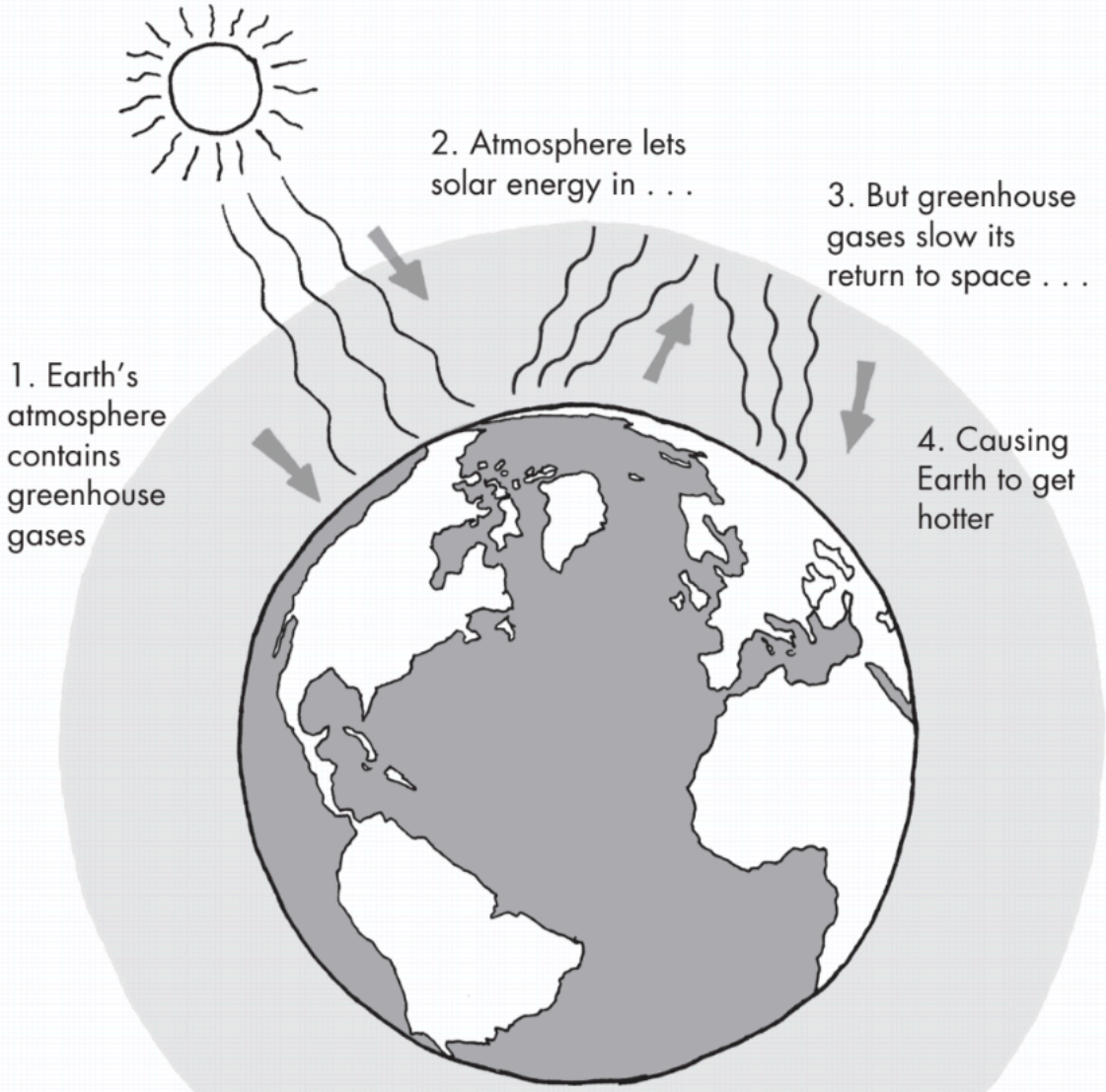
• Marine scientists say that at least one-third of the world's fish populations are crashing because of over-fishing.

• A huge 2021 study looked at dozens of bird, mammal and reptile species that are caught for their meat, kept as pets or used in traditional medicines. The conclusion was clear: populations of wild animals involved in the global wildlife trade are shrinking fast.

The **fifth** main cause of biodiversity loss is also our second global challenge: the climate crisis. Here it is in a nutshell.

1. The Greenhouse Effect

The *greenhouse gases* – e.g. *carbon dioxide* (CO_2), *methane*, *nitrous oxide* and *water vapour* – exist at low levels in Earth's *atmosphere*.



Like the glass in a greenhouse roof, greenhouse gases let *solar energy* from the sun **in**, but stop some of it returning immediately to space, after it bounces **off** the planet's surface.

Without greenhouse gases, Earth's surface would be around –18 degrees Celsius and life as we know it would be impossible.

During the Industrial Age, human activities started producing these gases in truly colossal amounts and today . . .

2. **Greenhouse Gas Levels Are STILL Rising**

Around **three-quarters** (73%) of all human-made greenhouse gas emissions come from burning *fossil fuels* (coal, oil and natural gas), which produce most of the energy that keeps our world moving, as well as a stupendous amount of carbon dioxide gas.

We've pumped enough extra greenhouse gases into the air to raise average temperatures by more than one degree Celsius since the 1800s. That might not sound like much of a jump, but it's already altering weather patterns and causing more extreme storms, droughts, heatwaves and wildfires. It's making life harder for hundreds of millions of people across the globe. And it's taking its toll on our planet's ecosystems. For example:

- Bush fires in Australia during 2019–20 scorched an area nearly the size of the whole of New Zealand, killing or

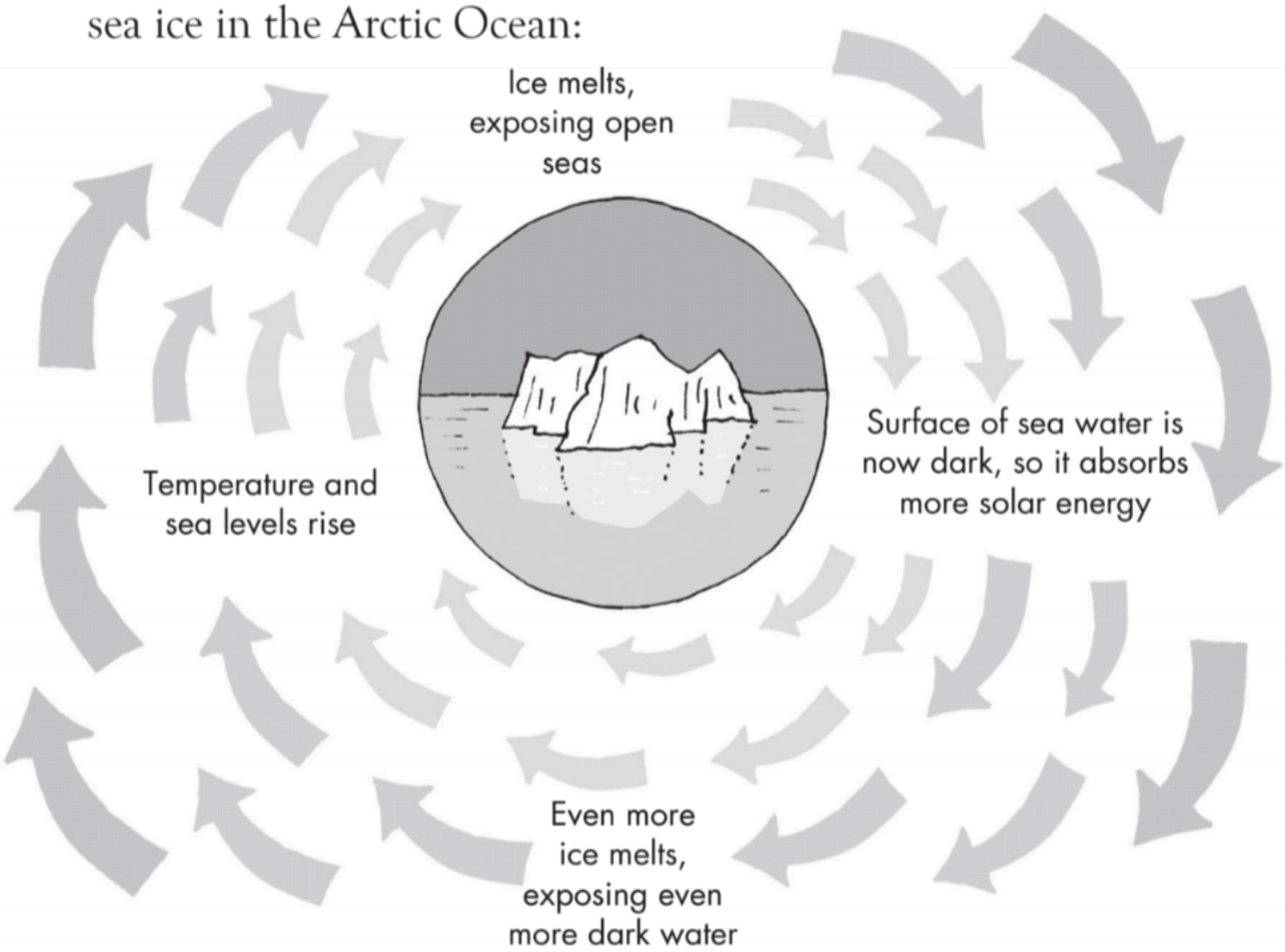
displacing three billion mammals, birds, reptiles and amphibians. Fires like these are becoming more common and destructive.

• Sea levels are rising and oceans are becoming warmer and slightly more acidic, damaging coral reefs and many other marine life forms.

And if we don't act soon . . .

3. **Things Could Get *Much* Worse**

Many climate scientists are really anxious about '*positive feedback loops*': changes to the climate that trigger further changes that make the climate crisis worse and worse, like this one involving sea ice in the Arctic Ocean:



Feedback loops often involve wild ecosystems. If lots of them kicked in at the same time, they could push the climate past a series of irreversible *tipping points*.

These **could** be real headlines by the early 2100s:

TEMPERATURES UP BY SCORCHING 4.5 DEGREES CELSIUS

ARTIC ICE CAPS VANISH FOR EVER

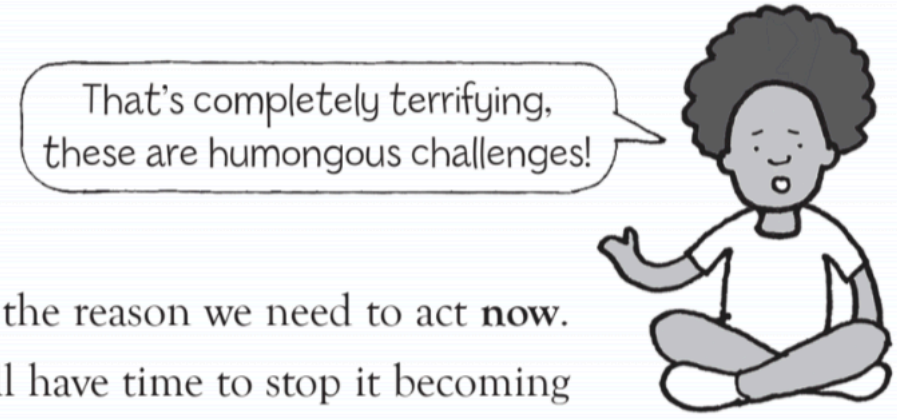
WILDFIRE CATASTROPHE: BILLIONS OF ANIMALS PERISH

FAILED HARVESTS TRIGGER REFUGEE CRISIS

AMAZON RAINFOREST DESTROYED

WORLD'S CORAL REEFS NEARLY ALL GONE

NEW YORK SWAMPED BY RISING SEA LEVELS



It's the reason we need to act **now**. We still have time to stop it becoming reality. And right now, the biodiversity and climate crises are making each other **worse**. We need to take urgent action on both – which is where rewilding really can help.

By now, most of us understand that the main thing we need to do to slow down the climate crisis is to wean ourselves off fossil fuels.

Far fewer people know that rewilding could be **just as important**. Biodiverse ecosystems have the power to both slow the climate crisis **and** help living things cope when the climate changes in the future.

When it comes to protecting and, wherever possible, **increasing** the variety and abundance of our planet's priceless biodiversity, rewilding – like crazy – is 100% our best hope.

Right. But if this is going to work, we humans have got to remember that we're as much a part of the natural world today as our ancestors were back in the last Ice Age. And no amount of fancy technology will change the simple fact that, if the ecosystems that sustain us die, we die.

Now we know how things got messed up, it's time to get to grips with how nature goes about its business, filling our world with colour and life.

So let's venture boldly . . . into the wild.