**About 300 million years ago, not long after the most basic forms of life had found their way out of the sea, our planet’s atmosphere contained quite a lot of carbon dioxide. About 8000 parts per million in fact, which is about 20 times more than today.**

**It didn’t take long for evolution to figure out a way to combine the energy in sunlight with the carbon in the atmosphere to make things grow. That process was photosynthesis, and one of the very earliest products of photosynthesis was trees.**

**A few hundred million years later trees had evolved into countless different species covering most of the land mass of the planet, and carbon dioxide levels in the atmosphere had dropped to as low as a hundred parts per million.**

**As early humans evolved, they figured out that if they bashed some flint with an axe to put a spark into some tinder then, if they were lucky, they could make twigs and branches from trees catch fire.**

**The benefits to humans that came from that discovery were of course quite profound, including heat and light, security from predators and bigger brains from the higher calorific content of cooked meat, all of which resulted in rapid human colonization of just about every corner of the planet, with trees providing for most of our energy, shelter and transport needs.**

**Fast forward to the 21st Century and our species was beginning to take stock of what we’d collectively achieved.**

**A 2015 study published in Science magazine found that there were only half as many trees on earth as there were when human civilisation arose, and that we were losing about 15 billion more every single year.**

**And that wasn’t ideal because trees really are very good at removing CO2 from the atmosphere, which is kind of what we need to happen very quickly to avoid runaway temperature increases and catastrophic climate change.**

**In that same year, the nations of the world got together in Paris and agreed to hold global average temperature rise to well below 2 °C.**

**In 2017 The US National Academy of Sciences published their own study showing that natural climate solutions including conservation, restoration, and improved management of global forests, could be employed to provide more than one-third of the cost-effective climate mitigation needed between now and 2030 in order to meet the Paris targets.**

**It all looked very encouraging. It felt like the world had woken up and taken a bit of collective responsibility for its actions.**

**Then Donald Trump withdrew the United States from the Paris Accord.**

**And then this guy got elected as leader of Brazil and custodian of one of the largest and most important areas of rainforest on the planet.**

**And that’s not gone well.**

**Hello, and welcome to Just Have a Think.**

**Donald Trump’s efforts to reverse American progress on climate mitigation are well documented, but this timeline, recently developed by the Wilderness Society, shows us the astonishing number of retrograde steps his administration has managed to implement in just 3 and a half years.**

**Trump and his officials began opening up public lands to the energy industry immediately after he took office in January 2017. Ever since then, it’s been hard to keep track of all the regulation rollbacks and revoked protections.**

**I’m not expecting you to read every single one of these policy decisions and executive orders as they roll by your screen. There’s simply too many of them to take on board in one go. But you can go to this website to use the interactive version for yourself, where you can view the timeline in 3D or 2D versions.**

**And of course, I’ll leave a link to that site in the description box below.**

**Countering Trumps actions are major initiatives all over the world to rapidly accelerate reforestation and the restoration of ecosystems.**

**In March 2019 the United Nations declared a Decade of Ecosystem restoration.**

**Their stated aim is to**

**“massively scale up the restoration of degraded and destroyed ecosystems as a proven measure to fight the climate crisis and enhance food security, water supply and biodiversity. “**

**Tree planting will be a major feature of this new initiative. But simply planting billions of new trees all over the planet isn’t necessarily a quick fix solution to our climate crisis.**

**Not all forests are the same for a start. In fact, depending on their geographic location, the composition of tree species in our planets woodlands varies widely.**

**Tropical rainforests generally have higher tree density than forests in northern Europe. They also tend to support more biodiversity and store more carbon per hectare.**

**And many of the world’s most endangered species of animals and plants rely on tropical rainforests for their survival.**

**The folks at Global Forest Watch have combined data from dozens of studies worldwide to generate a powerful algorithm that drives this interactive map of forestry cover all over the world.**

**The green areas represent existing forestry. Areas of tree loss are shown in red and areas of tree gain are represented in blue, so the redder an area gets, the worse the net tree loss is.**

**And then they overlay areas with emerging hotspots in yellow.**

**And that’s where Jair Bolsonaro comes into the picture.**

**Throughout the twentieth century Brazil’s relationship with the Amazon rainforest was always a battle between ecosystem sustainability and national economic prosperity.**

**The first cracks in the Amazon started in the nineteen twenties as modern communication links grew between the eastern side of Brazil and the western parts of South America. That encroachment accelerated rapidly between the nineteen sixties and the nineteen eighties under the countries long period of military rule.**

**During that time the existing roads were expanded into major highways, dams were built, and mines were opened up across large areas of the rainforest.**

**A ray of hope did appear in the mid-eighties when the military dictatorship ended and a new, democratically elected government, headed by President Tancredo Neves, took over.**

**That administration started to work alongside the indigenous people of the Amazon to make historic reparations and provide them with a legal mechanism to reclaim some of their land. A government agency called FUNAI was set up to allocate protected zones across the territory.**

**During the Presidency of Lula Da Silva, between 2003 and 2010, 87 new reserves were approved in the Amazon, but the lobbyists from the agricultural, mining and logging companies were growing in strength all the time and as successive administrations came along, so funding for FUNAI decreased and the balance of power began to move back in industry’s favour.**

**Bolsonaro’s immediate predecessor, Michel Temer only managed to approve one new protected area during his time in office from 2016 to 2018.**

**Bolsonaro himself made no secret of his disdain for indigenous lands and his desire to eradicate them. In fact, he made it a major campaigning issue in the run up to the presidential elections.**

**And now the industrial pressure groups have their man in power, so they feel like nothing can stop what they regard as the relentless march of progress.**

**Unsurprisingly, Bolsonaro has not approved any new protected areas. In fact, he’s slashed FUNAI’s funding, sacked its existing boss, and appointed a guy called Marcelo Xavier da Silva to head up the department – a man with very strong ties to the agricultural industry.**

**The result has been a massive increase in illegal invasions of protected zones by loggers during the first year of Bolsonaro’s regime.**

**And while most governments around the world have locked down their economies during the first half of 2020, in an attempt to protect their populations from the worst effects of COVID-19, not only has Bolsonaro very publicly defied this generally accepted wisdom, but his administration has also turned a blind eye to a rampant increase in deforestation by criminal groups who spotted an opportunity to up their game while the world’s focus was elsewhere.**

**According to this BBC article, many of the field agents working to protect reserves have pulled out of the region in recent weeks, because of the pandemic, allowing loggers and miners to target these areas with the result that deforestation in the Amazon has jumped 55% in the first four months of 2020 compared with the same period last year.**

**In April, as the number of cases rose and states started adopting isolation measures, deforestation actually increased 64% compared with the same month in 2019, according to preliminary satellite data from Brazilian space agency INPE.**

**In May the space agency published a report highlighting the dangerous links between COVID-19 and deforestation. It said that wildfires that inevitably follow tree felling, contain pollutants that work their way into people's lungs, worsening the same respiratory issues that leave people more vulnerable to the coronavirus.**

**The report warns that a joint peak in forest fires and COVID-19 cases could overwhelm hospitals without what it called "incisive intervention by the State to curb illegal acts,"**

**Logging and wildfires, together with illegal mining and land clearances were already at an 11-year high, according to the BBCs research, and scientists say we're fast approaching a point of no return - after which the Amazon will no longer function as it should.**

**Climate Scientist Antonio Donato Nobre told the BBC**

**“The destruction of the Amazon rainforest up till now is much bigger than the almost 20% that they talk about in the media.”**

**He points out that to get a more complete sense of the scale of the destruction, you have to take into account the figures for overall degradation caused by fires, logging and unlicensed hunting. All of these things mean that even if an area doesn’t lose all its trees and vegetation, it can still become impossible for the ecosystem to function properly, which strips the rainforest of properties that are vital to the planet and the slowing of climate change.**

**We’re used to talking about feedback loops in the context of Climate Change, and the Amazon is rapidly providing us with another one to add to the list.**

**As trees are felled, the tree canopy becomes more open. That obviously reduces the number of animal species that can live high up in the trees, but it also means more wind at ground level, which takes moisture away from the soil leaving it drier and much more susceptible to forest fires, which in turn reduce the canopy still further and so on and so on.**

**Nobre reckons that if we take deforestation and degradation together then more than 50% of the Amazon now no longer performs a beneficial environmental service for the region’s climate.**

**The risk is that, In the next 20 to 30 years, up to a quarter of the entire Amazon area could suffer deforestation. That would mean a much longer dry season and higher forest temperatures. Trees would start to die as a result and today’s vast tropical rainforest would be transformed into a dry savannah.**

**So as usual, the question is, what can be done to stop this happening?**

**Well according to a Brazilian climatologist called CARLOS Nobre**

**"First, we should adopt a zero-deforestation policy in Pan Amazonas, immediately, together with a reforestation programme in the south, south-east and east of the Amazon, which are the most vulnerable areas."**

**He goes on to say**

**"If we could restore 60,000 or 70,000 sq km in this large area, where the dry season is already much longer, we could help the forest get back to working better and it would be more resilient."**

**That seems unlikely during the administration of Bolsonaro.**

**But earlier this month Civil society groups and public prosecutors in Brazil took Bolsonaro's government to court for failing to protect the Amazon rainforest.**

**Lawsuits filed at the beginning of June challenge the government on two fronts: reducing inspections of exported timber, and freezing climate funds to preserve forests that other countries also rely on to offset their carbon emissions.**

**That may not make a difference quickly enough though, according to Ricardo Galvao, a former director of INPE who was sacked by Bolsonaro in 2019.**

**Lawsuits that take years to complete are not going to produce results fast enough, he argues. His view is that to curb deforestation in the Amazon, the best tools are**

**"positive actions that show [that] exploring the forest, rather than destroying it, gives economic returns." And he suggests that international organizations like the UN should certify products from sustainably managed forests and countries should lower import taxes on verifiable "green-stamped" goods.**

**EcoWatch point out that Brazil has a legal commitment to reduce deforestation in the Amazon to a rate equivalent to about 3,900 square kilometres per year from 2020 onwards. In 2012, measures to protect the Amazon had brought deforestation down to 4,600 square kilometres, close to the target, but by 2019, it had rebounded to 9,800 square kilometres.**

**With any luck, Bolsonaro’s first term in office will also be his last. His attitude towards exploitation of the rainforests combined with his handling of the pandemic so far, have already alienated him from many Brazilian voters. That gives some hope that he may be removed at the next democratic opportunity, which is at the next general election on 2nd October 2022.**

**And if there’s any justice in the world at all then an investigation currently looking into alleged obstruction of justice may bring impeachment proceedings that could remove him from power even sooner.**

**Until that happens the world will need to rely on the herculean efforts being undertaken by environmental organisations and governments all over the world to put in place national programmes of reforestation and land restoration elsewhere that might help to compensate for the devastation currently being brought about in Brazil.**

**Research shows that more than two billion hectares of the world’s deforested and degraded landscapes offer
potential for restoration. The UN Decade of EcoSystem Restoration highlights The Bonn Challenge which aims to restore degraded ecosystems in areas of land with the combined size of India by 2030, and the AFR100 African Forest Landscape Restoration Initiative which will bring another 100 million hectares of degraded land under restoration over the next decade.**

 **And there’s a multitude of other initiatives, large and small, going on all over the planet to restore areas that our human activities have decimated over the years.**

**Those efforts are so numerous that the details of what each of them is specifically aiming to achieve are outside the scope of this video, but I’ll definitely be returning to check out their progress in future episodes.**

**In the meantime, get yourself involved if you can. All of these groups rely heavily on donations and voluntary support and activism from ordinary folks like you and me. And there’s something going on just about everywhere, so you can choose the geographic region of restoration that you feel most strongly about or that you’re most able to support.**

**And of course, if you have news, views or useful information that you can share with us all then dive down into the comments section below and leave your thoughts there.**

**That’s it for this week though.**

**A massive thank you as always to the channel’s supporters over at Patreon who allow us to maintain 100% independence, and a special shout out to the folks who joined the Patreon team since last time, with pledges of ten dollars or more a month.**

**They are**

**Richard Swain**

**Andrew Coleman**

**Gak Man**

**Charlotte Melia**

**Richard Pardoe**

**And**

**Mikkel Nørgaard**

**And of course, a big thank you to everyone else who’s joined our Patreon page since our last video.**

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**As always, thanks very much for watching,**

**Have a great week and remember to just have a think**

**See you next week.**