BUSH FIRES IN AUSTRALIA-The nature’s giant furnace.

**Bushfires in Australia** are a widespread and regular occurrence that has contributed significantly to shaping the nature of the continent over millions of years. Eastern Australia is one of the most fire-prone regions of the world, and its predominant eucalyptus forests have evolved to thrive on the phenomenon of bushfire. However the fires can cause significant property damage and loss of both human and animal life. Bushfires have killed approximately 800 people in Australia since 1851 and billions of animals. The gradual drying of the Australian continent over the last 15 million years has produced an ecology and environment prone to fire, which has resulted in many specialized adaptations amongst flora and fauna. Some of the country's flora has evolved to rely on bushfires for reproduction. Aboriginal Australians used to use fire to clear grasslands for hunting and to clear tracks through dense vegetation, and European settlers have also had to adapt to using fire to enhance agriculture and forest management since the 19th century. Fire and forest management has evolved again through the 20th and 21st centuries with the spread of national parks and nature reserves, while human-caused global warming is predicted to continue increasing the frequency of blazes.

Between 1 November 2019 and 31 January 2020, Australia had one of the worst bush fires in history. The deadliest bushfire disaster was that of "Black Saturday" in February 2009 when 180 people died in Victoria. 2019 had been the hottest record year for Australia. Fires have raged near the Australian capital Canberra for weeks, and had shut down the city's airports as flames approached the perimeter. A little more than 24 and a half million acres that have been affected can compare to the 32 million acres of England. Grass fires typically can spread around 14 miles per hour.

In recent times most major bush fires have been started in remote areas by dry lightning or by electric power lines being brought down or arcing in high winds. Many fires are as a result of either deliberate arson or carelessness, however these fires normally happen in readily accessible areas and are rapidly brought under control. Man-made events include arcing from overhead power lines, arson, accidental ignition in the course of agricultural clearing, grinding and welding activities, campfires, cigarettes and dropped matches, spark from machinery, and controlled burn escapes. They spread based on the type and quantity of fuel that is available. Fuel can include everything from trees, underbrush and dry grassy fields to homes. Wind supplies the fire with additional oxygen pushing the fire across the land at a faster rate.

Large, violent wildfires can generate winds of their own, called fire whirls. Fire whirls are like tornadoes and result from the vortices created by the fire's heat. When these vortices are tilted from horizontal to vertical, this creates fire whirls. These whirls have been known to hurl flaming logs and burning debris over considerable distances.

Some reports indicate that a changing climate could also be contributing to the ferocity of the 2019–20 fires with hotter, drier conditions making the country's fire season longer and much more dangerous. Strong winds also promote the rapid spread of fires by lifting burning embers into the air. This is known as spotting and can start a new fire up to 40 kilometers (25 mi) downwind from the fire front. In the Northern Territory fires can also be spread by black kites, whistling kites and brown falcons. These birds have been spotted picking up burning twigs, flying to areas of unburned grass and dropping them to start new fires there. This exposes their prey attempting to flee the blazes: small mammals, birds, lizards, and insects.

**Climate change**

Australia's climate has warmed by more than one degree Celsius over the past century, causing an increase in the frequency and intensity of heat waves and droughts. Eight of Australia's ten warmest years on record have occurred since 2005. A study in 2018 conducted at Melbourne University found that the major droughts of the late 20th century and early 21st century in southern Australia are "likely without precedent over the past 400 years". Across the country, the average summer temperatures have increased leading to record-breaking hot weather, with the early summer of 2019 the hottest on record. 2019 was also Australia's driest every year since 1900 with rainfall 40% lower than average.

Heat waves and droughts dry out the undergrowth and create conditions that increase the risk of bushfires. This has become worse in the last 30 years. Since the mid-1990s, southeast Australia has experienced a 15% decline in late autumn and early winter rainfall and a 25% decline in average rainfall in April and May. Rainfall for January to August 2019 was the lowest on record in the Southern Downs (Queensland) and Northern Tablelands (New South Wales) with some areas 77% below the long term average.

In the 2000s the Intergovernmental Panel on Climate Change (IPCC) concluded that ongoing anthropogenic climate change was virtually certain to increase in intensity and frequency of fires in Australia – a conclusion that has been endorsed in numerous reports since. In November 2019, the Australian Climate Council published a report titled *This is Not Normal* which also found the catastrophic bushfire conditions affecting NSW and Queensland in late 2019 have been aggravated by climate change. According to Nerilie Abram writing in *Scientific American* "the link between the current extremes and anthropogenic climate change is scientifically indisputable". In 2020, an international team of scientists found the hot and dry conditions that helped drive Australia’s 2019-2020 bushfire crisis would be eight times more likely to happen if the earth warms by 2C.

**Carbon emissions**

Until the 2019–2020 Australian bushfire season, the forests in Australia were thought to reabsorb all the carbon released in bushfires across the country. This would mean the forests achieved net-zero emissions. However, scientists now say that global warming is making bushfires burn more intensely and frequently and believe the 2019-2020 fires have already released approximately 350 million tonnes (390 million short tons) of carbon dioxide – as much as two-thirds of Australia's average annual carbon dioxide emissions (530 million tonnes (580 million short tons) in 2017) in just the past three months. David Bowman, professor of [pyrogeography](https://en.wikipedia.org/wiki/Pyrogeography" \o "Pyrogeography) and fire science at the University of Tasmania warned that so much damage has been done that Australian forests may take more than 100 years to re-absorb the carbon that has been released so far this fire season.

In January 2020, the British Met Office said Australia's bushfires in 2019-2020 were expected to contribute 2% to the increase in the atmospheric concentration of major greenhouse gases which are forecast to hit 417 parts per million, one of the largest annual increases in atmospheric carbon dioxide on record. Climate studies show that conditions which promote extreme bushfires in Australia will only get worse as more greenhouse gases are added to the atmosphere.

**Impact on wildlife**

Bush fires kill animals directly and also destroy local habitats, leaving the survivors vulnerable even once the fires have passed. Professor Chris Dickman at Sydney University estimates that in the first three months of the 2019–2020 bushfires, over 800 million animals died in NSW, and more than one billion nationally. This figure includes mammals, birds, and reptiles but does not include insects, bats or frogs. Many of these animals were burnt to death in the fires, with many others dying later due to the depletion of food and shelter resources and predation by feral cats and red foxes. Dickman adds that Australia has the highest rate of species loss of any area in the world, with fears that some of Australia's native species, like the Kangaroo Island dunnart, may even become extinct because of the current fires.

Koalas are perhaps the most vulnerable because they are slow-moving. In extreme fires, koalas tend to climb up to the top of a tree and curl into a ball where they become trapped. In January 2020 it was reported that half of the 50,000 koalas on Kangaroo Island off Australia's southern coast, which are kept separate to those on the mainland as insurance for the species’ future, are thought to have died in the previous few weeks.

Wildlife ecologist Professor Euan Ritchie from Deakin University says that when fires have passed, frogs and skinks are left vulnerable when their habitats have been destroyed. Loss of habitat also affects already endangered species such as the western ground parrot, the Leadbeater's possum, the Mallee emu-wren (a bird which cannot fly very far), and Gilbert's potoroo. Beekeepers have also lost hives in bushfires.

Kangaroos and wallabies can move quickly trying to escape from fires. However, the Guardian reported in January 2020 that dozens, maybe hundreds of kangaroos "perished in their droves" as they tried to outrun the flames near Batlow in NSW. The most resilient animals are those that can burrow or fly. Possums often get singed, but can sometimes hide in tree hollows. Wombats and snakes tend to go underground.

Economic impact

Economic damage from 2009's Black Saturday fires, the costliest in Australia's history, reached an estimated A$4.4 billion. Moody's Analytics says the cost of the 2019–2020 bushfires is likely to exceed even that figure and will cripple consumer confidence and harm industries such as farming and tourism. Medical bills from the current fires and smoke haze are expected to reach hundreds of millions of dollars with one analysis suggesting disruptions caused by the fire and smoke haze could cost Sydney as much as A$50 million a day. The Insurance Council of Australia estimates that claims for damage from the fires would be more than A$700 million, with claims expected to jump when more fire-hit areas become accessible. In January 2020, it was reported that the [ANZ](https://en.wikipedia.org/wiki/Australia_and_New_Zealand_Banking_Group) gauge of consumer confidence fell to its lowest level in more than four years.

In response to the current fires, the federal government announced that compensation would be paid to volunteer firefighters, military personnel would be deployed to assist, and an A$2 billion bush fire recovery fund would be established. New South Wales, which has been hardest hit by the crisis, has pledged A$1 billion focused on repairing infrastructure.