

# How the Threat to Entire Ecosystems in Australia Impacts Climate Change

January 24, 2020 | Doria Lotan

The headlines of most major publications around the world that are reporting on the devastating wildfires that continue to plague Australia have been since the very beginning largely focused on a loss of biodiversity and a threat to ecosystems. The number of human lives lost is reported with great sadness, but the emphasis over the past five months on the mass death of wildlife has been of major concern, with the image of thirsty koala bears and burnt kangaroos etched into our collective minds. But what does a loss of biodiversity and a threat to ecosystems really mean, and how are these scientific terms relevant to the discussion on the long-term global effects of climate change?

Fundamentally, the function of an ecosystem is to maintain a balanced exchange of energy and nutrients

in the food chain. These exchanges sustain plant and animal life on the planet and are responsible for the necessary decomposition of organic matter and for energy production.<sup>1</sup> The ecosystem serves society’s everyday needs and supports life. We rely on our ecosystems to, among other things, purify the air we breathe, sequester carbon to regulate our climate, cycle nutrients so we can access clean water and pollinate our crops. There is, therefore, a direct correlation between our increased dependence on healthy ecosystems and growth in the world’s population. As the population of the world continues to grow, so does our dependence on healthy ecosystems to provide the necessities essential to our survival.<sup>2</sup>

## But how does all this affect climate change?

### 1. COMPROMISED STABILITY

The stability of our ecosystems is largely related to the diversity of the species within the specific system. For example, forests such as the ones currently burning in Australia contain plants that are responsible for harnessing the energy of the sun in order to reduce carbon through photosynthesis. As such, a decrease in the productivity of an ecosystem directly correlates with a decrease in the rate at which carbon dioxide is being removed from the atmosphere by that system. The stability of the system — its ability to maintain consistent levels of removal of greenhouse gases from the atmosphere — is thus greatly compromised.

### 2. COMPROMISED FUNCTION

Ecosystems such as the ones found in the forests of Australia and surrounding oceans are considered **carbon sinks**, functioning very much like a sink by draining the carbon dioxide that is released into the atmosphere, absorbing it, and keeping it out of harm’s way. According to the Global Carbon Project, on a global level, carbon sinks absorb about 55 percent of the human-made carbon emissions each year.<sup>3</sup>

For millions of years, the island continent of Australia was isolated from the rest of the world, creating optimal conditions for evolution to take place uninterrupted by human influence. It is therefore no surprise that Australia is considered one of the great **biodiversity** centers in the world. Wildfires have always been a common occurrence in Australia, with many of the fire-adapted ecosystems dependent on periodic fires to promote plant and wildlife diversity, burn away accumulations of dead plants, and maintain habitat structures. And while some of the continent’s naturally dry regions are expected to go up in flames every year during the dry season, this season’s fires have burned in many habitats that usually do not burn and thus have little tolerance to fire, leaving the wildlife and plants in these habitats vulnerable and defenseless. With fires still

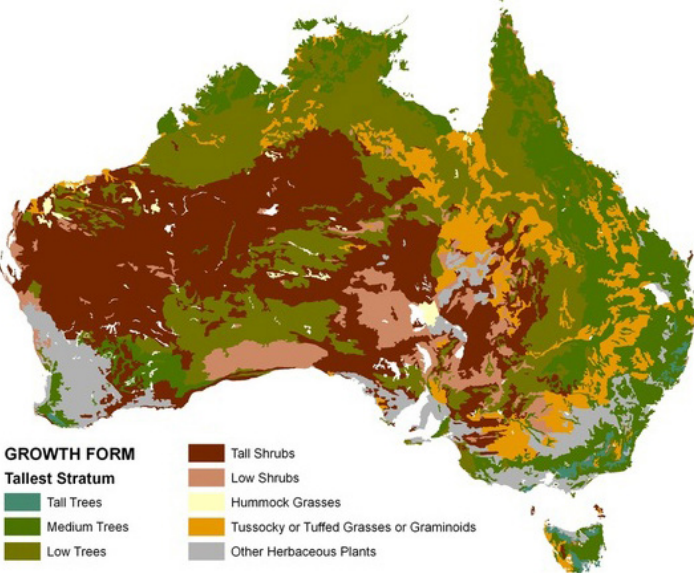


Figure 1. Growth Form. Copyright 2016 by Commonwealth of Australia

devastating the country, it is estimated that 17.9 million acres of land have already burned. The toll these fires have taken on wildlife has been unprecedented, with scientists reporting that more than a billion animals have already perished with the inevitable loss of habitat and food sources likely to raise that number drastically in the months and even years to come.

What we are now facing is a combination of two major issues working together to potentially accelerate the environmental devastation caused by excess carbon emissions on a global level. We have on the one hand unsustainable amounts of carbon being emitted into the atmosphere by forest fires, and on the other hand we have a breakdown of the natural ecosystems that are in place to defend us from them. With many forest ecosystems around the globe wiped out by longer-than-usual fire seasons and with ocean ecosystems pulling in so much more CO2 than they can handle, the function of these ecosystems as natural sponges of toxic carbon emissions becomes ineffective. The Australian bushfires are therefore a wake-up call to recognize that any threat to the life of an ecosystem in any part of the world is a threat to our way of life in every other part of the world.

<sup>1</sup> E.E. Cleland (2011). Biodiversity and ecosystem stability. *Nature Education Knowledge* 3(10):14. <https://www.nature.com/scitable/knowledge/library/biodiversity-and-ecosystem-stability-17059965/>.

<sup>2</sup> Biodiversity & human well-being. *Green Facts*. <https://www.greenfacts.org/en/biodiversity/l-3/1-define-biodiversity.htm>.

<sup>3</sup> A. Kenward (July 19, 2011). Climate change may make carbon sinks less effective, studies say. *Climate Central*. <https://www.climatecentral.org/news/forests-and-oceans-help-store-carbon-but-are-vulnerable-to-climate-change>.