

Fire! Why are Wildfires Increasingly Frequent?

In the longer term, it is predicted that an increase in global carbon dioxide will affect tropical and sub-tropical savannahs and grasslands by shifting them towards woody vegetation which, in turn, will lead to a reduction in fires.

BY FELIX PATTON

Mount Kenya, Aberdares, Mount Kilimanjaro, Rwenzori Mountains. East Africa's world-renowned forest areas and nationally vital water catchments have all suffered devastating wildfires in recent years. Such fires are getting more frequent and more severe not just in East Africa but worldwide.

Fire has long been a method of controlling and improving habitat but a wildfire is one which, however, caused, burns out of control. Climate change has led to increased drought, high air temperatures, low relative humidity,

dry lightning and strong winds which have, according to a new report by the United Nations Environment Programme (UNEP), resulted in hotter, drier and longer fire seasons.

These dangerous weather conditions are also causing vegetation that would not normally burn, such as rain forests, permafrost and peatland swamps, to dry out and combust. Large amounts of irrecoverable carbon are stored in peatlands and forests so, when burning, release vast quantities of carbon dioxide into the atmosphere enhancing global warming.

Forests are the "lungs" of the Earth taking up and storing carbon dioxide and giving off oxygen. The second-largest tropical forest, (after the Amazon), is in the Congo basin of which some one third is in the Democratic Republic of Congo



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Another factor to consider concerning an increase in wildfires is the impact on a growing human population found in and around high-risk fire areas.

(DRC). Recent wildfires have been blamed on a seasonal rise in temperature and the out of control burning of surrounding savannah as practised as ‘slash and burn agriculture’.

Backing on to the DRC are the Rwenzori Mountains of western Uganda which, in 2012, suffered from a major wildfire that had been thought impossible so lacked adequate control measures.

These forests, along with those of the likes of the Aberdares and Mount Kenya, are water catchment areas, vital for maintaining the rivers that supply water for wildlife and communities in their surroundings. Fuel management practices, which may include controlled fires, within the forests are essential to maintain the desired yield and quality of water from the catchment. High-intensity wildfires can adversely affect the future water yield and quality for several years, even decades.

Water storage in these areas can be enhanced by reducing a targeted amount of live vegetation using controlled burning, animal rewilding, grazing or mechanical means. This is known as landscape rewetting and it can help buffer against dry periods by preserving soil and vegetation moisture. Forest thinning, wetland restoration and the reintroduction of landscape engineering species (e.g., beavers) can enhance water storage capacity within forested watersheds, with the beneficial side effect of reducing general sensitivity to fire.

Where water-supplying catchments experience extreme fire events, it is important to be able to measure, monitor and mitigate against any post-fire issues. One detrimental side effect of a wildfire is the possibility of hillside erosion (landslides) after a subsequent major rainfall.

Another factor to consider concerning an increase in wildfires is the impact on a growing human population found in and around high-risk fire areas. Human activity is considered the primary source of ignition in the tropical forests, savannah and agricultural regions of Africa.

In Kenya, a recent wildfire in Kirisia Forest has been attributed to honey harvesters or charcoal makers who have also been blamed for fires in the Aberdares. In 2019, over

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Most wildfires are started by people, but dry weather, drought, and strong winds can create a recipe for the perfect disaster which can transform a spark into a long blaze that consumes tens of thousands of acres. Another possible cause of forest fires is lightning.

90%
Percentage of all wildfires that are man-made. Human causes of wildfires can range from discarding cigarette filters to leaving campfires unattended.

CONSERVATION



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80,000 hectares of forest were destroyed by fire in Mount Kenya National Park, which was blamed on farmers clearing land to plant illegal marijuana while other sources blamed local honey gatherers and residents burning grass to kill ticks.

Fire needs fuel. Wherever there is sufficient fuel to maintain its spread, a fire can easily become a wildfire. In sub-Saharan Africa, dried out grasses provide the fuel for fires. However, in arid regions of Africa, lower rainfall, higher temperatures and drought can reduce the amount of grass and lead to a decline in burnt areas. In these situations, it is only when there is increased rainfall and subsequent greater grass growth, that leads to wildfires. In some cases, it will be important to prevent the build-up of the grass biomass by using controlled fire as a management tool.

In the longer term, it is predicted that an increase in global carbon dioxide will affect tropical and sub-tropical savannahs and grasslands by shifting them towards woody vegetation which, in turn, will lead to a reduction in fires.

Anything that burns is fuel – live or dead vegetative material – but it is fine fuel that influences the behaviour and spread of a wildfire. Fine fuel is largely comprised of leaves, bark, twigs, shrubs and grasses with a diameter of 3mm for live fuels and 6mm for dead fuels.

Invasive alien species have come to the fore in recent years and are becoming more prominent in forests, bush and grassland. Alien vegetation tends to burn more intensively than indigenous vegetation and is very difficult to control once they get established.

In 2017, one of the most damaging wildfire events was recorded in the Knysna region of the Western Cape of South Africa. The severity of the fires was intensified by an unprecedented drought, the conversion of natural fynbos shrublands to timber plantations and the invasion of alien trees, all in combination with a history of fire suppression that resulted in fuel build-up.

Often, only a change in weather conditions enables a wildfire to be brought under control. Technology is limited in its use as wildfire behaviour is highly dependent on the prevailing weather, fuel conditions and accessibility.

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Wildfires are a force of nature that can be nearly as impossible to prevent, and as difficult to control. Firefighters control a fire's spread by removing one of the three ingredients fire needs to burn: heat, oxygen, or fuel. They remove heat by applying water or fire retardant, fuel by cutting and digging to remove burnable vegetation and by deliberately setting fires to rob an approaching wildfire of fuel (fighting fire with fire).





PHOTO BY FELIX PATTON

Managing the fuel sources before a wildfire breaks out is vital but is not easy over a large area. Controlled burning, physical removal or chemical treatment can reduce the intensity (and therefore the likely impact) of a fire. Creating firebreaks – strips of land that are fuel-free and prevent the fire from spreading – are useful but often are not sufficiently well maintained over time.

While lightning strikes and human carelessness have long sparked uncontrolled blazes, human-induced climate change, land-use change, and poor land and forest management mean wildfires are more often encountering the fuel and weather conditions conducive to becoming destructive. Wildfires are burning longer and hotter and are flaring up in unexpected places. Other species also pay the price; besides a devastating loss of habitat, the smouldering swathes of land left behind in the wake of a wildfire are scattered with the charred remains of animals and plants possibly fast-tracking extinctions.

The interaction between ignition conditions, fuel biomass accumulation, rainfall seasonality and human management of fires

will determine the effect of climate change on wildfires in the future. Changes in rainfall are uncertain and increasing carbon dioxide and climate change will alter global projections for rainfall and fire frequency. Given this level of uncertainty, measures to control wildfires must be properly resourced and financed. ●

*Full detail of the report mentioned can be found in: United Nations Environment Programme (2022). **Spreading like Wildfire – The Rising Threat of Extraordinary Landscape Fires.** A UNEP Rapid Response Assessment. Nairobi.*

Download the report at <https://www.unep.org/resources/report/spreading-wildfire-rising-threat-extraordinary-landscape-fires>

Controlled burning roads with bush free margins are useful fire breaks but must be regularly maintained. Clearing up the working place from any flammables 10 to 25 feet around; avoiding the use of heating and spark-producing equipment near dried-up vegetation; restraining from working with potentially dangerous equipment in dry and windy weather; providing fire-extinguishing equipment for wildfire prevention concerns.



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