

Five years on – Remembering the Rural fires of 14th to 18th October 2017

Today 13th October 2022 is the International Day of Disaster Reduction.

It is appropriate therefore to look back 5 years to 2017, which will be remembered as one of the darkest years in Portuguese history, as far as the death toll from wildfires in Portugal is concerned. During that year, there were around 21,000 wildfires, which burned an area of 539, 920 ha of forests, shrub land and agricultural land causing 117 deaths.

Of these, two episodes stand out: Firstly the catastrophic fires in Pedrógão Grande in June that cost the lives of 66 people, followed by the fires in October the same year, which claimed the lives of a 51 more.

Safe Communities Portugal monitored the fires at the time, liaising closely with the then ANPC, has met Professor Domingos Viegas Director of the Association for the Development of Industrial Aerodynamics (ADAI) and of its Centre for Forest Fire Research (CEIF), who has authored the various reviews/investigations of the fires, as well as studying these reports and others in detail.



Five years almost to the day, this feature reflects on the October fires, which raged from 14th to 18th October 2017. These fires were perhaps unique, as the approach of Hurricane Ophelia both exacerbated the intensity of the fires and the rains from the storm on 17th, contributed to the extinguishing of the fires!

On 15th October more than 500 fires started and several of them developed into major fires burning a very large area (244,000 ha) in a relatively short period of less than 10 hours and causing devastation in a much wider area than the fires of Pedrógão Grande. There were seven major complexes of fire, most of them having more than one ignition point and were the result of several fires spreading in the same area'

2017 Weather conditions

The year 2017 presented extreme meteorological conditions, with a severe heatwave and extreme atmospheric instability in June and the influence of Hurricane Ophelia and record breaking-drought in October. These extreme conditions led to a multiplicity of wildfires, many active fire fronts and explosive fire behaviour, contributing to the catastrophic fires in the central and northern regions of the country, with heavy impacts on human lives and property. These critical fire episodes are often referred to as mega-fires or extreme wildfire events (EWEs)

The very dry conditions that were felt throughout the summer of 2017 continued in mid-October with the drought code for Coimbra reaching record values of 800, well above the average value of 400 for the time of year. The FWI (Rural Fire Hazard) conditions prior to and during the wildfires showed very high and extreme cumulative fire danger, conditions which prevailed in the days in which the fires spread and during the weekend of 14 October.

Hurricane Ophelia

The storm winds from the hurricane Ophelia induced a very strong southerly wind that blew hot and dry air from North Africa over the major part of the territory, increasing fire danger during 14th and, especially, 15th October. For example, the overall average value of the FWI for Portugal was 62 on 15th October and in Coimbra it reached an all-time record value of 82, making it impossible to control fires that escaped the initial attack. During this day, high maximum temperature and very low values of relative humidity were recorded over almost the entire territory. By the coast, in the central part of mainland Portugal, air temperatures exceeding 35°C coexisted with very low (10-20%) relative humidity records.

The information on fire danger conditions provided by EFFIS indicates the capacity of a fire to ignite and spread, linked to the resources required for fire control. Fire danger above an FWI value of 50, which was predominant in the whole Portuguese territory during 15 October, implies that fires cannot be controlled by either ground or aerial firefighting.

They launch burning material that produces spot fires, up to 3 km ahead of the fire front in the 15 October events posing a major threat to firefighting crews, and increasing the number of simultaneously active fire fronts. IPMA classification for extreme fire behaviour starts at FWI = 38.

Critical fire events burning in extreme fire danger conditions, such as those described in this feature, can only be extinguished when the weather conditions improve and fire danger decreases.

The five extreme wildfire events of 15th October reached maximum spread rates in excess of 3 km/h and up to 9 km/h. Between 16.00 on 15 October and 04.00 on 16 October the area burned by these fires in an hour ranged from 7 000 to 14 000 ha. Firestorm conditions were felt at night after the cyclone winds had dissipated; they were caused by fire-atmosphere interactions and, possibly, interactions between fires.

As in the PG fires, the most severe fire behaviour coincided with the timing of most human fatalities and occurred when air temperature was decreasing and relative humidity was increasing. In these fires a much smaller proportion of persons lost their lives while running away from their houses. As the fires spread mostly at night, many persons were surprised by the fire and did not have time to react.

On 17th October there was precipitation in most of the country, decreasing the fire danger and helping to control most fires on 18 October, with only minor fires still burning north of Figueira da Foz.

Causes

At least one of the fires in October was caused by electrical lines, but the major causes were fire use (36.0 %), arson (35.7 %) and rekindling (10.7 %); these percentages refer to the total number of fires in the period 14–15 October for which a cause could be determined. The shape of the fire perimeters indicates wind-driven fires with elongated scars following the direction of the predominant wind when fires ignited; these winds were generated by hurricane Ophelia. Just a day before the fires the President of the Republic had spoken about the findings of the report into the Pedrogão Grande fire in June (where 66 had died and 204 injured) and the IPMA had issued orange warnings due to the approach of Hurricane Ophelia with associated high temperatures. The warnings were there.

Reflection

In June/July 2022, the heat wave produced similar extreme meteorological conditions, with even higher FWI hazards, but with the lesson learned from 2017, over 90% of fires were contained within the first 90 minutes,

with far fewer casualties. It is however, a point of reflection that it took the deaths of some 117 people, to bring about the improvements we see today.

(Sources, EEFS, EU Joint Research Centre, and Copernicus); Photo Source: H3lio Madeiras

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