Weather and Grass Fires – A Fact Sheet

Overview

- The weather plays a crucial role in determining fire conditions generally.
- This Fact Sheet provides advice and guidance on how weather and climate affects fire potential within grass fuel types, and consequently how fire behaviour may differ as a result.

Weather and grassland fires

- Fire behaviour within grass is greatly affected by how cured it is – in other words, what proportion of the grass is dead as opposed to green.
- Annual grasses, which complete their lifecycle within a year, tend to have shallower roots and so cure more easily, leaving them more susceptible to burning.
- Perennial grasses, which complete their lifecycle over a number of years, tend to have deeper roots which can draw more moisture from deeper soil and so cure differently.
- Weather and the seasons determine the state of vegetation, including grasses.
- The moisture content of dead grasses and litter is significantly affected by the moisture content in the air, or relative humidity.
- On a warm day with low humidity, litter and dead grasses can become very dry by midday to early afternoon.
- This leads to a peak in fire potential at this time of day and the likelihood of being able to ignite a fire increases significantly.

The Spread of a Grass Fire

- If the grass is very green, typically over 50% green, then it is very unlikely that a fire will spread, as the heat of the fire is used in drying the grass before being able to ignite it.
- However, when the grass is progressively more cured, the rates of spread can increase dramatically.
- The wind also plays an important part in determining the rate of spread of a grass fire, the stronger the wind, the faster a flame front will travel.
- When grasses are dry, they can be amongst the fastest spreading fire of any fuel type, as the fuel is very fine, and very well aerated.
- Stronger winds are also more likely to carry burning embers through the air, and lead to secondary fires starting away from the initial source.
- Grass fires in strong winds are less likely to significantly damage the underlying soil, and habitats may even survive such quickly moving fires.
- Grass fires are generally less intense than other fuel types, and less likely to significantly damage the soil below.
- However, when grass fires combine with other heavier fuel types, it can produce fires which are very difficult to control.

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Controlled burning of grass

- Grass fires are commonly used to maintain habitats and recycle nutrients in the soil. They can help to encourage new growth of vegetation and can be important to the general conservation of an area. Controlled fires are also used to reduce the risk of wildfires in grasslands by reducing the amount of fuel and providing firebreaks.
- The weather forecast can play an important role in understanding how a fire will behave over the hours in which it is likely to burn. The forecast can also assist in identifying the most suitable days for a controlled burn.
- Controlled burns in grassland areas must, by necessity, be carried out when the fuel is able to ignite, but under conditions within which control of the fire will not be lost.
- Strong winds and gusts greatly affect how the burn will progress. As burns can take a number of hours, consulting the weather forecast should always be helpful in decision making as to whether to initiate a burn.
- Fires can easily become out of control if the wind speed changes, or if the wind direction changes during the course of a burn.
- Never leave a fire – the weather can change unexpectedly and carry the flame front to unintended areas.
- Using a more powerful ignition source can help an area to ignite more easily. This can sometimes allow burns to be carried out under conditions which otherwise would have not been possible using a less powerful ignition. This can potentially lead to burns being undertaken in safer conditions.
- Controlled burning during the early part of the burn season also requires caution. After a long hot and dry summer, the ground can be very dry, and a controlled burn can carry a risk of starting a peat fire.
- Ideal conditions for burning only the surface vegetation are when the underlying soil base is wet, though when the surface vegetation is sufficiently dry to ignite. This is best undertaken at the start of dry spell – rather than after a prolonged period of dry weather.
- Burning up hill can lead to problems, particularly in windy conditions. Wind is generally more erratic and unpredictable around steep hillsides.

Seasonality of grassfires

- There is usually little risk of significant grass fires over the winter period.
- By April, the weather usually begins to warm up. The dead vegetation litter on the ground, along with those grasses which have yet to green up, can dry out significantly.
- The most common period for grassland wildfires is in the springtime when the conditions are warming up, with a dry brisk wind. When these conditions coincide with a bank holiday, the likelihood of a fire starting can increase dramatically.
- Grasses vary in their greenness throughout the year, though most usually green up as the season progresses through summer, lowering the likelihood of a fire starting.
- As grass dies off towards the autumn period, particularly after a long drought period through the summer, the risk of fires igniting increases again.
- Under such conditions, the ground is likely to be very dry as well, and where the grass is on a peat base, this could lead to the peat itself igniting.

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Further information

The Met Office have a continuing research programme to further tailor and improve the forecast system and will continue to keep abreast of research and development both within the UK and across the world.

About the Met Office www.metoffice.gov.uk

Information for England www.openaccess.gov.uk

Information for Wales http://csaw.ccw.gov.uk/fireriskindex.html

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