Smouldering Fires

Smouldering is a slow, flame-less form of combustion that can persist for long periods of time. It can spread over extensive areas, with sub-surface propagation through layers of soil with high organic matter (e.g. peat, humus, duff).

Smouldering can be initiated by weak sources of heat (e.g. flaming vegetation). Once ignited such fires are difficult to extinguish and can abruptly start a flaming fire.

The main visible consequences of a smouldering fire are smoke haze, removal of soil layers, ground destabilisation and local subsidence, causing damage to root systems, producing impacts as habitat loss and important carbon emissions.

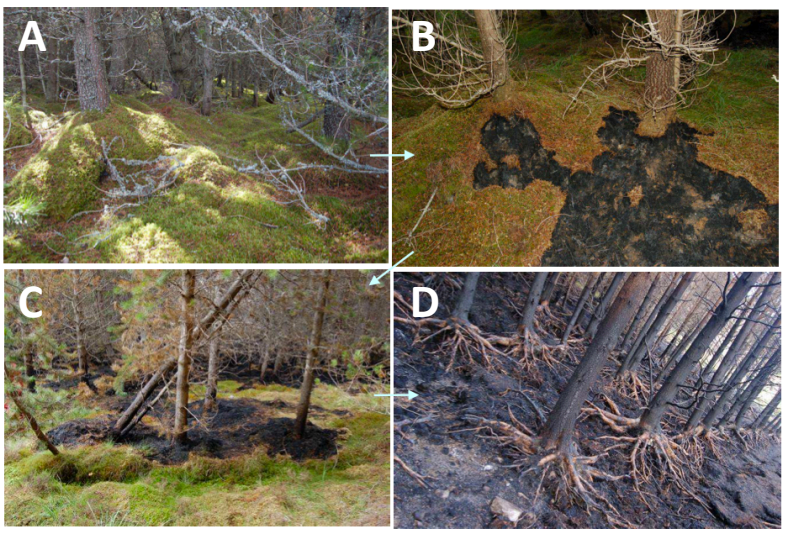
Above: A tree after a smouldering fire. The fire has removed the organic matter layer from the soil revealing roots damaged by the smouldering. Upper parts of the tree have been burned by a flaming fire.
Right: An example of a smouldering fire burning sub-surface layers of an organic soil. The fire is burning without any flames.
Bottom-right: Evolution of a smouldering fire: (A) pre-fire, (B & C) patches of burnt ground (D) organic soil layers completely removed after the smouldering fire.

Smouldering vs. Flaming fire

	Impact	Flame	Temperature °C	Propagation	Spread Rate cm/hour
flaming	vegetation	yes	1500	fast	100
smouldering	**soil**	**no**	**500-700**	**slow**	**<5**

Keys to identify smouldering:

- smoke coming from the ground
- slow propagation
- holes in the ground and soil collapse
- burnt surface patches
- tree destabilisation



More info:
Contact: Nuria Prat (nuria.prat-guitart@ucdconnect.ie)
Smouldering news: http://guillermo-rein.blogspot.co.uk

School of Biology and Environmental Science
University College Dublin
Belfield, Dublin 4, Ireland