



What are? **TYPES OF FIRE**

There are three basic types of forest fires: ground, surface, and crown.

During a wildfire, it's not uncommon to have all three types of fire. The proportion of each type, however, can vary greatly day to day or even minute to minute depending on fuel, topography, and weather conditions. Fuel, topography, and weather drive a fire's behavior, and changes to any of three may cause a ground fire to emerge as a surface fire or a surface fire to escalate into a crown fire, or vice versa.

Ground fires

Ground fires burn mostly in decayed roots below ground and in the duff layer. The duff layer is made up of compacted dead plant materials such as leaves, bark, needles, and twigs. Ground fires are sustained by glowing combustion (without flames) and can go undetected for a long time because they produce little to no smoke and spread slowly.



Photo Credit: Deschutes Land Trust

Surface fires

Surface fires burn loose needles, moss, lichen, herbaceous vegetation, shrubs, small trees, and saplings that are at or near the surface of the ground, mostly by flaming combustion. Surface fires spreading in surface fuels dictate much of a fire's expansion. They can grow in intensity to scorch or even consume the forest canopy, a characteristic that is seen in crown fires, depending on: the amount of surface fuel (is high), fuel moisture content (is low); slope and/or wind



Photo Credit: United States Forest Service

FIRE FACTS

speed (is high), the resultant surface flame length (is high); the height to the base of tree crowns (is small); and the density and compactness of tree crowns (is tight).

Crown fires

Crown fires burn forest canopy fuels, which include live and dead foliage/ branches, lichens in trees, and tall shrubs that lie well above the surface fuels. They are usually ignited by a surface fire.

Crown fires can be passive or active. Passive crown fires involve the burning of individual trees or small groups of trees (often called torching). Active crown fires, or also referred to as running crown fires, present a solid wall of flame from the surface through the canopy fuel layers as seen in the photo below. Active crown fires spread from one tree crown to the next through the canopy.



Photo Credit: United States Forest Service

For more information:

Bennett, M., S.A. Fitzgerald, B. Parker, M. Main, A. Perleberg, C.C. Schnepf, and R. Mahoney. 2010. Reducing Fire Risk on Your Forest Property. PNW 618: 40 p.

[Fire Science Core Curriculum](#). 2017. OSU Extension Service, EM 9172: 197p.

[Fire Words](#). Glossary of Fire Science Terminology. Date accessed, April 10, 2019

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