

# HUMAN MANAGEMENT OF WILDFIRES AND ITS RESULTING EFFECTS

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**Abstract:** This paper examines the relationship between humans and wildfires in relation to socio-psychological factors. Managing the coexistence of wildfires and humans is necessary for the health of our wildlands. Included is an overview of several articles illustrating the importance of wildfires, some issues created by human management of wildfires, and socio-psychological factors implicated.

**Keywords:** Wildfires, Forest, Health, Socio-psychological, Human, Management

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Wildfires pose a constant threat to human lives and property, creating the need for immense effort and allocation of resources towards their management and mitigation. Strategies for dealing with wildfires mainly involve outright suppression. These management techniques have an implicit cost that is now becoming more and more evident.

An important role is played in ecosystems by wildfires, which aid in the regeneration of forests and plant species, ultimately enhancing biodiversity. This natural system has been interrupted by human involvement with wildfires. Furthermore, the outright "putting out" of fires has often resulted in fuel buildup, leading to more intense wildfires. These larger fires prove difficult to manage and wreak havoc on communities and resources. New techniques need to be devised in order to avoid these recurring issues.

Forest ecosystems depend on wildfires. Wildfires are a part of the natural regeneration process in many forests. Contributing to the overall health of a forest, wildfires remove dead trees and debris in order to make room for new growth. Some plant species even require wildfires in order to propagate, such as the Lodgepole and Ponderosa Pine trees (Reilly, 2015).

Wildfires contribute to a forest's biodiversity – the variety in its plant species, which has intrinsic value to its ecosystem (Chuvienco, Martínez, Román, Hantson, & Pettinari, 2014). Biodiversity has serious implications for food production, fresh water stocks, and harvest of wood products. Not only that – breathable air, soil

fertility, climate regulation, and carbon storage are also all interconnected, flowing quite directly from biodiversity (Chuvieco et al., 2014).

Constant suppression of wildfires has caused an unanticipated and somewhat paradoxical problem. Wildfires perform an important job in the maintenance of forests, particularly the cleaning of forest floors. Immediate attack and elimination of wildfires once they are noticed has led to the build-up of wildfire fuels. This fuel build-up allows for wildfires of higher severity to burn through forests (Stevens, Safford, & Latimer, 2014). These larger wildfires are more difficult to contain, and can put human lives and property in greater jeopardy. Furthermore, in contrast to a regular-intensity wildfire, a larger, high-intensity fire can more greatly disrupt natural processes (Stevens et al., 2014).

This realization that fuel build-up on the forest floor can contribute to high-severity fires has led to a diversification in wildfire management techniques. One method developed calls for prescribed fires, also known as "controlled burns". Prescribed burns are fires intentionally set under controlled conditions and the supervision of fire-management personnel (Government of Canada, 2016). The aim of prescribed fires is to get rid of built-up fuels in a controlled manner, ultimately reducing the likelihood of high-intensity fires (Government of Canada, 2016). Another method is the complete withholding of wildfire suppression / intervention in areas where human life and property are not present, allowing a wildfire to take its natural course and reduce fuel loads (Government of Canada, 2016).

The management of wildfires with current strategies demands a lot of human resources and a great deal of effort. During the 1990s, the United States alone invested just under a billion dollars annually in wildfire management, with projected costs only rising in the new millennium (Reilly, 2015). The potential for more frequent and larger wildfires has become evident, and the demand for resources will only increase with the current wildfire management techniques in place.

Wildfires threaten human lives, land use, settlements, and the natural resources we use. Our efforts therefore are directed towards their protection. Of particular importance is the wildland-urban interface (WUI). This is the area where human communities and infrastructure intermix with natural vegetation, "where most of

the human fatalities, home losses and fire-suppression expenditures occur" (Moritz, Syphard, Batllori, Bradstock, Gill, Handmer, & Schoennagel, 2014).

Notably, the WUI has a substantially lower population density than other areas within communities. Many dwellings in the WUI are second homes and cottages which are rarely occupied (Reilly, 2015). Humans are increasingly taking up residence in fire-prone areas, concerned little with wildfire-friendly housing designs (Moritz et al., 2014). This shows how little thought goes into planning urban expansion compatible with natural processes which include wildfires.

Forest regeneration and biodiversity maintenance are complex systems consisting of many interdependent components. Wildfire is an integral part of these systems. Human intervention in wildfire activity is now having an effect on more than just wildfires. According to Scott, Amel, Manning, & Koger (2016),

ecosystem interdependence means we can't just alter one thing in isolation. Even one seemingly minor change can ripple through a system, sometimes slowly and sometimes more quickly, sometimes dramatically and sometimes subtly, and often in ways that couldn't be foreseen. (p. 69)

The relationship between human behaviour and the role of wildfires in forest ecosystems outlines two distinct ways of thinking. First, the placement of human communities illustrates a view held by many humans that nature can and should be controlled (Scott et al., 2016). This view reflects how many humans assume the right to settle wherever they like, that natural, "interfering" forces should be dealt with in order to maintain this way of living. Second, the value placed by many people on second homes, cottages, and recreational land uses is immense and widespread enough to outweigh the costs of adequate forest regeneration and biodiversity upkeep. These costs have serious implications, shown to be worsening over time.

The values and beliefs held by Western society are certainly tied into this complex issue. Settlements are often built with little consideration of wildfire activity and protected almost religiously, at the expense of maintaining natural forest ecosystem cycles. Indicators of potentially ill effects on forest ecosystems are still being uncovered.

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