

Key Learnings: A Wildland-Urban Post-Fire Case Study - The 2023 Grouse Complex, BC

Introduction

This document captures the key insights from the post-fire case study report on the 2023 Grouse Complex. It is intended to summarize important learnings so others can learn from it.

Background

- In August 2023, the Grouse Complex of wildfires in the Okanagan region burned a total of 15,076 hectares, prompting the evacuation of about 30,700 people from 12,100 properties and affecting 303 structures.
- To understand the impact of the 2023 fires, the BC FireSmart Committee and the Institute for Catastrophic Loss Reduction (ICLR) enlisted FPIInnovations to analyze the Grouse Complex wildfires, which included the McDougall Creek, Clarke Creek, and Walroy Lake wildfires. The study focused on:

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1. How the wildfire spread into communities and how it continued to move once there.
2. Factors that caused or prevented damage to buildings.

Key Insights

- Long-term drought conditions, several weeks of high temperatures, low RH values and minimal precipitation preceded the ignition of the wildfires in the Grouse Complex.
- The McDougall Creek wildfire became a fast spreading, high intensity crown fire due to strong, gusty winds associated with the passage of a cold front that stalled over the region, and rugged topography, including valleys with steep slopes.
- An unusually dry, fast moving cold front stalled east of Kelowna resulting in a towering convection column that produced a massive amount of short- and long-range spotting.
- Embers were lofted over 2.5 km ahead of the main fire front, including across Okanagan Lake, igniting both the Walroy Lake wildfire in Kelowna and the Clarke Creek wildfire in Lake Country.
- The fire entered the impacted neighborhoods almost exclusively via burning embers, rather than direct flame contact, and quickly shifted from being a wildfire to a set of several urban fires burning simultaneously.

- There were clear examples where timely action by fire suppression personnel, such as removing or dousing combustible materials, saved adjacent structures.
- The presence and management of combustible materials (vegetative and non-vegetative) within 10 m of structures emerged as one of the most significant factors influencing whether a structure survived or was damaged by the fire.
- Yards containing cedars, junipers, and undamaged coniferous trees and/or an abundance of other easily ignitable material were particularly problematic.
- Homes situated on steep slopes, often with overhanging decks above flammable vegetation, were particularly vulnerable given fire's natural tendency to burn rapidly Uphill.
- Recommendations for homeowners to increase their resilience included:
 - Construct decks from fire resistant materials, keep them well-maintained, and remove combustible items located on and under decks.
 - Remove or relocate combustible items (e.g. firewood, scrap lumber, vehicles, recreational equipment, etc.) within 10 m of a structure.
 - Establish a 1.5 m zone around structures that is free of all combustible material (vegetation and non-vegetation).
 - Remove, reduce or replace combustible vegetation on slopes immediately below Structures.
 - Manage coniferous vegetation from 1.5 to 10 m from a structure according to FireSmart guidelines using spacing, thinning, pruning, and planting leafy (deciduous) species.
 - Plant low-flammability deciduous tree species 10 m to 30 m from structure.
- Private industry and government are also encouraged to plan, build, maintain, and prepare structures and properties to minimize ember-caused ignitions.
- A comprehensive literature review of existing development policies and practices identified pathways forward for stronger integration of FireSmart principles into land use planning and development policies and practices.
- This report highlights the critical role proactive mitigation plays in reducing damage associated with wildland-urban fires and underscores the importance of ongoing research to better prepare for future wildfire events.
- Empowering communities with this knowledge will play a significant role in protecting residents and responders by ensuring communities are better prepared and more resilient in the face of the current and future risks posed by wildland-urban fires.