

Introduction

Fires don't generally call for region wide attention unless the fire migrates to adjoining buildings, homes, or property or is determined to have the potential to do so. Fast-spreading structure fires can quickly threaten a large amount of people, as well as tax the resources of local fire-fighting jurisdictions

King County is at risk for three types of fire threats: structure, wildland, and wildland-urban interface fires. These threats are typically defined as:

Structure Fire: a fire of natural or human-caused origin that results in the uncontrolled destruction of homes, businesses, and other structures in populated, urban or suburban areas.

Wildland Fire: a fire of natural or human-caused origin that results in the uncontrolled destruction of forests, field crops and grasslands.¹⁴

Wildland-Urban Interface: a fire of natural or human-caused origin that occurs in or near forest or grassland areas where isolated homes, subdivisions, and small communities are also located.¹⁵

High Probability Low Impact	High Probability Moderate Impact	High Probability High Impact
Moderate Probability Low Impact	Moderate Probability Moderate Impact	Moderate Probability High Impact
Low Probability Low Impact	Low Probability Moderate Impact	Low Probability High Impact

The Washington Department of Natural Resources and its federal and local partners found that 181 communities were at high risk for fire threats, including some communities housed within the jurisdiction of King County. Communities were evaluated based on fire behavior potential, fire protection capability, and risk to social, cultural and community resources. Assigned risk factors included area fire history, type and density of vegetative fuels, extreme weather conditions, topography, number and density of structures and their distance from fuels, location of municipal watershed, and likely loss of housing or business. The evaluation used the criteria in the wildfire hazard severity analysis of the National Fire Protection

¹⁴ Sinnett, George M, Meteorologist, Fire Weather Summary, 1983-1991, Department of Natural Resources, Division of Fire Control, Washington State, 1992.

¹⁵ Skagit County Natural Hazards Mitigation Plan

<http://www.skagitcounty.net/EmergencyManagement/Documents/2003HazMitFinal/Section%20II%20Final%20Documents/5%20HIVA%20Skagit%20Fire.pdf>

Association's NFPA 299 Standard for Protection of Life and Property from Wildfire, 1997 Edition.¹⁶

As a result, fire hazards are a very real risk for King County residents and businesses and must be vigilantly prepared for and mitigated against in efforts to keep our region and surrounding counties and communities safer.

Hazard Identification

A fire needs three elements in the right combination to ignite and grow – a heat source, fuel, and oxygen. How a fire behaves primarily depends on the characteristics of available fuel, weather conditions, and terrain. Fuels can include ignition sources like poor wiring or unattended candles, lighter fuels like grasses and leaves, heavier fuels like tree branches and logs, and hazard trees that may be diseased or dying.¹⁷

Weather also plays a role in the forms of wind, low precipitation, and lightening. As a result, strong, dry east winds in late summer and early fall can produce extreme fire conditions west of the Cascades. Drought, snow pack, and local weather conditions can also expand the length of the fire season.¹⁸ Additionally, according to data from 1992-2001, lightening ignited 135 wildland fires annually and burned more state-protected acreage than any other cause, an average of about 10,866 acres annually.¹⁹

Terrain is an additional factor, as the topography of a region or local area influences the amount and moisture of available fuel. Other elements like barriers and land elevation also need to be taken into account as highways and lakes can affect spread of fire, as can an uphill/downhill orientation, as fire spreads more easily as it moves uphill.²⁰

In addition to natural conditions for fire viability, humans also play a role. From 1992 to 2001, people, on average, caused more than 500 wildland fires each year

¹⁶ Washington State Hazard Mitigation Plan, Hazard Identification and Vulnerability Assessment on Wildland Fire, <http://emd.wa.gov/3-map/mit/mit-pubs-forms/hazmit-plan/Tab%207.1.9%20Wildland%20Fire%20final.pdf>

¹⁷ Washington State Hazard Mitigation Plan, Hazard Identification and Vulnerability Assessment on Wildland Fire, <http://emd.wa.gov/3-map/mit/mit-pubs-forms/hazmit-plan/Tab%207.1.9%20Wildland%20Fire%20final.pdf>

¹⁸ Washington State Hazard Mitigation Plan, Region 6, <http://emd.wa.gov/3-map/mit/mit-pubs-forms/hazmit-plan/reg-6-profile.pdf>

¹⁹ Washington State Hazard Mitigation Plan, Region 6, <http://emd.wa.gov/3-map/mit/mit-pubs-forms/hazmit-plan/reg-6-profile.pdf>

²⁰ Washington State Hazard Mitigation Plan, Hazard Identification and Vulnerability Assessment on Wildland Fire, <http://emd.wa.gov/3-map/mit/mit-pubs-forms/hazmit-plan/Tab%207.1.9%20Wildland%20Fire%20final.pdf>

on state protected lands. Human caused fires burn an average of 4,404 state-protected acres each year.²¹

Hazard Impacts

Most wildland fires are usually extinguished in their initial stages being less than one acre in area.²² In fact, Western Washington is less prone to the danger of large or catastrophic wildland fires than the Eastern half of the state. The Western slopes have a shorter fire season, receive more rainfall, have wetter and cooler spring seasons, and are more urbanized.²³ However, these conditions don't make wildland fires any less dangerous, as statistics show that on an annual basis, an average of 905 wildland fires burn 6,488 acres resulting in a resource loss of \$2,103,884 in Washington State.²⁴

Depending upon temperature, wind, topography, and other factors, wildland fires can spread rapidly and may require thousands of firefighters working several weeks to extinguish.²⁵ Wildland fires can create their own winds and weather, and generating hurricane force winds of up to 120 miles per hour. Fires can also heat fuels in their path, drying them out, and making them easier to ignite and burn.²⁶

With the increasing urbanization of King County, the threat of wildland/urban interface fire grows, due to a rise in the building of vacation homes and the prevalence of more comprehensive transportation systems. King County residents can live outside of crowded city centers while commuting or telecommuting to work. As a result, wildfires can encroach onto residential properties and structure fires can invade wooded areas. These fires are also quite difficult to fight, as the remote locations of residential properties in wooded areas make fire-fighting response times to those areas take longer than normal residential responses. In addition,

²¹ Washington State Hazard Mitigation Plan, Region 6, <http://emd.wa.gov/3-map/mit/mit-pubs-forms/hazmit-plan/reg-6-profile.pdf>

²² Skagit County Natural Hazards Mitigation Plan <http://www.skagitcounty.net/EmergencyManagement/Documents/2003HazMitFinal/Section%20II%20Final%20Documents/5%20HIVA%20Skagit%20Fire.pdf>

²³ Washington State Hazard Mitigation Plan, Region 6, <http://emd.wa.gov/3-map/mit/mit-pubs-forms/hazmit-plan/reg-6-profile.pdf>

²⁴ Skagit County Natural Hazards Mitigation Plan <http://www.skagitcounty.net/EmergencyManagement/Documents/2003HazMitFinal/Section%20II%20Final%20Documents/5%20HIVA%20Skagit%20Fire.pdf>

²⁵ Skagit County Natural Hazards Mitigation Plan <http://www.skagitcounty.net/EmergencyManagement/Documents/2003HazMitFinal/Section%20II%20Final%20Documents/5%20HIVA%20Skagit%20Fire.pdf>

²⁶ Washington State Hazard Mitigation Plan, Hazard Identification and Vulnerability Assessment on Wildland Fire, <http://emd.wa.gov/3-map/mit/mit-pubs-forms/hazmit-plan/Tab%207.1.9%20Wildland%20Fire%20final.pdf>

most fire fighters are trained to fight either wildfires or structure fires and interface fires require both skills, making it difficult to balance the two.²⁷

Structure Fires: In addition to typical methods of occurrence, structure fires are a potential secondary hazard of earthquakes and riots. One study estimated that 80-100 fires would occur from a large earthquake in the Seattle area.²⁸ Building codes requiring fire detectors and sprinkler systems are in effect for most large structures, therefore reducing some vulnerability. However, injuries and casualties to structure occupants are the primary concern. These events can also cause the release of hazardous materials as well as disconnect utility lines.

Wildland/Urban Interface Fires: King County is becoming more vulnerable to the effects of wildland/urban interface fires due to increased building, living and recreating in forested areas. The effects of interface fires can be the combined affects of both structure and wildland fires.

History of Events

The largest fire in King County history remains the 1889 Seattle fire, which was estimated to have consumed 60 acres of the downtown area.²⁹ Also notable was the Blackstock lumberyard fire in 1989 which took the life of one fire fighter and the Mary Pang warehouse fire in 1995 which killed four fire fighters.

In contrast, wildland fires historically, were not considered a hazard, as fire is a normal part of most forest and range ecosystems in the temperate regions of the world, including King County. Fires historically burn on a fairly regular cycle, recycling carbon and nutrients stored in the ecosystem, and strongly affecting the species within the ecosystem. The burning cycle in western Washington is every 100 – 150 years.³⁰ Controlled burns have also been conducted because the fire cycle is an important aspect of management for many ecosystems. These are not considered hazards unless they were to get out of control.³¹

None of Washington State's most significant wildland fires have occurred in King County, although smaller wildland fires have occurred in the region. All but the Snoqualmie Pass area of King County is part of the South Puget Sound fire

²⁷ Washington State Hazard Mitigation Plan, Region 6, <http://emd.wa.gov/3-map/mit/mit-pubs-forms/hazmit-plan/reg-6-profile.pdf>

²⁸ McDonald, Terrence J, "Conflagration and Other Large Urban Fires", Seattle: A Hazard Identification and Vulnerability Analysis, Masters Thesis, Cornell University, 1995, p 82.

²⁹ McDonald, Terrence J, "Conflagration and Other Large Urban Fires", Seattle: A Hazard Identification and Vulnerability Analysis, Masters Thesis, Cornell University, 1995, p 82.

³⁰ Pierce County Department of Emergency Management Hazard Identification and Vulnerability Assessment Urban/Wildland Interface Fires Section, <http://www.co.pierce.wa.us/pc/abtus/ourorg/dem/EMDiv/NaturalHaz.htm>

³¹ Washington State Hazard Mitigation Plan, Region 6, <http://emd.wa.gov/3-map/mit/mit-pubs-forms/hazmit-plan/reg-6-profile.pdf>

protection region of the Washington Department of Natural Resources. During 1992-2001, the South Puget Sound region averaged 182 fires a year that burned an average of 81 acres of state-protected lands.³²

Past Mitigation Efforts

The Blackstock lumberyard fire fatality resulted in the development of an accountability system called the passport system. This system works with the Incident Command System for tracking the assignments and locations of fire fighters during a response. The system worked so well, that it has been adopted on a national basis for safety improvement on the fire ground. Similarly, the fatalities at the Mary Pang fire have reinforced the continuing need for accountability and safety at a fire scene.

Public education programs are key elements of educating King County residents on indoor and outdoor fire safety, including the importance of fire alarms, extinguishers, fire insurance, and knowledge and understanding of building codes. In efforts to avoid injury or death, residents must plan how to safely exit their home and workplace in the event of a structure fire.

Additionally, effective early fire detection programs and emergency communications systems are essential. Wildland fire prevention education and enforcement programs can reduce the number of wildland fires Washington State faces each year. As a result, the importance of immediately reporting any wildland fire must be impressed upon local residents and visitors utilizing wooded areas. An effective warning system is crucial when needing to notify local residents and visitors in the fire risk area, as well as an evacuation plan detailing primary and alternate escape routes.³³

The prevention of wildland/urban interface fires, fire-safe development planning requires coordination between county building and transportation planners, to ensure adequate fire escape routes for new sections of development in forested areas. Road closures may also be increased during peak fire periods to reduce access to fire-prone areas.³⁴ Land use, building codes, mandated sprinkler system installation, vegetation management, survivable materials used in construction of

³² Washington State Hazard Mitigation Plan, Region 6, <http://emd.wa.gov/3-map/mit/mit-pubs-forms/hazmit-plan/reg-6-profile.pdf>

³³ King County Office of Emergency Management Fire Resource Section, <http://www.metrokc.gov/prepare/preparerespond/hazardsdisasters/firehazards.aspx>

³⁴ King County Office of Emergency Management Fire Resource Section, <http://www.metrokc.gov/prepare/preparerespond/hazardsdisasters/firehazards.aspx>

homes, highly trained and equipped fire services and accessibility are all methods used to assist in mitigating urban/wildland fire risk.³⁵

³⁵ Pierce County Department of Emergency Management Hazard Identification and Vulnerability Assessment Urban/Wildland Interface Fires Section,
<http://www.co.pierce.wa.us/pc/abtus/ourorg/dem/EMDiv/NaturalHaz.htm>