Allianz Commercial

Wildfires

Emerging Risk Trend **Talk 4**

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Introduction

Emerging risks have unique characteristics that require specialist technical, management and organizational skills. Our Risk Consulting expertise across different industries and lines of insurance business around the world is key to helping companies understand and mitigate these exposures. In our Emerging Risk Trend Talk series, we address such topics, highlight loss events, and look at targeted loss prevention measures.

Wildfires are unplanned fires that burn in natural areas such as forests, shrublands and grasslands. Sometimes called bushfires, forest fires or brush fires, wildfires are not controlled or structure fires. They are characterized by their unpredictability and rapid spread through combustible vegetation.

The behavior and severity of wildfires are influenced by various factors such as available fuels, including the amount of vegetation and its moisture content, physical setting and topography, and weather conditions, including temperature, humidity, and wind speed and direction. Climatic cycles, which include wet periods that create substantial fuels, followed by drought and heat, contribute significantly to severe wildfires. These cycles have been exacerbated by climate change increasing the frequency and intensity of wildfires.

Wildfires can be ignited by natural causes, including lightning and spontaneous combustion, or human causes, including overhead powerlines, arson, accidental ignition from discarded cigarettes or poorly managed campfires, uncontrolled use of fire in land clearing, or use of equipment that generates sparks such as chainsaws, grinders or mowers.

Wildfire exposures vary significantly from year to year due to variations in weather conditions, often with years of high wildfire risk separated by many years of low wildfire risk. They can spread quickly through dry, uninterrupted fuels. The stronger the wind, the faster the spread of fire. The forward rate of spread of wildfires burning in forests and shrublands in relatively dry conditions is approximately equal to 10% of the average 10m open wind speed, with rates of up to 10km/hr observed in dry eucalypt forests and slower speeds in conifer forests and temperate shrublands.[1] Grass fires can move three times faster than a forest fire.[2] They can advance in various ways and the wind can carry embers up to 30km (over 18 miles), creating new spot fires ahead of the main fire front.[3]

Hazards to watch

- Climate change
- The wildland urban interface
- Wildfire occurrence in previously lower-risk areas
- Proximity to combustible vegetation
- Combustible building materials
- ‘Hot work’ in high-risk areas
- Heightened regulation and increasing litigation

Large wildfires can even create their own weather patterns, leading to pyrocumulus clouds, or fire clouds, which can produce lightning, sparking additional fires. Wildfires can also lead to strong winds and the formation of pyronados, which can reach tornado-like rotational velocities up to 145km/hr (90mph).[4]

The intensity of wildfires tends to increase during the daytime due to lower humidity, higher temperatures, and increased wind speeds.

The geographical zones most exposed to wildfires include the western US, western Canada, southern and eastern Australia, and southern Europe (Spain, Portugal, France, Italy, and Greece). Other regions exposed to a lesser extent include Chile, Sweden, Finland, Russia, and South Korea, which suffered the deadliest wildfire outbreak in its history in March and April 2025.[5]

The trend

The frequency, severity and geographic occurrence of wildfires have increased significantly in recent years. Climate change is believed to be driving many of these changes. The 10 warmest years since 1850 have all occurred in the past decade (2015-2024), with 2024 the hottest on record, according to the World Meteorological Organization.[6]

Wildfires are now occurring in locations not previously regarded as a significant risk, including forests in northern regions of Canada, Scandinavia, and Russia. Seasons are starting earlier and lasting longer, which impacts on the ability to share firefighting resources within regions. Catastrophic wildfires are becoming larger and more frequent. The impacts of the worst wildfires in the last decade in terms of property damage and fatalities have been significantly greater than for at least 50 to 100 years in some regions.

Climate change is elevating risks by increasing fuel loads, drying fuels, strengthening winds, boosting lightning activity, and promoting invasive flammable species. Increased CO_2 concentrations in the atmosphere are increasing vegetation growth[7] which may increase fuel loads[8] and increase fire occurrence in some regions.[9]

Future severe fire weather, in south-eastern Australia for example, will increase mainly during the spring and summer, due to a combination of low rainfall and humidity, high temperatures, and higher wind speeds.[10]

Photo: Adobe Stock

The wildland urban interface

As well as climate change, wildfire exposures are being intensified by changing land use, in particular in the 'wildland urban interface', or WUI – locations where human development is expanding into areas of wildland vegetation prone to fires. The amount of people and built property exposed to wildfires is increasing, particularly in the US[11] and Australia.

In the US, more than 60,000 communities are believed to be at risk of WUI fires, according to the National Association of State Foresters.[12] This exposure coincides with increased lengths of electricity lines and roadways – both key ignition sources.

Los Angeles wildfires, January 2025

These highlight the vulnerability of urban areas near forests. Initially forest fires, they were driven downhill into urban areas by hot, dry Santa Ana winds. The fires spread rapidly, penetrating over 2km (1.2 miles)[13] into residential zones and destroyed an estimated 16,000 homes, businesses, infrastructure, and commercial and community structures.[14]

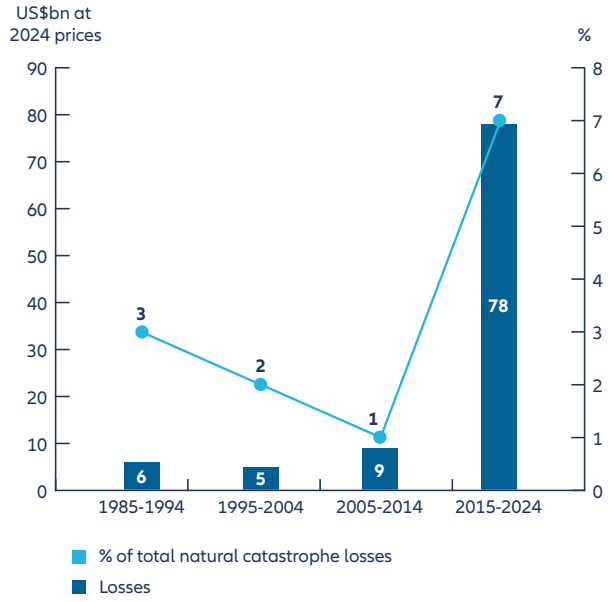
Global insured losses on the rise

The increasing severity and frequency of wildfires, coupled with the growing number of people affected by them, has driven a significant rise in related losses. Global insured losses from wildfires increased from US$8.7bn in the 2000s to $56.3bn in the 2010s, according to Swiss Re.[15]
This is assumed to be largely driven by the catastrophic wildfires caused by overhead powerlines in California from 2015 to 2020.

In the US, the number of fatalities and property losses for extreme wildfires increased after 2017, with four of the five years from 2017 to 2021 being considerably worse than any year since at least 1990.[16]

The historic series of fires that struck Southern California, in particular the Greater Los Angeles area, in January 2025 are believed to have incurred insured losses ranging from $28bn[17] for the two largest fires to $40bn for all five. The Lahaina fire in Maui, Hawaii, in 2023 caused $5.6bn[18] in damages.

Global insured losses from wildfires



Source: Swiss Re Institute

Cost of fires sparked by powerlines

Overhead utility infrastructure is a significant wildfire risk, jeopardizing property and human life. There are many ways these fires can start. Powerlines or conductors might clash, causing sparks to fall, or vegetation might come into contact with a line, sparking a fire. Birds or animals might touch the lines, fuses can explode, or equipment on poles can fail.

In the US, the wildfires linked to powerlines have resulted in the following multi-billion wildfire damage claims:

$11bn+
CAMP FIRE (2018)

$10bn
WINE COUNTRY FIRES (2017)

$6bn
MAUI WILDFIRES (2023)

$4bn+
WOOLSEY FIRE (2018)

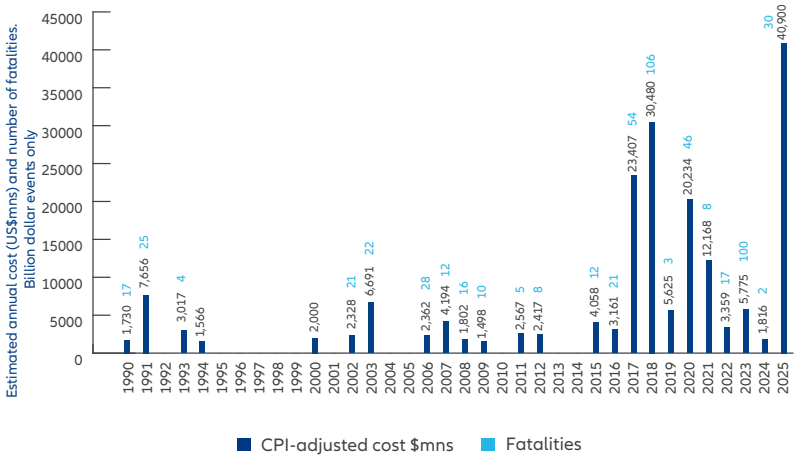
Note: Approximate figures only. Loss estimates may change. Sources include Aon, Guy Carpenter, Munich Re, Moody's RMS, California state filings and company disclosures.

Australia has a long history of catastrophic wildfire seasons. The country's average insured losses from significant wildfires (assumed to be mostly property losses) were approximately AU$365mn per year from 1967 to 2023, with six years incurring losses exceeding AU$1bn (as CY2022 normalized values).[19] The infamous Black Summer of 2019-2020 was the largest natural catastrophe in Australian history, burning for 240 consecutive days and incurring around AU$2.6bn (US$1.71bn) losses for the insurance industry.[20]

The 2023 wildfire season in Canada was the worst on record in terms of areas burned (15mn hectares/37mn acres), and at least four wildland firefighters died on duty.[21] Several Canadian towns have been severely damaged by wildfire in recent years, including Fort McMurray in Alberta in 2016 (insured losses reached C$3.6bn),[22] and Jasper in Alberta in 2024 (estimated insured losses were C$700mn).[23]

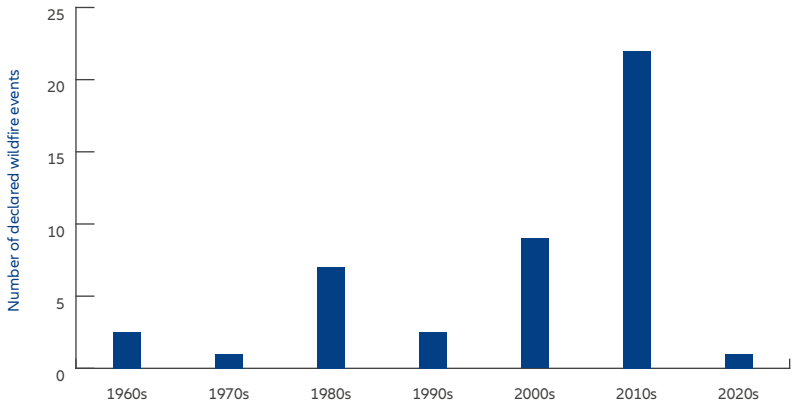
In Europe, currently 85% of the burned area is in Southern Europe (Portugal, Spain, France, Italy, and Greece) due to the higher risk weather conditions in the Mediterranean region.[24] In recent years, unprecedented wildfires have caused loss of life and significant environmental and economic damage across Europe. 2022 was the second-worst year in the EU in terms of the area burned – nearly 900,000 hectares of land was burned.[25]

US annual wildfire costs ($mns) and fatalities for wildfire events exceeding $1bn

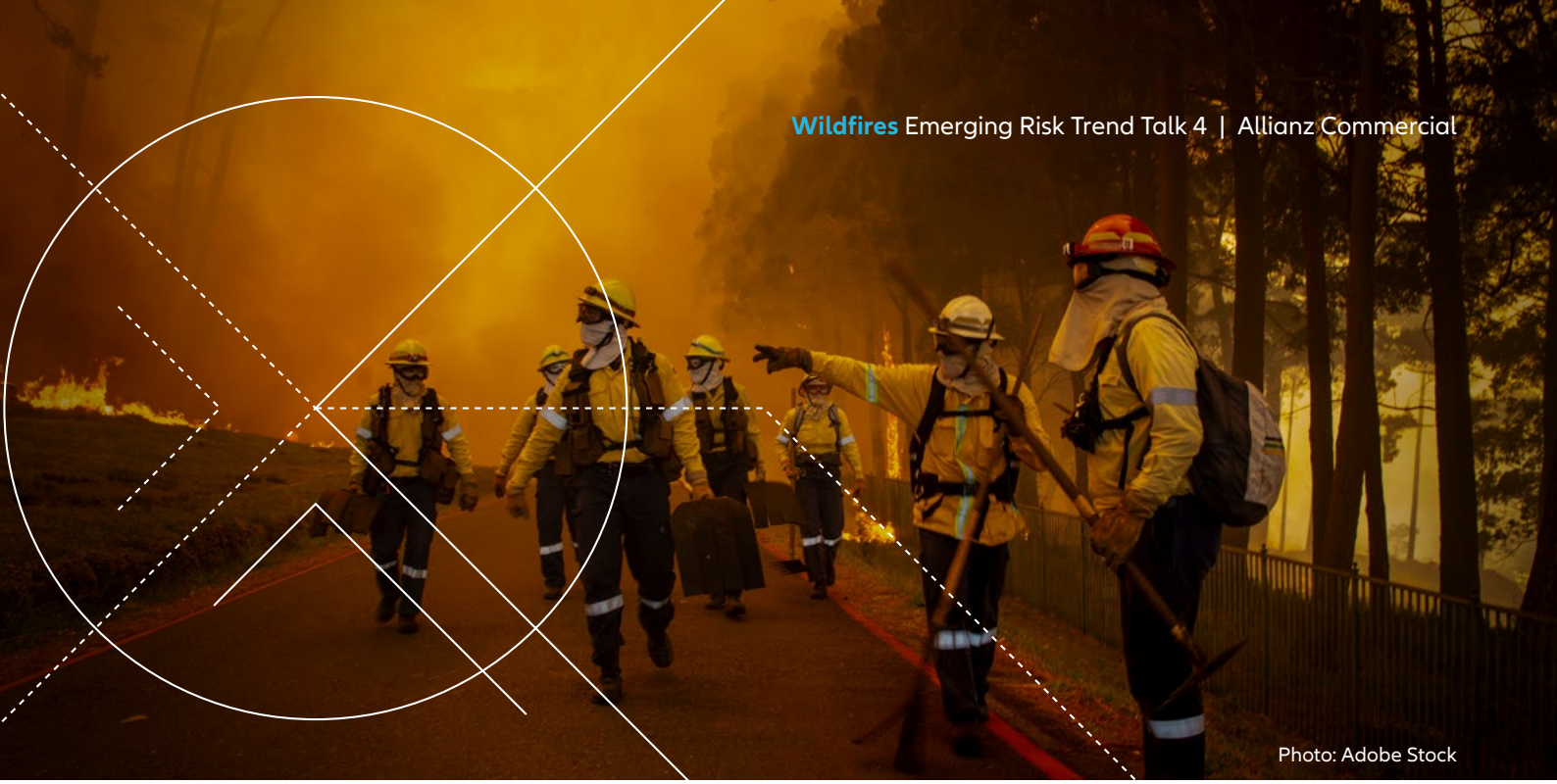


CPI-adjusted as of March 2025.
Source: Compiled by Tom Carmichael. Data from 1990 to 2024 was sourced from the National Oceanic and Atmospheric Administration (NOAA) National Centers for Environmental Information (NCEI) U.S. Billion-Dollar Weather and Climate Disasters. Data for 2025 represents the Los Angeles Wildfires of January 2025, based on mid-range of cost estimates ($28bn to $53.8bn) by the Los Angeles County Economic Development Corporation. Wildfire events with costs of less than $1bn are not represented. Data predominantly relates to physical property, infrastructure, business interruption and wildfire suppression costs. Excluded are broader societal economic impacts such as supply chains, contingent business interruption, bodily injury, life value, natural capital and environmental degradation.

Number of declared wildfire events per decade in Australia



Source: Compiled by Tom Carmichael. Data sourced from the Insurance Council of Australia, as of April 2025. Note: This graph incorporates loss data for wildfires declared by the Insurance Council of Australia to be significant events or catastrophes. It does not include losses from wildfire events of a lesser nature.



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What are the main risks?

The damage caused by wildfires can be devastating, including bodily injury, loss of life, damage to property, business interruption, air pollution, the destruction of habitats, and reputational damage.

Property damage

Wildfires can cause direct damage to buildings, equipment, and stock, affecting raw materials, work-in-progress, finished products, and equipment. If fires reach buildings they can damage perimeter walls, break windows, and weaken structural elements such as column-beams and roof connections.

Business interruption

Wildfires can force the temporary shuttering of businesses, impacting revenue and potentially causing the layoff of staff. The disruption or closure of business can last long after the wildfire event itself.

Damage can be compounded by the loss of vital infrastructure, such as electricity, telecommunications and bridges, which can complicate site access. Prolonged operational disruption can result in lost custom, with affected areas restricted by public authorities even after the fire has been extinguished.

Bodily injury

Injuries and fatalities can be the result of direct fire, radiant heat, heat related stress and smoke exposure. Prolonged periods of smoke exposure can extend over major cities, as was experienced during recent catastrophic wildfires in California, the north-Eastern US, eastern Canada, and New South Wales, Australia, with potential long-term consequences for health.

Environmental damage

The potential environmental fallout from wildfires includes:

- Air pollution, which can affect major population centers, as well as cause business interruption and bodily injury.
- Water pollution, such as ash and eroded soil affecting the quality of water in municipal supplies or stores.
- Vegetation loss, including timber forests and agricultural crops.
- Loss of animals and native fauna. In Europe, biodiversity loss could be a liability risk.
- Habitat modification, which increases hazards like flooding and water run-off.
- Soil erosion / landslides due to subsequent rainfall on areas where the vegetation has been destroyed by fire.

Fire suppression costs

The costs of fire suppression can be significant for major wildfires, and they are an emerging liability risk.
The party causing or contributing to the wildfire extent might be subject to claims in some jurisdictions. In the US, the annual federal agency suppression costs increased from approximately US$1.5bn in the mid-2000s to over $4bn in 2021.[26] This does not include the state agency cost, such as in California, where over the five years from mid-2017 to mid-2022, the average annual unplanned expenditure on large wildfires by the lead wildfire agency, Calfire, was $630mn.[27]

Vegetation, topography, and climate risks

Business activities that could potentially ignite a wildfire are generally located outdoors. The wildfire risks associated with proximity to vegetation vary from a few meters for small heat sources, such as welding, to 100 meters or more for major heat sources, such as the bulk storage of petroleum hydrocarbons.

The vegetation must be dry enough and small enough to be ignited, and there must be enough of it to propagate a wildfire that is not easily extinguished by rain or human firefighting efforts. Dry grass, fallen bark, leaf litter, and small branches accumulating in the landscape can catch fire easily. Grasslands are particularly vulnerable, drying out quickly in hot weather, and highly flammable.

Some introduced grass species, such as buffel grass, are highly invasive and flammable, and can change the risk of a wildfire occurring and spreading. This was demonstrated in the wildfires in Hawaii in 2023. Grassland fires can spread very quickly, particularly under strong winds, but do not burn as long or have as much heat energy as a forest fire.

Larger fuels, such as tree trunks, often burn later after the fire front has passed. The flammable natural oil in eucalyptus trees (native to Australia) and the resins in some pine, fir and cedar trees make them readily ignitable. Eucalyptus trees planted in California and Portugal have added to the local fuel load.

Forests take longer to dry out in hot weather and need more energy to ignite a fire, but once the fire starts, they are much more intense than grass fires and have been responsible for the majority of losses of life and built property from wildfires.

The climatic conditions most favorable for wildfire ignition and propagation are hot, dry, and windy. These conditions typically occur during prolonged dry weather and droughts. Prolonged lack of rainfall is a clear indicator of wildfire risk. Wind serves two critical functions for wildfire – it feeds the fire with oxygen, and it blows the flames into fresh fuel, drying it and bringing it to ignition point.

Fire moves more quickly uphill than downhill. As a rough rule, each 10% increase in slope doubles the rate of fire spread. The reverse is the case downslope. Slopes facing the equator are more vulnerable to wildfire. A north-facing slope in the Northern Hemisphere or a south-facing slope in the Southern Hemisphere will be slower to heat up or dry out.

Topographic features such as saddles or passes between two ridges can change wind patterns, funnel air, and increase wind speed, which can intensify fires. Ridges, rocky outcrops, streams, rivers, lakes or roads can act as fire barriers and be used to create a boundary around fires for firefighting or fuel breaks for future fires.

In lower elevations, where most private land is located, fuels tend to dry out earlier in the year because of higher temperatures and lower precipitation. The opposite is true for fuels at higher elevations. There is also a tendency for more lightning strikes and subsequent ignitions at higher elevations.

Heightened regulation

There is increasing regulation of wildfire risk management for some industry sectors and jurisdictions. This addresses risks such as overhead electricity and telecommunications lines in California and Washington in the US, and in Victoria, Australia. In some locations, organizations and industries are obligated to prepare detailed Wildfire Management Plans (WMPs) in accordance with specific regulatory requirements.

Guidelines have been prepared by regulators in some jurisdictions in relation to vegetation management, such as in Australia, where extensive guidelines were prepared on the management of vegetation near electricity assets,[28] and in relation to prescribed burning activities.[29]

In Canada, regulatory guidelines were introduced to manage wildfire risks from railways.[30]

Third-party liability exposures

Two key factors that create potential liability exposures are human actions igniting the wildfire and the resulting property damage or bodily injury affecting third parties. These impacted parties may file liability claims against those responsible for starting the fire. Fires ignited by lightning or purely structural fires are not considered wildfire liability exposures.

Photo: Adobe Stock

Litigation

Electricity transmission and distribution are the highest risk exposure for wildfire liabilities. There has been extensive litigation in the US and, to a lesser extent, Canada and Australia in relation to wildfires caused by electricity utilities and, in some instances, telecommunications companies and railway companies. Vegetation management contractors, inspection and maintenance contractors, and other entities undertaking field operations which trigger wildfires have also been the subject of litigation.

Successful litigation requires sufficient proof that an entity was responsible for triggering the wildfire and that the wildfire caused losses to third parties. This proof can be difficult when there are multiple causes of wildfires at the same time in the same location. Nevertheless, electricity utilities in the US and Australia have paid out significant sums for wildfire liabilities.

There is potential for class actions in the US and Australia in relation to wildfire smoke emissions covering large urban areas, such as happened in California and New South Wales in 2019 and 2020. There is also potential for class actions in relation to health and environmental impacts of fire suppression chemicals during firefighting activities, particularly when those activities have failed.

Which sectors and activities are the most exposed?

Any sector can be impacted by a wildfire, but some are more exposed to hazards than others.

Utilities and energy

Wildfires pose particularly significant risks to power generation facilities, which can have extensive consequences for both the facilities themselves and the broader power grid, leading to power outages and costly repairs. Risks include physical damage, as well as disruptions to fuel supplies like natural gas pipelines. Overhead electricity distribution and transmission lines in the wildland urban interface and rural areas are a particular concern of triggering wildfires or being damaged by wildfires.

Operational disruptions are also exposed, with facilities potentially shutting down to prevent damage or comply with evacuation orders. Damage to transmission lines can cause grid instability, blackouts, or brownouts (temporary drops in voltage in electrical power systems).

Environmental impacts include deteriorating air quality which can affect both human health and the operation of sensitive equipment, and water contamination from firefighting efforts, which could disrupt cooling systems or other water-dependent processes.

Financial and legal risks are also significant, with substantial costs for repairing or replacing damaged infrastructure, and the challenges and costs of ensuring compliance with environmental and safety regulations during and after a wildfire.

Renewable facilities such as solar farms and wind farms are also at risk, with Battery Energy Storage Systems (BESS) a growing area of concern.

Finally, reputational risks should not be overlooked, as prolonged outages or perceived inadequate responses can damage the reputation of the power generation company.

Photo: Adobe Stock

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Real estate and construction

Property damage from wildfires reduces available housing and increases construction demand for rebuilding. This can lead to increased costs and longer timelines for development projects. Wildfires can halt the progress of construction projects, damage structures, and result in costly delays.

Forestry, timber, and agriculture

The forestry sector, including timber production, can experience both immediate losses from burned forests and long-term impacts due to the time required for reforestation. The long-term impacts on soil quality and water availability can also affect agricultural productivity.

Transportation

Wildfires can disrupt transportation networks by damaging roads, bridges, and rail lines, leading to delays and rerouting of goods and services. Railway lines located in rural and urban-fringe areas used by electric or diesel trains may face liability exposures.

Retail and services

Businesses in affected areas may suffer from reduced customer traffic, supply chain disruptions, and direct damages to their premises and inventory.

Hazardous activities in wildland areas

Companies such as construction or maintenance contractors conducting field work in wildland areas are exposed to liability risks associated with 'hot work' like welding, cutting or grinding on infrastructure, plant and equipment.

Vegetation management contractors undertaking mechanical removal of vegetation, such as cutting and slashing, in the vicinity of infrastructure such as powerlines and roadways are also exposed, as failure to remove sufficient vegetation or hazardous trees could result in accidental contact with powerlines and trigger a wildfire.

Allianz Risk Consulting Risk Mitigation and Loss Prevention Measures

Create defensible space

Defensible space is both horizontal and vertical (low-lying brush to large tree canopies). Your property should be divided into three zones around your buildings.

Zone 1

1.5m (0 to 5 feet) from the exterior wall of your building/s

This zone is closest to your facility, so it requires the most careful selection and intensive management of plants and materials, creating a combustible-free area.

- Install hard surfaces in this zone, such as a concrete, stone, or gravel walkway, or use non-combustible mulch products, such as rock mulch.
- Regularly water lawns and plantings to prevent dry vegetation.
- Remove dead vegetation, dried leaves, pine needles, and ground debris.
- Remove plants adjacent to combustible siding and foundation vents, as well as plants under or next to windows, under-eave vents or interior corners.
- Remove trees/shrubs next to the buildings and when branches are overhanging the roof or within 3m (10 feet) of chimneys.

Zone 2

1.5m to 9m (5 to 30 feet) from your building/s, or to the property line

Maintaining plants in this zone will help prevent fire from climbing into the top portion of trees or shrubs and burning directly to your facility.

- Maintain trees and shrubs in well-spaced groupings. Trees should be spaced to a minimum of 2.5m (18 feet) between crowns, with the distance increasing with increasing slope.
- Remove dead plant material and lower tree branches.
- Remove ladder fuels (vegetation under trees) to avoid surface fire reaching the crowns.
- Maintain lawns and native grasses – general recommendation is a height of 10cm (4 inches).
- Prune limbs and branches to a height of up to 4.5m (15 feet). For shorter trees, pruning should not exceed 1/3 of the tree height.
- Regularly water plants, trees, and lawns to keep them from becoming dry.
- Install fuel breaks such as driveways, walkways/paths, patios, and decks.

Zone 3

9m to 30m (30 to 100 feet) from your building/s, or to the property line out to 60m (200 feet) (where applicable).

Maintaining plants in this zone will help reduce the energy of wildfire, slowing its advance to your building/s. Tree and brush spacing should force any fire in the tops of the trees, brush, or shrubs to drop to the ground.

- Remove dead plant material and tree branches from vegetation on a regular maintenance schedule.
- Create islands or groupings of vegetation.
- Remove lower tree branches. Remove small conifers and brush between mature trees.
- Maintain trees with a minimum horizontal spacing of 3m (10 feet) between crown edges.

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Reduce organic fuel

Create a Vegetation Maintenance Plan (VMP) to reduce ignition sources. If you are using plants around a building, select those with low combustibility characteristics such as a high moisture content, low oil or resin content, deep roots with thick, heavy leaves, and minimal production of dead vegetation. Use pebbles or rocks as mulch. Plant windbreaks to slow winds and deflect embers. When developing a VMP, consult a landscape professional such as a forester, range manager, or natural resources specialist.

Rooftop-mounted equipment

Protect rooftop-mounted equipment with metal sheets to avoid embers reaching it and starting a fire.

Outdoor/yard storage

Remove, where possible, any flammable liquids, such as IBC (intermediate bulk containers) storage and above-ground diesel tanks, and combustible materials, such as idle pallets and waste containers, which could create a fire bridge connecting the external vegetation to the buildings.

External tanks, silos and pipe racks

Remove or carefully study the position of external tanks and silos to avoid potential involvement in a fire coming from the vegetation. Similarly, remove or carefully study the routing of pipe racks, especially if they transport flammable liquids or hazardous gases.

Clear debris

Draw up a thorough checklist for each building which identifies common areas where debris could accumulate, such as roofs, gutters, and around building perimeters at ground level. Debris should be removed weekly during peak periods and at other times when the local fire risk is considered elevated. Coordinate with local authorities to reduce the possibility of a wildfire escalating in external areas beyond your company's control.

Non-combustible building materials

Use non-combustible materials for building signage, avoiding wood, plastic and vinyl, and for exterior wall cladding (consider concrete or brick). Select windows that are dual-paned with tempered glass and roof covers with a Class A fire rating based on testing to ASTM E108 or UL 790. Select gutters and downspouts made of non-combustible materials such as aluminum. Install 1/8-inch non-combustible mesh screening over all vents to prohibit wind-blown embers from entering your building.

Fire suppression and protection

Install certified portable fire extinguishers
These should be in good condition and of the appropriate type (such as water, foam or carbon dioxide) and distributed so they are visible at all times, with clear signposting. Ensure they are maintained according to the manufacturer's instructions.

Access for emergency services
All roads, external or internal, to the site must be capable of supporting emergency access vehicles and should be a minimum of 6m (20 feet) wide.

Fire protection
Reinforce fire protection systems by ensuring water tanks are full, installing external sprinklers, and maintaining water cannons. The private water reservoir (above ground tank) and fire pump station must be positioned far from any combustible materials and in a position that is not exposed to vegetation fire.

Yard hydrants and hoses must be easily accessible. Additional wildland fire defense equipment should be arranged in a safe and accessible position free of vegetation and/or combustible storages.

Install fire breaks
Suitable fire breaks should be installed around the perimeter of the site and, where the site permits, these should also be installed internally. Fire breaks must be constructed to ensure vegetation is not able to grow in or through the fire break.

Heed warnings
If you are under a wildfire warning, get to safety right away. Leave if told to do so. If trapped, call emergency services. Listen for emergency information and alerts. Use masks that meet appropriate standards to keep particles out of the air you breathe.

Wildfire preparedness programs

A thorough response and evacuation plan should be implemented prior to staff and guests arriving at the property. This plan should be practiced, with training for anyone who may be required to participate.
A plan could include the following:

- ✓ Create a dedicated response team. Identify and train those who will communicate with local authorities and establish alternates for all roles, with training as appropriate.
- ✓ Create a communication method that can promptly alert everyone on the property.
- ✓ Conduct hydrant testing and use this to verify proper equipment is on hand.
- ✓ Conduct comprehensive annual training exercises including the shut-off of all non-essential gas and liquid fuel supplies to the buildings and the shut-down of heating, ventilation and air-conditioning (HVAC) equipment.
- ✓ Determine how many vehicles will be required to evacuate the site and maintain fuel levels for these.
- ✓ Keep any water tanks or portable supplies filled and ready. Maintain rally or refuge points in accordance with company refuge area guidelines.
- ✓ No smoking outdoors should be strictly enforced during periods of drought.
- ✓ Test/start the emergency generator.
- ✓ Back up computer and server data and take them off site.

Regularly update and review your inventory, business continuity, evacuation, and safety plans.

Innovations in modelling and mitigating wildfire risk

There is a range of increasingly sophisticated technical tools and innovations that can be used to model and mitigate fire risk. These include:

Wildfire risk modelling: Wildfire agencies, research institutions, reinsurers and some electrical utilities have been developing new tools and models to predict the likelihood and consequences of wildfires, as well as early detection to enable prompt suppression. The level of precision with some can be down to the scale of an individual power pole.

Seasonal forecasting: Wildfire risk forecasts are continually being developed and improved, although they are highly complex and contain inherent uncertainties. They are increasingly used by electrical utilities to assess and manage wildfire risks on a year-to-year basis.

GIS (geographical information system) mapping: Utilities are increasingly using GIS to map their assets with overlay of wildfire risk mapping from government agencies to guide asset inspection and maintenance, including vegetation. The best vegetation management contractors are using their clients' GIS data and mapping each tree requiring trimming or removal.

Field data management tools: Some utilities and vegetation management contractors are using electronic tablets in the field to report and update progress in vegetation management, seek approval from clients to address urgent issues, report hazards and incidents, and undertake audits, with real-time automated reporting to stakeholders.

LiDAR surveys: There is growing use of LiDAR (light detection and ranging) surveys using drones, helicopters or foot patrol to map vegetation encroachments and condition of overhead electricity and telecommunications lines. However, these are not foolproof and field crew observations are required to verify findings.

Thermal imaging: This can be used to identify potential abnormalities before failure in vulnerable transmission and distribution lines or equipment.

Vegetation management systems: Improvements in these systems include linking vegetation survey tools to utility assets mapping via GIS, to the scale of individual power poles and even individual trees, overlaid with best-in-class wildfire risk mapping; real-time field reporting on field surveys and vegetation removal works, enabling immediate approval to address new finds; and the development of tools to estimate likely vegetation growth rates, to fine-tune vegetation removal.

Rapid earth current limiters (fast trip devices): Operators in the US and Australia have been installing these devices or similar, such as fault current limiters or current limiter circuit breakers, on powerlines in areas of high risk. The devices limit or stop the flow of electricity in the event of damage to the electricity line or equipment, reducing the risk of wildfire.

Conductor spacers / spreaders: These prevent powerlines clashing in high winds.

System hardening works: Electrical and telecommunications utilities in the US and Australia have invested significant sums in system hardening – physical works to reduce the likelihood of their networks triggering a wildfire, including upgrading electricity poles and wires and undergrounding powerlines.

De-energizing powerlines: This measure is sometimes implemented in times of high risk in certain jurisdictions, including California and Australia. It presents a trade-off between the harm caused by customers having no power and the risks from wildfire.

AI cameras: Artificial intelligence cameras on poles in high-risk areas can assist in early fire detection and map its location.

Photo: Adobe Stock

Conclusion

Businesses need to be aware of how their assets and operations could either initiate or be affected by wildfire. They should identify the risk for their operations to trigger wildfires or be impacted by wildfires started by human or natural causes, assess the potential impacts and develop well documented wildfire management plans appropriate to their operations and regulatory requirements.

As fire regimes and risk management strategies evolve, keeping up with new practices and technologies is vital to ensure risks remain insurable.

Wildfire mitigation calls for a multi-faceted approach, including individual companies' compliance with all relevant laws and regulations concerning fire safety and their mitigation and prevention of fire. More broadly, preparing for wildfire will require efforts to mitigate greenhouse gas emissions, adapting to changing environmental conditions, and implementing effective wildfire management strategies. This might involve a combination of government policies to reduce carbon emissions, land use planning to minimize exposure to wildfire risk, and investments in technologies that enhance fire detection, prediction, and suppression.

Mitigating wildfires is a complex and pressing issue that requires coordinated action at local, national, and global levels to minimize risks and build resilience in the face of a changing climate.

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