



## International Wildfire Management: Strategic Insights and Collaborative Opportunities for Fire Leadership

### Preface

This white paper examines the outcomes and opportunities identified during the second International Fire Department Exchange (IFDX), held in conjunction with the International Association of Fire Chiefs' (IAFC) Wildland-Urban Interface (WUI) conference held in March 2025 in Kansas City, Missouri. Year two of the IFDX further strengthened efforts to share knowledge, refine practices, and foster partnerships between diverse regions, each contributing its unique expertise to fire management. The exchange widened and deepened perspectives about wildfire issues on an international scale by building on the insights and feedback from the inaugural exchange held in 2024.

### Executive Summary

Wildfires pose a growing threat worldwide, fueled by climate change and the expansion of populations into fire-prone areas. Wildfire management requires integrated strategies that address fuel reduction, emergency response, community resilience, and international collaboration. Fire service members from Australia, Canada, Portugal, South Africa, the United Kingdom, and the United States were brought together to discuss critical areas including fuels management, evacuation strategies, response & pre-planning, community engagement, and building safety & regulation. This exchange also identified actionable collaboration opportunities that can inform future wildfire strategy development and implementation. These findings are intended to support fire chiefs and emergency leaders.

### Fuels Management

The objective of fuels management, according to the U.S. Department of Interior, is to “build wildfire resilience by reducing small trees, brush, dead branches, and limbs (called ladder fuels), which makes it less likely that future wildfires will torch an entire landscape.”<sup>1</sup> Key strategies include prescribed burning, vegetation management, and risk mapping.

Australia and Wales conduct seasonal prescribed burns supported by simulation toolkits. In particular, New South Wales, Australia, employs specific fire behavior modelling run on Amazon Web Services to compare mitigation costs with potential losses. In the United States, prescribed burns are implemented by various agencies with differing levels of public acceptance and legal frameworks. In Portugal, to manage vegetation levels, incentives are placed on landowners to plant alternatives to eucalyptus. While economically valuable, they are highly flammable and

---

1. <sup>1</sup> U.S. Department of the Interior, “Fuels Management,” Wildland Fire, <https://www.doi.gov/wildlandfire/fuels>.

fast-growing. South Africa's Free State enforces landowner responsibility for firebreaks under the National Veld and Forest Fire Act. Challenges vary by region. These include increased wildfire fuel loads in Wales due to a decline in livestock grazing, the absence of registered landowner details in Portugal, and limited national oversight of fuel treatment implementation in South Africa. Fuel management practices differ across countries, shaped by the operational roles of fire agencies, land use patterns, and governance structures. Comparative analysis of these approaches clarifies where alignment exists and where differences present challenges and opportunities.

Desired outcomes for fuels management include developing data-driven risk mapping, implementing locally adapted fuels management practices, and comprehensive vegetation mapping to inform efficient mitigation. Networking with stakeholders to share strategies and strengthen wildfire resilience is a key component to ensuring the success of preventing wildfires.

### **Evacuation Strategies**

Evacuation strategies, according to the Canadian Interagency Forest Fire Centre, are “organized, phased, and supervised withdrawal, dispersal, or removal of civilians from dangerous or potentially dangerous areas, and their reception and care in safe areas.”<sup>2</sup> These strategies vary significantly across countries, shaped by geography, governance, and public communication systems.

New South Wales employs transportation corridor risk assessments to identify potential bottlenecks and optimize evacuation routes. These assessments are integrated into broader fire planning frameworks, particularly in high-risk regions where road access is limited. Since pre-planned evacuations are rare in New South Wales, emergency warnings are used to communicate expected behavior. Canada demonstrated the effectiveness of large-scale evacuation during the 2024 Jasper Fire, where over 20,000 residents were relocated with minimal incident. This success was attributed to the Unified Command's response to this incident and the years of building relationships between the people themselves, not just the organizations and agencies. The United States relies on a decentralized system where evacuation alerts and planning are managed at the local and state levels, often as an “opt-in” method of alerting. Tools such as geo-spatial mapping, reverse 911 systems, and web-based platforms are used to notify residents. However, the variability in systems and protocols across jurisdictions can lead to inconsistencies in execution and public understanding. Portugal and Wales coordinate evacuation and response through the European Response Coordination Centre (ERCC), which facilitates the deployment of international teams. While this model supports rapid mobilization, it can sometimes result in misalignment between international responders and local landowners or agencies, particularly when evacuation priorities differ. Free State, South Africa, evacuations are issued through local radio and SMS systems. This strategy is primarily community-based and emphasizes local readiness. A critical gap identified across all regions is the absence of standardized cross-border evacuation protocols. This is particularly relevant in areas where wildfires may span national

---

<sup>2</sup> Canadian Interagency Forest Fire Centre, “Glossary,” CIFFC, accessed July 23, 2025, <https://glossary.cifff.ca/>.

boundaries, such as between the U.S. and Canada or the U.S. and Mexico. Without harmonized procedures, agencies may face delays or legal barriers in coordinating evacuations across borders.

Desired outcomes include the development of cross-border, interoperable evacuation policies and communication strategies that can function across jurisdictions and national boundaries.

### **Pre-Planning & Response**

Effective planning and response rely not only on the availability of personnel and equipment but also on the clarity of roles, interoperability of systems, and the ability to adapt to rapidly evolving fire conditions. In NSW, details of the coordinated firefighting arrangements at a local level are recorded in the Bush Fire Management Committee's Plan of Operations, which "sets out the types of work scheduled to deal with the risk of bush fires in an area from a community engagement event to hazard reduction activities."<sup>3</sup>

The United States utilizes a tiered Incident Management Team (IMT) structure, which scales from local Type 5 teams to national Type 1 teams (Complex Incident Management Team) based on incident complexity. This system enables flexible deployment of resources and leadership, but challenges persist at higher planning levels, where resource scarcity and interagency coordination become more complex. The U.S. also integrates tribal, federal, state, and local agencies under the National Incident Management System (NIMS), which provides a standardized framework for command and control. Similar to the United States' NIMS, Australia utilizes the Australasian Inter-Service Incident Management System (AIIMS) and adapts team size to the complexity of the incident. As mentioned prior, the NSW local level Plan of Operations ensures a state of readiness by identifying key incident planning information such as operational readiness triggers based on fire danger, key stakeholders, and mapping of significant assets at risk and key operational data that may support responding firefighters. Canada operates under the Canadian Interagency Forest Fire Centre (CIFFC), which facilitates mutual aid across provinces and territories. The majority of Canadian fire departments are trained in wildfire response, enabling a high level of interoperability. The CIFFC model emphasizes pre-season planning, resource sharing agreements, and national-level coordination, which proved effective during recent large-scale fire seasons. Wales employs the DEEPA model (Direction, Exposure, Evacuation, Plan, Anchor), a multi-hazard planning framework that supports regional coordination. This approach integrates wildfire planning into broader emergency management strategies, ensuring that wildfire response is not siloed from other hazard responses. Portugal's response functions under the National Authority for Emergency and Civil Protection (ANEPC), which oversees firefighting operations, logistics, coordination, and communication during wildfires. The Free State, South Africa, has developed a community-based volunteer firefighter model, particularly in rural areas where formal fire services are limited. This model is supported by the adoption of the Incident Command System (ICS), which enhances coordination between volunteers and professional

---

<sup>3</sup>NSW Rural Fire Service. "Bush Fire Management Committees." *NSW Government*.  
<https://www.rfs.nsw.gov.au/plan-and-prepare/managing-bush-fire-risk/bush-fire-management-committees>

responders. The integration of local knowledge and community engagement into response planning has improved initial attack times and situational awareness.

Desired outcomes include improving wildfire response capabilities, strengthening existing planning frameworks and agreements that facilitate cross-border resource mobilization, operational interoperability, and interagency collaboration. This would be independent of the US-Canada-Mexico agreement that only specifies the US Department of Agriculture and the US Department of Interior exchange and resource sharing.

## **Community Engagement**

Community engagement is a foundational element of wildfire risk reduction. The role of education and local participation in building fire-adapted communities improves overall safety and resilience. Effective engagement strategies improve preparedness and cooperation between residents and fire authorities. South Africa's National Veld and Forest Fire Act requires landowners “to have available equipment and trained personnel to extinguish any veldfire that may start or spread from their land and compels landowners to actively prevent the spread of fires from land under their control.”<sup>4</sup>

New South Wales implements a multi-agency approach through its Bush Fire Management Committees, made up of landholders, land managers, fire authorities, and community organizations, which coordinate localized education, preparedness campaigns, and risk communication. These committees serve as a model for integrating diverse stakeholders into a unified community risk management framework. South Africa promotes Community-Based Veldfire Management, which includes a training program focused on defensible space creation, early detection, and local response coordination. This model is particularly effective in rural areas where formal fire services may be limited. Canada operates the FireSmart program, which provides homeowners and communities with tools to reduce structural ignition risks. While generally adopted in western provinces, uptake in eastern regions remains limited due to differing risk perceptions and resource availability. Successful local FireSmart initiatives in Banff include incentives to install sprinklers, replace combustible roof materials and remove conifer trees immediately adjacent to homes. The United States supports several initiatives including Firewise, Fire Adapted Communities, and the Fire Learning Network. These programs emphasize homeowner responsibility and landscape-level planning. Portugal's local civil protection units and volunteer fire brigades play a central role in outreach and preparedness. In some regions, municipalities have partnered with residents to implement fuel management zones and conduct evacuation drills. Wales's community support and engagement involves adopting and adapting Firewise initiatives, risk awareness and preparedness, and awareness of wildfire causes including accidental and deliberate ignitions.

Desired outcomes for community engagement include continued investment in scalable, community-based engagement models that integrate local stakeholders into risk reduction

---

<sup>4</sup> South African Government. National Veld and Forest Fire Act 101 of 1998. Chapter 5: Fire Fighting. Accessed July 31, 2025. [https://www.gov.za/sites/default/files/gcis\\_document/201409/a101-98.pdf](https://www.gov.za/sites/default/files/gcis_document/201409/a101-98.pdf)

planning, promote shared responsibility, and adapt outreach strategies to regional needs and capacities. In the US, exploration of new funding facilities should be paramount to this effort given the current emphasis on local and state-derived support.

## **Building Safety & Regulation**

Minimizing wildfire risk in the WUI requires construction standards and enforcement mechanisms. This focus area addresses how building designs, materials, and land-use planning can reduce structural vulnerability to wildfire ignition and spread. The European Civil Protection and Humanitarian Aid Operations is “reinforcing WUI fires risk reduction strategies by designing, testing and operating a virtual workbench service for the analysis of fire hazards and buildings vulnerabilities at different European WUI realities which assist engineers and architects in their designs and will provide scientifically-based information to fire services and regulatory bodies.”<sup>5</sup>

New South Wales has a legislative requirement for bush fire protection measures to be considered in high-risk areas, which includes measures such as defensible space, ember protection, and ignition-resistant materials. Canada promotes ember-resistant construction through national guidance and provincial programs like FireSmart. These standards focus on non-combustible materials and vegetation management around structures. Wales has recently undergone regulatory changes due to the Building Safety Act 2022 to reduce fire spread potential in both new and existing structures. However, Wales has seen an increase in fire risk due to the use of building with wood and composite materials for fencing, decks, and outdoor structures. Portugal has increased its focus on WUI resilience research initiatives, such as evaluating local construction materials and ember exposure. These initiatives have been utilized to develop practical mitigation strategies. Municipalities are increasingly incorporating fire-resistant design principles into local planning, including defensible space requirements and restrictions on flammable vegetation near homes – similar to FireSmart standards. Free State, South Africa, is classified as a high wildfire hazard zone. While national building regulations provide a framework for fire protection, including structural stability, smoke control, and escape routes, implementation at the provincial and municipal levels varies. There is growing recognition of the need to integrate wildfire-specific considerations into land-use planning and construction, particularly in rural settlements and agricultural zones where informal housing is common. The United States applies a patchwork of WUI codes, with only a few states adopting the International Wildland-Urban Interface Code (IWUIC) statewide. Local jurisdictions often modify the IWUIC to reflect regional fire risks. Key provisions include Defensible space requirements, Ignition-resistant construction for roofs, walls, and vents, Emergency access and water supply standards, and Fire-resistant landscaping and fuel breaks. Enforcement challenges remain, and retrofitting older structures in the WUI presents significant logistical and financial hurdles.

---

<sup>5</sup> European Commission. Wildland-Urban Interface Virtual Essays Workbench (WUIVIEW). Civil Protection and Humanitarian Aid Operations. [https://civil-protection-humanitarian-aid.ec.europa.eu/funding-evaluations/financing-civil-protection/prevention-and-preparedness-projects-civil-protection/overview-past-track-i-and-track-ii-projects/wildland-urban-interface-virtual-essays-workbench-wuiview\\_en](https://civil-protection-humanitarian-aid.ec.europa.eu/funding-evaluations/financing-civil-protection/prevention-and-preparedness-projects-civil-protection/overview-past-track-i-and-track-ii-projects/wildland-urban-interface-virtual-essays-workbench-wuiview_en).

Desired outcomes include recommending that governments and fire authorities promote the adoption and enforcement of wildfire-resilient building codes while supporting research, public education, and financial incentives to improve compliance and facilitate retrofits in locally determined high-risk areas. It is also recommended that codes be communicated to response agencies, ensuring that current research is actionable.

### **Opportunities for International Collaboration**

Three key opportunities for collaboration were identified. First, common training curricula, resource classification systems, and cross-jurisdictional data sharing policies and protocols should be expanded to enhance interoperability and mutual aid. Shared frameworks can support joint mobilization and clearer role integration during complex wildfire incidents.

Second, international-boundary wildfire planning should include the development of joint evacuation and response agreements and protocols, coordinating planning with national security/immigration and emergency agencies to ensure legal clarity, resource coordination, and communication. Third, exchange programs should facilitate the sharing of wildfire risk modeling algorithms, forecast predictors, and metrics to assess wildfire preparedness and property resilience among participating countries.

### **Conclusion**

This white paper provides a foundation for international strategic wildfire management and collaboration. By aligning efforts across Fuels Management, Evacuation Strategies, Response & Pre-Planning, Community Engagement, and Building Safety & Regulation, fire chiefs can lead the charge in building more resilient, adaptive, and cooperative fire management systems. The IFDX 2025 reaffirmed the necessity of international information exchanges to address the growing complexities and promote best practices of wildfire management across agency types and boundaries.

Thank you to the IFDX Sponsors  
Skeeter Emergency Vehicles  
Mystery Ranch  
International Code Council