International Association of Wildland Fire

POSITION PAPER ADVOCATES LONG-TERM USE OF APPLIED FIRE

The International Association of Wildland Fire (IAWF) is an independent, nonprofit organization. For more than 30 years, the IAWF has facilitated global communication on wildland fire and provided objective leadership through a neutral forum of diverse experts who consider and address all important, and at times controversial, wildland fire issues. IAWF membership spans all continents; the association is a primary global voice of wildland fire personnel, land managers, and scientists. IAWF's goal is to tackle contemporary issues confronting wildland fire communities to achieve a sustainable wildland fire paradigm.

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1. OVERVIEW AND PURPOSE

This IAWF position statement articulates the critical importance of intentional burning as a landscape management tool, including the skillful application of fire to meet multiple resource objectives.

For almost 400 million years, fire has shaped our planet. Humans have used fire for millennia – for land clearing, cultural practices, agriculture, hunting, migration corridors and travel pathways, and even warfare.

Across the globe there are multiple perspectives on human-environment relationships and the role of fire, and the notion of prescribed fire incorporates western perspectives on nature combined with scientific principles and methods. Prescribed fire is applied for a range of outcomes that can include managing fuels, maintaining a carbon balance, ensuring the supply of clean water, sustaining ecosystems and conserving biodiversity.

Globally diverse Indigenous groups may have different understandings of the interconnectedness of fire, people and other phenomena and those viewpoints and insights shape their use of fire for particular cultural purposes.

Contemporary uses of fire for land management broadly fit into three categories:

• fuels management (often called prescribed burning or hazard reduction burning);

• landscape and ecosystem management (often called prescribed fire);

• Indigenous cultural fire practices. (Note: many Indigenous, First Nations or Aboriginal Peoples do not consider cultural burning to be a category of prescribed fire.)

According to a 2013 article "Perspectives of prescribed burning" by Jeremy Russell-Smith and Richard Thornton, in Frontiers in the Ecology and the Environment, the use of fire for land

management has been controversial almost everywhere it has occurred, for various reasons, from the impact of smoke on human health and agriculture to the anti-logging position that fires are visible symbols of post-harvesting debris removal.

For humans to aid ecosystems in adaptation to climate change and mitigate the impact of changed fire regimes on landscape values, the role of fire as a management tool must increase in importance.

Climate models predict drying and warming trends across many parts of the world. According to the "Sixth Assessment Report of the United Nations Intergovernmental Panel on Climate Change in 2021," the trends are likely to exacerbate wildfire risk, both the likelihood of fire and extreme fire consequences. Warming and drying trends will have a significant impact on the use of prescribed fire as the only broad-area management tool. It is predicted that around the globe, traditional weather windows for prescribed burning will shift and change.

2. AIMS, EFFECTIVENESS AND ISSUES ASSOCIATED WITH TYPES OF PRESCRIBED BURNING It is widely accepted by wildland-fire managers that burning vegetation, whether through prescribed burning or leaving an appropriate wildland fire to burn, can mitigate the negative impacts of wildfire.

Challenges to conducting prescribed fires include funding, workforce capability and capacity; lack of comfort among residents with fire and smoke; and in some countries, fines for smoke pollution. In addition, many agencies are risk averse (often as a result of an escaped prescribed burn) and reluctant to allow prescribed burns, based on political and social fear. Increasing the application of prescribed burning, in some regions, will necessitate broad agency interaction to balance the risk of poor air quality from a wildfire with the risk to air quality and health under conditions during which prescribed fire can be used. Social science research can, and has, advanced the understanding of the barriers to and opportunities for prescribed fire for landowners and the public. Prescribed burning can reduce the severity of future fire behaviour, create safer communities, increase the potential success of containment efforts for wildfires, improve biodiversity, and maintain and improve the health and resilience of ecosystems.

Prescribed burning can be completed at scales ranging from small site-specific projects of less than five hectares to large, landscape burns totaling more than 50,000 hectares, with a treatment range from single to combinations of burns with various aims, and single to multiple applications over several years.

Prescribed burns can be carried out over multiple jurisdictional boundaries involving many landowners and managers. The common goal is to enable more successful landscape outcomes, which often requires significant political and social awareness for the expanded use of wildland fire to minimize fuels, support biodiversity and adapt to climate change.

i. Fuels / hazard reduction

The purpose of this type of prescribed burning is to reduce fuel levels (fuel hazard, change in structure and continuity, decrease fuel load) to:

a. enable easier control of fires during an initial attack

b. reduce the likelihood of fire ignitions (for example, roadsides)

c. improve community and firefighter safety, and reduce potential economic losses

d. provide areas of decreased fire intensity and reduced ember production for safer firefighting operations, including backburning and burnout, for increased opportunities for containment and operational safety

e. reduce fire exposure and potential impact on firefighters, biodiversity, cultural values, communities, assets, and key infrastructure.

f. minimize the potential for large fire runs.

Wildland fire managers have developed and refined prescribed fire as one of several modern and efficient tools to reduce future wildfire intensity and severity. While climate change is altering some of the parameters, prescribed burning remains a critical process in managing the future impacts of wildfire on our landscapes and communities.

Although prescribed fires can reduce the severity and intensity of future wildfires, the level of effectiveness decreases under extreme hot, dry, and windy weather conditions. Under these conditions the fire and atmosphere are coupled and therefore promote increased drying of fuels, fire spotting, and the generation of pyro-cumulous and pyro-cumulonimbus clouds.

Most wildfire incidents occur under moderate conditions during which litter and understorey / fuels are the primary driver of fire behaviour. The impacts of such fires can be substantially mitigated if there is an existing network of fuel reduced areas. Between 95 per cent and 98 per cent of fires are brought under control during the initial or extended attack.

A case study of the 2003 fires in Victoria, Australia, showed that reduced fuel hazard decreased fire severity sufficiently to lessen impacts on wildlife, soil, water and cultural values compared to the impacts of the same fire burning through heavy fuels, and even a wildfire burning under extreme conditions.

Managing any parcel of land for multiple values will cause potential conflict in many cases, so tradeoffs between values are necessary. For example, burning will favour some species over others. Equally, more frequent burning to protect watersheds, critical infrastructure or residential areas will have a negative impact on some species and biodiversity.

Another tradeoff is the impact of a prescribed burn measured against the severe and devastating impacts of a future wildfire. Even if a prescribed burn has some substantial undesirable effects, these should be evaluated against the damage potential of an uncontrollable wildfire.

There is a possibility that prescribed fire implemented for hazard reduction will have negative effects on biodiversity or other values if prescribed fire is too intense, too frequent or conducted in an inappropropriate season. So, planning with local land managers is essential. It is also important to monitor fire effects after a burn, so practices can be improved. Decisions to conduct prescribed burns depend on the values managed in a particular landscape or a management unit, and tradeoffs between those values, which should be considered in the context of the larger ecosystem and over multiple timescales.

An additional complexity of prescribed burning is reaching a consensus on smoke management with communities and the organisations that are responsible for air quality. Smoke from wildfire significantly impacts human health and is associated with an increased risk of respiratory and heart morbidity, as reported in a 2015 literature review of 61 epidemiological studies linking wildfire and human health. Additionally, a 2018 report in the Medical Journal of Australia acknowledged that smoke from planned burning impacts human health and argued for factual discussions about the role of prescribed fire in risk reduction, while considering the health burden associated with fire smoke.

Managing the effects of smoke on human health is a complex problem. Agencies and affected groups need to enter a discussion that includes bushfire practitioners and managers who are able to influence burning operations. The IAWF suggests a re-focused, balanced comparison that considers the totality of risks and benefits of prescribed burning, rather than unrealistic smoke or no-smoke comparisons. It would be beneficial to contrast possible levels of smoke during prescribed burning and wildfire seasons and other impacts of wildfires (for example, impact on life, ecosystems and diversity, fuel loads, property, and critical infrastructure). According to a 2022 report prepared for the American Lung Association, prescribed burns are typically of shorter duration than wildfires, are less severe, and occur at known times of the year, so precautions can be taken in advance of a prescribed fire season. The conversation should also include the benefits of prescribed burns and natural fires that are allowed to burn under pre-set prescriptions.

ii. Ecosystem management (biodiversity, carbon, water yield and quality)

Ecological burning is a critical process for maintaining healthy ecosystems. In some systems, the purpose of ecological burning is to return fire as a natural disturbance to fire-prone landscapes, where suppression activities have excluded fire. Prescribed fire would aim to decrease the departure from natural fire regimes and therefore maintain ecosystem health. Important functions of fire include stimulating regeneration, increasing flora and fauna species diversity, disadvantaging invasive species, and providing high-quality habitat for a diverse range of species.

A 2020 article in the Journal of Ecology titled “Fire as a fundamental ecological process: Research advances and frontiers,” states that fire is a powerful ecological and evolutionary force that regulates organismal traits, population sizes, species interactions, community composition, carbon and nutrient cycling, and ecosystem function. Fire also presents a rapidly growing societal challenge, due to both increasingly destructive wildfires and fire exclusion in fire-dependent ecosystems.

According to Marcelo Simon et al. in 2009, and Tianhua He et al. in 2019, fire is a recurrent process, a regime, which is integral to ecological function. Fire regimes have direct ecological effects and act as selective evolutionary forces. Moreover, as species are adapted to the fire regimes in which they evolve, they in turn influence the fire regimes to which they are subject. Humans have altered fire regimes in many ways such as converting forests to farmland, suppressing fire and prescribing fire. Ecological burning seeks to impose fire regimes that support healthy, diverse, resilient ecosystems. Prescribed burning, aimed at achieving ecological resource objectives, is a tool that could support ecosystem adaptation to the changing climate.

iii. Indigenous cultural burning practices

Cultural burning is a type of prescribed burn that has been ingrained in cultures for generations for ceremonial purposes, to sustain desired species and habitats, and to maintain a lifestyle synchronised with regional ecosystems and Earth. Cultural burning has been practiced by many Indigenous Peoples and preindustrial communities around the world for millennia. It usually differs from agency prescribed burn practices in the reasons, techniques, and times for burning. Colonization often resulted in fire exclusion and brought a sudden end to many cultural burning practices. Many Indigenous Peoples do not consider cultural burning to be a category of prescribed burning, because they consider the two practices to be fundamentally different. In the last two decades, Indigenous Peoples around the globe have reintroduced cultural burning techniques and objectives on a larger scale, although it's important to note that many Indigenous groups in South America, Africa and Australia never stopped burning. For example, in California, legislation has been passed through extensive work by Indigenous groups that recognizes cultural burners and cultural burning practices. Important to this is not just the application of fire, but the resurgence of Indigenous knowledge and issues of sovereignty, autonomy, and cultural transmission between generations. Recent studies have demonstrated that Indigenous land management practices, such as cultural burning, have increased biodiversity and reduced net carbon emissions.

Many barriers still exist toward implementing cultural burning and Indigenous-led cultural burning programs, including lack of understanding, cultural appropriation, and unsympathetic laws and governance.

3. CALLS TO ACTION

The IAWF's vision is to safely and effectively extinguish wildfires, when necessary, and to use prescribed burning and wildland fire where and when possible, to meet human objectives. Those objectives include human protection and safety; management of ecosystems, landscapes, resources and fuels; increased landscape resilience in the face of climate change; and support for Indigenous inherent rights to fire as a cultural practice. The pathway to this vision is the education of communities in the appreciation of the value of fire regimes culminating in a co-existence between people and wildland fire and smoke.

To achieve this vision, the IAWF proposes that the global wildland fire community:

1. Identify and enhance community co-existence with fire.

• Develop public understanding of the overarching long-term benefits of fire on our landscapes to mitigate potential risks, and the necessity for prescribed, controlled and Indigenous burning, as well as wildfire.

2. Identify ecosystems most at risk to large, high-severity wildfires.

• Prioritize landscapes that are at the greatest risk, for treatments and mitigation measures to build landscapes that can withstand changes in fire regimes in accordance with climate, land and resource management objectives. The

IAWF proposes that wildland fire communities and agencies consider several actions to achieve these objectives.

A. ORGANIZATIONS, AGENCY POLICIES, PRACTICES, WORKFORCE AND CULTURE

Organizations and agencies will need to balance the ever-increasing complexity in policies, procedures, planning and approvals processes with the need for agility and readiness to take advantage of the decreasing windows of opportunities to burn, which might change as fire weather and landscapes are altered by changes in climate.

As prescribed burn programs address the increasing risk to people and ecosystem services, it is inevitable that some mistakes will be made during program planning and delivery. It is important that agencies move away from a blame culture, so mistakes can be analyzed without fear of retribution. Doing so will enable organizations and agencies to learn from mistakes and improve processes, procedures and knowledge within their workforces.

Agencies need to continually maintain skills and capacity, recognizing that the challenges for fire management and effective application of prescribed burning cannot be met by any one agency, organization, or community alone. Leaders in wildland fire, weather prediction and regulators must all identify where greater collaboration is required. As landscape and community risk increases, adaptable funding mechanisms are crucial to managing the complexity of wildland fire and smoke management across multiple agencies and jurisdictions. The focus should be to set appropriate objectives for the management of the broader landscape, management units (forest block, national parks) and the use of prescribed burning.

Setting objectives also facilitates engagement with communities affected by prescribed fire and managed wildfire. Although burn-program objectives at a regional or national level are commonly used, it is essential to accommodate local scales and perspectives, to improve the types of actions that might achieve objectives, and to widen their adoption. The organisations should utilise available tools to predict and minimise smoke impact on human health.

Planned-burn programs should reflect longer-term, inter-agency strategies designed to manage for a range of outcomes. Such strategies could include the protection of life, property, industry and assets; fuels reduction and maintenance; promotion of ecosystem health and diversity; establishment and support for diverse species habitats; control of invasive species; management of air quality risks; and protection of cultural assets.

B. COMMUNITIES AND SOCIAL LICENSE

In its broadest sense, shared responsibility is about negotiating a new social contract for wildfire preparedness, management and recovery under which governments and communities agree on the allocation of rights and responsibilities.

The shared responsibility for wildland fire management is about the ways citizens and governments can work together to minimise the potential impact of future wildland fire events. This can be achieved by focusing on the meaning of shared responsibility in specific contexts and the significance and challenges for the way citizens and all levels of government can work together to manage infrastructure, air quality, health and wildfire risk. A renewed focus is required on mitigation, community resilience, maintenance of defensible spaces and collaborative planning between residents and first responders. We must recognise that different agencies, businesses and communities have different capabilities and therefore different vulnerabilities and strengths.

Gaining and maintaining social license for prescribed burning is crucial; without it, large burning programs cannot be conducted. This is where the role of community engagement and education is extremely important. Communities must be engaged in pre-fire action planning and reach a consensus on the value of fire-safe initiatives such as creation of defensible space, evacuation planning and provision of firefighting water supplies. IAWF vice president Steve Miller proposed in a 2013 webinar titled Burning in Their Backyards and Having Them Say Thank You, Wildland Fire Lessons Learned, that wildland fire leaders should learn from experiences in communities that were previously resistant to prescribed fire, but have come to understand how it can work for them. Lessons and comparisons of post-fire, fire-safe communities and communities that are not fire-safe can encourage positive action. Also a comparison between healthy post-fire ecosystem recovery from prescribed burning with similar post-fire recovery of severely burned ecosystems can help communities understand the difference. Wildland fire organizations and agencies must listen to community concerns about prescribed fire, adjust their plans accordingly, and refrain from assuming what the community values. Social scientists can help to bridge the gap between wildland fire organizations and communities.

Prescribed burning can have significant benefits in terms of developing community awareness and behaviour in relation to wildfire. Through participation in planning and operations, people are better prepared for wildfire, acquire a better appreciation of the threats of wildfire, recognise when fire control will be difficult, and are better able to understand the benefits and limitations of specific fuel management operations.

C. USE OF TECHNOLOGY

Technology is critical to efficient prescribed burning, effective sharing of data, and helping people and organizations be more innovative, safe, and productive. The role of technology is to enhance prescribed burning, and to improve communication, situational awareness and safety. Technology is an enabler for improving current practices. Agencies and jurisdictions should share information and create partnerships to expedite technological development.

D. RESEARCH AND SCIENCE

Fire management needs to be based upon the best available science and this science should be made publicly available to communities it serves. Knowledge, research, science, and experience should be shared among all related wildland fire management organizations and agencies. Active fire research programs, combined with international and interagency collaboration, provide the means to make information available to all fire managers, communities and governments.

Technology, tools, research, human expertise, and both physical and social science are critical to address our ‘new normal’ fire regimes and to tackle unique challenges in the future. Opportunities to bring western science and traditional knowledge together for mutual benefit should be maximised. At the same time the limits of scientific methods and knowledge need to be recognised. Respect must be shown for local cultural perspectives, insights and wisdom.

The IAWF continues to support the need for extensive research and modelling to better forecast present fire danger and future change. Research and science are particularly important for better understanding our current and future state of changed climate. Priority areas for investigation

include: changes in temperature, especially sustained high temperature; change in precipitation; prolonged droughts; and changes in vegetation types and species composition, especially changes that result in increased fire severity and frequency.

E. CONTINUOUS IMPROVEMENT AND ADAPTIVE MANAGEMENT

Linkages, causes and effects of wildland fire are complex and continue to evolve and change. Therefore, wildland fire management must be adaptive. Agencies must be prepared to invest in research, rethink procedures and challenge accepted wisdom. Indigenous Peoples and local communities have critical knowledge and agencies must be open to receiving it. Useful learning must result in rapid, near-term change and adaptation. Making changes through learning must become routine, not just something that happens after disasters. Land and fire management agencies, businesses and communities must learn together, so that they can respond expeditiously to problems and achieve better outcomes. Adaptation takes effort and time, and success will depend on deliberate investment across the community and agency workforces.

To achieve continued improvement and adaptive management, it is important to undertake monitoring, evaluation, and reporting (MER), which allows agencies to quantify the efficiency and effectiveness of their strategies and the work they have undertaken. Doing so allows for full transparency of management outcomes for fire management staff, to the government and community.

F. INDIGENOUS LEADERSHIP

Indigenous leadership offers new insights as many governments, wildland fire agencies and other organizations grapple with climate change and mega fires and seek new ways to deal with public safety, fire ecology, increasing suppression costs and other wicked problems.

The first step is recognition that traditional processes of leadership, governance and decision making have adapted and remain strong in many Indigenous communities across the globe, despite disruptions to land access and many cultural practices. Ongoing connection to country, continuity of knowledge, and the exercise of traditional authority are now evident in the resurgence of cultural burning.

The legislative and policy landscape is also changing in many parts of the world, providing new mechanisms for recognizing traditional ownership of land and enabling self-determination and sustainable livelihoods. Emerging Indigenous corporations and organisations are bringing together western and traditional governance and empowering new forms of leadership in fire and natural resource management, economies, and state institutions.

Agencies seeking to address seemingly intractable fire management problems must engage with Indigenous leadership at local, regional and state levels so that diverse cultural perspectives and two-way learning can inform the strategies, policies and actions needed for a sustainable future.

OUR COMMITMENT

IAWF will continue to provide opportunities for research, knowledge and experience sharing through conferences, webinars, workshops, Wildfire magazine, newsletters and the International Journal of Wildland Fire (IJWF), with a focus on science, knowledge and best practices in relation to

how wildland fire and those who work in fire and smoke research or wildland fire management can adapt to and mitigate the impacts of climate change.

IAWF will continue to take a position on contemporary wildland fire issues and advocate with national and international policy makers for improvements in wildland fire management policies in relation to prescribed fire.

IAWF will work with Indigenous Peoples to support Indigenous-led cultural burning practices and facilitate the sharing of knowledge and practices with other Indigenous Peoples, as well as with land and fire managers.

IAWF will continue to advocate for improved diversity in global fire management. A diverse workforce, including a variety of gender, age, cultural and religious backgrounds provides superior ideas and work outputs at a time when the challenges and complexity of problems brought about by climate change require deeper and broader thinking and progressive and deliberate actions.

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