

# WORKING ON FIRE 20<sup>TH</sup> ANNIVERSARY SYMPOSIUM

Marking 20 years of Saving Lives, Protecting the Environment, and Restoring Dignity, the Working on Fire - Kishugu Joint Venture hosted a Fire Symposium that convened experts from diverse fields.

In this publication, read about the insights gained from the symposium, showcasing a shared commitment to proactive measures in Integrated Fire Management against the ongoing threat of wildland fires fuelled by climate change and global warming.



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# WORKING ON FIRE - KISHUGU JOINT VENTURE CELEBRATES 20 YEARS WITH INTERNATIONAL FIRE SYMPOSIUM

The Working on Fire - Kishugu Joint Venture marked its 20th anniversary with a Fire Symposium that convened experts from diverse fields. Held at the scenic Kruger National Park from 8 to 10 November 2023, the event focused on reinvigorating coordination and collaboration in integrated fire management activities at local, national, and international levels. It also reflected upon the learnings and resolutions derived from both local and global firefighting experts.

The symposium brought together a range of professionals, ranging from wildfire management practitioners and scientists to weather experts, provincial and local disaster management practitioners, and international speakers. Wildfire management practitioners, wildfire scientists, weather experts, and provincial and local disaster management practitioners, as well as a host of international speakers (Canada, Italy, Finland, the United Kingdom, Tanzania, Madagascar, and South Africa), presented papers on implementing preventative measures in the face of escalating wildfires exacerbated by climate change.

They were joined by local municipalities, Fire Protection Associations, forestry companies, conservation agencies, and the agriculture sector who participated in the three-day Fire Symposium which also served as a platform for a fresh look at coordination and collaboration between stakeholders involved with Integrated Fire Management activities and responsibilities.

The common theme of the symposium echoed a pressing concern in the face of climate change and global warming: the urgent need for collaboration in response, research, prevention, and education

to combat the escalating threat of wildland fires. The year 2023 witnessed devastating wildfires in countries such as Canada, Hawaii, Greece, and Algeria, and closer to home in South Africa's Northern Cape and North West Provinces, stressing the critical importance of addressing this global challenge.



What made the symposium particularly enriching was the participation of educated and experienced speakers from around the world. Experts from Canada, Tanzania, and Italy shared their insights from various fields, including research and engineering. The speakers not only presented case studies but also opened a dialogue on internal processes and collaborative projects that spanned across borders.



The choice of Kruger National Park as the venue for the symposium highlighted the symbiotic relationship between firefighting efforts and the preservation of biodiversity. The synergy between local municipalities, fire protection associations, forestry companies,

conservation agencies, and representatives from the agriculture sector showcased the need for an interdisciplinary approach to tackle the multifaceted challenges posed by wildfires.



## INTEGRATED FIRE MANAGEMENT APPROACH TO FIRE MANAGEMENT

Kruger National Park’s Danie Pienaar - Senior General Manager: Conservation and Area Integrity - kicked off Day 1, welcoming all in attendance at the Fire Symposium. This day saw a convergence of minds, all echoing one message: *Integrated Fire Management and collaborative efforts are critical in the battle against wildland fires intensified by the effects of climate change.*

In his address, Pienaar shared how human-induced fire use has played a pivotal role in shaping ecosystems, with savannas serving as a notable example of this intricate relationship. He also commended Working on Fire (WOF), as it has emerged as a crucial player in guiding and implementing strategies for the effective use of fire.



## CLIMATE CHANGE AND WILDFIRES: THE RAPIDLY CHANGING GAME

Central to all the discussions and sessions was the acknowledgment of climate change as a significant exacerbating factor. Trevor Abrahams, Project Manager of the Working on Fire - Kishugu Joint Venture, stressed the critical interplay between wildland fires and climate change in his official opening and keynote address. He was adamant that the time for action is now and together, all can make a difference.

mission statement: *community stands as the primary defense in managing climate change, emphasising the immediacy of collective action.*

“The rate of fire increase in South Africa over the last year is significant. According to the Global Forest Watch, there were 17,685 VIIRS fire alerts reported in South Africa in 2023, considering high confidence alerts only. This is 6% higher than the number of fire alerts reported in 2022, and the highest number of fire alerts reported in South Africa since 2012. In 2023 we already had 2093 fires. That is almost peaking at the highest level in the last eight years,” Abrahams said.

His message extended beyond the camaraderie of firefighting solutions, urging a collective recognition of the urgent need for teamwork in addressing climate change, especially in Africa. Abrahams positioned wildfires as not just a challenge but a pivotal ecological factor, reinforcing WOF’s



## SOUTH AFRICA’S PREPAREDNESS FOR FUTURE WILDFIRES

Collaboration emerged as a recurrent theme, stressing that no single entity or discipline can address this challenge in isolation. Roland Hendricks (Director of Fire Services) from the National Disaster Management Centre (NDMC), acknowledged the flaws in the existing disaster management system and highlighted the need for a comprehensive and effective approach to disaster management. Hendricks shared how the NDMC is on a path to creating a new framework for managing disasters in South Africa.

also enhances the framework’s adaptability to the unique challenges faced by different regions within South Africa.

“The evolving disaster management framework is the NDMC’s commitment to empower and support local role-players. We recognise the invaluable contribution of local communities in disaster response and recovery, and the new framework aims to enhance their capabilities and support systems.”

The involvement of stakeholders in the framework’s development ensures that diverse perspectives, experiences, and expertise are considered. This not only fosters a sense of shared responsibility but

As South Africa navigates the complexities of disaster management, the commitment and ongoing efforts to create a collaborative, community-focused, and legislatively aligned framework signal a transformative era in disaster preparedness and response.



# CLIMATE CHANGE AND THE NEW NORMAL IN INTEGRATED FIRE MANAGEMENT



The second session of the first day focused on the significant impact of climate change on wildfire occurrences globally. The year has seen catastrophic wildfires in various countries, including Algeria, Greece, Spain, Portugal, Hawaii, and Canada. The Working on Fire - Kishugu Joint Venture deployed 800 firefighters to assist in Canada's worst wildfire season. South Africa also faced unprecedented wildfires in multiple provinces, causing

extensive damage and loss of life.

The session was facilitated by Working on Fire Board Chairperson, Professor Edit Vries, and brought together experts to discuss the emerging "new normal" due to climate change and the need for risk mitigation and adjustment strategies in the wildfire, emergency services, and environmental sectors.

Kevin Rae, Chief Forecaster: Disaster Risk Reduction (DRR) at the South African Weather Service, kicked off the session by exploring and comparing performance and daily behavioural characteristics of the Canadian Fire Weather Index and Lowveld Fire Danger Index (FDI) models in a South African Domain.

Rae stated the enduring presence of the Lowveld FDI system is here to stay and

that the collaborative efforts of the SAWS/CSIR team are dedicated to infusing scientific precision into fire danger models, emphasising a proactive and informed approach. Recognising the necessity for accessible warnings, the focus is on refining model-derived alerts to ensure they are not only accurate but also user-friendly, facilitating easy interpretation for heightened preparedness in the face of potential fire threats.



Kim Connors, the Executive Director of the Canadian Interagency Forest Fire Centre (CIFFC) in Canada, delivered a presentation on "Strengthening Global Collaborations in Wildland Fire Management. This encompassed lessons learned from Canada's unprecedented fire season where WOF-Kishugu JV personnel were called upon to assist.

Connors key message emphasised the importance of collective resilience through mutual support and global collaboration. To achieve this, a commitment to exchanging standards at all levels and flexibility - considering diverse cultural and training perspectives - is crucial. He also shared the preference for bilateral agreements over multilateral ones.

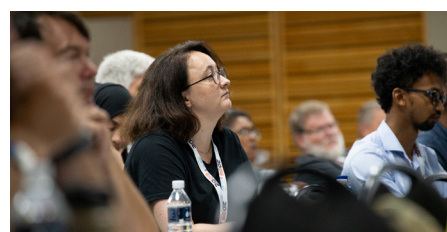
Dr Danie Boshoff, a Senior Lecturer in Physical Geography at the Vanderbijlpark Campus of the North-West University, delved into the impact of climate change on wildfires, bringing the issue closer to home by focusing on large fires in the Western Cape. These include the Knysna Fires (June 2017), Table Mountain Fires (March 2015), George Fires (October

2018), and UCT Fires (April 2021). Dr. Boshoff stressed the role of climate in driving fires, urging a shift from short-term weather focus to considering long-term climate patterns. He noted the correlation between La Niña events and major fires, highlighting the significance of ENSO and SAM as influential factors in climate-induced fires in South Africa.



Dr Christo Marais, an experienced specialist in Natural Resource Management Economics and Ecological Restoration, highlighted key points during his presentation titled "Climate Change and the "New Normal" for Integrated Fire Management: The potential contribution of integrated wildland fire management to Ecosystem-based Adaptation to Climate Change."

- IFM is needed for sustainability.
- We need to keep our biomes intact.
- We need to revive extension services.
- Think of transformed landscapes like plantations as Wildland Developed Zone Interfaces.
- We need to relook the use of prescribed burning in light of a changing climate.
- Use fire more adaptively in our land management practices.
- Soil movement through erosion is more than 100% more in pristine fynbos stands after fires.



# EMPOWERING AFRICA TO BECOME INTEGRATED FIRE MANAGEMENT COMPLIANT

The concluding session of the first day encapsulated the overarching theme of the day's discussions. The session stressed the crucial steps needed to align with Integrated Fire Management practices, highlighting the importance of a collective effort to enhance fire management strategies across the African continent.

It was facilitated by the previous session presenter, Dr Christo Marais, who has had a long history with the Working for Water and Working on Fire Programmes. He has served in various

leadership positions within the Department of Forestry, Fisheries, and the Environment (DFFE), and has been directly responsible for the management from the DFFE's side for the functioning of the Working on Fire Programme.

This session brought together academics who set the tone for a future where IFM compliance becomes a shared goal, reflecting a commitment to proactive and sustainable fire management practices throughout Africa.

## Haritiama Zacharie

Researcher: Land, Landscape and Development Research Lab (LLandDev), Madagascar.



“Using remote sensing data in supporting wildfire early warning in East Africa, experiences from the Regional Eastern Africa Fire Monitoring Resource Center (REA-FMRC)”

- Developed a model that is about 80% accurate in predicting fires in extreme fire danger conditions
- The model is based on the Canadian Fire Danger Rating
- Disseminate information to the public via WhatsApp, radio, and other accessible methods.

## Dr Paolo Fiorucci

CIMA Research Foundation, Italy.



“Enabling Integrated Fire Management strategies through integrating a comprehensive smart modelling chain into Wildfire Early Warning System”

- Early warning systems are essential, the most difficult task is to get info into the field.
- Risico is an early warning system that takes into account all the factors that influence fire behaviour.
- A propagator is a model that can be used to model fire spread and intensity.
- These models enable managers to identify when, where, and which interventions are needed.

## Tiaan Pool

Head of Department: Nelson Mandela University.



“Implementation of Integrated Fire Management Practices on the Southern Highlands of Tanzania”

- We need to empower people by getting back to the real basics of fire management
- Change our paradigms, and embrace the views of the community and local culture to implement effective IFM.
- Use showcase examples (communities where it has been successful) to motivate for broader adoption.

## Professor John F. Kessy

College of Forestry, Wildlife and Tourism, Sokoine University of Agriculture, Tanzania.



“Development of community-level action plans for the enforcement of National Integrated Fire Management (IFM) Policies: Processes and Lessons from Tanzania”

- Policy developed at the governmental level must be implementable/actionable at the ground level.
- We need more/better extension.
- Community involvement is key, in fact, they are the ones mostly dealing with fire suppression activities.

## Ida Herdieckerhoff

University of Eastern Finland.



“Taming the flames: participatory GIS as a tool to support community-based fire management in land use planning in the Southern Highlands of Tanzania”

- Community-based fire management is about empowering people.
- There is an intrinsic link between land use planning and how fires occur within an ecosystem.
- Participatory mapping and similar techniques are simple to use and flexible tools to obtain local buy-in and knowledge for IFM.
- It is important to understand both the beneficial and detrimental aspects of fire use in the opinion of the community.

## Navashni Govender

Senior Manager: Conservation Management, Kruger National Park.



“Integrated Fire Management Plan for the Kruger National Park: Lessons from seven (7) decades of fire management”

- Fire history should inform fire management plans.
- Need to determine the needs of nature with regard to fire, and ecology-driven management.
- We need to use strategic adaptive management.

# WILDFIRE MANAGEMENT STRATEGIES AND TOOLS

The Working on Fire 20th Anniversary Symposium entered its second day with a focus on the transformative potential of Integrated Fire Management (IFM). In a world where wildland fires are becoming increasingly prevalent and the impacts of climate change are felt on a global scale, the need for robust and innovative

firefighting strategies and tools has never been more critical. Day 2 featured experts in the field, who shed light on the latest solutions and practices that organisations can adopt to ensure continuity in the face of wildfire challenges.

## Aerial Firefighting: Global Best Practices



Concluding the session, Emile Grobbelaar, CEO of Kishugu Aviation, provided insights into the role of aerial firefighting as a critical component of the early initial attack. By exploring global best practices, Grobbelaar highlighted the importance of leveraging aerial resources for swift and strategic firefighting efforts.

## Fleet Management in Integrated Fire Management



Coenie Lamprecht, CEO of Kishugu Fleet, shifted the focus to the critical role of fleet management within the framework of Integrated Fire Management. Exploring how advanced technology can be applied to vehicles and drivers, Lamprecht stressed the significance of an efficient fleet in responding to wildfires promptly and effectively.

## Wildfire Training Amidst Climate Change Challenges



Tony Mancos, CEO of the Kishugu Training Academy, took the stage to discuss the evolving landscape of wildland fire training for both management and firefighters. Against the backdrop of climate change and global warming, Mancos delved into the future of wildfire management, highlighting the importance of staying ahead of the curve through continuous training and adaptation to changing conditions.

## Dräger's Solutions for Wildland Firefighting



Wimpie van Onselen from Dräger South Africa shared a presentation on innovative solutions for wildland firefighting. Dräger, a leader in emergency and rescue services, likely presented cutting-edge technologies and equipment designed to enhance the efficiency and safety of firefighting operations in challenging environments.

# WOF - KISHUGU JOINT VENTURE SHOWCASES ITS EXPERTISE

One of the highlights of Day 2 was the live demonstration of a controlled burn in the Pretoriuskop Section - Hlangwini Enclosure at the Kruger National Park. The Working on Fire-Kishugu Joint Venture showcased their expertise in the suppression and prevention aspect of Integrated Fire Management. Aerial and ground resources extinguished a wildland fire, illustrating the synchronised efforts required for successful fire management.

deploy resources from the air allows for strategic and targeted firefighting efforts. On the ground, specialised Working on Fire Programme teams, are equally critical in containing and suppressing fires. The demonstration saw the integration of these resources -1 Spotter, 1 AT802, 2 Hueys, and the Sekororo ground crew.



Kishugu Aviation aerial resources have, over the past years, played a crucial role in gaining control over large-scale wildfires. The ability to swiftly



## Why conduct burns in integrated fire management?

As climate change continues to exacerbate the frequency and intensity of wildland fires, there is importance in adopting and refining integrated fire management strategies. The implementation of a block burn, a controlled and intentional fire across a designated area, delivers a range of benefits, particularly

in the context of land management and ecological restoration.

Two key advantages that stand out are the improvement of forage quality and the effective clearing of invasive alien species.

## Enhanced Forage Quality:

Block burns are known to have positive effects on forage quality in ecosystems. By selectively burning certain areas, the process promotes the regeneration of grasses and other vegetation. The controlled burn eliminates dead or decaying plant material, which, in turn, allows sunlight to reach the ground, stimulating the growth of new and more nutritious forage. This rejuvenation of plant life can be highly beneficial for grazing animals.

## Clearing of Invasive Alien Species:

Invasive alien species often pose a threat to native ecosystems by out-competing local vegetation and disrupting natural processes. Block burns can be strategically employed to combat these invasive species.

The fire's intensity can target specific plants while leaving native species more resilient. The controlled burn serves as a natural method for reducing the density of invasive plants, creating space for the re-establishment of native flora. This approach aligns with ecologically sound practices for restoring and maintaining biodiversity.



# PREVENTION IS THE FOUNDATION OF A RESPONSE POSED BY WILDLAND FIRES

The Working on Fire 20th Fire Anniversary Symposium reached its third and last day on Friday, 10 November 2023. The critical theme of PREVENTION and the imperative need for global collaboration in the face of mounting wildland fires was the agenda of the day.

## Gaston Hedwigino Tahintsoa

Researcher REAFMRC Madagascar.



“Analyzing Interactions Between Landscape Structure and Fire-Resilience at Watershed Level”

Tahintsoa shared experiences from Ankarafantsika National Park in Madagascar, offering insights into the complex interactions between landscape structure and fire resilience at a watershed level.

Looking at the difference between landscapes with different types of vegetation, the research shows that areas with shared and uniform vegetation tend to face more severe burns. On the other hand, places with diverse and mixed vegetation show some level of resilience to fires. This means how we design landscapes, especially in terms of the variety of plants, becomes crucial in reducing the dangers of wildfires.

## Dr Pieter Olivier

M.A.P Scientific Services Director.



“Harnessing the Power of Wildfire Data to Enable Integrated Fire Management for Safer Landscapes”

Dr Olivier explored how using data can completely change the way we manage fires, making landscapes safer. He highlighted that having information is crucial in creating strategies to protect against wildfires. The introduction of a data-driven approach means that having lots of information does not just help with reporting and planning, it also makes it easier to investigate fires in detail. By using the power of data, we can create a strategy that is both proactive and well-informed, making landscapes safer and more resilient to the threat of wildland fires.

## Louise Wessels

Manager - Greater Overberg Fire Protection Association, South Africa.



“7th International Wildland Fire Conference, Porto, May 2023: A Benchmark Exercise with Some New Perspectives and Take-Home Messages”

Wessels gave us a look into how the world manages wildfires, sharing insights from the 7th International Wildland Fire Conference in Porto. She pointed out that it is crucial to consider the perspectives of landowners and communities near wildlands, known as the Wildland Urban Interface. Understanding how these communities see wildfires can help us encourage responsibility, involve everyone who has a stake in the matter, and communicate effectively with the public. This approach ensures that everyone is on the same page when it comes to dealing with the challenges posed by wildfires.

Recognising the importance of preserving ecosystem health, protecting human lives, and minimising economic losses, communities must prioritise Integrated Fire Management strategies such as fire awareness and education, fuel load management, early detection systems, regulatory measures, and international collaboration.

The day unfolded with a lineup of speakers, each offering unique perspectives and expertise on various aspects of wildfire management.

## Nokuphila Buthelezi

eThekweni Municipality, KwaZulu-Natal.



“Using Fire to Manage Grasslands in Ethekewini Municipality”

Buthelezi shed light on the innovative use of controlled fires as a strategic tool. She shared how the eThekweni Municipality’s Fire and Invasive Species Control (FISC) Programme responds to environmental threats in Grassland ecosystems by using fire as a management tool through prescribed burns, concurrently addressing invasive alien plant control. Going beyond environmental conservation, FISC also generates socio-economic benefits while fostering compliance and responsibility among landowners.

## Dave Dobson

Forestry Valuer.



“How Changes in the Ecology of Fires as a Result of Climate Change Will Affect Management Decision Making”

Dobson looked into how climate change is affecting the way fires happen in nature. He emphasised the importance of being flexible and adjusting how we manage things because wildfires are changing. Dobson explained that in forestry management, the timing of fires is changing due to climate change, leading to longer fire seasons. This means managers have to change their usual methods and do things like burning at different times or using new techniques like mulching to deal with the higher risks of fires happening unexpectedly.

## Nothando Ngobeni

Fire Researcher, Working on Fire South Africa.



“The Effect of Time of Day on Factors That Affect Fire Intensity in Southern African Savanna”

Nothando Ngobeni from Working on Fire explored the timing of wildfires, looking at how different times of the day impact factors affecting fire intensity in Southern African savannas. The findings showed a strong connection between temperature and how fast the fire spreads, highlighting the crucial role of climate conditions in shaping fire behaviour. Additionally, relative humidity, or how much moisture is in the air, was closely linked to fire intensity, with the most intense fires happening during the peak of the day when conditions are driest and temperatures are highest.



**Angel A. Goldsmith**

*Kings College London, Geography Department, United Kingdom*

*“Prophylactic Land-Use for Wildfire Risk Reduction at South Africa’s Wildland-Urban Interface”*

Goldsmith delved into proactive land-use strategies aimed at reducing wildland fire risks in areas where wildlands meet urban spaces. In the case of Knysna and its surroundings, using landscapes in diverse ways is seen as a smart approach to lower the risk of wildfires.

However, this strategy faces challenges, especially the clash between the need for housing and the goals of conserving biodiversity and

ensuring safety. Another challenge is that some residents are not involved or affiliated with the Fire Protection Association (FPA), creating an obstacle. To address these issues, a comprehensive plan is needed. This includes careful developmental planning that considers both housing and ecological preservation, rules about building materials to make structures more resilient, managing fuel to decrease fire dangers, and ensuring people in residential areas are well-informed about fire risks.

DAY 3

## BETTER COLLABORATION AT GLOBAL, CONTINENTAL, AND LOCAL LEVELS

The recent wildland fires in Canada highlight the intensified impact of wildland fires due to climate change. This also raises a need for a collaborative and comprehensive approach. In response to this interconnected challenge, it is crucial to pool resources, share expertise, and enact integrated fire management strategies. This requires fostering global partnerships between nations, encouraging regional cooperation at the continental level, and facilitating local coordination to implement effective

integrated fire management solutions.

The final session of the symposium emphasised the burning issue of better collaboration across all sectors. The resounding message was clear: collaboration is critical in addressing challenges in environmental conservation and disaster management, especially in the context of escalating wildland fires exacerbated by a changing climate.

**Johann “Savage” Breytenbach**

*General Manager - Free State Umbrella Fire Protection Association.*



Breytenbach talked about how Incident Command Systems play a crucial role in responding to emergencies, especially wildfires. Recognising the limitations in the current structure of the Free State province, they have set up a new provincial wildfire management framework

that aims to have clear procedures, good communication, and efficient management of teams and resources. It is important because it allows for smooth teamwork with organisations like Working on Fire and includes volunteers in the process. This structured approach is expected to improve the province’s ability to handle wildfires effectively and work well with different groups involved.

**Dr Abigail Croker**

*Centre for Environmental Policy, Imperial College London, United Kingdom.*



Dr. Croker provided a review of the evidence surrounding community-based fire management in savanna-protected areas, emphasising the importance of local collaboration. The way we usually share information about managing fires with communities is from the top down,

meaning authorities tell people what to do. However, there’s growing evidence that we should also include a bottom-up approach. This means involving local communities more and using their indigenous knowledge – the wisdom passed down through generations. This collaboration allows everyone to work together, combining traditional practices with modern strategies for better and more effective fire management.

## WORD OF THANKS

We acknowledge the support and participation of the board members of Working on Fire, Kishugu Aviation, Kishugu Fleet, Kishugu Training and Kishugu Holdings, as well as the management of the Working on Fire - Kishugu Joint Venture.

A word of gratitude and thanks to all our sponsors for your generous donations in support of our Working on Fire 20th Anniversary Celebrations.

We also acknowledge all our loyal partners and stakeholders, many of you who have been with us on this 20-year journey, as the Working on Fire programme grew and developed into one of our best youth employment programmes in South Africa.

Those who also travelled to our WOF@20 Fire Symposium, the Municipalities and their Fire Chiefs, officials from the Department of Cooperative Governance and Traditional Affairs (COGTA), the National Disaster and Provincial Disaster Management Centre

Officials, our Fire Protection Associations, Fire Protection Officers, Environmental and Conservation Agencies, the Forestry Sector and our Exhibitors, a big thank you to each and every one of you for having participated in our Fire Symposium.

To all our speakers, those who travelled from Europe and especially to our speakers from Africa, to the Canadian Interagency Forest Fire Centre (CIFFC), and those from across our beautiful country, thank you for your presentations.

Lastly, we acknowledge the Nelson Mandela University, (Tiaan Pool and his team) and SANParks, (Navashni Govender and her team) for helping us over the past six months as we planned this Fire Symposium.

**WOF@20 Fire Symposium Coordinator:**  
Linton Rensburg

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