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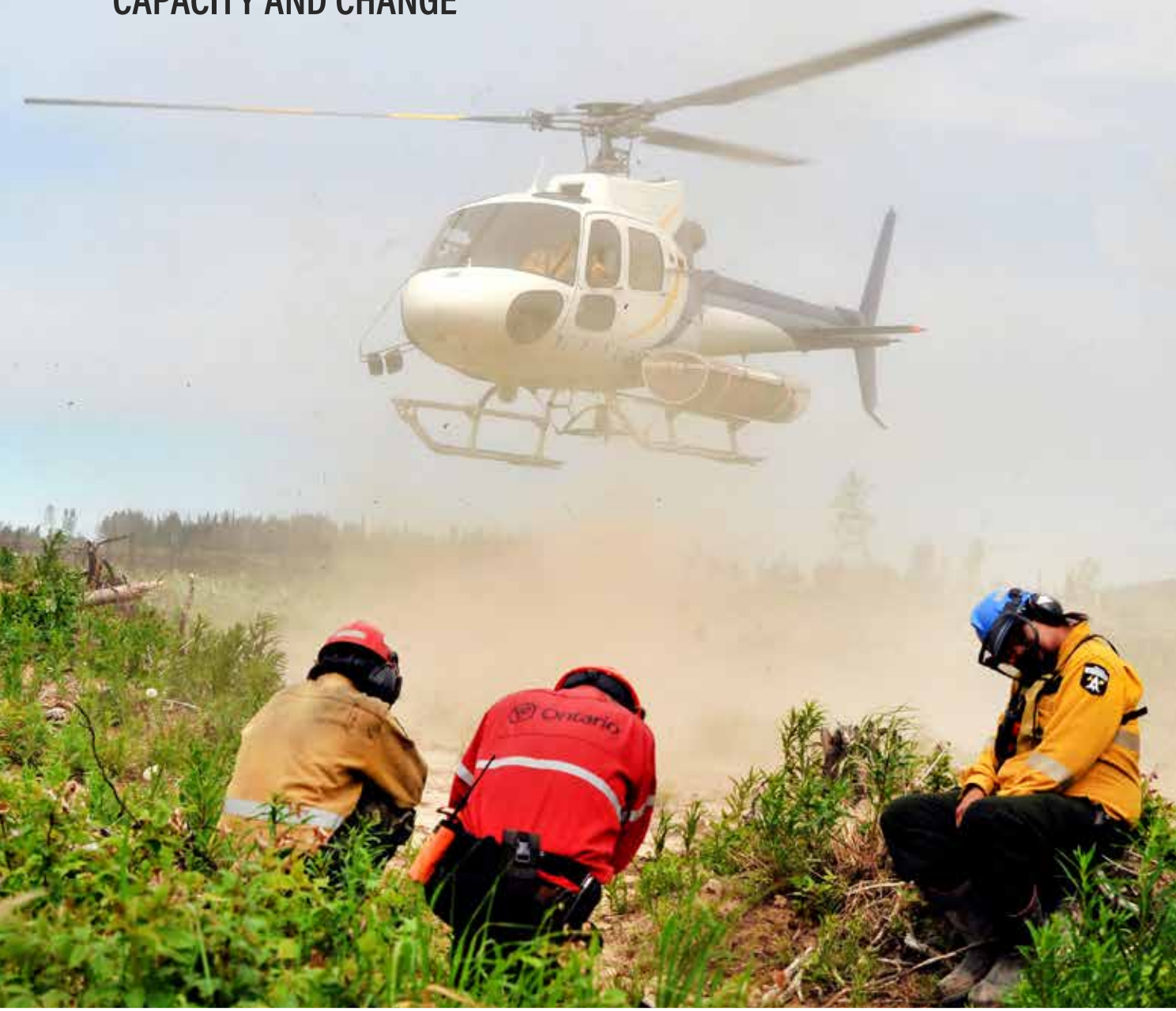
WILDFIRE

An official publication of the INTERNATIONAL ASSOCIATION OF WILDLAND FIRE

OVERVIEW 2023

THE IMPACT OF CLIMATE, CAPACITY AND CHANGE



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NEWS AND OPINION

FEATURES

OVERVIEW 2023

COVER PHOTO: Alberta and Ontario firefighters shield themselves from the dusty rotor-wash of an arriving helicopter during firefighting operations near Fox Creek, Alberta, in May 2023. Photo courtesy CIFFC.

WILDFIRE
An official publication of the International Association of Wildland Fire

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A GLOBAL PERSPECTIVE

BY LAURA KING

By the time the Lahaina fire killed almost 100 people and destroyed more than 2,000 structures on the island of Maui, Hawaii, on Aug. 8, the northern hemisphere was in the throes of a disastrous wildfire season.

Greece and Canada (page 22) experienced significant wildland fires in the summer of 2023, and in the case of Canada, some municipalities were woefully unprepared. A report by the city of Halifax, presented to municipal council in October, after a May 28 fire burned 151 homes, said the municipal emergency plan had not kept up with growth, and hadn't been updated since 2018.

The report also said the lack of evacuation routes led to some residents being trapped behind fire lines, and confusion behind the scenes compounded the challenges faced by residents.

As for Lahaina, scientists said in late December the fire was caused by the same meteorological phenomenon responsible for California's most damaging wildfires – a downslope windstorm – and was not, as originally suspected, the effect of Hurricane Dora.

Overall, in the United States, there were fewer fires in 2023, but with more significant impact. As Rich McCrea writes (page 42), as of Sept. 22, more than 44,011 wildfires had burned 2,342,143 acres (947,831 hectares). The 10-year average wildfire occurrence for the United States (2013-2022) is 44,575 fires burning 6,046,153 acres (2,446,791 hectares).

Contrast that with Greece (page 36), which experienced one of the worst fire seasons on record, with more than 140,000 hectares burned, hundreds of structures destroyed, and more than 20 fatalities.

As past IAWF board member Gavriil Xanthopoulos and colleagues write, the 2023 fire season "again highlighted the inadequacies of the Greek fire management system."

While many countries have embraced prescribed burning, Greece's Civil Protection organization remains focused on fire suppression.

"However, the firefighting doctrine has not changed and much of the control efforts are carried out from the roads, which, as a rule, are compromised. Even existing and ad-hoc firebreaks are not used effectively to control intense fires, let alone the strips around the roads where understory vegetation has been removed. Over-reliance on aerial resources continues."

In Catalonia, in northern Spain (page 28), the evolution of wildland fire from first generation incidents partially attributed to lack of farming and more forested area, to extreme, sixth-generation, weather-driven events caused the Catalan Fire Rescue Service to implement a prescribed burning program, but as Marc Castellnou and Edgar Nebo write, global collaboration on best practices is necessary to manage the landscape.

In Cyprus, the effect of climate change on wildland fire is a relatively new reality, according to Petros Petrou and Kostakis Papageorgiou (page 32).

"The 2023 fire season in Cyprus was severe and particularly destructive. Following a winter with below average precipitation and a hot and dry summer, the conditions were particularly favourable for the ignition and rapid spread of forest fires."

A lengthy heatwave in Cyprus, during which temperatures reached 46 C, worsened conditions.

"Cyprus has experienced aggressive fire activity, an above-average number of fires and burned area, and the ignition of several significant fire incidents that had severe impacts on communities and the environment."

In Australia (page 18), La Nina contributed to three consecutive years of below average fire seasons, although, writes David Bruce, "fire is an almost year-round experience in Australia, with the fire season moving in a predictable north to south direction from the Top End around June to Tasmania up until March."

Experts predicted a more intense 2024 fire season, and with a new Australian Fire Danger Rating System established in late 2022, the federal minister for emergency management, Murray Watt, emphasized the importance of national co-ordination and support.

"But we're conscious that this is shaping up to be the first significant fire season since Black Summer (2019-20), so we're doing everything we can to be as prepared as possible at every level."

These geographic overviews emphasize the importance of learning and global collaboration, which are highlighted by Ciaran Nugent, Jan Kaczmorowski and Alex Held (page 8) in their piece about Forest Camp in Poland, which in 2023 included more than 130 participants – firefighters, foresters, policy advisors, scientists, students, and journalists – from 22 countries.

"There is much more to these exchanges than just fire fighting; the mix of disciplines, inter-regional exposure to wildfire and wildfire training and development are natural precursors to genuine integrated fire management across borders, across disciplines and across cultures."

This issue of *Wildfire* magazine offers a global perspective and a consistent refrain to share information, ideas, strategies and tactics, training, and research – all in line with the IAWF mission and vision.

Managing editor Laura King is an experienced international journalist who has spent more than 15 years writing and editing fire publications. She is the Canadian director for the National Fire Protection Associaiton (NFPA), works closely with FireSmart™ Canada to help residents build resilience to wildland fire, and has partcipated in the development of the Canadian wildland fire prevention and mitigatgion strategy.

REFLECTIONS ON MAUI

BY JOAQUIN RAMIREZ

In the summer of 2022, I wrote about the tragic losses from wildfires across Southern Europe, Northern Africa, and in my home country of Spain. Once again, as the summer of 2023 unfolded, we were all reminded of the challenge that wildfires pose to our communities and landscapes.

On Aug. 8, a wildfire gripped the western side of the island of Maui, Hawaii, claiming the lives of 99 people, destroying more than 2,200 structures, and obliterating the historic town of Lahaina. These tragic events serve as a stark reminder of how vulnerable the islands and their communities are to wildfires. While Maui is a global destination, attracting visitors from all corners of the world to enjoy paradise, many of these visitors lack an understanding of the local terrain and associated risks.

This year, Tenerife and Madeira faced similar challenges, and the land of Alexander the Great experienced the largest European fire on record. The events of the summer emphasize the pressing need for extensive international collaboration to prevent such tragedies.

Wildfire science informs us that the Maui event resulted from a complex interplay of weather, vegetation, infrastructure, response, operational, and social challenges; while attributing it solely to hurricane winds is an oversimplification, weather science underscores the impact of changing pressure systems and downslope wind events on fire behavior.

The Lāhainā incident also highlights the necessity of advanced forecasting. To frame the risk effectively, we require proper weather station monitoring to understand real-time conditions and robust warning alert systems that provide residents with the most pertinent information for timely action.

Reflecting on the tragedy, we must ask how to be proactive. Can we rely solely on science to raise awareness within our society, urging preparedness for extreme events? Fire is fundamentally a social problem, and we must lead our society with the right set of strategies for living with fire in a more resilient manner.

To address these questions, I believe we need to invest more in both physical and social sciences to prevent similar disasters. We must ensure that communities at risk have the infrastructure for real-time risk monitoring and the ability to plan effectively for evolving risk conditions. Citizens must also play a role by considering the type of construction they employ, the importance of resilient housing, and best practices to adopt.

The tragedy underscores the need for our association to continue its community-focused efforts, including improving science, promoting positive land and vegetation management practices, advocating for prescribed burns, and advancing public safety solutions that effectively safeguard communities. Wildland fire professionals must remain engaged year-round because there is much work to be done.

Furthermore, we must ensure that all voices and backgrounds are part of our association's efforts. I am pleased to announce that our association is introducing new membership levels and corporate engagement opportunities to enable more individuals to join our important work. The IAWF membership committee has diligently worked on this initiative, guided by the following goals:

The tragedy underscores the need for our association to continue its community-focused efforts, including improving science, promoting positive land and vegetation management practices, advocating for prescribed burns, and advancing public safety solutions that effectively safeguard communities.

- Ensure IAWF membership is accessible to anyone who wishes to be part of our community, regardless of their ability to pay the full membership fee.
- Increase membership in underserved countries to facilitate global knowledge sharing.
- Foster relationships with corporate and organizational partners to promote additional support.

Reduced-rate individual memberships will be accessible to those previously constrained by economic or geographic factors, students, early career professionals, seasonal and volunteer firefighters, and retirees.

Current and new members applying at the full rate can sponsor a member or contribute to an IAWF initiative, such as a conference or academic scholarships, to offset the reduced-rate memberships for those in need. Additionally, we are introducing various organizational membership levels to expand the types of valuable corporate and organizational partnerships that the association enjoys and to create more opportunities for additional support.

I am immensely proud of our association and the path that lies ahead. Traditionally, association presidents serve for two years before passing the torch to continue our journey together. As my tenure concludes in 2023, I want to express my deep gratitude for the honor of serving as your president. I am genuinely pleased with what we have accomplished over these past two years, including opening our membership to new voices, giving the association a more international perspective, enhancing the organization of our conferences, solidifying strategic partnerships with leading organizations, transitioning our *International Journal of Wildland Fire* to open access starting in 2024, and advancing wildfire science and operations understanding through the development of two association position papers that will guide us and our community into the future.

I invite you to join me in congratulating Kelly Martin on her election as the next IAWF president. Martin has served as a board member since 2019 and brings a diverse background in land management, fire operations, and ecosystem health, along with a strong commitment to creating a more inclusive association and wildfire community. I highlighted Martin in my first column, and I am deeply grateful for her willingness to serve all of us, demonstrating true leadership in action. With Trevor Howard serving as the new vice president and our new board members, I look forward to supporting them in addressing the new challenges and successes we will face together.

With that, I hope to see many of you at our upcoming conferences. Thank you from the bottom of my heart. Stay safe out there, and hasta la vista, amigos.

Joaquin Ramirez Cisneros is a wildland fire technologist who has been working for the last 25 years to bridge the gap between scientists and end users. In 2013, Ramirez moved to San Diego from Spain, and now works with agencies worldwide trying to convert the best science into actionable tools. Ramirez is the creator of several of the most advanced fire behavior software model implementations and decision support systems, including the Wildfire Analyst and fiResponse software tools. Since 2011, Ramirez has co-ordinated the first European M.S. in Forest Fires (www.masterfuegoforestal.es) with Prof. Rodriguez Francisco y Silva (UCO) and Prof. Domingo Molina (UdL). Ramirez is a founder and active member of the Pau Costa Foundation. He earned his PhD in remote sensing and GIS at the University of Leon in 2003, an M.S. in forestry from the University of Lleida, and his B.S. in forest engineering from the Polytechnical University of Madrid, Spain.

Participants from 22 countries gathered in Western Poland in May for the third Association of National Forest Experts (known as SNEP) Forest Camp. Forest Camp provides hands-on training delivered through a series of live and simulated scenarios in the field. Photo by Tomasz Stankiewicz, SNEP.

COLLABORATION IN EUROPE

FOREST CAMP PROVIDES EXCHANGE OF FIRE-MANAGEMENT KNOWLEDGE

BY CIARAN NUGENT, JAN KACZMOROWSKI AND ALEX HELD

In late May 2023 more than 130 participants from 22 countries gathered in the sunny forests of Western Poland at Gubin, close to the German border, to attend the third Association of National Forest Experts (known as SNEP) Forest Camp. This event was funded by the European Forest Institute´s WKR project (Waldbrand-Klima-Resilienz) and supported by both the International Association of Wildland Fire and the Pau Costa Foundation. Now in its second year, Forest Camp provides a basis not only for learning but also a focal point for the development of the forest fire community across Europe, at a time when co-operation and mutual assistance have never been more important.

Relationships come before actions, as the saying goes, and fire outcomes are often determined by relationships among communities and their activities on the land long before a fire ever starts. In Europe, it is already recognised that the forest fire community consists of more than just the people who actually fight fires. Forest Camp not only provides direct training, but also an opportunity to create real teamwork among participants from different disciplines, as well as different countries and stages of development around fire issues.

Therefore, SNEP organized the forest camp and invited not only firefighters, but also foresters, policy advisors, scientists, students, and journalists.

The basic concept of Forest Camp is the provision of hands-on training, delivered through a series of live and simulated scenarios in the field. Being embedded in a fire camp with long hiking, orienteering and physical and mental challenges creates the ideal environment to forge trusting relationships and teamwork. Nine instructors from South Africa, the United States, Spain, Ireland, Wales and Germany with significant experience in fire management and capacity building facilitated training workshops and provided participants hands-on tactics, crew safety, techniques, fire behaviour, and the effective use of hand tools in realistic wildfire scenarios. Participants also had an opportunity to try out the latest in fire-pack and wildland-fire technology courtesy of Mystery Ranch and Vallfirest brands. While the action takes place, in the background the SNEP team facilitates the training experience, providing all technical equipment (including fire apparatus), monitoring progress and ensuring smooth communication among the instructors and teams. The SNEP team includes 2023 IAWF Firebreak Award Winner Jan Kaczmorowski, of the Polish Forest Service.

Some crews covered close to 30 kilometres on foot during the Forest Camp exercise. Photo by Tomasz Stankiewicz, SNEP.

Less-experienced participants and newcomers are welcome at Forest Camp, but the culture of knowledge and skills sharing is also imparted. Participants leave knowing that the knowledge they have gained has to be shared and passed on to the future generation of wildland fire and forest managers. Photo by Tomasz Stankiewicz, SNEP. Photo by Tomasz Stankiewicz, SNEP.

Teams from 22 countries participated, including Cyprus, Czechia, Germany, Ukraine, the United Kingdom, Ireland, Sweden, Latvia, Lithuania, Netherlands, Lebanon, Croatia, and the United States. There was even one Australian! Participants were assigned into eight teams of 10 people. Team leaders were assigned and were briefed and prepared for the main camp day, where a variety of real fire scenarios and learning experiences awaited, under the guidance of the instructors. The exercises ranged from live fire suppression to portable pump operation, progressive hose lay, pump-and-roll techniques, fire line constructions, innovative technologies, entrapment prevention, fire shelter deployment, emergency medical scenarios and the use of new hand tools. To add to the challenge, participants were required to navigate significant distances on foot through the forest environment between work stations, replicating the real-world requirements of wildland fire fighting.

As the day progressed, crews needed to overcome increasing fatigue to complete the various work tasks, training goals were achieved, and teams and enduring friendships were formed. Some crews covered close to 30 kilometres on foot during the exercise, spurred by team spirit, grit and thoughts of the fine Polish food and hospitality that awaited them at the end of the long trail.

The sharing of experiences, skills and knowledge is something significantly natural for the fire management community. Not only are less-experienced participants and newcomers welcomed, but the culture of knowledge and skills sharing is also imparted. Participants leave knowing that the knowledge they have gained has to be shared and passed on to the future generation of wildland fire and forest managers.

Exchanges like this in all its forms – TREX, EoE, Flamework – increasingly fuel the progress of international networks and frameworks for knowledge sharing and informal mutual assistance. These approaches can help a growing number of stakeholders and communities engage with the fire management community, better prepare for fire events, and allow for more holistic training

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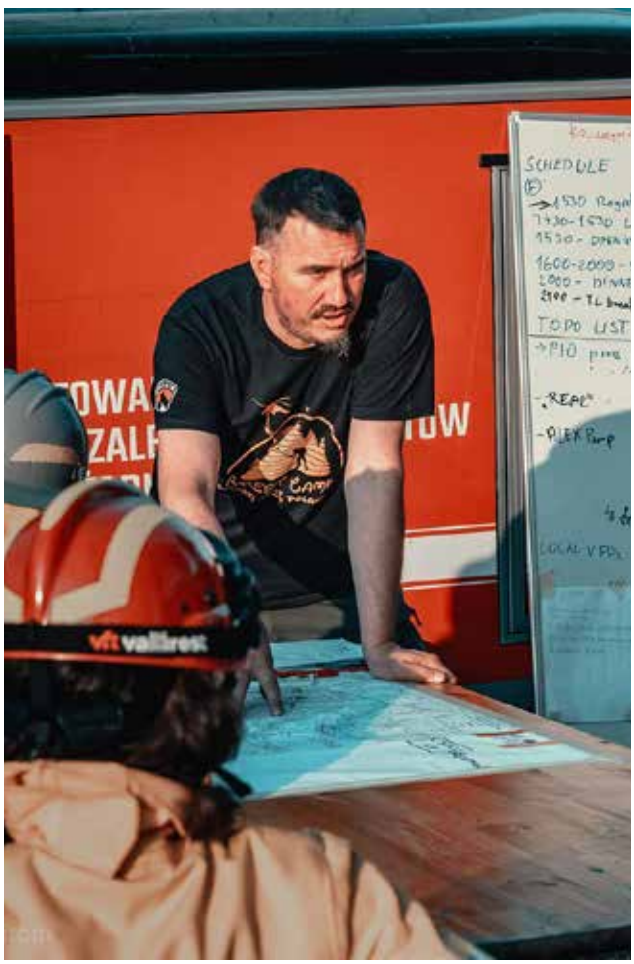
approaches required by integrated fire management. There is much more to these exchanges than just fire fighting; the mix of disciplines, inter-regional exposure to wildfire and wildfire training and development are natural precursors to genuine integrated fire management across borders, across disciplines and across cultures.

The international yet close collaboration among so many countries is inspiring and beneficial – it has been another great experience and next year's event is already in the planning pipeline. Mark your calendar: the next edition is June 7-10, 2024, in Bardo, Poland. If you are interested, please contact SNEP directly via jmkaczmarowski@gmail.com.



Team leaders were assigned and were briefed for the main camp day. Exercises ranged from live fire suppression to fire shelter deployment and use of new hand tools. Photo by Thomasz Stankiewicz, SNEP.

Ciaran Nugent is from Ireland and graduated from University College Dublin with a degree in forestry in 1996, and a master's degree in forest engineering in 2004. He joined the Forest Service as a district forestry inspector in 2000 and currently leads on forest engineering within Forest Service. He has extensive experience in land management and land-use policy development with a focus on forest infrastructure and forest protection. Since 2010, Nugent has led fire management development in Ireland, including the adaptation of FAO fire management guidance to Irish conditions and development of prescribed burning guidance and improved fire danger rating systems for use in the Irish forestry sector.

Alexander Held holds MSc in Forest Science from Freiburg University, Germany. He started as a fire ecologist at the fire ecology working group of the Max-Planck Society, and earned a number of operational qualifications in the United States and South Africa. Held moved from fire ecology to fire management and worked with the Global Fire Monitoring Center GFMC in Europe and Southern Africa. Later, Held worked with the South African Working on Fire Program, from its beginnings until 2012 when he joined EFI. At EFI, Held works on the current project Waldbrand-Klima-Resilienz, where the exchange of expertise and knowledge, mutual assistance and co-operation in Europe is the tool to create more resilient landscapes and better-informed fire management for Germany. His expertise is in fire management, silviculture and deer management for resilient forests.

Jan Kaczmarowski is a forester from Poland. He works at the General Directorate of State Forests as a senior specialist in the forest protection department. His main task is the co-ordination of the forest fire protection system at the national level. He is also a lecturer at the Fire Academy, where he teaches in the postgraduate program titled Forest Fire Protection. Kaczmarowski is a lobbyist for the implementation of controlled burning in Poland and a co-founder and main forest trainer at the Association of Independent Fire Experts (SNEP). He also gained experience in fire management abroad. For his actions so far, he was awarded the IAWF Firebreak Award for Excellence in Wildland Fire Management for outstanding achievements in fire prevention.

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STRESS MANAGEMENT

USING OPERATIONAL TACTICS DURING DOWN TIME

BY BEQUI LIVINGSTON

In the wildland world, we have rules and guidelines, some that are inflexible and others with latitude. We have these for a reason, oftentimes creating the roadmap for our tactical operations, woven into the incident action plan. What if we were to take some of these principles into the realm of stress during the off season, and particularly during the holiday season? What if we weave the familiar operations protocol LCES – lookouts, communications, escape routes, safety zones – into the lives of our wildland fire personnel and their families as they navigate the off season, especially those who are laid off or taking vacation time?

We know down time can be stressful for anyone, but add traumatic stress experienced during the fire season, and you could have a recipe for disaster. The fire season tends to perpetuate our survival response, keeping our stress hormones in a continual cascade, or firestorm. With holidays come stress: finances; socializing; lots of food and booze; time off; and amped up emotions. Because many of us are already in a state of fight-flight-freeze-fawn, we can't just turn off the spigot of stress hormones; stress hormones can easily get re-activated during this time, creating a firestorm of reactions and behaviors. Particularly for those who have been laid off or are taking time off, there is a lot of opportunity for reflection, and this can be scary. Perhaps we can use the LCES principles to help us better navigate the rigors of down time and the grief and sadness that might accompany it, particularly as we recognize that suicide attempts and completions, along with mental and emotional health conditions in the wildland fire world, are escalating.

I recently attended an EMS and mental health conference in New Mexico and learned that

suicides in the first responder community are at an all-time high, with the worst months being September and January. There are so many factors, including down time, illness, relationship hardships, and financial troubles, that contribute to these staggering numbers. We also recognize that September is the time that most wildland folks are laid off, or during which the fire season comes to an abrupt halt. Our wildland folks have been on high alert for six-to-nine months, their stress hormones on a continual cascade, with little, if any time for recovery and rest, and come September they are forced to reintegrate into their families, and society, much like a combat veteran coming back from war.

How might we use LCES to provide support to our wildland personnel, and their families, who might be dealing with the effects of traumatic stress?

LOOKOUTS

Look out for yourself, and one another. Recognize that many of us are hypervigilant, and constantly scanning our environment for danger. Being your own lookout first is important to recognize any people, events, and environments that may activate your stress levels. Trust your gut. Also, have others be your lookout, have your back, especially when you may not be

RESOURCES FOR TRAUMATIC STRESS AND GRIEF

The following resources are available to wildland fire personnel, first responders, veterans, or anyone in need of help in the United States. When dealing with crisis, trauma, and grief, reaching out and asking for help is often the hardest thing to do, yet it's the most important.

Crisis

This is especially relevant to anyone who is feeling hopeless or in despair, including having suicidal or homicidal thoughts, of hurting yourself or others. This is a crisis emergency that requires immediate support.

- **NATIONAL SUICIDE PREVENTION:** DIAL 9-8-8
- **FIRE RESPONDER CRISIS TEXT HOTLINE:** Text BADGE to 741741
- **SAFE CALL NOW CRISIS LINE:** 1-877-230-6060
- **FIRE/EMS HELPLINE:** 1-888-731-3473
- **COPLINE:** 1-800-267-5463
- **FRONTLINE STRONG TOGETHER FOR FIRST RESPONDERS:** 1-833-34-STRONG

Non-emergency support

These resources are for those needing support, but not a crisis or emergency. Sometimes, just talking to someone who understands makes the world of difference.

- **COPLINE:** 1-800-267-5463
- **FIRE/EMS HELPLINE:** 1-888-731-3473
- **FRONTLINE STRONG TOGETHER FOR FIRST RESPONDERS:** 1-833-34-STRONG

Trauma therapists and coaches

- **ANNE MARTIN,** Master practitioner and integrative coach; Evergreen Coaching and Wellness: (former wildland firefighter): www.evergreencoachingandwellness.com
- **BEQUI LIVINGSTON,** (former wildland firefighter); trauma specialist and trauma safe somatic movement coach: www.bodysensewellness.org
- **DANI SHEDDEN**, mental health counselor: (former wildland firefighter); www.closethegapwellness.com
- **THOMAS WURM:** (former wildland firefighter): www.mountainmindtricks.com
- **JENNIFER KINDERA,** certified trauma recovery coach: www.jenniferkinderacoaching.com

Other resources

These resources provide ample support to first responders and veterans; a few of them provide inpatient programs for those dealing with substance abuse, addictions and post-traumatic stress disorder.

- **FIREFIGHTER BEHAVIORAL HEALTH ALLIANCE:** www.ffbha.org
- **SAFE CALL NOW USA:** www.safecallnowusa.org
- **BADGE 2 BADGE:** www.badge2badge.com

in a place to recognize danger. I remember when I was in the middle of my complex post-traumatic stress; I was a mess, and couldn't recognize what was going on. It took my family and therapist to always be my lookouts, watching for my behaviors and symptoms, especially when things turned really dark during the holidays. They always had my back because I could not see the wildfire for the trees. When we are really stressed, our pre-frontal cortex, in our brain, where executive functioning and decision making take place, goes off line. We need others to be our lookouts when we can't be our own lookout.

COMMUNICAITON

We know the importance of communication in a wildland incident; it's imperative that we maintain good communication at all times to relay important information and safety concerns. Although we are encouraged to communicate important safety information, the minute we communicate our feelings we're put on the crazy list. The stigma around mental and emotional health in the wildland world is still in need of improvement, despite all the work that continues to be done; that's why it's imperative to have the courage to communicate when you might be struggling emotionally, and mentally. Holding this stuff in will only make it worse, and this is where suicide ideations begin – in silence. Communicate to others what you need and what you feel, particularly if you are in crisis. Remember that NO is a complete sentence. Be willing to ask for help and receive it and communicate when you see someone else in distress; it might save a life.

ESCAPE ROUTES

We all know the importance of having escape routes on wildland incidents, knowing that the escape routes will continue to change. One thing about post-traumatic stress and complex post-traumatic stress is the sense of not feeling safe. Because we are in a state of survival, in our brains and physiological bodies, we always need to find safety. It's important to recognize the environments that may activate you, especially this time of year, and have an escape route when needed. Remember, your cognitive brain may not be functioning, and the escape route needs to be planned, and known, ahead of time. Sometimes, when people get laid off after a crazy wildland season, they don't feel safe in their own families or homes, their work environments, not even in their own bodies. Having situational awareness that you may be feeling activated is first and foremost, followed by using your established escape route when you need to flee and find safety. When I was still working, and my C-PTS was debilitating, my escape route was the regional office parking lot. I would walk for hours because I didn't feel safe in my own office.

SAFETY ZONE

The safety zone is just what it implies in wildland – that place that we can safely ride out a wildland fire situation and be safe and out of harm's way; this is critical when dealing with stress, especially when it becomes distress or crisis. Our traumatic brain is in a state of survival, and nothing, or no one, feels safe to us. Planning your safety zones ahead of time and communicating them to loved ones or a trusted person is important. It's a safe place, where you can let your nervous system calm down, without any additional stress. Simple places are fine, such as a car, bedroom, bathroom, church, sanctuary, hospital, or even the woods where you can safely land. For years, my safety zone was my car. It was the one place I could always go to feel safe and be alone, without the stress of others. I would cry, scream, and beat the heck out of my car seats, but it always gave me a place to unwind. Again, my family and therapist always knew where to find me, so please be sure to communicate.

Planning your safety zones ahead of time and communicating them to loved ones or a trusted person is important.

Remember that down time doesn't have to stress you out, and you always have a choice in what is best for you; it's a matter of having the courage to speak your truth and set healthy boundaries, to keep you safe and healthy. It's also good to have a prevention plan in place, and critical to ensure that you know what to do, especially in the event of crisis. Left unaddressed, symptoms can become cumulative and lead to dysfunctional behaviors that can lead to tragedy. Suicides, substance abuse and divorce are at an all-time high within the first responder and veteran communities and can get worse over the dark winter season. Until we do a better job providing proactive measures to better help our wildland personnel deal with the stress of the job, these numbers will continue to rise. Simple measures can be taken by leaders, colleagues, families, and communities to better serve those who serve us. Knowing what to do, and what not to do, in the event of chaos and crisis, can make the difference between life and death, and health and illness

Bequi Livingston was the first woman recruited by the New Mexico-based Smokey Bear Hotshots for its elite wildland firefighting crew. She was the Regional Fire Operations Health and Safety Specialty for the U.S. Forest Service in Albuquerque, New Mexico. bequilivingstonfirefit@mns.com

AUSTRALIA

AGENCIES BRACE FOR SUMMER OF EXTREMES

BY DAVID BRUCE

Across southern and eastern Australia, where most of the population resides, a strong La Nina has contributed to three consecutive years of below average fire seasons. Flood and storm response has been the main recent focus with fire and land management staff and volunteers heavily involved in incident management, response, public alerts, rescue, and clean up – much of it in the early days also combined with a significant contribution to pandemic response.

By the fourth quarter of 2023, the Bureau of Meteorology had declared that El Niño and a positive Indian Ocean Dipole (IOD) were underway, the two climate drivers likely to lead to a warmer and drier spring and summer.

With the ground still moist or barely dry from La Nina rain, southern and eastern Australia again prepared for a busy fire season. The high rainfall was accompanied by grass growth particularly in some areas and hampered attempts to fully complete prescribed burning plans over the last few years. The fire agencies were primed to respond, and for the first time, in late September, the Australian government held a National Bushfire Preparedness Summit with around 250 crisis management, response and recovery specialists from governments, industry, research, community and the not-for-profit sector.

Fire is an almost year-round occurrence in Australia with the fire season moving in a predictable north to south direction from the Top End around June to Tasmania up until March. But recently the rules have been ignored – one week in September this year saw large destructive bushfire activity in the Barkly region of central Northern Territory, coastal Central Queensland and in Tasmania, which is in the southernmost region of Australia.

Australia's climate influences have shifted significantly over 2023, making predictions difficult. Following above average rainfall experienced during consecutive La Niña years, the Bureau of Meteorology predicted a switch to higher chances of above average temperatures and below average rainfall for almost the entire country. However, while the temperatures were high so was the spring rainfall with serious flooding in many regions, complicating and delaying fire preparations.

With the introduction of the new Australian Fire Danger Rating System (AFDRS) at the end of 2022, Australia commenced its first full bushfire season with a nationally consistent way to predict and communicate fire danger. The AFDRS replaced the 60-year-old McArthur-based system.

The AFDRS uses eight fire behaviour models

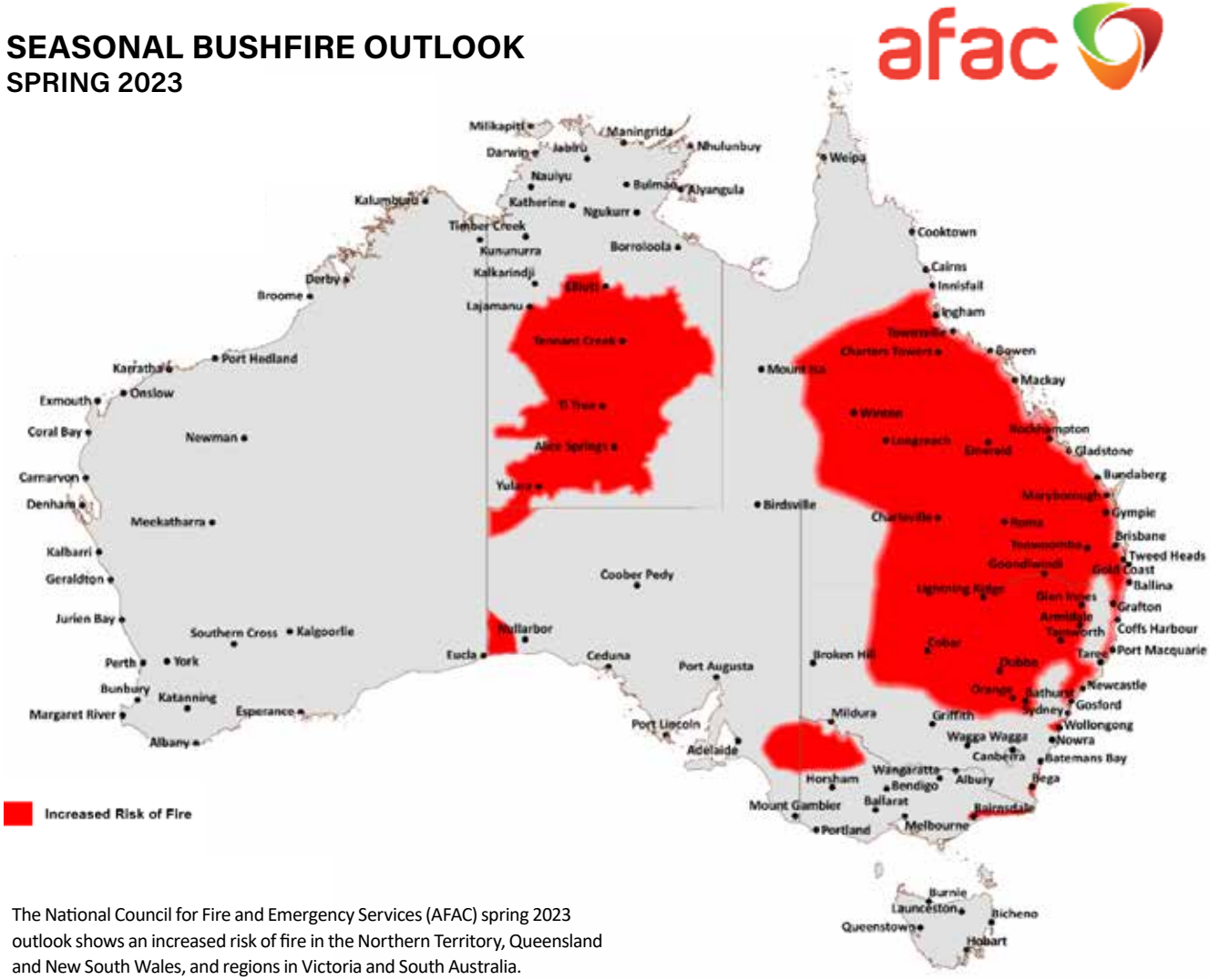
rather than the two used by the McArthur system of fire danger. The eight vegetation type models comprise forest, grassland, savanna, spinifex, shrubland, Mallee heath, buttongrass and pine.

Each of these fire behaviour models include modifications to expand their use to 22 national fuel types. Using these models and fuel types, AFDRS can better account for the diversity of vegetation types across Australia.

The fire danger ratings have been simplified to four levels from six: Moderate (green); High (yellow); Extreme (orange); and Catastrophic (red).

For many Australian firefighters, an early start to the fire season had an international flavour. With the final 27 personnel returning home from Canada early September, the largest ever international deployment of Australasian personnel to Canada was completed.

Since late May, 746 personnel from all jurisdictions across Australia, as well as New Zealand, were deployed to Alberta, British Columbia and the Northwest Territories. Representing fire, land management and state emergency service agencies, the Australasian personnel have been fulfilling arduous firefighter, incident management, aviation management and supervision roles. Many of



The National Council for Fire and Emergency Services (AFAC) spring 2023 outlook shows an increased risk of fire in the Northern Territory, Queensland and New South Wales, and regions in Victoria and South Australia.

the personnel were deployed across remote and challenging areas in Canada including Slave Lake, High Level and Peace River, in Alberta, and Fort Smith, in the Northwest Territories. Thousands of international resources from the United States, Central and South America, Europe and South Africa also assisted wildfire suppression efforts.

As Australians watched the extreme wildfires of Canada, Hawaii and across southern Europe in the hot northern hemisphere summer, they hoped their extra efforts at preparation would be enough.

The federal minister for emergency management, Murray Watt, said recent history had raised the importance of national co-ordination and support: "But we're conscious that this is shaping up to be the first significant fire season since Black Summer (2019-20), so we're doing everything we can to be as prepared as possible at every level."

David Bruce is the communications director with Natural Hazards Research Australia. Prior to that he held the same position at the Bushfire and Natural Hazards CRC and its predecessor, the Bushfire CRC. Bruce led the development and implementation of the branding and communications in the start-up phase of the centre and leads a small team managing publications, online media, stakeholder relations, media relations and events. Bruce completed two terms on the IAWF board and remains on the communications committee. Bruce is a member of the Public Relations Institute of Australia. His working life began as a journalist and news editor with Melbourne's daily broadsheet The Age and News Limited's community newspapers, and later as the communications and media manager at Monash and Deakin universities.

CANADA

STANDING TOGETHER

BY HEATHER SIMPSON

Canada faced extraordinary challenges in 2023 as wildfires raged across the nation, shattering records and pushing resources to their limits. As temperatures soared and the relentless flames burned hectares of land, the country bore witness to a remarkable display of national and international solidarity, the undeniable impact of climate change, and the fortitude of its fire management community. In the eye of this unprecedented storm stands the Canadian Interagency Forest Fire Centre (CIFFC), an organization with more than 40 years of experience co-ordinating wildfire management resource movement across the country. This year has proven to be unlike any other in CIFFC's history.

As autumn approached, Canadians finally began to comprehend the magnitude of what had transpired. The estimate of the national hectares burned by fire exceeded 17 million (42 million acres), a number that may still evolve as more accurate mapping becomes available. That the previous record of ~7.5 million, set in 1989, was shattered in June speaks volumes to the magnitude of the season. For perspective, this year's burned area surpassed the combined landmass of Switzerland and Greece, akin to the size of Uruguay or the state of Florida.

While wildfires are a natural part of Canada's ecosystem, the scale of the resource demand this season was unparalleled, quickly challenging national capacity. Resource demands were initiated in Alberta, where an early and aggressive spring fire season forced the province to declare a provincial state of emergency on May 6. Unusually high temperatures coupled with strong winds and a lack of precipitation set the stage for a record-breaking season.

Alberta was not alone in facing unprecedented challenges. Six of CIFFC's 13 member agencies (provinces and territories) saw their burn areas exceed their 10-year averages by factors ranging from five to 30 times. Member agencies that didn't have record-breaking seasons were often unable to offer extensive assistance to their neighbours. Canadian parks were not spared either, as Parks Canada faced a consistently high fire load that produced six times the 10-year average burn areas.

Quebec experienced a remarkable season, with a colossal hectare-burned record that surpassed the combined totals of the previous two decades. As swaths of Quebec burned, there were widespread evacuations. Smoke from Quebec and other regions blanketed cities to the south, causing air quality concerns, event cancellations, and flight delays.

In Nova Scotia, one blaze became the province's most damaging, resulting in the evacuation of

An operation section chief analyzes the situation from the air in the James Bay giant fires area in the sumemr of 2023. Quebec experienced a colossal hectare-burned record that surpassed the combined totals of the previous two decades. Photo courtesy SOPFEU.

thousands and the loss of more than 200 homes near the provincial capital, Halifax; another became the province's largest wildfire on record.

On the west coast, British Columbia grappled with a strong start to the season in the north. This included the Donnie Creek wildfire, which gained notoriety as it became the province's largest fire on record and claimed a firefighter's life. The fire season in British Columbia had not let up by late summer. There were numerous notable fires, significant structure loss, and evacuation alerts and orders continued into early autumn.

The Northwest Territories bore the brunt of extreme spring conditions that persisted through the summer. Fort Good Hope in the Northwest Territories, located just 145 kilometres (90 miles) south of the Arctic Circle, experienced a scorching 37.4 C (99.3 F) day on July 8, marking the northernmost occurrence of a ~100 F temperature ever recorded in North America. This is one example of the unprecedented heat and extremes expected to occur with climate change– extremes that have been too common this wildfire season, especially in the northern regions.

This year, temperature records across the north were shattered. Persistent drought and successive windy days caused structure loss and widespread evacuations of the Northwest Territories majority Indigenous population, including the capital city,

A member of BC Wildfire opens up a stump with a Pulaski tool during firefighting operations at West Kelowna's McDougall Creek wildfire in August 2023. Photo by Chris Martin.

As autumn approached, Canadians finally began to comprehend the magnitude of what had transpired. The estimate of the national hectares burned by fire exceeded 17 million (42 million acres), a number that may still evolve as more accurate mapping becomes available.

Yellowknife. Regrettably, history tells us that more than 40 per cent of wildfire evacuations in Canada involve Indigenous communities. This year, the wildfire crisis disproportionately affected Indigenous populations nationwide, underscoring the critical need for culturally sensitive evacuation and support efforts. The wildfire emergency highlighted the importance of engaging with Indigenous communities and respecting their traditional knowledge.

As part of ongoing efforts, CIFFC, through the national FireSmart™ program, worked hand in hand with member agencies to engage with communities to enhance their preparedness and resilience against wildfires. Educational outreach programs play a pivotal role in ensuring residents understand the importance of creating defensible spaces and having evacuation plans in place. These efforts prove invaluable as communities face evacuations and the looming threat of approaching flames. The expanding wildland-urban interface presents new challenges, necessitating a re-evaluation of fire management strategies. The need for investment in wildfire prevention and preparedness through programs like FireSmart, becomes evident. Strengthening these initiatives is crucial to mitigating the impact of future wildfire seasons.

Canada's 2023 wildfire season has been truly historic, a fact underscored by the CIFFC National Preparedness Level (NPL). For 120 consecutive days, the NPL remained at its highest level, NPL5,

indicating extreme wildland fire activity and resource demand. During NPL5, national and international resources were fully mobilized to combat the fires. The 120-day duration of NPL5 far exceeded recent significant seasons, with CIFFC spending 50 days at NPL5 in 2021, 29 days in 2018, and 55 days in 2017. Although the situation had improved by mid-September, active wildfires persisted, evacuations were still happening, and numerous personnel remained deployed.

Canada's member organizations played a pivotal role in addressing the crisis. CIFFC is a not-for-profit corporation owned and operated by federal, provincial, and territorial wildland fire management agencies, dedicated to co-ordinating resource sharing, mutual aid, and information exchange. In the face of the 2023 wildfire season, CIFFC's member agencies took center stage in the response effort. Their commitment and collaboration with different agencies and nations showcased their dedication to protecting the country from the devastating effects of wildfires.

CIFFC is grateful for the momentous international assistance this season. Some partnerships have been longstanding, such as that with the United States, which has existed since with since 1982. Before the 2023 fire season, CIFFC also had agreements with Australia, New Zealand, South Africa, Mexico, and Costa Rica. This summer, Natural Resources Canada finalized negotiations with Portugal for a permanent arrangement, and CIFFC negotiated interim agreements with Chile, France, Spain, Korea, and Brazil. This international assistance showcased the goodwill and collaboration that can emerge during times of need. Negotiating these agreements and co-ordinating international efforts was a remarkable achievement, highlighting the interconnectedness of nations in addressing climate-related challenges.

Throughout the season, fire management personnel demonstrated exceptional courage and unwavering dedication; they battled fatigue and adverse conditions, often working extended hours on the frontlines and behind the scenes.

A Parks Canada firefigher looks for hot spots in Wood Buffalo National Park. Parks Canada faced a consistently high fire load that produced six times the 10-year average burn areas. Photo courtesy CIFFC.

There was an outpouring of multi-agency co-operation and assistance during this fire season. The Canadian military joined the action, providing crucial logistical support. CIFFC member agencies worked alongside structural firefighters, police, and other emergency staff and volunteers. All member agencies and partners strive to swiftly respond to the Canadian public to manage crises effectively. Evacuations were frequent, showcasing the importance of preparedness and the need for continued public education.

Firefighters in British Columbia grappled with a strong start to the season in the north, included the Donnie Creek wildfire, which became the province's largest fire on record and claimed a firefighter's life. Photo courtesy CIFFC.

Unfortunately, this season comes at a cost to our fire management personnel. While there is a sense of camaraderie in this line of work, fire management personnel have made untold sacrifices. They have sacrificed their summer and time with friends and families. We know that stress and cumulative fatigue will impact mental and physical health. There were injuries, and tragically, eight of our colleagues lost their lives. These sacrifices underscore the significance of supporting and honouring those who safeguard our forests and communities. CIFFC had the solemn responsibility of honorary host of the 2023 Canadian Fallen Firefighters Foundation ceremony in Ottawa. Part of this ceremony was honouring a Manitoba firefighter who was killed during the 2022 season. This ceremony serves as a stark reminder of the sacrifices made by those on the frontlines. As we shift our efforts to recovery, we cannot lose focus on our fire management personnel's mental and physical health.

As the 2023 wildfire season draws to a close, CIFFC reflects on the lessons learned. Enhanced interagency co-operation, improved resource allocation, technological advancements, and community engagement will be instrumental in future wildfire management. CIFFC also emphasizes the importance of integrated fire management as a long-term strategy to mitigate the severity of future fire seasons. Invaluable insights have been gained, ensuring that Canada stands better prepared to confront the challenges of future wildfire seasons. Together, we can safeguard our forests, communities, and the natural beauty of our remarkable nation.

Heather Simpson is the fire science manager at the Canadian Interagency Forest Fire Centre. Simpson combines a decade of Canadian firefighting experience with academic expertise. Having spent a decade in Australia where she conducted firefighting research, Simpson now resides in Canada and serves as a fire science manager at the Canadian Interagency Forest Fire Centre. Simpson's primary mission is to bridge the gap between research and fire management.

CATALONIA

UNDERSTANDING THE FIRE-GENERATION CONCEPT

BY MARC CASTELLNOU AND EDGAR NEBO

Europe is undergoing a change in the fire regimes of its forest ecosystems that is forcing organizations and society to adapt and integrate these environmental changes into land management, urban development, economic models, and civil protection policies. These ecological changes are not unique to Europe and are happening all over the world.

Catalonia is located within the European continent and features diverse forest landscapes, with a rich fire regime. Historical wildfires are well-documented, and fire behaviour and burn intensities vary considerably. The Pyrenees mountain range to the north, the Ebro valley and the Iberian system to the south and west, and the coastal mountain range along the Mediterranean Sea to the east all contribute to this. The abundance of wildfires has helped society learn to live with fire and incorporate the risk of wildland fires into policies for prevention, land management, and population protection.

The Catalan Fire and Rescue Service (CFRS), as part of this society, has evolved over the last 45 years; it has understood the phenomenon of wildfires, the challenges of their management and integration into the social, economic and biodiversity management system. CRFS has been able to gather the lessons learned from historical wildfires, their patterns and characteristics, and to implement a program of prescribed fires. CRFS has adjusted the tactical deployment and strategy according to the different scenarios of complexity in wildfire management, and by belonging to the international community of fire analysts, it has been able to relate the observed behaviour of wildfires in Catalonia to spread patterns in other parts of the world, thus establishing similarities and shared knowledge.

THE FIRE-GENERATION CONCEPT

This evolution has not been the same in all regions of Europe. Society and the fire community have had to adapt to the different starting points and scenarios according to their fire regimes, and the diversity of realities faced by fire suppression organizations. The description of the different problems encountered, the challenges and their lessons learned are explained in the fire-generation concept, which focuses on the problem driving the fire regime.

FIRST-, SECOND- AND THIRD-GENERATION FIRES

One of the historical changes (first generation), on the landscape is the abandonment of agriculture and the increase in forested area. Fires increase in fuel continuity when the managed mosaic from centuries is lost. Responding as firefighters only

buys time for more fuel build-up; this will bring more fast-spreading fires (second- generation problem) and with time, more fast and intense fires that will overwhelm the extinguishing capacity (third-generation problem). This is the well-known fire paradox that is happening worldwide: the more fire suppression resources are deployed, the fewer fires will escape in the short term. However, the relentless fuel build up will facilitate fires that eventually will exceed the capacity of the system.

Given the difficulty of managing fuel over large areas when society becomes urban, a selective approach has evolved, based on strategic management points in the territory. The approach is also promoted by biodiversity preservation that focuses on minimizing land management and public budget limits. We understand that every part of the landscape is linked to a portion of the fire-shed. So, some areas protect fire to get into one fire-shed or a portion of it. Applying this concept, we can design the landscape management building a mosaic of strategic management points that guarantee our capacity of management in key locations in front of extreme wildfires.

Another solution is to promote the use of fire behavior models and analysis to be proactive with the operations divisions of our fire services. The operations divisions need to think tactically in deciding where and when to act, choosing the place where they can win, and clearly stating at what cost this will be achieved. Every decision is a trade-off between what we leave unprotected to guarantee the protection of another asset. In this adaptation, every fire service has had to increase the type of tools and skills to be able to use them in as many tactical opportunities as possible. Across European fire regions, prescribed burning has made a resurgence in recent years after long being either banned or simply not part of the fire service's tools and skills. Data supports the impact of prescribed burning on the creation of a healthy forest.

FOURTH-GENERATION FIRES

The fourth generation incorporates the civil protection emergency when second- or third-generation wildfire problems impact critical infrastructure and population. Agencies must react to protect threatened infrastructure and then prioritiize which resources to protect, especially when there are not enough resources for all of them. During wildfire suppression operations, triage may need to be used, which requires knowing what and who is present and where. Now, the pressure is no longer on defending forests from fires; it is on protecting societies from large high intensity wildfires that burn through unhealthy forests.

A culture of self-protection must be introduced among the population so that people have passive protection systems and know how to act during an emergency. The emergency management system cannot neglect wildland fire to focus only on the impacts on wildland-urban areas. If the wildland fires are not managed, it will affect new vulnerable elements and cause the whole system to collapse. Fires such as those in Maçanet de la Selva in 2003 with 670 houses involved, La Jonquera in 2012 with five towns impacted and 11,000 people confined inside, and Vallirana in 2013 where 345 houses were involved in the first hour of the initial attack, are examples of this learning process. In these situations, tactics applied to prioritize the few houses involved in the flames during the initial attack had a trade-off of further house losses. Forest management and strategic management points located to protect the wildland-urban interface become a pivotal approach, but we need an extra tool. Triage becomes a lesson learned: we can let one house burn to protect two, but never can leave two to be lost to protect one. The same lessons become imperative when, instead of houses, we protect lives.

FIFTH-GENERATION FIRES

The fifth generation came with the problem of fourth-generation wildfires occurring

simultaneously. Such a situation may exceed fire suppression capabilities and affect the population and critical infrastructure in several locations at the same time. Strategic triage on decision making at this landscape level is a difficult task when it comes to assessing the trade-off. Here, the solution comes by introducing the concept of the common good, which should be discussed beforehand as a participatory process with the community. The agreements on the values, priorities, and strategic management are a contract between fire service and society to reduce uncertainty on the decisions and outcomes of the fire management strategy during the emergency. A new paradigm has resulted from this process, shifting the response away from the classic people first, then assets and finally forest rule. We now assess first a common good approach in strategic management, avoid tactical collapse, and guarantee capacity of action when planning operations, so when it comes, you always can save lives, assets, and forest. The old approach of lives first failed; when saving one life we have lost many. It is a lesson learned the hard way and one that is difficult to teach. However, is a lesson we cannot afford to learn repeated times.

To improve the response in this complex scenario of simultaneous large-scale emergencies, assistance among neighbours requires a harmonised and known catalogue of capabilities of the different equipment available, such as, for example, that of the fire analyst capacities. The exchange of people and equipment before the emergency response is a necessity, as it allows the creation of relationships based on trust among agencies. This trust and prior knowledge are key to making the most of the assistance received where it is most effective. This response is being well co-ordinated under the European Union civil protection.

SIXTH-GENERATION FIRES

The last scenario is the most worrying – the scenario of the sixth fire generation. In it, fire couples with the upper layers of the atmosphere, creating a new and difficult situation with extreme fire behavior. Extreme fires are shifting from fuel hypothesis to extreme weather hypothesis under the climate change crisis. This scenario is characterised by a change in the behaviour of large-scale fires, several kilometres away. Las Máquinas in 2017 (Chile), burning 8000 hectares an hour through the night, Pedrógão Grande in 2017 (Portugal), spreading at 4,000 hectares an hour and killing 64 civilians, Santa Ana-Bíobío in 2023 (Chile), and Santa Coloma de Queralt in 2021 in Catalonia, show the current challenge on forecasting the transition from a fuel-driven wildfire to a pyrocumolonimbus (PyroCb) phenomena and the implication of this uncertainty in emergency management decision making.

To confront the magnitude of the challenge posed by this new scenario, it is necessary to accept that some of the processes involved in pyroconvection are not yet fully understood. Research should focus on the study and understanding of this complex fire-atmosphere interaction effect and provide to the responding agencies with scientific criteria for the triage based on the common good preserved in every achievable strategic scenario.

GLOBAL COLLABORATION

It would be beneficial to reflect with colleagues worldwide on the fact that the processes and patterns of wildfires are universal. However, what differs is how the fire suppression system perceives and deals with them. We need to share lessons learned to avoid reinventing the wheel every fire season in different parts of the world. We need to speed up the learning process to evaluate and understand the fire problem globally. A critical need is when it comes to integrate fire management and fire use in our urban society. Fire needs to be integrated as a disturbance in the landscape; this means that its presence is planned, agreed with the territory and with a legal basis. In the Pyrineed, at the Val d'Aran, regional government has legislated to integrate shepherds management, that is, using grazing animals to reduce the build-up of flammable vegetation, and cultural fire-use into its emergency management decision-making process. Starting in 2023, any natural or deliberate ignition that occurs in an

area designated in the Aran prescribed burn plan will be managed to achieve the fire-use plans if the weather conditions are within the prescribed limits for the following days. This policy was implemented after the Canejan fire in March of that year.

Thus, the key learning factor is the capacity of society and its emergency management system to understand fires and wildfires, to anticipate decisions without falling into fear and reactivity. The approach is setting our wildfire reality a step ahead of the collapse we were facing the last decade. We are starting to build a complex emergency management approach that integrates different stakeholders in a common view. The approach is not looking to build response, but to proactively manage the landscape to promote effective fire management actions. Involving society in education about the approach to a solution instead of the approach to a response is creating spaces to manage complex emergencies into a society that is aware of and educated in self-protection and the risks it faces.

Marc Castellnou is the founder and former president of Pau Costa Foundation, and now serves on its board. Castellnou is a professor at the University of Lleida Master Fuego. He started as a firefighter in 1989 and became an ecology forester in 1997. In 1990, Castellnou started as an incident commander at and wildfire strategic analyst at the Catalan Fire Service, where he created the GRAF teams, along with prescribed burn plan and a wildfire training program. Castellnou was recognized by the IAWF with its safty award in 2015. Castellnou is a PhD candidate in boundary layer physics and wildfire spread patterns.

Edgar Nebot is with the Catalan Fire and Rescue Service.

CYPRUS

CLIMATE CHANGE RESULTS IN SEVERE AND DESTRUCTIVE SEASON

BY PETROS PETROU AND KOSTAKIS PAPAGEORGIOU

Situated at the north-eastern end of the Mediterranean basin, Cyprus is the third largest island in the region, with an area of 9.251 square kilometres; it is mostly a mountainous country with an intense Mediterranean climate.

The period from May 1 to Oct. 30, is considered as the official forest fire season in Cyprus. As in all European countries in the same geographical zone, fire is considered the major destructive agent for forests and wildland.

For Cyprus, dealing with forest fires is an issue of essential public safety. According to the National Risk Assessment of the Republic of Cyprus, forest fires present the highest level of risk, compared to other risks, such as earthquakes, coastal erosion, and floods.

The Department of Forests is the responsible authority for the protection of the state forests and of a two-kilometre zone from the state forest boundaries, against fires. This area constitutes about 57 per cent of the land on which forest fires and wildfires occur. For the protection of forests from the risk of forest fires, an integrated fire management system is applied, which is based on three pillars: prevention; preparedness; and suppression.

FIRE PROTECTION MEASURES AND ACTIONS

As far as the prevention of forest fires is concerned, the main measures applied include the implementation of a public awareness and enlightenment campaign, the application of forest legislation, the construction and maintenance of firefighting infrastructure and the use of fuel management practices.

In the context of the second pillar, which concerns preparedness, the main measures applied are continued planning and monitoring, the improvement of co-ordination and co-operation among all stakeholders involved in fire fighting, the training of personnel, the organization of firefighting exercises, the operation of fire lookout stations, and the implementation of air and ground patrols.

The fire suppression pillar includes the implementation of a duty roster for personnel, the formation of the firefighting squad, the use of fire engines and heavy machineries such as bulldozers, and the availability of air firefighting means.

The most destructive wildfire of the year in Cyprus started at around 2 p.m. on Friday, Aug. 4. The fire ignited near Paramytha, Limassol District, and burned 8.8 square kilometres covered with wild vegetation. Photos courtesy of the Department of Forests (Cyprus).

IMPLEMENTATION OF NEW TECHNOLOGIES IN FIRE MANAGEMENT

Following a disastrous fire that occurred in Cyprus in 2021 that burned 44.5 square kilometres and caused the death of four people, the president of Cyprus asked for a study to consider the introduction of a holistic technological system in fire management. Among the measures that were included in this study and already implemented, is the use of electroptic systems that use heat sensors for the detection of thermal anomalies and therefore for the automatic detection of fire ignitions. So far, four systems have been installed and are operating in different forest areas. Moreover, for surveillance purposes, unmanned aerial vehicles are used. Other measures proposed in the study and planned for implementation include the use of aerostats for surveillance and the supplement of mobile co-ordination centres for use as incident command posts.

THE 2023 FIRE SEASON IN CYPRUS

The 2023 fire season in Cyprus was severe and particularly destructive. Following a winter with below average precipitation and a hot and dry summer, the conditions were particularly favourable for the ignition and rapid spread of forest fires. In contrast, fire statistics by the end of June showed that 2023 was a light year for forest fires, with a near average number of forest fires and a lower burned area compared to the last decade average. However, a period of prolonged heatwave conditions that lasted for almost three weeks starting in mid-July, with temperatures reaching 44 C to 46 C in some areas, worsened conditions and reflected negatively on the island's fire danger. Since then, the country has experienced aggressive fire activity, an above-average number of fires and burned area, and the ignition of several significant fire incidents that had severe impacts on communities and the environment.

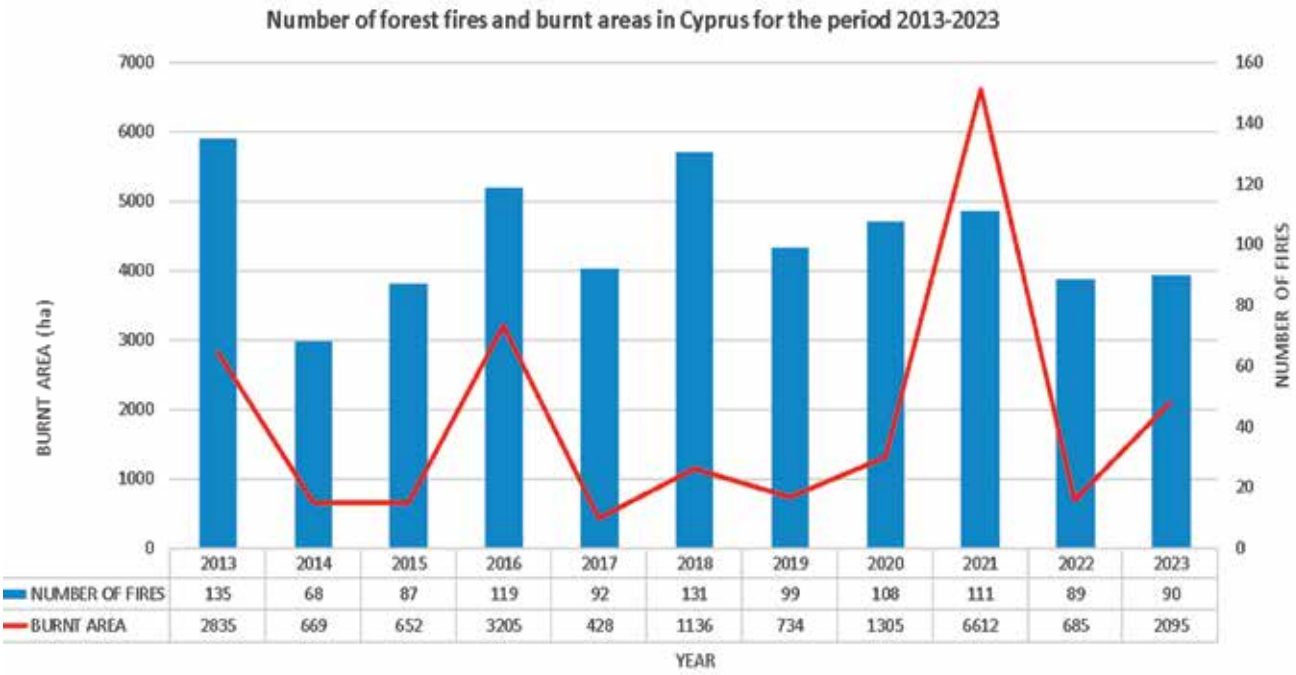
Statistically, July 2023 will go down as one of the hottest months in history and regarding the number of forest fires, as one of the worst on record.

2023 FIRE OCCURRENCE, AFFECTED SURFACES AND MAJOR FIRES

Up to mid-September of 2023, Cyprus experienced 83 forest fires, affecting a total land surface of 2,073 hectares, mostly wooded areas. Of these, eight fires were more than 50 hectares in size. The 10-year average is 66 fires and 1,528 hectares. Comparing the above figures with 10-year averages, there is an increase of 26 per cent regarding the number of forest fires and 36 per cent regarding the burned area.

The most destructive wildfire of the year started at around 2 p.m. on Friday, Aug. 4. The fire ignited near Paramytha, Limassol District, and burned 8.8 square kilometres covered with wild vegetation. The fire swept through several communities of the Limassol Province and apart from the vegetation, destroyed livestock facilities and damaged houses in the area. Residents of the affected communities were evacuated. On Aug. 6, the government requested the support of the European Union Civil Protection Mechanism to tackle the fire event. The Cyprus government requested assistance from nearby non-EU countries, based on bilateral agreements. In total, 20 aerial aircraft were involved in the firefighting operation: 11 national assets composed of five aircrafts and six helicopters; the rescEU module from Greece composed of two aircraft; two aircraft from Israel; two helicopters from Lebanon; and three helicopters from Jordan.

On Saturday, Sept. 9 at around 1:30 p.m., a massive fire that started near Akrounta community, Limassol District, burned 4.6 square kilometres, covered with forest vegetation. The fire swept through Limassol State Forest. Scattered houses in the area were preventively evacuated. Cyprus requested assistance through the EU Civil Protection Mechanism. Italy responded to the request, offering one module of two Canadair aircrafts. However, due to improvement



	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
NUMBER OF FIRES	135	68	87	119	92	131	99	108	111	89	90
BURNT AREA	2835	669	652	3205	428	1136	734	1305	6612	685	2095

of the firefighting operation the following day, the request for assistance was withdrawn. The Cyprus government requested assistance from Jordan, based on a bilateral agreement. Jordan responded with two helicopters. The fire was suppressed on the morning of Monday, Sept. 11.

CLIMATE CHANGE AND FOREST FIRES

The increasing trend of forest fires frequency and extent, as a result mainly of climate change, is a new reality for Cyprus. Limited precipitation and frequent long-lasting periods of heatwaves are worsening the situation in Cyprus, affecting both fire ignitions and the intensity of forest fires. Facing the challenges of climate change, with longer fire seasons and more extreme fire weather and behaviour, is not an easy task. Assessing the existing system and identifying weaknesses and areas of improvement, is the crucial step for better and effective fire management.

Up to mid-September of 2023, Cyprus experienced 83 forest fires, affecting a total land surface of 2,073 hectares, mostly wooded areas. Of these, eight fires were more than 50 hectares in size. The 10-year average is 66 fires and 1,528 hectares. Photo courtesy Department of Forests (Cyprus).

Petros Petrou holds B.Sc. in Forestry, M.Sc. in forestry, sustainable management of environment and natural resources, M.Sc. in ecology and protection of forest ecosystems and a PhD in silviculture-applied ecology from the Democritus University of Thrace, Greece. Petrou has authored or co-authored 10 papers in international peer reviewed journals and a number of papers presented at peer reviewed conferences. Since 2008, Petrou has been employed as a conservator of forests in the Cyprus Department of Forests. Petrou served as a lecturer in the Cyprus Forestry College from 2008 to 2015; from 2015 through 2018 he was head of the utilization sector, and since June 2018 he has served as the fire protection officer of the Department of Forests. Petrou has been active in forest fire management since he started working in the Department of Forests in 2008; Petrou represents the department in forest fire related committees and consultations in Cyprus, in the European Union, and other relative organisations.

Kostakis Papageorgiou holds BSC& MSC in forestry and natural environment from the School of Forestry and Natural Environment Aristotelean University Thessaloniki-Greece, a specialised post-university diploma and MSc on conservation and management of Mediterranean ecosystems from the Mediterranean Agronomic Institute of Chania, and an MSc in public management from the Neapolis University Paphos-Cyprus. Papageorgiou is senior conservator of in the Cypru' Department of Forest/ Ministry of Agriculture, Rural Development and Environment, and head of the Fire Protection and Forest Engineering sector.

GREECE

LESSONS NOT LEARNED

BY GAVRIIL XANTHOPOULOS, EMMANOUELA ZEVGOLI, KONSTANTINOS KAOUKIS AND MILTIADIS ATHANASIOU

The forest fire season of 2023 in Greece was one of the worst the country has experienced and has yet again highlighted the inadequacies of the Greek fire management system.

More than 140,000 hectares burned across the country, hundreds of structures were destroyed and unfortunately there were more than 20 fatalities.

One particular fire, in the prefecture of Evros near the border with Turkey, marked the season, as it lasted more than 15 days and burned more than 93,000 hectares, breaking by far the previous record of 55,000 hectares, in Northern Evia, in 2021. The Evros fire was probably the largest wildfire in recent European history. Despite the efforts of the Greek government and the implementation of a forest fire prevention program called Anti-NERO in preparation of the forest fire season, the forest fire suppression mechanism proved to be insufficient under difficult conditions.

The official fire season in Greece extends from May 1 to Oct. 30. Following a dry winter, the spring was particularly rainy. The rain started in mid-April and continued until the beginning of June, resulting in excessive growth of herbaceous vegetation. At the beginning of July, this vegetation was still green and the fire situation was quite mild. Then, the country was struck by one of the longest heatwaves ever recorded, according to the National Observatory of Athens; it lasted from July 12-26, with temperature exceeding 43 C in many parts of the country. Due to these extremely high temperatures, the green and wet herbaceous vegetation turned into dry and flammable fuel within a few days, increasing the potential of wildfires to ignite easily and spread very fast. And they did.

On July 17, a number of almost simultaneous fires near Athens, in Attica and Corinthia, put the reflexes of the firefighting mechanism to the test. Three of the fires – Saronida, Loutraki, and Dervenochoria – escaped initial attack and started threatening settlements and infrastructure, continuing for three days in spite of the very strong response with ground and aerial resources.

Following the doctrine established in the last few years, evacuation and protection of settlements became an absolute priority, allowing the fires to grow.

With all the emphasis on these fires, a new fire on the tourist island of Rhodes, on July 18, received relatively weak attention and aerial firefighting support. The realization of the high damage potential of the Rhodes fire came after the second day, when, under the influence of the strong north-northeast meltemi – wind that is characteristic of the Aegean sea in the summer – the fire started growing rapidly toward the southern coast of the island, threatening tourist installations. Meltemi usually blows from northerly directions in the central-eastern Aegean, and from

north-westerly or occasionally westerly directions in the southeastern Aegean. Again, emphasis was on citizen evacuation with alert messages on mobile phones transmitted through the 112 Civil Protection emergency number; it was not an easy task but was carried out without casualties. More than 20,000 people, mainly tourists, were evacuated by civil protection, local authorities and the citizens of neighbouring villages. In some cases, residents and tourists had to evacuate on foot. The fire kept growing for five days, finally reaching the sea.

The burned area reached 20,661 hectares, and included parts of a previous large burn of 2008 that was under regeneration. Tourism was affected negatively for a few weeks but by the end of August there were already signs of recovery.

Simultaneously, on July 23, three forest fires started near the city of Aigio, in North Peloponnese, on the island of Corfu and near the town of Karystos in the south of Evia island. Again, there was extensive use of the emergency number 112, prompting evacuations of all villages in the general vicinity of the fires. The ground resources once again focused on saving property and evacuating civilians, leaving fire control to the aerial resources. On July 25, a fatal crash of a Canadair CL-215 waterbomber took place next to the village Platanistos, near Karystos. The plane was making its final drop on small flames before leaving to refuel; it was flying very low to maximize effectiveness and one of the wings hit the top of a tree. The damage resulted in loss of steering capacity and finally the plane crashed on the slope, killing the two pilots.

> The need for proper forest management by a renewed well-staffed and funded Forest Service, which has been neglected for years, started being discussed only after the 2023 disaster.

On July 26, with the passage of a cold front over the country, a series of fires started and grew rapidly, following wind velocity and direction changes. The most challenging were a large fire on the island of Corfu and a series of fires in Thesssaly and Phthiotida in the center of Greece. The later fires reached the outskirts of the city of Lamia and the industrial park of Volos. Most important, one of the fires, burning in light fuels, reached the Greek Air Force base near the town of Nea Anchialos, where it caused a huge explosion of ammunition. There were no fatalities, but the town, although at a distance of five kilometres, experienced serious damage.

The fire in the prefecture of Evros on Aug. 21, 2023. Photo by Pascalis Christodoulou, president, Beekeepers Association of Evros.

On Aug. 18, a forest fire started in the prefecture of Evros, at a short distance from the border of Greece with Turkey to the north of the city of Alexandroupoli. It is believed that the fire was a restart of a lightning-caused fire that had been extinguished but was not guarded properly. The fire progressed under the influence of strong meltemi wind, escaped initial attack and grew quickly in size. Warning and evacuation messages on mobile phones through the 112 early warning system were sent extensively, in an effort to eliminate the risk of fatalities. The same pattern of focusing on village protection was repeated. By Aug. 21, 12 villages had been evacuated and the fire had become huge, burning thousands of hectares of forested and cultivated land (see photo 1). The next day (see photo 2), the Alexandroupoli hospital was evacuated and the patients moved into a ship at the port, as the fire approached and the air was filled with smoke and ashes. That same day, a second fire that had started a few kilometres to the north, in the national protected forest of Dadia, moved southwards and merged with the first. In doing so, the fire trapped 18 immigrants who had entered the country illegally and were trying to move through the forest. Two more fatalities were counted later, while 25 more immigrants were rescued by firefighters. The fire continued burning for 17 days, even after its front had reached and stopped at the sea, spreading along its western flanks and even turning northwards when the meltemi wind stopped for a few days. This fire became the largest on record in recent European history according to the Copernicus Emergency Management Service of the European Commission. The burned area is estimated at 93,500 hectares, including oak forest (Quercus sp.), pine forest (Pinus brutia and Pinus nigra), evergreen shrubs and agricultural land.

On Aug. 22, while the Evros fire was the focus of attention, a forest fire originating at more than one point started near Phyli, to the south of mount Parnis (or Parnitha) in Attica, at the outskirts of Athens (see photo 2). The evacuation scenario was repeated at the settlements (Aspropyrgos, Phyli, Agia Paraskevi, Agios Nikolaos, Acharnes, Thrakomakedones) and firefighting attention focused on protecting homes as the fire moved slowly up the mountain slopes against the meltemi wind. Although there were many firebreaks, including recently created or maintained ones in the frame of the Anti-NERO fire prevention program, and new ad-hoc firebreaks were opened with dozers overnight, the firebreaks were repeatedly compromised as they were not used appropriately. The fire continued for four days, finally burning 6,057 hectares and many houses and infrastructure. Most important, this fire was the final blow for the Parnitha national park, as it burned most of what had been spared from the devastating fires of 2007 and 2021 (see photo 3).

Smoke from the fires in Evros, Viotia and Parnis mountain in a NASA satellite image captured Aug. 22, 2023.

STOPPING THE DESTRUCTION BY WILDFIRES **STARTS NOW.**

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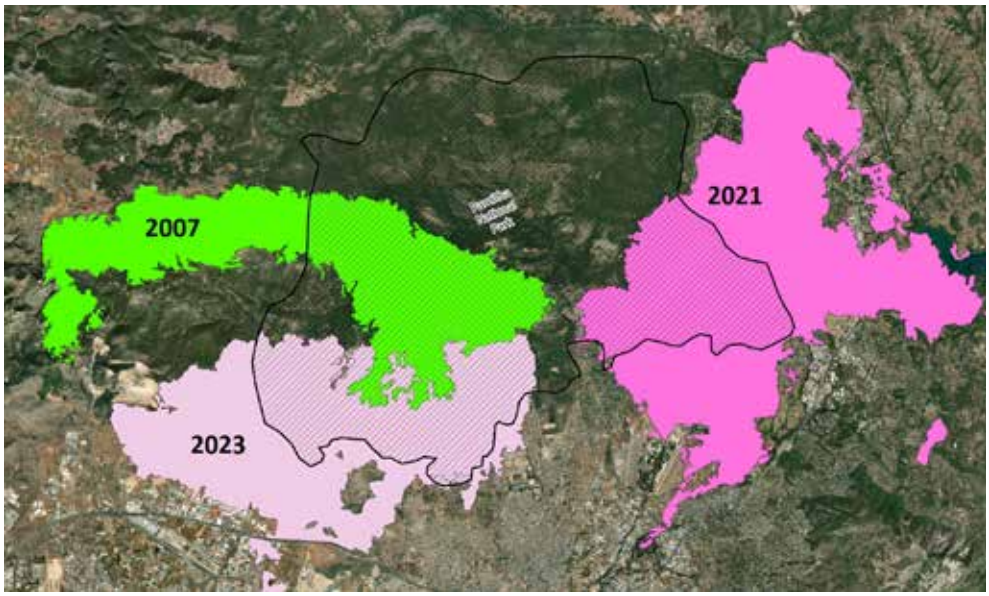

Precious areas of Athens National Park of Parnitha that were burned by large fires in June 2007, August 2021, and August 2023.

The difficult part of the fire season came quite suddenly to an end in September with the successive passage of two record-breaking storms that brought unprecedented amounts of rain, exceeding 900 millimetres in 24 hours in parts of Thessaly, and caused huge flooding damage. Added to the heatwaves and the huge fires, the storms served as a reminder of what the future may look like under climate change.

Looking back at this fire season, it becomes evident that little has been learned from the mistakes that were evident in the two previous fire seasons. The Civil Protection organization remained focused on fire suppression with new resources added every year. However, the firefighting doctrine has not changed and much of the control efforts are carried out from the roads, which, as a rule, are compromised.

Even existing and ad-hoc firebreaks are not used effectively to control intense fires, let alone the strips around the roads where understory vegetation has been removed.

Over-reliance on aerial resources continues.

As these measures control the flames but do not necessarily put-out the fire completely, without co-ordinated ground intervention away from roads, fire restarts are abundant and the fires continue for many days.

The firefighting weaknesses led to requests for international help. In response, firefighters and aerial resources came from other European countries (Bulgaria, Croatia, Cyprus, France, Italy, Malta, Poland, Romania, Slovakia), in the frame of the RescEU mechanism of the European Union, and from countries outside the EU (Egypt, Jordan, Israel, Serbia, Turkey). The resources were very helpful. Once more, the tendency to evacuate all villages and towns in the general area of the fire became a contributing factor to the firefighting failures.

So far, the government seems convinced that all problems are due to the difficult conditions caused by climate change. Strong response is promised, ranging from heavier penalties for those who start fires, even inadvertently, to employing more than 100 drones for fire prevention in the near future. Aerial resources are going to be strengthened further as Greece is planning to order 12 CL-515 waterbombers as soon as they become available.

There do not seem to be any doubts about the firefighting doctrine and the failure of the one-sided emphasis on suppression.

Little is understood and planned regarding the requirement for a co-ordinated effort to improve the resilience of the agricultural and forestry landscapes.

The need for proper forest management by a renewed well-staffed and funded Forest Service, which has been neglected for years, started being discussed only after the 2023 disaster. Lessons have not been learned.

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UNITED STATES

FEWER FIRES, BIGGER IMPACT

BY RICH MCCREA

The 2023 fire season in the United States was particularly challenging, with many large incidents, including the Lahaina Fire on the island of Maui in Hawaii that killed 99 people. However, while Texas and Louisiana endured higher than normal wildfire activity, other regions experienced a quiet season.

Data from the National Interagency Fire Center, the daily Incident Management Situation Report (IMSR), Geographic Area Coordination Centers (GACC), and agency public information officers provided valuable insight. As of Sept. 22, more than 44,011 wildfires had burned 2,342,143 acres (947,831 hectares). The 10-year average wildfire occurrence for the United States (2013-2022) is 44,575 fires burning 6,046,153 acres (2,446,791 hectares) – a slower overall season.

The Alaska GACC experienced an abbreviated fire season with fewer than 300,000 acres (121,405 hectares) burned as of mid-September. In an average year, Alaska wildfires blacken about 650,000 acres (263,045 hectares). In 2023 there was limited large fire activity until drier weather and lightning occurred the third week of July.

In Texas and Louisiana, wildfire numbers and acres burned were much higher than normal. Extensive areas of southern pine occur across much of west Texas and Louisiana. One of the larger fires that occurred in western Louisiana – the Tiger Island fire – ignited Aug. 22 and burned across pine plantations of multiple ages; it was a challenging incident due to drought, high temperatures and heavy areas of downed woody fuels from Hurricane Laura in 2020. As of Sept. 22, 31,290 acres (12,662 hectares) had burned, with containment estimated at 84 per cent. The Southern GACC incident management team (SA Blue Team) was mobilized to manage this wildfire. The Tiger Island fire was the largest blaze to ever occur in Louisiana and was unprecedented in terms of fire behavior and size.

The Lahaina fire burned 2,170 acres (878 hectares) with 2,207 structures damaged or destroyed, and 97 confirmed fatalities. Extreme fire behavior occurred that day with wind gusts more than 50 miles per hour and very dry fuels due to low humidities and drought conditions. Officials in Hawaii say this wildfire was one of the deadliest natural disasters in the state's history.

The Confederated Salish Kootenai Tribe (CSKT) in western Montana experienced five large fires from July to August that burned more than 43,000 acres (17,401 hectares). On July 24 and July 30 lightning storms pummeled the Mission and Salish mountains and ignited four wildfires. Another fire that was ignited at the same time was human caused. Propelled by high winds with hot temperatures these fires raged across tribal lands, with extreme fire behavior, as flames torched through timber stands and spotted long range. At one point two of

Seven fires were ignited by lightning in Olympic National Park on Aug. 28, and the flames blackened 4,135 acres (1,673 hectares) by late August. Tactics to contain the blazes included using natural barriers such as mountain ranges, high alpine zones, and rivers. Photo courtesy National Park Service, Olympic National Park.

these fires spotted across the Flathead River, which must have greatly alarmed the crews on the scene. The Northern Rockies GACC Team 8 was mobilized for three of these fires and the CSKT Division of Fire managed the other blazes.

Another agency that faced challenges was the National Park Service in Olympic National Park in northwestern Washington state. Seven fires were ignited by lightning in the park on Aug. 28, and the flames blackened 4,135 acres (1,673 hectares) by late August. Fire operations included protecting infrastructure and creating fuel breaks (defensible space) to limit fire spread in selected areas. Tactics to contain the blazes included using natural barriers such as mountain ranges, high alpine zones, and rivers. Fire is an integral part of the forested ecosystems on the Olympic Peninsula and plants and animals have evolved with fire for thousands of years. Even the emerald hued rainforests in the deep river valleys, such as the Quinault River, have evolved with fire, which naturally occurred at long term intervals.

The Gila National Forest in southwestern New Mexico experienced a busy fire season, with numerous lightning fires in July. The Gila is very mountainous with three extensive wilderness areas, blanketed by stands of ponderosa pine, pinyon-juniper, and mixed conifer, broken up by sweeps of bunch grass and oak. During the summer, 12 fires were managed for resource benefits, which burned a total of 132,000 acres (53,418 hectares).

The devastating fire season in Canada had several impacts in the United States with smoke from those conflagrations impacting states from Montana to Vermont and even as far south as Colorado. While wildfire smoke wedged south, U.S. assistance flowed north to Canada. As of Sept. 22, support to the Canadian provinces and northern territories included five fire crews of 18 to 20 people, two incident management teams, five overhead personnel, and nine engines.

The 2023 fire season peaked at the end of August into early September when more than 20,000 personnel were employed on around 70 large blazes

across the United States. The fire season slowly waned and by late September 8,300 personnel were deployed on large blazes (Sept. 22 IMSR report). Significant fires were ongoing and were expected to continue through September into November in Washington, Oregon, California, and other states. Fall weather unfortunately can bring windy and very dry conditions along the west coast, with Santa Anna and east wind episodes that can rapidly turn small fires into conflagrations.

In late September, fires were burning in the Sierra Nevada range, Klamath Mountains, Siskiyou Mountains, Cascades, and Olympic Mountains. These fires were generally difficult to control due to the steep and rugged terrain and heavy fuels. Fire crews faced arduous hikes, long days, and short cold nights with the hope that rain and snow would slow the blazes or that flames could be herded into rock slides and backfires would hold.

Rich McCrae worked 32 years in fire management and forestry with federal agencies in the United States. Outfitted with a degree in forestry, McCrae started his career as a seasonal employee with the forest service as a forestry technician and member of the Helena Interagency Hotshot Crew, then moved on to permanent positions with the Bureau of Indian Affairs as a forester and fire management officer at three different field locations and at the National Interagency Fire Center. The last 12 years McCrae has worked as a fire management consultant and a freelance writer and historian.

The Gila National Forest in southwestern New Mexico experienced a busy fire season, with numerous lightning fires in July. The Gila is very mountainous with three extensive wilderness areas, blanketed by stands of ponderosa pine, pinyon-juniper, and mixed conifer, broken up by sweeps of bunch grass and oak. During the summer, 12 fires were managed for resource benefits, which burned a total of 132,000 acres (53,418 hectares). Photo courtesy Gila ational Forest.

POWERFUL LESSONS FROM HOT SHOT SUPES

BY MICHAEL DEGROSKY

A late-summer road trip with my wife brought us near the Smith River, Happy Camp and Hoopa complexes of fires in Oregon and California. Along the way, we encountered Interagency Hotshot Crews (IHC) traveling to, from and around these fires. There are more than 100 IHCs in the United States – highly professional, mobile, and skilled hand crews assigned to the most challenging and high-priority fires. Though organization can vary, IHCs are typically led by a superintendent who is often referred to as The Supe.

As we passed the hotshots going about their business, I reflected on my long association with these crews. I was a hotshot for two fire seasons, one as a crew member and one as a squad boss. I consider those two seasons to have been foundational as a fire professional, a leader, and as a person. Later, as a division supervisor, I was always grateful when assigned hotshots; an all-career experience came when I was assigned six IHCs, punching hotline overnight, over steep and rugged terrain and through the ugliest snag patch I can recall.

Last year, a friend gave me *The Supe's Handbook: Leadership Lessons from America's Hotshot Crews,* by Angie Thom. I am quite proud that I know or knew more than 20 of the people profiled in Thom's book – firefighting colleagues, training cadre teammates, audience members and training participants, and consulting clients. (Sadly, some are no longer with us.)

I was immediately drawn in by a balanced, honest, on-point foreword by Anthony Escobar, who had served as the superintendent of the Kern Valley IHC and retired as the fire management officer for the Los Padres National Forest in California. It is worth the price of the book just to read the foreward.

Brit Rosso served as the superintendent of the Arrowhead Hotshots and retired as the manager of the Wildland Fire Lessons Learned Center. Included in this book are Rosso's lessons learned from the line-of-duty death of crew member Dan Holmes. Anyone leading a fire program or an agency with a fire program should read Rosso's account.

One night, while reading this book, I cried; the author's story of her trip to interview Paul Gleason, right at the time of his passing from cancer, brought a flood of memories. Gleason had been superintendent of the Zig Zag IHC, headquartered on the Mount Hood National Forest in Oregon, long before retiring from the National Park Service and serving as an adjunct professor for the Wildland Fire Science program at Colorado State University. Gleason's contributions to the U.S. wildland fire service are legendary, including pioneering sawyer certification and the Lookouts, Communication, Escape Routes and Safety Zones firefighter safety concept, commonly known as LCES. Gleason made it cool for firefighters to be "students of fire."

The author, Ms. Thom, had been introduced to Gleason by Jim Cook who accompanied her to the interview in Colorado. Cook was the superintendent of both the Arrowhead and Boise IHCs, retired as the training projects co-ordinator for the U.S. Forest Service, and was a principal architect of the National Wildfire Coordinating Group's leadership curriculum in the United States

Thom's story of going to interview Gleason reminded me that around the time of his death, I spent a powerful, emotional evening in a hotel ballroom in Santa Fe, New Mexico, with a group of his National Park Service colleagues, reminiscing and processing his passing. It proved an extra intense experience because it just so happened we were also doing the first staff ride of the Cerro Grande fire on which Gleason had been burn boss. Some of the people present had been principal players and most were already processing some strong emotions. All these years later, I find myself hoping the people who receive the Paul Gleason Lead By Example Award, presented by the National Wildfire Coordinating Group, have a deep and intense understanding of the fire-service leader in whose memory they are being honored for their own achievements, and what that means.

I had three takeaways from *The Supe's Handbook: Leadership Lessons from America's Hotshot Crews*.

First, I was reminded of how some really intelligent people are drawn to fire. Note I did not say

I was a hotshot for two fire seasons, one as a crew member and one as a squad boss. I consider those two seasons to be foundational as a fire professional, a leader, and as a person.

"educated" people. Some people profiled have or had formal post-secondary educations. Others are or were self-educated. Formal, higher education is not prominent in the group of hotshot superintendents profiled. However, intelligence is.

Second, whether the profiled supes overtly acknowledged it or not, they are and were passionate students of leadership, for whom the responsibilities of leadership weighed heavily; and they took their leadership very seriously. The fire part seemed to come easily; their focus was on leading their people.

Third, I was reminded me of how often I have seen this kind of intelligence and leadership savvy go under-recognized, under-utilized, and even dismissed, because people could not see past big, sometimes rough and blunt personalities, educational credentials, or their own insecurities.

As a lifelong fire professional, including 20 years as a consultant to wildland fire agencies, I've encountered more than one senior leader who would have benefitted from some coaching and mentoring from people in this book.

Mike DeGrosky is a student of leadership, lifelong learner, mentor and coach, sometimes writer, and recovering fire chief. He taught for the Department of Leadership Studies at Fort Hays State University for 10 years. Follow Mike via LinkedIn.

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