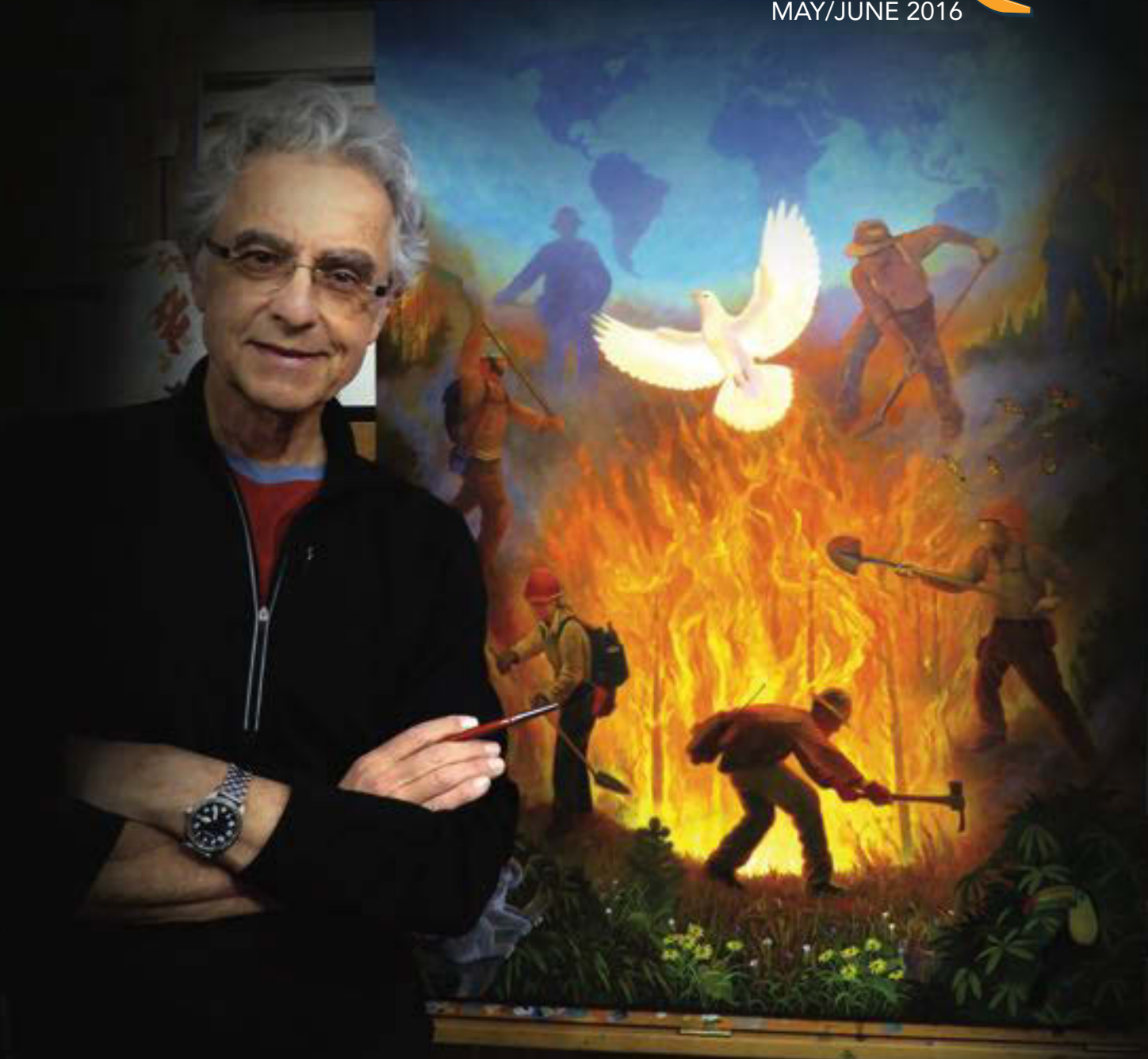


# *WILDFIRE*

"Uniting the Global Wildland Fire Community" **VOLUME 25.3**  
MAY/JUNE 2016



## MONTE DOLACK AND THE MAKING OF **FIRE ART**



An official publication of the **International Association of Wildland Fire**

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From the  
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*An early version of the circle of firefighters working fire, and the goddess of fire, that eventually became the completed painting and poster, "Wildland Fire, Uniting Globally," by Monte Dolack.*

*For more of his fire art and his reflections on fire, see our interview starting on **page 28**.*

May/June 2016

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Photo: Naomi Fox



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# THE INTERNATIONAL ASSOCIATION OF WILDLAND FIRE:

## *Continuing a*

# COMMITMENT TO EXCELLENCE



For 26 years the International Association of Wildland Fire (IAWF) has made an unwavering commitment to serve the global wildland fire community. As shown below, we strive to facilitate

communication, provide leadership, promote a better understanding of wildland fire, and build on the belief that an understanding of this dynamic force is vital for natural resource management, for firefighter safety, and for harmonious interaction between people and their

environment. We also seek to advance knowledge and education and science and management capability. During this time, the IAWF has been involved in a large number of activities. We have conducted numerous conferences, supported other conferences, sponsored webinars, maintained an active website ([www.iawfonline.org](http://www.iawfonline.org)), and published a refereed scientific journal (International Journal of Wildland Fire) and a popular magazine (Wildfire). As we complete the first quarter of 2016 and look at what has been achieved so far this year, it is apparent that activities in global wildland fire are not slowing down, but intensifying at a steady pace.



IAWF Mission

So far in 2016, the 5th International Fire Behavior and Fuels Conference was completed in April, the 2016 IAWF Award recipients were selected and recognized, support was provided to the Eighth International Seminar of Fire and Explosion Hazards in the Peoples' Republic of China in April, and planning and partnership support were provided to the International Conference on Forest Fires and WUI Fires in Aix en Provence, France to be held in May 2016. Support and assistance continues to the Western Regional Strategy Committee for the National Cohesive Wildland Fire Management Strategy in the United States. IAWF has also been represented at and/or supported other conferences including the Wildland Urban Interface 2016 Conference and the Aerial Firefighting International 2016 Conference. The 5th International Fire Behavior and Fuels Conference just completed was a joint offering at two concurrent locations: Melbourne,



Australia, and Portland, OR, USA. This was a large-scale effort aimed at showcasing the latest information regarding the many issues associated with fuels, fire behavior, large wildfires, and the future of wildland fire management. In these areas, significant issues abound. New solutions are needed. Obvious targets like increased funding are short-term fixes, less likely to have success, where long-term commitments, strategies, and actions are necessary. Management of fuel complexes; accelerated fuel treatments; preparation of communities to withstand wildfire; incorporation of learning, experience, emerging science and technology; as well as sustainable funding for wildfire suppression and fuel treatments are vital for success. The combined-location conference was well attended, presented a remarkable amount of new and pertinent information, and was highly productive, as evidenced by the following information:

- Combined Attendance: **650**
- Workshops: **13**
- Special Sessions: **7**
- Plenary/Keynote Presentations: **9**
- Oral Presentations: **263**
- Panel Discussions: **3**
- Poster Presentations: **68**
- Lightning Information Sessions: **7**
- Campfire Sessions (discussion workshops): **4**
- World Café: **2**
- Exhibitors: **37**
- Field Trips: **4**
- Wellness/Yoga Opportunities: **6**
- After Hours/Social Networking: **8**

IAWF 2016 Award recipients were selected and recognition was provided at the Fire Behavior and Fuels Conference.



Kevin Tolhurst receiving the Ember Award from IAWF Vice- President Alen Slijepcevic in Melbourne, Australia.

Dr. Kevin Tolhurst, Associate Professor in Fire Ecology and Management in the Department of Forest and Ecosystem Science at the University of Melbourne, based in Creswick, Australia, received the IAWF 2016 Ember Award at Melbourne for his long and outstanding career as a fire scientist. In 2015, he was made a Member of the Order of Australia in recognition of his contribution to fire science and the community over a long period.

Kevin has developed and taught a number of fire related subjects at undergraduate and post-graduate level as well as a national Fire Behaviour Analyst course for technical specialists in the fire and land management agencies. His current research activities and interests include developing and applying a bushfire risk management decision support system, improving wildfire behaviour prediction, developing prescribed burning techniques and guidelines, and advancing landscape-scale fire ecology management. Kevin's unique approach and perspective have set him apart from others and made him able to produce excellent scientific research but also to allow him to use his knowledge to provide support to fire and land management agencies which has led to improved fire ecology and management outcomes across Australia.

James Brenner, Fire Management Administrator for the Florida Forest Service, based in Tallahassee, Florida, USA, received the first IAWF Excellence in Wildland Fire Management Award. This award was established to honor achievements, excellence, and lasting contributions in the management of wildland fire programs. Jim's nomination listed him as one of the smartest, most innovative, and visionary people in the wildland fire management business. He has worked diligently throughout his career to place the State of Florida in the national forefront. His accomplishments have served to improve prescribed fire, smoke management, training and education, fire behavior prediction, and risk assessment at the State level with significant national implications and benefits. Specifically, he has authored the Florida Prescribed Fire Act, conceived and authored Florida's Wildland Fire Risk Assessment system, developed a Certified Burner Program and Interagency Prescribed Fire Training Program, developed the Fire in Florida's Ecosystem program that has educated more than 7500 teachers, improved and taught fire behavior prediction training courses, and wrote the first Smoke Management Plan to be approved by the EPA.

Dr. Guillermo Rein, Senior Lecturer in Mechanical Engineering at the Imperial College, London, England, was the recipient of the IAWF 2016 Early Career Award. Dr. Rein was not able to attend either of the conference venues so will receive the award at a conference later this year. This award was established to recognize promising early-career professionals who have demonstrated outstanding ability in wildland fire during the initial stage of their career. Dr. Rein is a prominent fire behavior scientist, studying ignition, combustion



James Brenner receiving the Excellence in Management Award from IAWF President Tom Zimmerman in Portland, OR, USA.

emission, smoldering and interactions of fires and ecosystems. Significant contributions in his career have been made in the area of smoldering wildfires, where he has revolutionized the experimental and numerical description of these fires, translating science from engineering to applications such as fire history, emissions and climate change. His work has been published in over 67 journal papers, receiving more than 1700 citations. Among these, 17 journal papers and 6 keynote lectures have focused specifically on wildland fires.

Also, at both conference venues, special appreciation for service to IAWF was given to five individuals who recently completed their tenure on the Board of Directors. These individuals not only gave considerable time and effort to the Board, but also served on Committees, as Executive Officers, conference chairs, and planners, helping make IAWF activities successful. Individuals departing from the IAWF board are Alan Goodwin and Richard Thornton (Australia), Kris Johnson (Canada), and Gene Rogers and Ron Steffens (USA).

Two individuals who have been highly supportive of IAWF during their career received special recognition at the Portland venue. Many of our activities would not have been of as high of quality or even possible without the support in many ways provided by Tom Harbour and John Cissel.

Tom Harbour is a recognized expert in wildland fire and aviation management policy and operations. He recently retired from the US Forest Service after serving the longest term to date as the National Fire and Aviation Management Director (National Fire Chief) in the more than one hundred-year history of the agency. During this time, Tom elevated professionalism and increased performance in the US Forest Service, provided valuable global fire leadership, and was a strong supporter of IAWF conferences and activities.

John Cissel is the Program Manager of the Joint Fire Science Program at the National Interagency Fire Center in Boise, ID, USA. He will soon be retiring and his leadership has significantly strengthened the science component of wildland fire management. His efforts advanced communication between science and management, facilitated fire research, improved technology transfer, and markedly improved management applications and capability. He has been a strong supporter of IAWF and helped make many of our endeavors successful.

Throughout the remainder of 2016, continued conference planning will take place. Preparations for the 2nd International Smoke Symposium are well underway and this event will be held in November 2016, in Long Beach, CA, USA. Planning has been initiated for the 14th International Wildland Fire Safety Summit with an innovative approach proposing to combine this event with the International Congress on Prescribed Fires in Barcelona, Spain in 2017 (keep watch for updates on this event). It is likely that a Human Dimensions track will be incorporated into this conference also. Planning has also begun for a joint IAWF - Association for Fire Ecology sponsored Large Fire Continuum Conference as a follow-up to the 2014 Large Wildland Fires: Social, Political and Ecological Effects Conference, co-hosted by these associations. Look for this conference in 2018.

Excellence in wildland fire management is a goal that we strive for. Conferences such as these strongly support the advancement of knowledge and education and expansion of science and management. The IAWF remains committed to work and partner diligently with other wildland fire associations, organizations, and interested parties to provide leadership and communication, and to hone wildland fire knowledge, safety, and capability through our many existing and future activities.



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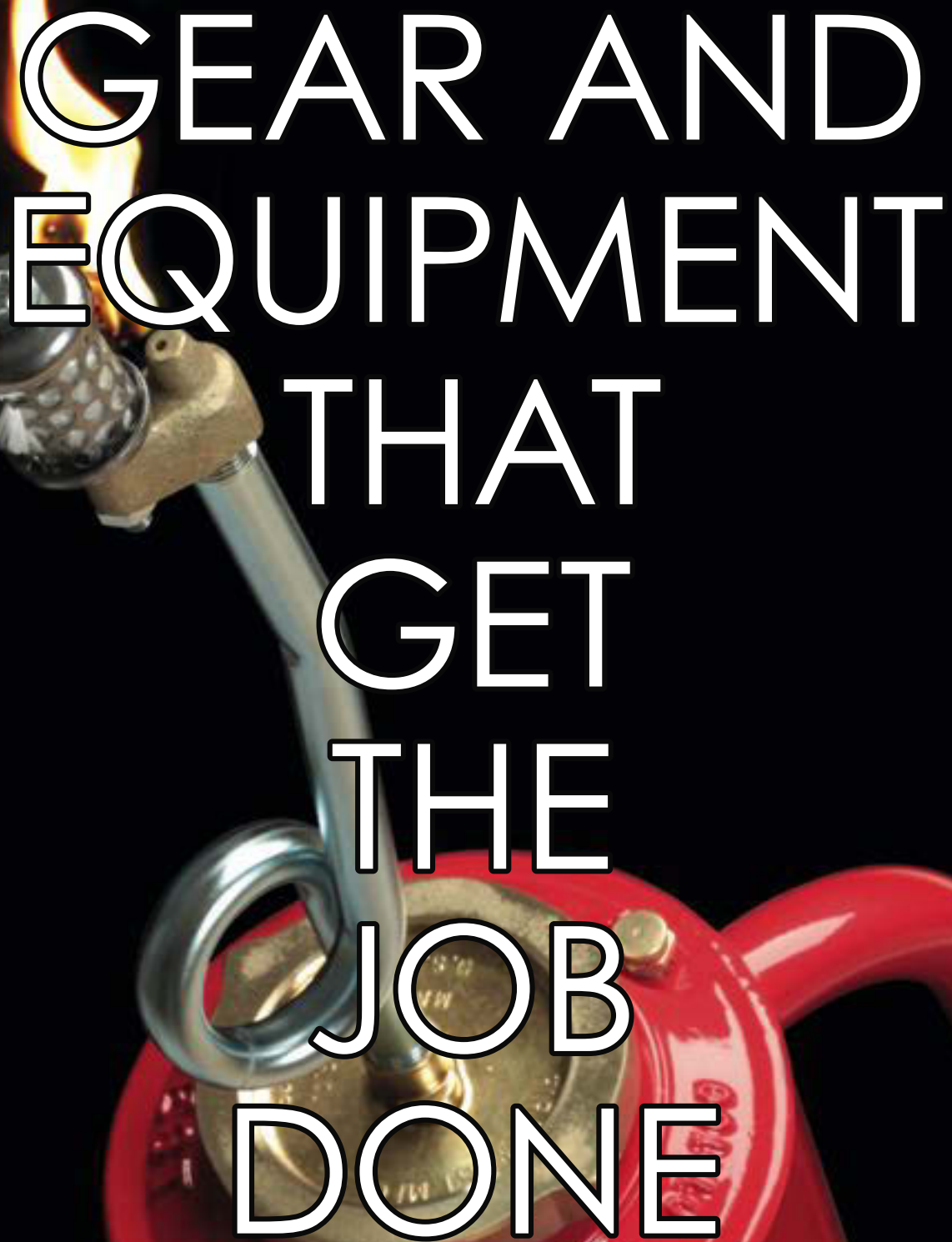
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# WHEN FIRE BURNS, ARE WE PREPARED?



**RON STEFFENS**

When you want to understand fire in Alberta, or understand fire, you can never go wrong by giving a call to Marty Alexander, former IAWF board member, author of key works on fire behavior, Canadian fire history, and firefighter safety, co-author of "Fire on Earth: An Introduction," and Alberta resident since 1981.

His home lies in the southern extent of the boreal forest. He thought he'd seen the biggest Alberta fire in 1998, when the Virginia Hills fire burned nearly 200,000 hectares, now surpassed by Fort McMurray at 229,000 hectares.

"To not have crown fires in black spruce would be unnatural," Marty said. "The only thing that's different this time," Marty said, "is that it hit a forested area and a community. It could potentially happen every summer. With more and more development, the likelihood is increasing."

He reminds us -- with every fire, whether "disaster" or "natural," there's much to learn. "Take the case of the Slave Lake fire -- a highly wind-driven fire situation, with 40 mph winds and spotting. In Fort McMurray, it was not nearly as severe winds. Low humidity and heat were factors."

A CBC meteorologist reminded his audience of the 30-30-30 rule of thumb for Canadian fire -- fires burn actively with 30 C temperature, 30% humidity, and 30 kph winds. "That's a good rule of thumb in the boreal, and it was certainly met in Fort McMurray."

But "certainly" and "certainty" aren't easy claims to make, and Alexander cautions against rushing to judgement until we know the facts. There will be an inquiry and likely major policy changes. For now, though, it's important to lay claim to what we know:

- That Fort McMurray, as tragic as its losses are, is not "the doomsday it's been portrayed. Ninety percent of Fort McMurray is intact. That's a far cry from what people think has happened."
- That a massive evacuation occurred safely. "What's remarkable to me," Marty observed, "is that you can get that many people out of town without incident. It's largely testament to the people who kept their head. There's one highway straight north, one straight south, and that's all there is. It can be done, but maybe next time [in the next fire-impacted community], it may not work."
- That the Canadian public has shown such support. "What's incredible is the way people are helping other people. The Canadian Red Cross is now up past \$50 million raised, a record for CRC history. A boy was selling lemonade to raise funds for the campaign and people were dropping \$100 bills into his can."

What we don't know yet? How can and will a community re-build, and how might we learn about the role of landscape-scale fire as "fireproofing" for the future? And there's the broader challenge, beyond Fort McMurray, of how to help citizens live with the uncertainty and risk of wildfires and communities. How to assume responsibility of our lives with fire when fire is such an essential component of many landscapes we call home? Will we re-build and re-shape our communities in FireSmart ways? Will we study this fire and fire in the landscape so we can come to terms with a phrase repeated often by Joe Stamm and quoted by Marty: "We don't have a fire problem, we have a people problem."

We are the problem and the solution. But during such a loss, there is no "people problem," only a common humanitarian challenge for all of us to face and offer our support.

Even before the Fort McMurray fire, this issue of *Wildfire* was focused on people and fire. The articles and commentary address the question, When fires burn, are we prepared? From training to commentary and policy, from art to shared stories, this issue offers a variety of answers that affirm that yes, as a fire species we are adapted to and prepared for fire. Yet are we prepared enough? Are we prepared to adapt to new conditions. Which is implied (though not explicitly enough) in #3 of the 10 Standard Firefighting Orders: "Base all actions on current and expected behavior of the fire."

If we learn nothing else from this issue's stories, it may be that these guidelines remain effective only if we take a moment to gather information, think and reflect. Which makes me wonder if we may wish to adapt another fire order -- "#2. Know what your fire is doing at all times." -- to also ask us to *Know what our fire challenge is doing, now and in the future.*

## WILDFIRE

A PUBLICATION OF THE  
International Association of Wildland Fire  
www.iawfonline.org

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The International Association of Wildland Fire is a 501(c)(3) nonprofit organization.

WILDFIRE, Volume 25, Issue 3 (ISSN: 1073-5658) is published by International Association of Wildland Fire, a 501(c)(3) nonprofit organization. The magazine supports IAWF's core mission -- "Uniting the global wildland fire community."

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# THE TRANSITION *Continues*

A couple of weeks ago, I ran into a Forest FMO that I know, who asked "So, are you going to tell us about how your first 90 days went?" I cannot say whether I succeeded because, in leadership, it is not our own perception that matters, but the perceptions of others.

In my last column, I described my transition plan as I jumped back into agency life as the leader of a fire and aviation management program after many years as a consultant. I wrote about my plan to accelerate my transition by giving myself just 90 days to reach the point where I was contributing more to the organization than I require of the organization to support my arrival. That, of course, required me to gather a lot of information, learn the details of my responsibilities and those of the people I lead, understand the challenges and opportunities our program faces, and generally gain situational awareness.

A couple of weeks ago, I ran into a Forest FMO that I know, who asked "So, are you going to tell us about how your first 90 days went?" While I had toyed with the idea, his question made me think that if this Wildfire reader was wondering, then maybe others were as well. Plus, I took it as a kind of challenge.

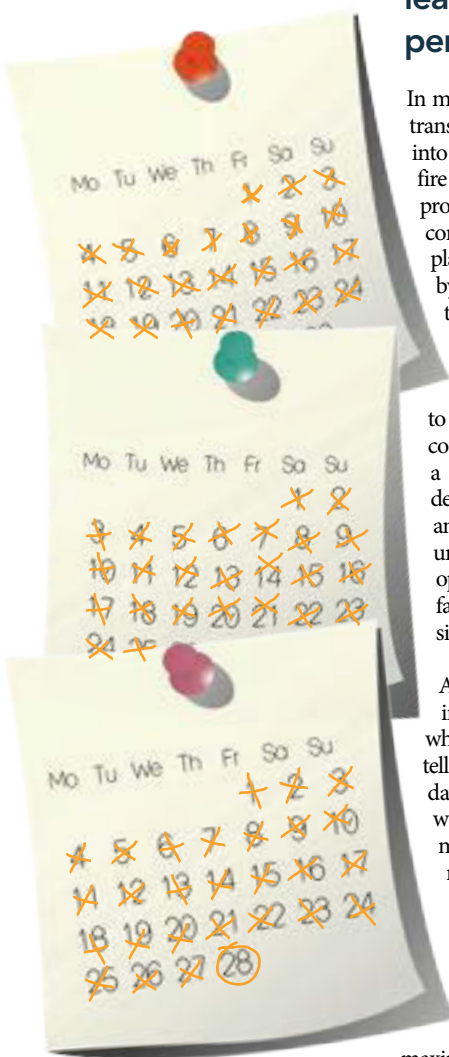
As I write, my 90th day has just passed. To the maximum extent possible, I focused on building credibility and earning the trust of both the people I am expected to lead and those who lead me. I worked at paying close attention; communicating clearly and effectively; adjusting for differences between myself and my co-workers; trying to keep calm and remain patient; and treating people with kindness, courtesy, dignity and respect. I cannot say whether

I succeeded because, in leadership, it is not our own perception that matters, but the perceptions of others. I do know that I tried, and continue to try to remain at my own personal, mindful best.

However, this transition experience reminded me that the more familiar I become with people and the more unguarded they become with me, the more mindful I must be. For example, I've started letting my sense of humor out a little bit, and I've found that some people clearly don't get what I find funny and I know I've hurt some feelings when I was really just kidding around, trying to break the ice. In addition, if not careful, I can routinely abrade people with my direct, assertive, and somewhat unvarnished communication. The challenge for me is that I know that some people appreciate my direct style (and have said so), while I'm pretty sure that others find me impolite. The trick remains to know which situation I'm in. Not that I didn't know, but I'm reminded that what one person finds refreshing, another may find incredibly boorish; and just as it does on the fireline, situational awareness represents the key to risk management in social settings as well.

I found one aspect of my transition experience particularly interesting. I've discovered that I find the need to stay on my toes -- to remain mindful, use a little emotional intelligence, and generally mind my behavior -- invigorating. Exhausting, but invigorating. It's not like I've been living in a cave but in my previous job, while I used all the same skills, I rarely spent more than two weeks around the same people without a break. Now, I know that I am going to see and work with the same people every day, for a long time; and that has made me keenly aware of my behavior and the consequences of that behavior. I actually find the vigilance this requires kind of cool; rarely do I find myself on auto-pilot at any time during the day. I go home wiped out, but I also go home feeling challenged; like I used to feel after I learned a new karate technique or improved my fly casting.

I also set out to ask a lot of questions. My intent was to gather information, learn the details of my responsibilities and those of the people I lead, understand the challenges and opportunities our program faces, and generally gain situational awareness. As always I also intended to ask questions to prompt people to think carefully, encourage them to tell me what's on their mind, promote dialog between us, and generally get people to engage with me. I am certain that I succeeded in asking lots of questions; in fact, I expect that some people in my organization find me exhausting. However, I know that asking lots of questions hastened my transition.





By asking people open-ended questions I assessed the capabilities, motivations and adaptability of the people I am expected to lead. I also gathered an enormous amount of information, maybe more than I can process; learned many of the details of my responsibilities and those of the people I lead; and gained an understanding of the challenges and opportunities our program faces. Whether people interpreted my motivations as I intended, only time will tell.

I hope that, by showing my willingness to listen and learn, I have demonstrated that I value and respect the people I work with and that I intend to foster confidence and trust in our relationships. I learned that, while interviewing everybody who works in your organization sounds good, and I still believe it is, this can prove a daunting task. In addition, I likely collected more data than I have time to process. Consequently, my advice to someone in my circumstance would be to get around to everyone, but make sure you prioritize.

I set out during my 90-day transition time to take advantage of my strengths without allowing my strengths to become weaknesses and annoyances for other people. My results-oriented nature, interest in effectiveness and continuous improvement, admiration of competence,

and personal drive have all served me well. However, I also realize that not everybody likes those traits or only likes them in small doses. Consequently, I rely on others to help me recognize and overcome my blind spots including tendencies toward impatience and insensitivity.

In closing, I can share one big lesson learned. I planned, for myself, a 90-day transition during which I would reach the point where I was contributing more to the organization than I required of the organization to support my arrival. While that sounded good in the abstract, reality intervened. Unanticipated meetings and travel; external influences; aspects of the job previously unknown; emerging issues and problems; human factors, both my own and of others; moving; getting settled -- all conspired to disrupt my plan.

Have I succeeded in my first 90 days? Mostly. I'm making some decisions, sharing ideas, branching out beyond the basics, and I'm getting some good feedback from people. However, I don't know all the people in the building, I have responsibilities for which I feel ill-prepared, and I've got a file cabinet sitting in the middle of my office and a bunch of boxes stuffed in the corner. In retrospect, I think an accelerated, 90-day transition represented a good goal, but a goal tempered by reality.



**MIKE DEGROSKY** is Chief of the Fire and Aviation Management Bureau for the Montana Department of Natural Resources and Conservation, Division of Forestry, and an adjunct instructor in leadership studies for Fort Hays State University. Follow Mike on Twitter @guidegroup or via LinkedIn.



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# AWARDS *and* CONFERENCE NEWS

The IAWF is pleased to announce the recipients of this year's Awards. For more details on these award winners, also see this issue's President's Letter.

## Posters Award at 5th International Fire Behavior and Fuels Conference

At the Portland location three students were presented awards for the best poster presentations. The presentations were judged on their quality as well as the knowledge, enthusiasm and engagement of the presenter during the poster session.

First Place was awarded to **Michael Vernon**, Humboldt State University for his poster presentation - Do Fuels Treatments Promote Drought Resistance in Lassen National Park?

Second place was awarded to **Harold Zald**, Oregon State University for his poster presentation - Understory Vegetation Changes with Different Seasons and Intervals of Prescribed Burning.

Third place was awarded to **Paul Hood**, University of Wyoming for this poster presentation - The Effect of Post-Mountain Pine Beetle Salvage Treatments on Fuel loads and Fuel Moisture in Colorado Lodgepole Pine Forest.

In Melbourne the Best Poster Award was presented to **Jon Boura, Amalie Tibbits, Michael Hansby, Damien Taylor, Alice Gower** from Terramatrix, Collingwood, VIC, Australia and **Damien Taylor, Kate McKenzie** and **Simon Thorning** from Mornington Peninsular Shire Council, Rosebud, VIC, Australia for their poster presentations - The Warringine Park Bushfire Case Study.

Congratulations to all of the recipients of the Best Poster Awards.

## Conference Updates

Thank you to those who attended the 5th International Fire Behavior and Fuels Conference in Portland, Oregon and Melbourne Australia. The conference were an overwhelming success with nearly 700 attendees in both locations. We would like to express our sincere gratitude to everyone who was involved in the planning of the conferences. Visit the conference webpage to view the video-taped Keynote and Panel Sessions. [www.firebehaviorandfuelsconference.com](http://www.firebehaviorandfuelsconference.com)





## Outstanding Student from S-590 Advanced Fire Behavior Interpretation

**Arthur Gonzales** was selected to receive the IAWF Membership Award from among the cadre of students attending S-590 Advanced Fire Behavior Interpretation at the National Advance Fire and Resource Institute in Tucson, Ariz., this March. The IAWF established the Membership Award to recognize the key role that advanced fire training courses offer in developing leaders and professionals in the field.

Gonzales, beginning his 22nd fire season, is the Fire Staff Officer for the Kaibab National Forest, Region 3, US Forest Service. He was selected by the cadre of instructors for the Membership Award based on his demonstrated leadership and support of colleagues during the challenging course.



## WHEN ASKED ABOUT HIS FIRE CAREER, GONZALES WROTE THIS:

My career in Fire Management stems from a long history of enjoying the outdoors and all that it has to offer. My childhood memories of hunting, fishing, and camping trips created a passion that I carry forward today as I now take my family on similar trips. Throughout my career, I have been fortunate to have developed an understanding of how fire has shaped landscapes and how it has been critical in developing and providing the opportunities I so greatly enjoy. With this understanding of the role of fire in ecosystems, I have dedicated myself to a career in Fire Management, with a particular focus in using fire to maintain and enhance landscapes so that everyone can experience all the opportunities that our public lands have to offer, both now and in the future. I look forward to continuing my role in leading the interdisciplinary approach the Kaibab and our partners have developed in order to continue to be a leader in the use of both wildfire and prescribed fire.

## WHAT DID YOU USE TO PROTECT YOUR FACE & LUNGS ON YOUR LAST WILDFIRE?

*Was your last mask a squishy "beanbag"?  
Ready to step up to professional wildland  
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# Bushfire 2016

## TO CONNECT 'SCIENCE, PEOPLE & PRACTICE'



**Bushfire 2016: Connecting Science, People and Practice** is a conference a decade in the making that promises to engage, inform and inspire by connecting fire scientists and ecologists with on-ground fire operators, fire managers and other fire professionals. Hosted and coordinated by the South East Queensland Fire and Biodiversity Consortium (SEQ Fire and Biodiversity Consortium), this Australian-wide conference will be held from the **28th to the 30th of September, 2016**, at the **University of Queensland, Brisbane**.

With a focus on applied fire ecology, fire management research, Traditional Owner fire projects and collaborative fire programs, **Bushfire 2016** aims to showcase successful partnerships that translate science into practice for beneficial onground fire management and environmental outcomes, while supporting land owners, land managers and scientists. **Bushfire 2016** is a chance to engage and network with Australia's best fire scientists and onground managers – an opportunity to learn something new about fire and build invaluable partnerships.

### KEYNOTE SPEAKERS & THE PROGRAM

The **Bushfire 2016** Organizing Committee is thrilled to announce the following internationally recognized keynote speakers:

- **Professor Ross Bradstock**, Director - Centre for Environmental Risk Management of Bushfires, University of Wollongong;
- **Dr Neil Burrows**, Senior Principal Research Scientist - Department of Parks and Wildlife, Western Australia; and
- **Associate Professor Alan York**, Head - Fire & Biodiversity Research Program, University of Melbourne.

The program will include two concurrent sessions running all day Wednesday and Thursday. Keynote speakers will be featured in the morning and after lunch. As much as

possible, time will be allowed for questions and discussion, after presentations or at the end of a themed session. Wednesday evening includes a catered poster session, Thursday evening an (affordable) informal dinner, and a field trip on Friday. A permanent poster display will be assembled in the main break out space, along with displays for sponsors and stallholders. Further information on the program, themes and social activities will be provided soon.

Session themes that are proposed for inclusion include:

- fire, flora and fungi;
- fire and fauna (including vertebrate pests);
- Indigenous and Traditional Owner fire projects;
- fire management for linear corridors (i.e. power infrastructure lines, rail, road);
- climate change, soils and fire;
- fire and land management;
- collaborative fire projects (i.e. successful stakeholder and community engagement); and
- fire, risk and biodiversity.

As the oldest collaborative organisation of its kind in Australia, the SEQ Fire and Biodiversity Consortium has an extensive network of sponsors, contributors and supporters, both in SEQ and interstate. This includes over 760 people on our e-news list, over 40 members in our Research Working Group and regular over-subscription to our very successful biannual forum series (i.e. one-day mini conference). The consortium has extensive experience and expertise in organising such events and are excited about the calibre of speakers and supporting organisations involved in Bushfire 2016, which are expected to attract delegates from across Queensland and the nation.

**Registrations and the Call for Abstracts are now open**, key diary dates include:

**MAY 6** (Abstract call closes) and **JULY 29** (Early bird registration closes).

Places are limited and given the very reasonable registration costs (Early bird standard registration is \$390) and the extensive interest we have had to date, we encourage you to register now and join our mailing list to ensure you receive updates and alerts.

For more information visit: [www.bushfire2016.org](http://www.bushfire2016.org)



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# All FIRE is L

Local and state fire responders manage more than 330,000 grass, brush and forest fires each year in the United States. Photo: Texas Fire Service.

By Michele Steinberg

Many more wildfire incidents – brush, grass and forest fires – are reported throughout the U.S. than ever make it to a newspaper headline or video footage on a Twitter feed. The casual media consumer would never realize that the nation's local fire service – some 30,000 departments strong – responds to wildfires on the order of 900 per day in an average year (source: *Brush, Grass and Forest Fires, NFPA, 2013*).

With nearly a quarter of annual calls involving a brush, grass or forest fire, the local fire service keeps very busy with wildfire response. However, more than half of local fire departments say that their personnel are not all trained to cope with the special challenges of wildland and WUI fires, and many struggle with acquiring and maintaining specialized equipment for wildfire response (source: *Third Needs Assessment of the U.S. Fire Service, NFPA, 2011*.) While large fires with massive deployments of federal agency firefighting resources capture media attention, these are only a small fraction of the wildfire incidents to which

the fire service must respond. For example, NIFC's report on the 2014 wildland fire season revealed that hotshot crews responded to 112 incidents, out of a total of 63,000 fires that year (source: National Interagency Fire Center, 2015).

A recent study by the National Fire Protection Association (NFPA) sought to learn more about the experience of local fire departments, who are typically the initial responders to an average of more than 330,000 brush, grass or forest fires each year (source: *Brush, Grass and Forest Fires, NFPA, 2013*). The report, *Wildland/Urban Interface: Fire Department Wildfire Preparedness and Readiness Capabilities* (NFPA, 2015), covers the first phase of a series of extensive interviews with 46 fire chiefs and senior line officers whose departments count wildfire response among their responsibilities.

NFPA, a global non-profit devoted to eliminating death, injury, property and economic loss due to fire, electrical and related





# LOCAL ARE WE READY?

**WILDFIRES ARE LOCAL FIRES – some 900 a day. A study by the National Fire Protection Association (NFPA) details the challenges and successes of municipal and rural fire departments in wildland firefighting and community risk reduction.**

hazards, supports the development, adoption, and enforcement of codes and standards, including those related to firefighting and firefighter safety. Its Fire Analysis & Research Division supports the fire community by providing reports and statistics on the loss of life and property from fires. The division produces dozens of reports each year on the overall fire problem, firefighter fatalities and injuries in the United States, major fire causes, fire protection systems, and more.

## **What we know – Needs Assessment of the Fire Service**

At the request of Congress, NFPA partnered with the U.S. Fire Administration and its parent agencies to develop the first Needs Assessment of the Fire Service in 2001, published in 2002. This report and its follow-up surveys in 2005, 2010 and 2015 looked at:

- personnel and their capabilities, including staffing, training, certification, and wellness/fitness;
- facilities and apparatus;
- personal protective equipment;
- fire prevention and code enforcement;
- the ability to handle unusually challenging incidents; and
- communications and new technologies.

The intent is to identify the needs of the fire service for resources required to safely and effectively carry out their responsibilities. The surveys indicated the resources fire departments possessed, while NFPA codes and standards and other national guidance documents defined the requirements. The gaps between resources in hand and resources required defined the needs. (See <http://www.nfpa.org/research/reports-and-statistics/the-fire-service/administration/needs-assessment> for more and for copies of the reports.)

From this series of Needs Assessment reports, NFPA was beginning to learn about the special challenges of local fire departments that respond to wildland fire. From its start in 2001, this survey included a few questions about wildland fire. Discovering that fully three-quarters of departments that said they responded to wildfire but lacked adequate training for all personnel was eye-opening. While that proportion has dropped to 52% in the latest survey (2015), additional NFPA research told the story of the significance of local fire department response to wildfires.

Using data from the National Fire Incident Reporting System (NFIRS), the world's largest, national, annual database of fire incident information, NFPA analysts studied incident reports from brush, grass and forest fires – the three incident types the system uses to describe what many would term “wildfire.” The results were jarring. Nearly one in four fires reported to a local fire department in a typical year (from 2007-2011) fell into this category. While the majority (76%) of these fires stayed small, burning less than an acre, the sheer number of incidents provides a very different picture of the impact on local fire departments.

NFPA's analysis also showed that local response to wildfires skewed heavily away from Western states, which was later reinforced by US Forest Service studies of NFIRS data showing that 70% of wildfires happen outside the western US. (Source: Short, Karen C. 2015. Spatial wildfire occurrence data for the United States, 1992-2013 <http://dx.doi.org/10.2737/RDS-2013-0009.3>). When one considers that federal lands are largely in the West and that fires on those lands are first responded to by federal agencies, this analysis makes sense. These glimpses into the size and distribution of the wildfire problem and the needs of municipal and rural fire departments prompted NFPA to conduct a qualitative study of U.S. fire departments coping with wildfire response.



The purpose of NFPA's WUI Fire Department Study was to identify the most important elements in a local wildland fire protection program, including both response and community risk reduction. The study also sought to describe how fire departments overcome barriers and adapt to risk given the resources available to them. Hylton Haynes of NFPA's Fire Analysis & Research Division led the effort, with collaboration and support from the IAFC Wildland Fire Committee, Sarah McCaffrey of the USFS Northern Research Station, Angela Garcia at Bentley University, and Rachel Madsen at Brandeis University.

The choice to take a qualitative approach to this study was deliberate. Given how little was known about local fire department experience in the wildland fire arena, a questionnaire approach was unlikely to capture the diversity and nuances of the challenges and approaches of the local fire service to the wildfire threat. An open-ended interview process was seen as more likely to yield rich results and a better understanding of the variety of needs of experienced fire service leaders coping with wildland fire.

The survey group included 46 fire chiefs or senior line officers, spread throughout the U.S., whose jurisdictions had experienced a wildland fire within the past one to five years. Twenty-six of the survey subjects were from rural jurisdictions (defined by NFPA 1142 as fewer than 500 people per square mile), with the other 20 from urban jurisdictions. The methodology included a 19-question pre-survey questionnaire with close-ended questions to provide a framework with some quantitative information. The survey itself consisted of one-hour recorded interviews accomplished either in person or on the phone. The interviews produced more than 1,150 pages of audio transcription over the more than 46 hours of recording. From this substantial and rich material, NFPA produced its "phase 1" report, *Wildland/Urban Interface: Fire Department Wildfire Preparedness and Readiness Capabilities in 2015*. This report used the findings gleaned from 25 of the 46 interviews.

Key findings of the study demonstrated the pragmatism of fire departments with responsibilities for both wildland and structural fire, as well as the challenges for departments in terms of training, communication and fitness levels.

- A number of departments made thoughtful choices about apparatus that could be used for a variety of purposes (for

example, the Type 3 'hybrid' engine), and about strategic dispatching to maximize the effectiveness of available resources.

- When communicating with the public, all departments reported to use traditional methods. Departments differed in their use of social media; this may be a missed opportunity for some.
- Nearly all of the interviewees spoke to the positive effect that community risk reduction efforts can have on mitigating the risks of major wildfire events and preventing the loss of homes and property should a fire occur.

Several problems regarding Wildland and WUI Fire training were identified, including:

- The need to transition from traditional training practices which emphasized structural fire training.
  - Inconsistent adoption of Wildland/WUI fire training, with local and regional variations in the level and adequacy of training.
  - Firefighter fitness levels that may not always be adequate for the rigors of Wildland/WUI fire events.




## What do we need to do next?

These common themes help direct NFPA and others who work with the fire service on future research and potential programs or services that may help address needs and gaps. However, across these diverse jurisdictions, there was also a diversity in experience, particularly with the issue of working with residents on wildfire risk reduction.

In general, interviewees considered increased awareness and acceptance of fire risk in residential areas to be one of the first necessary steps in community risk reduction. While most reported that they believe residents in their local wildland/urban interface communities are aware of the fire risk in the area, they tended to be less confident that residents were knowledgeable or proactive about preventing and mitigating fire around their properties.

In approaching how to work with communities, some fire departments found significant cultural barriers to mitigation efforts. Many surveyed were eager for their department to partner with homeowners to help manage vegetation in residential areas, but some were encountering resistance by residents in the form of distrust of government, and a general lack of understanding of the importance of wildfire mitigation



A briefing for a training burn at the 2016 Texas Fire Service Wildfire Academy. What we need to know about wildfire preparedness includes who we need to train and how well we meet our training and community preparedness goals. Photo: Texas Fire Service.

practices. In other areas, the more that agencies do to conduct mitigation work, the more they find that residents become reliant on them to provide fire prevention and mitigation services rather than take action on their own.

Cultural barriers in implementing community risk reduction and mitigation efforts are evident among fire department staff as well as among property owners. Interviews revealed the observation that the culture of the fire department itself can have a negative impact on the staff's engagement with the community and their enthusiasm in carrying out fuel reduction and vegetation management projects.

Many interviewees felt that the overall culture needed to change to view community risk reduction as a cooperative effort rather than placing the responsibility solely on the department or on the homeowners.

While funding restraints and pushback against regulation appear to limit the capacity of local fire departments in implementing community risk reduction, the majority of interviewees found that the publicly available range of programs – from the Ready, Set Go! template for fire departments to Firewise to Fire Adapted Communities – were all valuable tools that assisted the efforts in engaging local residents. In spite of any cultural resistance internal to fire departments, the captains and chiefs interviewed place great value on both homeowner and fire department staff involvement in mitigation activities.

Finally, while not every fire department embraced collaborative approaches to wildland fire risk management, the ones who put

high value on relationship-building were proud to share their accomplishments. They embrace collaboration and networks such as the Fire Adapted Communities (FAC) Learning Network, and the ability to participate in wildfire-themed conferences and forums. Through these venues, they have been able to share lessons learned, identify best practices, and address common challenges.

NFPA will be developing its Phase 2 report based on the remaining 21 fire officer interviews, to be published August 2016. Building upon the first report, analysts will further identify lessons learned and the currently observed “best practices”, and continue to identify motivators and barriers to change. NFPA staff wish to further explore the question of how fire departments prioritize when making changes to improve their wildfire response and mitigation capacity. The second phase of the study will also allow for further exploration of the differences from small to large jurisdictions, across rural and urban areas, and among paid, volunteer and combination departments.

While the second phase of the report is pending, NFPA has already used the initial findings to inform the development of its fourth Needs Assessment survey, completed earlier this year, and is providing the Fire Protection Research Foundation and wildfire-affiliated NFPA Technical Committees with information to help shape future research and inform the codes and standards development process. Visit <http://www.nfpa.org/research/reports-and-statistics> and choose “Outdoor Fires” to read or download the full report as well as the NFIRS analysis, Brush, Grass and Forest Fires.



**MICHELE STEINBERG** has served as manager of NFPA's wildland fire operations since 2014. Prior to that position, she led the Firewise Communities/USA® Recognition Program, which includes more than 1,200 communities across the U.S., and encourages local solutions for safety by involving homeowners in taking individual responsibility for preparing their homes from the risk of wildfire.

WE SHARE OUR CONCERN FOR THE RESIDENTS, FIRE MANAGERS, AND RECOVERY MANAGERS WHO WORK AND LIVE IN THE AREAS IMPACTED BY THE FORT MCMURRAY FIRE IN ALBERTA, CANADA. AND WE ASK, WHAT CAN WE DO TO PREVENT THE NEXT FIRE DISASTER.

# after FORT MCMURRAY

Fire and evacuees near Highway 63 in south Fort McMurray (Alberta). Photo: DarrenRD, CC BY-SA 4.0, <https://commons.wikimedia.org/w/index.php?curid=48561288>

by Robert Gray,  
Leda Kobziar,  
and Ron Steffens

## IAWF AND OTHER FIRE ORGANIZATIONS OFFER SUPPORT FOR ALBERTA

The International Association of Wildland Fire joins with fire organizations around the world to offer our support for the residents, fire managers, and recovery managers who live and work in the areas impacted by the Fort McMurray fires in Alberta, Canada. We suggest you join us in our support. We're offering donations to the Alberta Fires Emergency Appeal by the Canadian Red Cross

(<https://donate.redcross.ca/ea-action/action?ea.client.id=1951&ea.campaign.d=50639>).

The crown fires burn, the pyrocumulus rise from a landscape unfamiliar and far from most of us, but already the Fort McMurray wildfire is infamous. With an estimated 90,000 residents of Ft. McMurray evacuated, over 2400 structures burned, and an initial insured loss estimate of over \$9 billion, the 229,000 hectare (880+ square mile) Fort McMurray fire tells us what local residents and fire responders and fire managers know only too well and tragically – that dry and damaged forests will burn, and with a speed, intensity, and severity beyond what we may be able to imagine.

This is what we know, now. An estimated 10 percent of Fort McMurray has burned. Yet current assessments show that 85 percent of the city remains intact, and an amazing communal effort resulted in a safe evacuation, with no major injuries or deaths reported. For this, we honor the many responders who've served so many and in so many roles, and we offer our support for evacuees, residents, emergency recovery experts and leaders



for what will be a long and challenging recovery.

In the months and years ahead, the focus in Fort McMurray will be recovery. There will also be the soul-searching of how and why this happened, with the primary goal of learning how we may prevent this from occurring again. There will be challenging questions and a choice of potential "wicked problem" solutions, not any of which will be perfect or certain of success.

Until the fire is contained and the housing recovery launched, some will say it is too soon to seek solutions. We find it hard, though, not to face these fire questions when they've taken on such urgency. Anyone in our profession who's followed this fire will ask themselves, would I be prepared for an incident of this magnitude and speed? Would our prior planning, policies, and experience allow us to succeed? And how can we prepare? So we begin to ask these sorts of questions and offer observations -- not to begin a formal inquiry or to suggest any specific policies -- but to start building a frame for this lengthy and essential discussion, a frame that seeks solutions based in best-practices, the insights of science, and the reality of our landscapes and communities, and one above all that refuses to blame or second-guess. Consider these questions and comments as a few steps, adding to the many we've taken already, toward a new way of living with the forests we value and the fuels they can become.

What do we need to know, to prepare for and prevent the next fire disaster? Initially, we wonder how and why the climate and weather, the fire regime and fuels of the boreal forest convened at this time and place, and how an analysis of this pattern can prepare us for the next occurrence. Why did some houses burn and some didn't? And when a disaster does occur, how do emergency responders and citizen-responders support (or confuse) one another? Which communications processes worked, which didn't? Which communities are most affected by the fire? And which methods of assistance work best for which community? How does one rebuild and economy compared with how one rebuilds a neighborhood and a culture? These and more questions will await the essential process of deliberate and focused inquiry, when lessons learned can become lessons applied.

Before Fort McMurray, we have been exploring these questions. For now, we focus on forests, fuels, and policy.

Sadly, the tragic reality suffered in Fort McMurray has been forecast – wildfire and forest scientists and managers have identified the issues and proposed management actions, including those detailed in a 2015 position paper published

by the Association for Fire Ecology, International Association of Wildland Fire, and The Nature Conservancy titled: "Reduce Wildfire Risks or We'll Pay More for Fire Disasters" (<http://fireecology.org/Reduce-Wildfire-Risks-or-Well-Pay-More-for-Fire-Disasters>).

These calls for action have not yet taken root -- and perhaps the severity of losses in Fort McMurray (and from other towns and forests lost in recent years, from the US to Australia and beyond) may propel the change which often asks for courageous leadership at all levels, not just along the fire line. For instance, a review of policy in Canada, after Fort McMurray's fires are contained and recovery has begun, may build on examples where fuels and forests have been managed to also manage fire. Across Canada, forest concession models have at times and in some places hampered efforts to address landscape-scale fire hazard. In many landscapes in Canada, provinces manage public

forested lands under a forest license system whereby forest companies have access to either large tracts of land or large volumes of biomass for years, even decades. The focus of these lands is timber production, regardless of wildfire hazard, and therein lies the challenge -- where communities and forests come together.

Following the 2003 fire season in British Columbia for example, which resulted in three lives lost, 350 homes and businesses destroyed, and upwards of \$1 billion dollars in total fire cost (suppression plus indirect and additional costs accrued over time), recommendations were made for significant changes to the forest

management paradigm in order to address the large-scale hazardous fuels issues facing the Province. Unfortunately, little headway has been made in addressing what the Province calculated to be a 1.7 million ha problem (even prior to the major mountain pine beetle epidemic, which added over 20 million ha more of dead forests). However, there were no changes made to existing forest management policy, which means that the over-arching objective, even in the wildland-urban interface, is the maximization of timber volume regardless of fire hazard.

Federal lands in the US are managed under a different model – one in which the agency directly manages the land for multiple uses, and resources and timber companies have time-limited, smaller-scale, and intermittent contracts to extract timber volume or otherwise manage forest lands. Unfortunately, the federal agencies have not been able to move as aggressively on landscape-scale fire hazards as they would like, in part due to public opposition. Aversion to higher-cost fuel reduction interventions involving mechanical means (feller-bunchers, yarders, skidders, mastication equipment, etc.) is coupled with

All fires are local  
yet the effects of  
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public aversion to the smoke produced by less-expensive, yet effective, prescribed burning. Achieving fuel treatments at the scale of need has so far been limited by lack of economic, workforce, or leadership investment; this does not, however, mean that the scale of need cannot be achieved under a new management paradigm.

The road to change, however, is muddy: multiple court injunctions have greatly slowed the planning and implementation process, resulting in so much frustration that a number of western state legislatures are threatening to place federal land management under state control. The suggestion is that states could serve as better stewards of the resources, and would act faster to address wildfire hazards — a suggestion that, even if true, exposes even more contentious questions about US citizens' ownership of federal lands. Similar fuel- and fire-management logjams exist in Australia and elsewhere — between land managers and neighbors, environmentalists and loggers, policy makers and the public — raising the perennial question: How can we walk a common ground to effectively manage fuels and wildfires within the context of human populations and the conservation of natural resources?

Although some may see the forest industry and the traditional agricultural forestry model as part of the problem, a healthy and robust forest products industry is a key solution for making the management of hazardous fuels economically viable. What is needed is a recognition that forest management which promotes the long-term maximization of timber volume via high-density, hazardous stand conditions across the landscape is not the best model for forest and community fire resilience. Importantly, given the risk of destructive wildfire, it is unlikely to be the best economic option for the forest industry, either.

Before a complete investigation, it's too early to assume that any of these potential solutions might have mitigated the fire's impacts in Fort McMurray, and conjecture after the fact can be more painful than productive. But as we observe the fire's impacts, we can find parallels in landscapes found throughout communities in the boreal forests of northern BC, Alberta, Saskatchewan, etc. which are situated in predominantly high severity fire landscapes. These stands are managed by timber companies to promote maximum volume over the long-term, meaning no fuels reduction treatments are employed as they would result in some timber volume losses.

However, where ecologically appropriate, managers do have the option of converting large tracts of forest to deciduous forests of trembling aspen. Moderate to high density stands of healthy aspen, when greened-up, have lower flammability, earning these forests the nickname "asbestos forest." They could play a role in reducing fire behavior over the landscape, making suppression operations more effective and perhaps even safer. Prior to leaf-out in the spring and in the fall, prescribed burning conditions are often favorable in these forests. This was when First Nations people, who have inhabited the northern boreal for 12,000 years, burned these forests for promotion of forest products, wildlife habitat, and perhaps even catastrophic wildfire risk reduction. These fires were low to moderate intensity surface fires, not high-intensity crown fires, which are the more typical fire that may occur in of the industry-preferred, conifer-dominated forests of white and black spruce and jack pine. The scope of the problem requires we consider creative solutions, not only focused on fuels reduction but using our knowledge of how different forests burn for the greatest overall resilience across the landscape.

Just as we need new initiatives to create a healthy forest economy, we also need healthy and robust communities, invested in community fire management and supported with cohesive planning and reliable implementation budgets. This is where we must find common ground, since these communities are likely to need lower-commercial-value forests in the interface — more of the "asbestos" aspen, less of the flammable high-density conditions.

It is hard to speak of future necessities when what's needed now is continued vigilance by Alberta fire managers and citizens until the rains return. And what is needed now, more than ever, is our support — for the fortitude among the many who've lost so much and whose livelihoods have been irreversibly changed. So as we watch and wait for adequate rain, so many kilometers away, we wish for a safe resolution and re-construction for the evacuees. But we should also commit ourselves to the actions that we can take this summer, and next year, and the next: to learn from this tragedy so we may prepare for and prevent the next.

All fires are local yet the effects of the large and severe ones are increasingly universal. The Fort McMurray fires are our fires. We should own the solutions as much as we own and all share the greater impacts.

**ROBERT GRAY** is a fire ecologist based in Chilliwack, B.C. **LEDA KOBZIAR** is president of the Association for Fire Ecology and a professor at the University of Idaho. **RON STEFFENS** is managing editor of Wildfire Magazine and a professor of communications at Green Mountain College.



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# WILDFIRE ISSUES: FUNDING FIRE SCIENCE

**A letter to the U.S. Senate Committee on Appropriations--Interior, Environment, and Related Agencies Subcommittee supports the continued funding of wildfire science.**

*(Editor's note: We begin a new section in Wildfire Magazine -- "Wildfire Issues" -- to offer insights, opinions, and key documents to help us understand and engage in the issues that define our profession. And what could be more key to managing fire than understanding it. Yet a proposal now being considered in Congress would cut funding for US wildfire science and research. In response, leaders and leading organizations from the professional wildfire community prepared this testimony to the U.S. Senate and House of Representatives. Look for updates on the outcome of this funding question in future issues. - RS.)*

**From:** Association for Fire Ecology, International Association of Wildland Fire, Tall Timbers Research Station and Land Conservancy, The Nature Conservancy  
**To:** U.S. Senate Committee on Appropriations--Interior, Environment, and Related Agencies Subcommittee  
**RE:** USDA-Forest Service funding of the Joint Fire Science Program in FY17 Appropriations  
**Date:** April 15, 2016

## **JOINT FIRE SCIENCE PROGRAM FUNDING IS VITAL FOR MANAGING WILDFIRES SAFELY AND COST-EFFECTIVELY.**

The undersigned leading professional wildland fire organizations in the nation and the world are seriously concerned with the proposed cut and a new funding process for the USDA Forest Service's (USFS) Joint Fire Science Program (JFSP). The clear current wildfire trend is more acres burned, higher severity, and on more days each year, raising our challenge to apply resources in a wise, science-based manner. **We respectfully request that the USFS JFSP be funded at \$7 million through the Wildland Fire Management budget. We additionally request that the Department of the Interior Joint Fire Science program be funded at \$6 million.**

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The undersigned leading professional wildland fire organizations in the nation and the world are seriously concerned with the proposed cut and a new funding process for the USDA Forest Service's (USFS) Joint Fire Science Program (JFSP). The clear current wildfire trend is more acres burned, higher severity, and on more days each year, raising our challenge to apply resources in a wise, science-based manner. **We respectfully request that the USFS JFSP be funded at \$7 million through the Wildland Fire Management budget. We additionally request that the Department of the Interior Joint Fire Science program be funded at \$6 million.**

The USFS JFSP has a relatively small budget for a program that successfully yields important results which are directly and widely applied across a broad geographic landscape. These

tools and technology products support the fire risk reduction community that help track the effectiveness of Forest Service programs, such as vegetation management and hazardous fuels reduction. Their applied research supports resilient landscapes and communities, and provides key information on wildfire mitigation impacts on water quality, atmospheric emissions, and other natural resources and ecosystem services. We are concerned about the zeroing out of this program under Wildland Fire Management in exchange for funding a smaller portion from the already-constrained Forest & Rangeland Research budget. Restoring the USFS funding mechanism under Wildland Fire Management and ensuring an appropriated level of \$7 million would help to address the urgent need to maintain and further important research.

## **MAINTAINING RESEARCH**

The JFSP is a research program that builds on a 15+ year commitment to focusing research questions on the needs and objectives of fire managers. As such, JFSP serves as an independent and vital research arm of the broader efforts to safely and efficiently manage wildland fire on all ownerships. Additionally, JFSP:

- Generates priorities based on the expressed needs of managers and local land units, maximizing their relevance and effectiveness in improving fire management. This need-driven priority focus frees it from alternative priorities and mandates of any individual agency and ensures funded research is directly applicable to managers.
- Draws its strength and relevance from being truly collaborative and interdisciplinary - by engaging federal and

university scientists, land/resource managers and multiple stakeholders in advancing the field of fire science. This is vital for a profession in which fire knows no bureaucratic boundaries.

- Serves as an international forum for information and technology exchange particularly important in the face of global climate change.

### MORE RESEARCH, NOT LESS

Wildland fire management requires a significant investment from federal agencies, in particular the USFS. Currently, JFSP is only one percent of the total Wildland Fire Management budget. For an agency with approximately half of its budget focused on wildland fire management, it makes fiscal sense to invest in a research program like the JFSP in order to understand the science of fire management, fire prevention, and landscape-scale climate impacts.

With continued and even expanded funds for cutting-edge research, we could expect to pioneer safer and less costly methods to manage fires on public lands, thus earning long-term cost savings.

### CURRENT POLICY SUPPORTS RESEARCH

The Federal Wildland Fire Management Policy states as two of the guiding principles:

- “Fire management plans and activities are based upon the best available science.”
- “Knowledge and experience are developed among all wildland fire management agencies. An active fire research program combined with interagency collaboration provides the means to make this available to all fire managers.”

The National Cohesive Wildland Fire Management Strategy states as one of the guiding principles and core values:

- “Fire management decisions are based on the best available science, knowledge, and experience, and used to evaluate risk versus gain.”

Fully funding JFSP is one of the few ways to achieve these goals and sustain scientific and technological innovations that are critical for the vitality of wildland fire management and for expansion of knowledge and skill

We urge you continue to fund the USFS JFSP at \$7 million under the Wildland Fire Management budget and additionally the DOI JFSP at \$6 million. These levels and funding structures would emphasize Congress’ commitment to the continued development of research tools that have greatly improved our success in managing wildland fire in the past and which are needed even more so in the future.

#### Dr. Leda Kobziar

President, Association for Fire Ecology

#### Tom Zimmerman

President, International Association of Wildland Fire

#### Dr. William Palmer

President/CEO, Tall Timbers Research Station and Land Conservancy

**Cecilia Clavet**, Senior Policy Advisor on Fire and Forest Restoration, The Nature Conservancy

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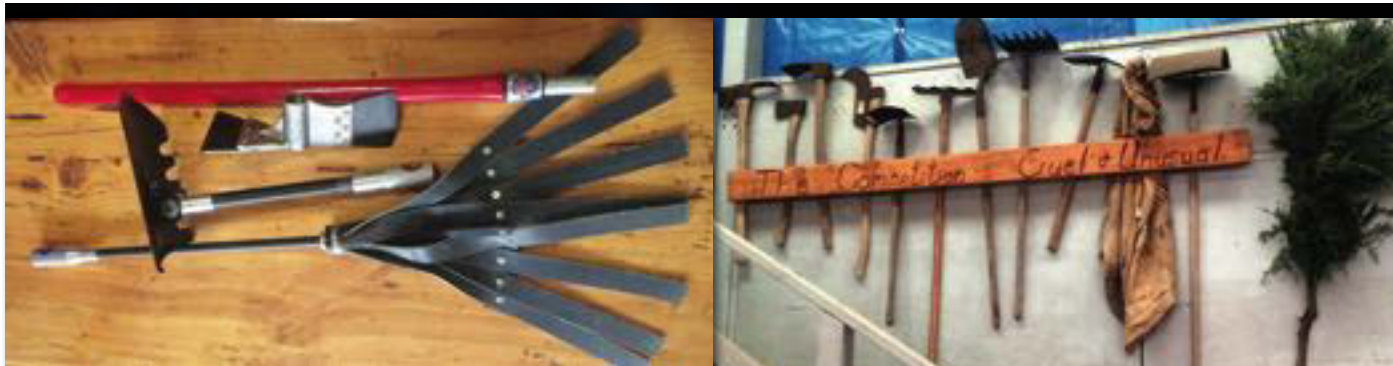
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# MONTE DOLACK: THE MAKING OF FIRE ART



Monte Dolack working on his painting. Photo: Naomi Fox.

Monte Dolack has been painting from a base in Missoula, Montana since 1974, when he opened his first studio. So it's only natural that over the years he'd partner up with another Montana (and global) institution, the International Association of Wildland Fire.

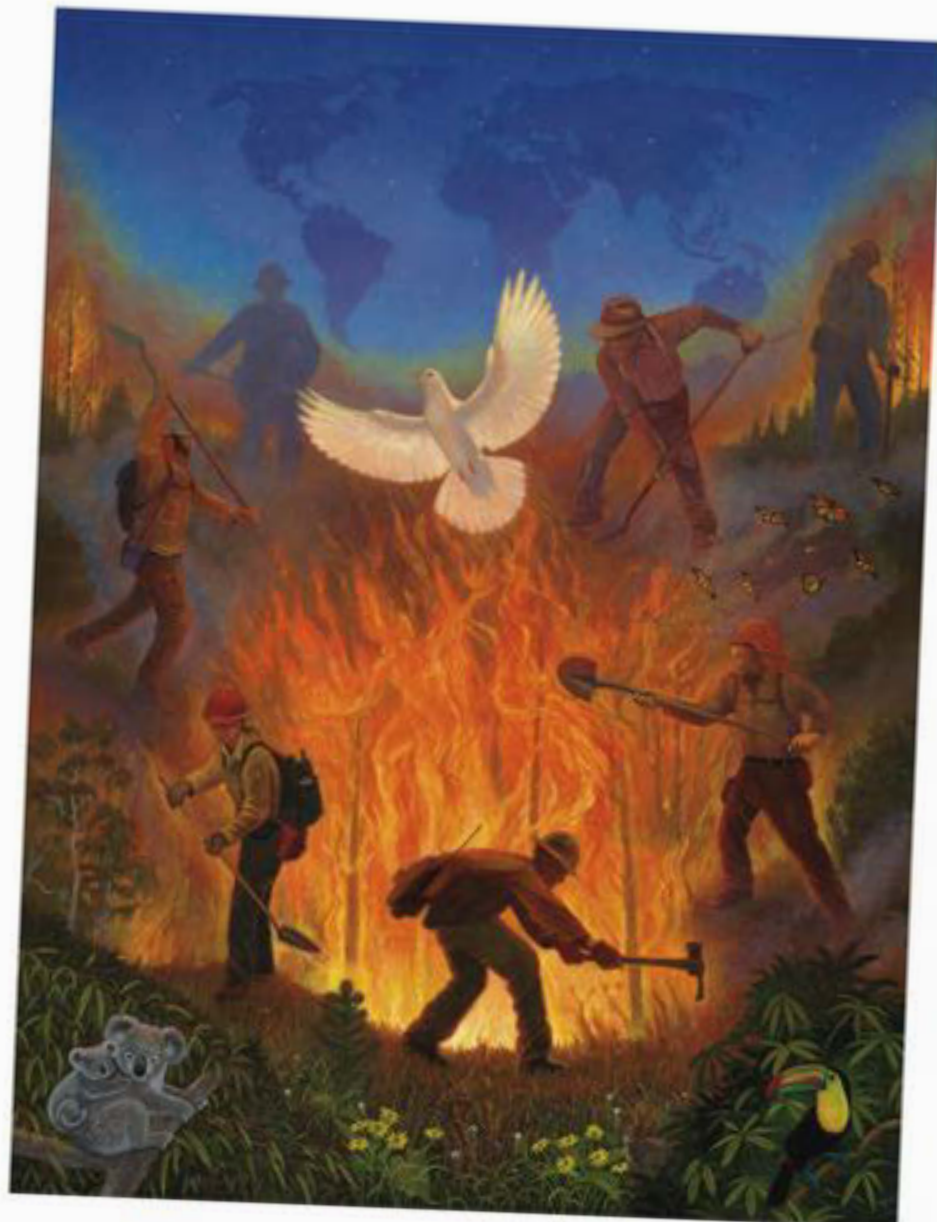
His latest work, "Wildland Fire, Uniting Globally," incorporates elements of the IAWF mission statement and was painted with input from former IAWF board president Dan Bailey and other fire practitioners. Dolack says "it took about 3 months, from when I started sketching till it was on the new printing 6-color printing press at Advanced Litho Printing in Great Falls.

The poster was recently shared with attendees of IAWF's 5th Fire Behavior and Fuels Conference in Portland, Oregon, and the original painting will be on permanent display in Washington D.C. at the National Association of Resource Conservation and Development.

On the evening of June 3, 2016, IAWF will co-host a poster reveal and celebration of Monte's wildfire art at Frame of Mind gallery in Missoula. For a preview and a sampling of Dolack's other fire-themed work, visit [Dolack.com](http://Dolack.com).

We caught up with Monte to ask about the story of this poster and his long-time fascination with fire as a theme for his art.





# WILDLAND FIRE

## UNITING GLOBALLY

INTERNATIONAL ASSOCIATION OF WILDLAND FIRE

The poster and painting, "Wildland Fire, Uniting Globally," will be on display at a gallery opening co-hosted by IAWF

**WF:** What prompted you to paint "Wildland Fire, Uniting Globally"?

**MD:** This began as an invitation from IAWF -- it was nice to be called in and to learn about this organization and issue. The painting expresses the idea that we should unite globally, in something. There's so much opposition happening but here in this organization there are so many countries -- China, Russia, Canada, Australia -- cooperating internationally in IAWF to solve this global problem, and we must cooperate to solve these problems. It's pretty neat. For an organization that included 28

different countries -- I wanted to capture that. In the sky, fire is becoming embers, becoming stars, and it includes the world.

And I added the koala bear in Australia with eucalyptus, the toucan representing tropical countries. Also the monarch butterflies, representing insects and other life forms. And there's the landscaped itself, on fire. As we're talking, up in Canada a fire is burning on an unprecedented scale. And people here in Missoula are looking again, to make sure they have plans for evacuation.





Monte Dolack drawing initial pencil sketches of firefighter images. Photo: Naomi Fox.

**WF: Who are these firefighters? What do they mean to you?**

**MD:** I started by creating a circle of figures, all working on the fire. Originally, they were very elemental shadowy figures connecting with the fire, fighting the fire, but as I worked on it I realized they needed a little more identify. Some were drawn from photos of local firefighters I've shot, and I looked at various other firefighters, from around the world. Often they are in their civilian clothes, out to defend. And I included a female firefighter on the left.

**WF: Some have wondered, why the white dove?**

**MD:** I think I wanted to keep a positive aspect to the painting -- peace and renewal, the white Phoenix-like dove. It was originally an image of the Phoenix in the flames, but the sense of peace of the white dove seemed essential to the message. There is too much conflict -- I wanted to make fire part of the solution, not simply a problem.

These images evolved a few times, it was the dove -- or the Phoenix -- rising from the flames and in the flames, burning. My final study is painted with the bird rising from flames. The Phoenix-bird becoming alive through the renewal process. From the flames comes hope.

**WF: Why paint with fire?**

**MD:** One reason I have connected with fire -- I've done a number of paintings of fire over the last 20

years -- is that I live in Montana, in Missoula. It's hard not to know someone who's involved in fire. The jumpers, the air tanker base. All the various people, organizations, folks doing computer modeling, and how all this information is exchanged internationally. So I painted "Stealing Fire" with a woodpecker. And a Firewise poster -- Firewise is used all over the US, and globally.

And fire is primal. In the poster, in the flames, there's the goddess of fire. Fire can be renewal. The primal forces are almost releasing the dove. The same with the butterflies, being released from the fire. There's so many symbolically embedded images. I wanted to paint those -- to somehow speak to those working with fires.



A sampling of prior fire paintings and posters by Monte Dolack.

See these and more at [Dolack.com](http://Dolack.com).

 **MONTE DOLACK**  
FINE ART



Monte printing the poster at Advanced Litho in Great Falls, Montana. Photo: Mary Huddle.

## ABOUT MONTE DOLACK

A native of Great Falls, Monte Dolack grew up surrounded by the same sweeping vistas and big sky that inspired Charlie Russell. His love of Montana and passion for the West's diverse landscapes and wildlife are evident in the images he creates and the commissions he undertakes.

After studying art at Montana State University and The University of Montana, Monte opened his first studio in 1974, beginning a successful career in fine art and graphics. His best known early works – wild animals wreaking havoc in human homes – comprise his "Invaders Series," exploring the myths of the West and how we view our relationship with our environment. The irresistible appeal of these images helped build Monte's national reputation and continues to attract collectors.

A love of the natural world, combined with his exuberant curiosity and travel experiences, has shaped the content of Monte's imagery. Blending mythology, technology and elements from nature, his work is infused with a sense of humor and irony. Monte's keen interest in environmental issues has lead to commissions for the Nature Conservancy, Defenders of Wildlife and Trout Unlimited as well as over 200 posters and prints for various organizations.

In addition to his acrylic, oil and watercolor painting, Monte continues to pursue his interest in traditional printmaking, having created numerous original lithographs. Since 1993, with his wife, Mary Beth Percival and staff, he operates a flourishing gallery in downtown Missoula.

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A firefighter in silhouette is seen from behind, wearing a helmet and holding a hose, fighting a large fire at night. The fire is intense, with bright orange and yellow flames and thick smoke. A fire truck is partially visible on the right side of the frame. The scene is dark, with the fire providing the primary light source.

# FROM THE **Fireground**

NEAR MICHELAGO, NEW SOUTH WALES

African lovegrass is an invasive pest species which burns fiercely. Photo: Jeremy Mears.

# Firefighting IN A TIME OF climate change

By Nick Goldie

In the summer, you always keep one eye on the horizon. By the time the pager had beeped, with its message of FIRE CALL, I was on the road in the old Cat Seven fire truck. I picked up neighbors Jeremy and Ray, and we headed for the enormous plume of smoke to the north. It was bending our way, like a tree in a gale.

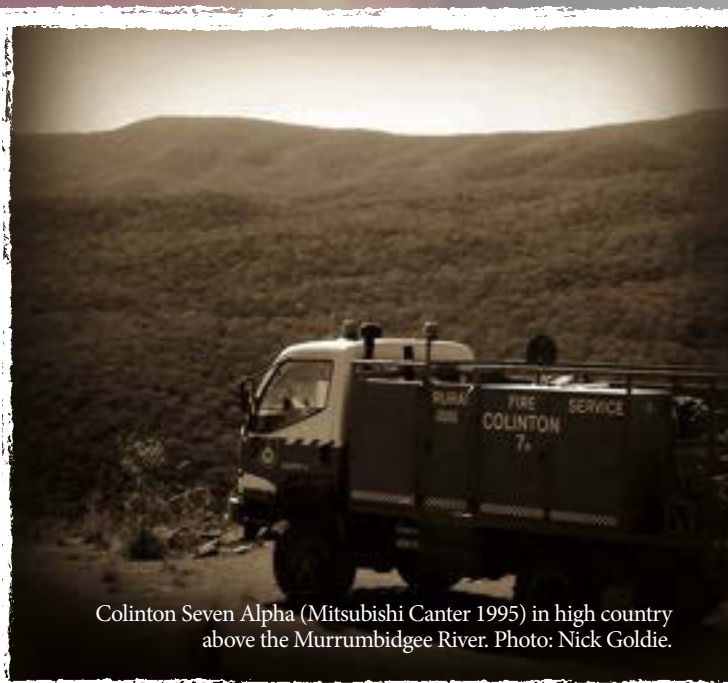
"We're on the road," we reported on the radio. "Where do you want us?"

"Just do property protection," was the answer. "We're not going to stop this bastard!"

We could see the flames, skipping hotly across the landscape. Flames from a grass fire reach two or three or four meters into the air, and they can travel at speeds of seventy kilometers an hour – rather faster than our old truck on a dirt road.

We turned in at the first gate. There was a line of pine trees along the drive, and the house was in a cleared area made by the circular drive, with some sheds outside the circle.

We drove the old Seven around behind the house. This was all according to the book – the house would provide some protection for the truck, while we protected the house. We rolled out two 38mm hoses, with Ray on point and Jeremy just behind him, taking the weight of the hose, while I



Colinton Seven Alpha (Mitsubishi Canter 1995) in high country above the Murrumbidgee River. Photo: Nick Goldie.

stayed with the truck to operate the pump and listen to the radio. With the pump going, and the roar of the approaching fire, I couldn't hear anything anyway.

A line of flame was racing towards us from the north-west. If it got into the pine trees, we'd be in trouble.

It all went according to the book. Ray and Jeremy simply stood their ground, aiming the water wherever the fire threatened to break through. It was as if an approaching train suddenly decided to split into two – one half roared around us to the right, the other to the left, and thundered away down the paddock leaving the house in an unburned island.

The sheds and outhouses were gone, of course. At one point I spotted Jeremy with a fire-hose in one hand and a singed chook under the other arm. Now and then he gave the chicken a gentle spray of cold water, then he handed the traumatized chook to the equally traumatized homeowner.



The next day the owner would have the sad task of going out with his rifle, patrolling the fence lines, dealing with the scorched sheep, and even some kangaroos, which were caught up, dying, in the wire.

Meanwhile we were following the fire. During the night it continued to the east, and into the foothills. This is steep country, with scrubby forest and vertiginous fire trails. The main fire trail runs from north to south, along the spine of the hills, and Fire Control had hopes of stopping the blaze where it would be forced to burn down-hill.

This is koala country. Everyone learns in school that koalas live on a diet of gum leaves and gum leaves only. Except that, after two hundred years of European settlement, somebody noticed that some koalas, in some places, like to chew on bark as well, and have been filmed in the act. They leave very characteristic gouges in the trunks of the young straight trees that they like, and, if you know what to look for, you can find koala scats in the leaf litter around the trees, even, with luck, spot a koala high in the canopy.

Not long ago, fire brigade maps were drawn with a thumb-nail dipped in tar, and directions to a fire were equally succinct: "There's a gate, and a cattle-grid. You can't miss it. Go past the water tank."

Today, koala country is considered an environmental asset, and hazard reduction burns have carefully marked boundaries which are not to be crossed. Older locals are skeptical: "Koala bears? Better roasted anyway." It's not always possible to prevent a wild fire getting in amongst the koalas, but the mapping, and the science, have improved out of sight. The maps, elegant creations at 1:25000, are produced daily during a major fire by the local Fire Control Centre, one for every truck, with boundaries, sectors, water sources, even weather predictions.

## Weather, nasty and nice

Weather, said WH Auden, *is what nasty people are nasty about, and the nice show a common joy in observing*. It's also of fundamental importance in fire operations.

Weather is not always well understood, and there's a great deal of weather research going on, as well as the more familiar climate research. If only we knew ... consider the famous Rattlesnake Fire (1953), in which a curious weather pattern in northern California resulted in a cascade of cold air rushing through a high valley and down a mountain-side, carrying the fire with it, resulting in the deaths of one US Forest Service ranger and 14 volunteer firefighters (who were also missionaries).

The US Naval Research Laboratories are particularly interested in "pyrocumulonimbus clouds," which may be generated by big bushfires such as the 2009 Black Saturday fires near Melbourne. These strange pillars of smoke are incandescent at the base, shoot upwards in a hot column which reaches the icy stratosphere, and then fall dramatically back to earth in a multi-directional cold wind-burst.

This is of obvious importance to firefighters, but what interest does the US Navy have? Simply that the massive amounts of soot, ash and even moisture forced up into the stratosphere may actually prevent US Navy satellites from "seeing" their targets.

According to the United Firefighters Union of Australia, "there are no climate skeptics at the end of a fire hose" but these folk are metropolitan fires, with a city view. Out in the bush, where climate skepticism is the norm, there's a perception that climate has always changed, always will, and fighting fires is just part of the job. Being on the end of a hose doesn't change anyone's view of scientists, or city slickers.

Surprisingly, it is rural politicians who lead the skeptical charge, rather than their constituents. According to a Latrobe University study: "Over half of (rural) politicians contacted had difficulty regarding climate change as a neutral scientific issue because they negatively associated it with groups they felt antagonism towards such as their political opponents, environmentalists, doomsayers and fundamentalist religions." Political belief will always trump scientific theory, partly because science as a matter of its own methodology continues, quite correctly, to refer to "theory" rather than asserting some absolute truth.

In a recent online piece for The Conversation (January 2016), University of Queensland researcher John Cook noted that in conservative think tanks, the denialists actually regard evidence for human-influenced climate change as part of the grand conspiracy. Can you beat that? he asks. He concludes that for people with a conspiratorial mindset, it's natural to believe that others are involved in conspiracy too. Therefore, the evidence that climate scientists produce is itself merely evidence of a greater conspiracy.

There's not much one can do about that. Anything you say may be used in evidence against you, especially if you are associated with (a) a union or (b) the Australian Climate Council. When the UFU quotes the Climate Council they are doubly damned: "Our bushfire preparedness is at risk from climate change as the fire seasons lengthen and overlap with the northern hemisphere. This means that fire services will be less able to share resources."

Three things are changing. Even if you are doubtful about the science itself, the climate is measurably changing. It's getting

warmer, there are more wild weather events (bushfires and blizzards are both influenced by warming) and sea levels are rising. Secondly, there's a demographic change, as tree-changing influences more and more mainly affluent people to move out of the suburbs into the bush. And thirdly, something is happening to the Australian tradition of volunteering. There are fewer volunteers, and they are getting older. Increasingly, volunteer fire brigades are becoming Dad's Armies. This is perhaps good news for the Dads, but as the National Institute of Economic and Industry Research has reported, we are going to need more, not fewer, volunteers: in the tiny Australian Capital Territory, for example, almost double the present number.



In 2007, Australia's peak scientific body, the Commonwealth Scientific and Industrial Research Organisation (CSIRO) produced a 'climate change projection study', which predicted increased fire weather, droughts, and extreme weather events. In 2015, the study was updated, and CSIRO's Senior Scientist Kevin Hennessy said, grimly, that although the new paper was based on more sophisticated climate tools, there were no surprises.

"These new projections are consistent with what we said back in 2007," he said. "One of the key findings is that in a warmer climate there'll be more extremely high temperatures and fewer colder temperatures."

And more, hotter, bushfires.

All this, as the tree-changers move into the countryside and the urban sprawl becomes ever more sprawled.

## Climate, weather, houses, and the fire roaring

Firefighter Jeremy, whom we met at the beginning of this story, recently spent some time at the National Interagency Fire Center (NIFC) in Boise, Idaho. He saw new housing largely along the tops of ridgelines. "This gives the occupants a great view of the approaching fire," he said, dryly.

The wildfires which have occurred in recent years in northern California and the north-west states have, like the blizzards in the eastern US states, been linked to global climate change. But high on the Californian authorities' list of problems is the rash



Jeremy Mears - Mopping up at Murrumbucca. Photos: Nick Goldie.

of building, mainly residential, along the forest edge and the prairie border. By all accounts, freedom reigns and "planning" is regarded as an unacceptable intrusion by Big Brother.

In Australia, or at least in New South Wales, planning permission is granted by the local shire or Council. After Melbourne's Black Saturday, and the more recent Blue Mountains (NSW) blazes, there's been increasing attention given to house siting and appropriate building materials.

Some years ago, I built a fully approved weatherboard house of western red cedar, with an external staircase and dormer windows. None of this would be signed off today – neither materials nor the complicated ember-trapping design. In fact, when I added a sun-room, the shire inspector insisted that the access steps be made of hardwood, with a steel frame, and that they must be on the eastern wall not the west, because most bushfires would come on the wings of a west wind.

As a firefighter, I have also recognized that it is increasingly common to hear the Incident Controller practicing a sort of triage: "don't bother with that building – it can't be defended" and "don't go down that road – there's no way out and we don't want you trapped!"

When the pager starts its beeping, and the little screen says FIRE CALL, you drop everything. (An SMS message will follow, on the phone, but there are still areas where the old-style pager is more reliable.)



"When the  
**pager  
starts its  
beeping,**  
and the little  
screen says  
**FIRE  
CALL,**  
you drop  
everything."

Knocking down the flames in the urban interface. Photo: Jeremy Mears

I shout to my wife in the house: "Call out!"; struggle into my yellow overall, and head for the truck. On the way down the road I stop briefly to pick up Jeremy and his partner Sandra, both experienced firefighters. The fire is half an hour away, a lightning strike on a rugged hill near Murrumbucca, and there are several farms under threat. Once again, the instruction comes on the radio: "Just do property protection!"

There are crews from brigades all around the district. We're given a grid reference and we find a small new farm house, with a clutter of sheds and garages. We have two trucks available, there's a chopper overhead, and once again we do it by the book.

We park our old Cat Seven, tucked away behind the house, with the back of the truck facing the fire so that the pump-man (Sandra) can see the nozzle man. There'll be too much

noise to hear anything, but hand signals will get the message through. We run out a couple of 38mm hoses, along one side of the house, so that the nozzle man has a full length of hose to use. The second truck does the same thing, in a mirror-image operation.

Each truck has about seven precious minutes of water.

The home-owner is running up and down the verandah, moving flammables like cushions and door mats into the house, and carrying a gas bottle from the BBQ to behind the shed.

There are embers falling, and the sky is a curious purple beige. The fire is close by, just the other side of a small hill. We can hear it roaring.

The home-owner brings us each a mug of hot sweet tea.



**NICK GOLDIE** (nickgoldie@bigpond.com) has been Senior Deputy Captain, Colinton Rural Fire Brigade, NSW since 2007. He and his wife live on a kangaroo-populated 100 acre olive-growing property bordering the Murrumbidgee River. Nick has been employed as science writer and broadcaster by CSIRO, Geoscience Australia, the Australian National University (Canberra), the Bureau of Rural Science. He writes regular book reviews for the Cooma-Monaro Express.





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