

Fireline

A firefighter in a yellow jacket and red helmet is the central focus, working on a fireline in a forest. He is wearing a red helmet with a clear visor and a yellow jacket with reflective stripes. He is holding a red tool, possibly a shovel or a chainsaw, and is looking towards the camera. In the background, another firefighter is visible, working on a fireline. The forest is filled with tall evergreen trees and some smaller trees with brown leaves. The overall scene is a depiction of wildfire management in a forest.

Yukon Wildland Fire Management
2022 fire season in review


Yukon



Table of Contents

From the director's desk	5
Fire science: reading the trees	6
Q&A with a new recruit	8
Fire season in review	10
Notable fires	11
By the numbers	14
Agency partnerships prove their value during an import-heavy season	16
Q&A with an ERO	18
Digital fire map sheds more light on the Yukon's fire situation	20
Community Wildfire Protection Plans add local buy-in to prevention and mitigation efforts	21
The aspen advantage	22
Next generation maps	24
LiDAR scans forests in 3D	24
Photo contest winner	27
Yukon pilots new fire forecasting tool	28
Documentary filmmakers turn the lens on Canadian fire lookouts	30
2022 wildfire crews	32

Fireline is the Government of Yukon's Wildland Fire Management Branch annual magazine.

Editors

Haley Ritchie
Mike Fancie

Follow Wildland Fire on social media through Yukon Protective Services and online at [Yukon.ca/Wildfires](https://www.yukon.ca/Wildfires).

Cover Image

Grey Hunter crewmember Devin Moses patrols the perimeter of MA-026 on July 14.

Photo by Haley Ritchie

Opposite

Wildland Fire personnel walk through the evidence of a successful prescribed burn.

Photo by Haley Ritchie

Crew leader Kevin Welin monitors
a spring prescribed burn operation
in the Southern Lakes region.

Photo by Haley Ritchie



From the director's desk

I write this in late August, one day after attending our first prescribed burn in a non-herbaceous fuel type; one week after our first community wildfire protection plan was endorsed; and one month after our last imported firefighting resource went home.

During this busy year, we still made time for mentorship and innovation.

At the peak of our fire season 25 Yukon crews, countless officers and support staff, four air tanker groups, 36 rotary-wing aircraft, 297 imported crew members and one 150-person camp were responsible for 275 fires. In such a significant season I view these stats with pride and optimism because I know our Wildland Fire Management team can excel in challenging situations.

Several WFM staff retired last year with over 35 years of service. We treasure the knowledge and expertise of our long-term employees – some with 25 to 45 years' experience and counting – and must transfer those skills to our newer team members. We also need to embrace new ideas and technology to adapt to changing conditions.

We can proudly claim successes like the FROG initiative, duty room modernization, ongoing renewal of equipment, communications, facilities and regional fire centres, updating Dispatch and iFMS+ systems and our emergency response officer and air attack officer trainee programs.

Looking ahead, we should continue down this path. Our future depends on how we capture the vast skills and experience of our senior members while giving voice to new perspectives about our future. Organizational growth takes many forms. We're providing professional development opportunities; presenting at conferences; instructing and learning at specialized courses and offering temporary assignments and export opportunities.

This unprecedented season was successful despite many challenges and competing, often stressful priorities. Each member of our team did what was needed to achieve our day-to-day goals – both on the fireline and in our many other workplaces.

Whatever you do this winter, please enjoy whatever life holds with my thanks for your hard work and dedication to protecting Yukoners from the impacts of wildfire.



Lisa Walker
Director
Wildland Fire Management



Fire science: reading the trees



Trees can tell us a lot about the past. All you have to do is count the rings.

Dendrochronology is the scientific process of dating tree rings. Trees record climate conditions and many natural events in the way they grow. By examining this evidence left behind we can learn a lot about what happened on the landscape hundreds of years ago.

This summer Emergency Response Officer Robert Westberg took a closer look at a tree harvested by Wildland Fire during a FireSmart operation.

This tree sparked our interest because you can see scarring from an old wildfire visible on its trunk. That's the reason one side of the tree kept growing and created this unique shape.

This tree was removed from a forest near Whitehorse's Pine Ridge subdivision as part of a FireSmart project. Communities organize FireSmart projects to reduce wildfire risk, and sometimes those projects do so by removing flammable conifers like this one.

By counting the tree rings backwards from the year it was harvested, we think the tree was scarred by a wildfire around 1891. The tree itself, a lodgepole pine, sprouted around 1839.

Tree rings vary in size based on factors like rainfall. For example, a wet summer means more growth and a wider ring. A dry summer will slow the tree's growth and the rings will be spaced closer together. What do you think happened to this tree's forest over the years? 🔥

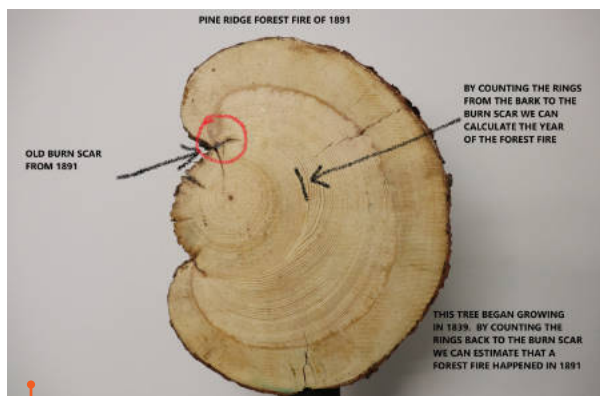


Photo by Rob Westberg



Emergency Response Officer Ted MacDonald working on a prescribed burn operation outside the Mary Lake subdivision on August 23.

Photo by Haley Ritchie



Q&A with a new recruit

After the hiring process, all Wildland Fire recruits spend 12 days outside Whitehorse at crew camp. In two short weeks, these new firefighters learn about everything from fire behaviour to orienteering. Classroom sessions focus on critical skills like using radios to stay in communication and learning about how fire behaves in different fuel types.

Outdoors, the crews learn how to use wildland fire equipment. They practise setting fires with drip torches and using hoses and pumps. By the end of crewmember camp, everyone must have passed the gruelling WFX-FIT fitness test.

The info team caught up with new recruit Hannah Deuling at the Southern Lakes Fire Centre one week after she successfully finished her course.

What made you want to apply for Wildland Fire?

HD: Well, I grew up in Whitehorse. One of my buddies had worked for Wildland Fire for a long time so I was always pretty curious about it. And then my older brother did fire last year, so he was telling me about it last summer and it sounded really interesting. It sounded like a lot of hard work, but also pretty cool too. A lot of new skills and experiences. So this summer I decided to apply and see how it went. Give it a go.

What was the crew camp experience like?

HD: I didn't really know what to expect. But it turned out super fun. It was pretty neat that they brought all the newbies together for training before everyone went off to the communities. It was cool to meet a bunch of different people, some of them not from the Yukon, and see their initial impression of Whitehorse. Overall, I thought crewmember course was great. The instructors were awesome.

The first few days there was a lot of classroom work. Long days of lots of learning a lot of new material. But then as the week went on we were busy with outdoor stuff too. I hadn't worked a lot with pumps before so that was new to me. I really enjoyed the fire behaviour stuff and the different scenarios we went over.

How tough was the fitness test?

HD: I think the more people talked about it, the more nervous everyone got. It was really hyped up. But they really walked you through the whole test beforehand so once I understood what it entailed I felt more confident. I was pretty intimidated at first but watching someone run the test first was a good example. It was definitely a doozy but once I got it done, that was a good feeling.

Anything you're looking forward to most in your first season?

HD: I think in my first summer, my goal is just to try to get just as much experience as I can, you know, just learn from everyone around me with more experience and learn as much as possible. 🔥



“I think in my first summer, my goal is just try to get just as much experience as I can, you know, just learn from everyone around me with more experience and learn as much as possible.”

**Hannah Deuling,
first-year wildland firefighter**



Fire season in review

The 2022 wildfire season in the Yukon will go down as a busy one. Unusually hot weather and lightning storms doubled last year's number of fires on the landscape. Combined with other events – including flooding, highway washouts, landslides and telecommunications outages – crews experienced challenging conditions as more fires crept onto the landscape.

By mid-June warm weather arrived in the Yukon and stayed, as smoke began to drift east from intense fires burning in southwest Alaska.

Summer arrived on schedule in the territory, but an unusually stubborn high-pressure ridge brought hot temperatures and lightning into the territory at the end of June. By the Canada Day long weekend, the Yukon had 40 fires and had implemented a territory-wide fire ban.

As Yukoners headed out for a long weekend, duty rooms across the Yukon were buzzing with intensity, lit up by screens crowded with orange icons depicting new wildfires. During the late evening on June 30 a lightning-caused fire resulted in an emergency evacuation of the Frances Lake campground – the unofficial start of a two-week fire boom.

Hot temperatures continued, drying out forests and contributing to rapid growth and rates of spread that challenged suppression efforts. The territory saw thousands of lightning strikes per day, resulting in an average of 20 new fires per day. New fires burned late into the evening with nearly 24 hours of daylight as crews made quick decisions about numerous emerging initial-attack targets.

The Yukon asked for assistance through the Canadian Inter-agency Forest Fire Centre and received help from British Columbia, Ontario and Alberta. The arrival of these imported crews and rain helped to get things back under control. By July 13, the Klondike and Robert Campbell Highways reopened, the evacuation alert for the Silver Trail was rescinded and new starts slowed down. August, by comparison, was a normal summer month and the number of new fires dramatically slowed down. Most of the territory received average rainfall, outside southeastern Yukon, where persistent dry conditions brought some large fires back to life.

Fire risk tends to wind down in Yukon as quickly as the short summer. By September, shortened days and cooler nights further reduced risk levels until the dramatic fire season officially ended on Oct. 1. 🍂

Notable fires

Crystal Creek and Upper Willow Creek (MA-21/MA-29)

Cause: Lightning
Report date: July 2
Response zone: Full
Size: 4,545 hectares and 1,521 hectares

The Crystal Creek fire was a lightning-caused fire that started near the Klondike Highway on July 2 as fire conditions began to heat up. The fire grew too quickly for air tankers and initial attack.

As a massive column of smoke began to grow beside the road, the Klondike Highway was temporarily shut down two days later. At times, visibility had dropped to two metres. The community of Stewart Crossing was placed on evacuation alert soon after on July 3. Crews deployed to place structure protection on nearby properties and Wildland Fire partnered with the Department of Highways and Public Works to move vehicles on the highway by pilot car.

Due to the sheer amount of fire on the landscape, the evacuation order was expanded to include the entire Silver Trail. Backup arrived from British Columbia on July 7 and the management of the two fires was taken over by a B.C. incident management team, operating out of a fire camp set up beside the Pelly Crossing airstrip that quickly grew to house and support 150 people. Crews got to work building control lines, addressing residual heat and getting smoke under control as rain eliminated new growth. The highway reopened on July 13.



Crystal Creek/ Upper Willow Creek (MA-21/MA-29)
Photo by Kris Johnson

Frances Lake (WL-008) Fire
Photo by Scott McKenzie



Frances Lake (WL-008)

Cause: Lightning
Report date: June 30
Response zone: Strategic
Size: 6,566 hectares

Late in the evening on June 30, a rapidly growing fire was reported less than two kilometres from the Frances Lake campground. Fortunately, the campground was already closed due to flooding. Only a few vehicles, boaters and local residents were in the area.

A low-flying bird dog aircraft blared its siren to alert those in the area. Wildland Fire crews, police, volunteer firefighters and other Government of Yukon staff worked together to immediately evacuate people.

Plans were put in place to protect cabins and First Nation values in the area, including an Elder's cultural camp. The fire crossed the road days later and the Robert Campbell Highway was temporarily closed. A series of successful ignition operations took place to divert fire away from structures. Despite bucketing and rainfall, the Frances Lake fire proved persistent all summer, with smoke still visible until the end of fire season.

Mount Hansen (CA-027) and Fort Selkirk (CA-017)

Cause: Lightning
Report date: July 4 and July 2
Response zone: Transitional
Size: 900 ha and 2,571 hectares

The Tatchun region also had its hands full this summer. Crews responded to multiple fires of concern, including two that threatened beloved homes and Yukon landmarks.

On July 2, a lightning-caused fire was burning four kilometres southwest of Fort Selkirk. Wildland Fire crews focused on site protection and keeping Selkirk First Nation and the Minto Mine informed as smoke grew and the situation progressed. Two weeks later, the fire received considerable rain and quieted down.

Just east of this fire, across the Yukon River, a second lightning-caused fire threatened two more central Yukon landmarks. The Mount Hansen fire burned aggressively far above the banks of the Pelly River. Between the river and the fire were two properties: Stepping Stone, well-known for its role as a Yukon Quest checkpoint, and the Pelly Farm. Crews protected both sites with sprinkler systems, landscape-level FireSmarting, bucketing and air tanker support.

Eventually a controlled ignition was used to set up a blackline and bring the threat under control on the mountain above the homes.

Snag Creek (BC-003) Fire
Photo by Ted MacDonald



Snag Creek (BC-003)

Cause: Lightning
Report date: July 1
Response zone: Transitional
Size: 4,035 hectares

Beaver Creek saw plenty of smoke this summer. Starting in June, smoke drifted from a massive number of large fires in the southwest Alaska. As dry conditions moved east, a small lightning-caused fire started in the afternoon 17 kilometres away from the community on July 1 that would eventually grow to 4,000 hectares.

Visible from town, the fire generated smoky skies and caused concern, but it never came close enough to Beaver Creek to trigger any evacuations. Structural protection was set up near the town as a precaution, but the fire burned mostly north away from Beaver Creek.

The fire received significant rainfall on July 6 which reduced fire growth and activity.



Rancheria Mountain (WL-011)

Cause: Lightning
Report date: July 2
Response zone: Strategic
Size: 1,525 hectares

This fire was started by a lightning strike on July 2 south of the Alaska Highway between Watson Lake and Whitehorse. Aggressive fire behaviour prevented successful initial attack. It remained relatively quiet until suddenly blowing up three days later, making a run towards the Alaska Highway.

Owing to the fire's location between the Yukon's main supply transportation arteries, the Cassiar and Alaska Highways, this fire quickly became a high profile monitoring fire. Public reports poured in about this fire until the end of the fire season, but since it did not threaten the highway, the fire was allowed to perform its natural role. The burned area will provide a valuable break in an otherwise continuous forest when the next fire ignites in this area.



Rancheria Mountain (WL-011) Fire
Photo by Kris Johnson



Mount Hansen (CA-027) Fire
Photo by Ted MacDonald

Beaver River (WL-014)

Cause: Lightning
Report date: July 4
Response zone: Wilderness
Size: 32,469 hectares

This fire was one of the numerous lightning-caused wildfires that burned east of Watson Lake late into the fire season. As of Oct. 1 it takes the crown as the largest fire of the 2022 season.

Fire season in review

By the numbers



Fires by zone

Fire management zones divide the Yukon into five areas that guide fire suppression decisions: critical, full, strategic, transitional and wilderness. Typically, the closer fires are to the critical zone, the higher priority for suppression. Fires in the wilderness zone are allowed to fulfill their natural role in the boreal forest whenever possible.

Response zone	Area burned (hectares)*	% of total burned area
Critical	38	0.02
Full	9,969	5
Strategic	17,247	9
Transitional	19,263	10
Wilderness	150,396	76
Total	196,913	100

*this number represents the preliminary numbers for area burned. The final number is expected to be larger. 1 hectare equals 10,000 square metres.



Fires by district and area

This year, a total of 275 fires burned in the Yukon's 10 fire districts. The total area burned was 196,913 hectares. Mayo had the most fires and the greatest area burned.

Region	District	# of fires	% of total burned area	Area burned (hectares)
Klondike	Dawson	41	5	10,543
	Old Crow	17	14	28,406
Kluane	Beaver Creek	11	2	4,205
	Haines Junction	2	0.00005	0.1
Southern Lakes	Teslin	12	0.8	1,492
	Whitehorse	27	0.04	74
Northern Tutchone	Mayo	62	31	61,189
Tatchun	Carmacks	37	8	16,074
	Ross River	43	11	22,101
Tintina	Watson Lake	38	27	52,829
Yukon		290	100	196,913



Prescribed burns

Wildland Fire was also able to do a number of prescribed burns this year. Southern Lakes completed three prescribed burns; Tintina completed one in the region and one in Lower Post in collaboration with the BC Wildfire Service, Daylu Dena Council and Yukon First Nation Wildfire. Two more prescribed burns took place in 2022 in Kluane and Northern Tutchone.

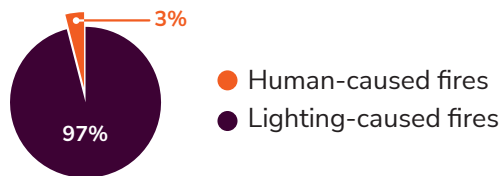
By carefully planning and executing burns under controlled conditions we can restore natural balance and eliminate fuel build-ups. Sometimes, fire is good. It's a powerful tool we can use to protect our communities.



Scan the QR code to hear more about prescribed burns from Southern Lakes regional protection officer Doug Cote.



A busy summer for lightning



2022-23 budget forecast

This is the second year of Wildland Fire Management's new budget structure. It's a forecast because our year isn't yet over, although fire season has ended.

Prevention and mitigation: \$3,319,706

These are the costs associated with reducing community wildfire hazard, including the FireSmart program, Yukon government-led large-scale projects and implementing Community Wildfire Protection Plans.

Preparedness: \$16,495,789

These are day-to-day operational costs, including employee salaries and readiness costs such as annual air attack contracts.

Variable direct fire costs: \$18,225,041

These are the costs spent actually fighting fires.



Agency partnerships prove their value during an import-heavy season

This year, Wildland Fire Management and Yukon First Nations Wildfire signed a three-year Unit Crew Services Agreement.

Under the agreement, funds provided by the Yukon government will support Yukon First Nations Wildfire to employ 20 youth each year to assist with the Yukon's wildland fire response operations, forest fuel reduction and prevention and mitigation activities that will create wildfire resilient communities.

Before summer season could truly take off, Wildland Fire Management was faced with Emergency Measures Organization requests to provide flood response staff.

The Yukon First Nations Wildfire unit crew was redirected to Ross River, where their staff supported the community by installing defensive works near the community's ferry landing and footbridge. Later, as high water threatened Carmacks and an evacuation alert was issued to parts of the community, the unit crew redeployed before eventually taking part in fire operations as numerous major incidents developed in the area.

Meanwhile, 2022 was a banner year for visiting firefighters as resources from British Columbia, Alberta and Ontario joined the effort through the Canadian Inter-agency Forest Fire Centre (CIFFC) to manage both existing campaign fires and emerging initial attack targets.

At peak fire season in mid-July, a British Columbia incident management team was working out of an imported 150-person camp that housed multiple unit crews and initial attack firefighters. IA crews were also assigned to Yukon fire centres alongside single resources like dispatchers and specialist resources. The Yukon's airtanker program doubled in size as two groups were imported.

Surge resources are an important part of the wildland fire resource management process. Early in the summer, Wildland Fire Management exported three staff to support operations in Alaska. When local fire activity decreased, Wildland Fire exported six single resources through both CIFFC and the Northwest Compact to support campaigns in British Columbia, Washington and Idaho. 🍷

Above

A British Columbia Wildfire Service unit crew receives a briefing.

Photo by Scott McKenzie

Incoming BC crews are briefed after their arrival in the Yukon.



Members of the Yukon First Nations Wildfire unit crew.



YFNW crews provide flood relief in Ross River.



BCWS firefighters in action.



Q&A with an ERO



Wildland Fire has four dedicated emergency response officers (EROs), who work out of the Yukon Fire Centre. This year a fifth position was created to bridge the role of crew leaders and more senior officer personnel in the organization.

At the end of the season info caught up with first-year ERO Robert Westberg, who filled this pilot position.

What is an Emergency Response Officer?

RD: Basically, we're additional resources if needed that can fill a lot of different roles.

If there's training or mentorship that needs to be done, or covering an officer or regional district officer position in different regions if people are taking time off, or have a fire load that exceeds operational capacity, EROs can be an additional resource. We are adaptable because we have fireline experience and an understanding of the more administrative side as well.



What did you do this summer?

RD: We were all instructors for the crewmember and crew leader courses, which was pretty cool. Different EROs focused on different areas, depending on our different strengths.

My goal was to shadow in three different regions, which ended up being Mayo, Watson Lake and Whitehorse. Each region has a duty officer running the show, so shadowing was basically sitting on their coattails as the RDO would show me - usually for a day or two - how they operate. Then I would take the reins, help run dispatch duties, give daily briefings and delegate tasks for all the crews in the region and make sure operations are going smoothly.

I think the best part of the job this summer was being RDO in Ross River. It was the first time I really got thrown in the hot seat. I had five crews, a number of active fires and three helicopters. It was super cool just to actually be in that officer position on my own.

Not everybody likes that kind of high-pressure experience, but that's what I love about the job.

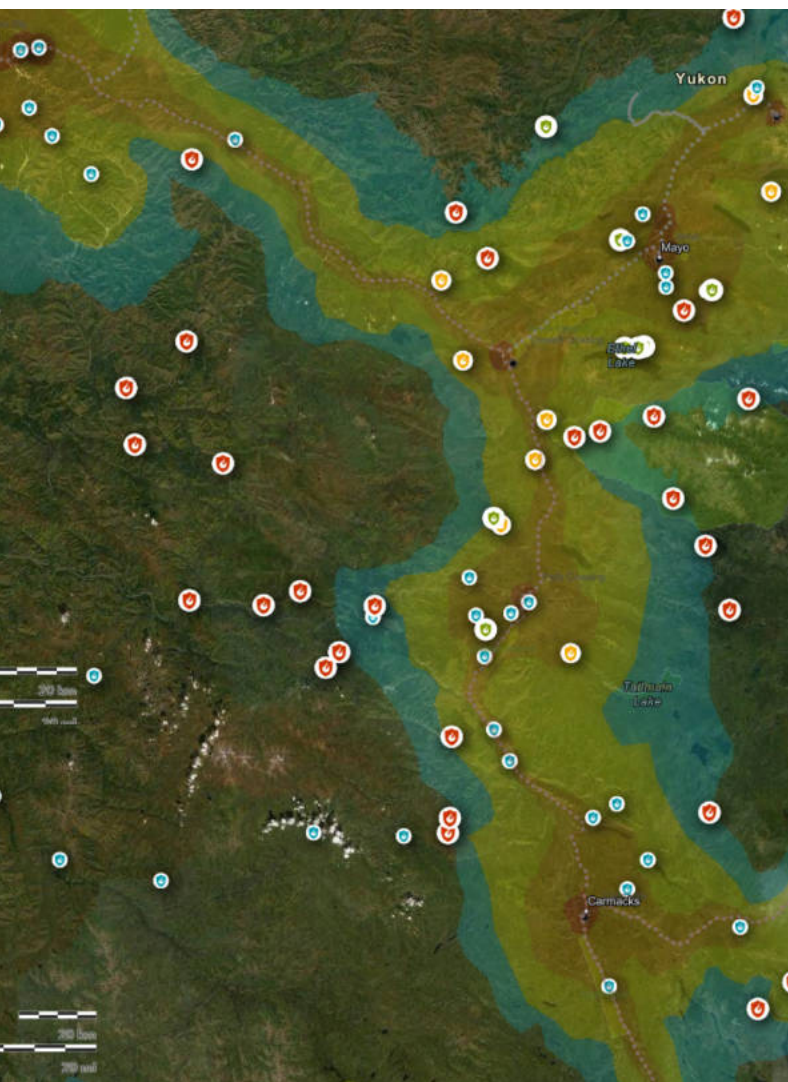
How was being an ERO different from being a crew leader?

RD: Well, as an ERO you get to know the organization's ins and outs a lot better. You have to.

All the EROs also shadowed the Yukon Duty Officer, who oversees the whole territory's operations. There's very few people who have the experience to fill that role.

As a crew leader, you only worry about one or two crew members. As an officer, your world basically keeps getting bigger and you need to make sure everyone's good to go every day. It's a lot more delegating. You're also in charge of making sure all those people come home safe. I think the more you move up, the more stressful your job becomes - so the amount of support and training in this role is essential. 🔥

Digital fire map sheds more light on the Yukon's fire situation



What's the latest on the fire? Does it affect my plans? Am I or my property at risk?

Wildfire season affects countless people every year, and this summer's extreme wildfire activity underscored the need for readily accessible, real-time information. To ensure that the best information is available to the Yukon public, Wildland Fire expanded the fire map that helps people better understand the Yukon's fire situation while learning more about fire activity in a given area.

This ArcGIS map, developed by Highways and Public Works eServices staff, includes statistics about fire activity in each geographic fire management district as well as in the fire response zones that guide fire response planning. The map still contains fire danger ratings for the Yukon's 42 weather stations, which now also include the basic weather data that generate the ratings.

By sharing this information proactively, the government is advancing the discussion about how we balance public safety and natural ecological processes.

This is an important tool the public can use to inform themselves about potential hazards in their area, and to plan and prepare in case of wildfires. 🔥

➔ [Check out the fire map at Yukon.ca/firemap.](https://Yukon.ca/firemap)

Community Wildfire Protection Plans add local buy-in to prevention and mitigation efforts

While our crews are focused on responding to wildfires across the Yukon, a group of prevention specialists and fire centre officers are working with communities across the Yukon to build long-term plans for our extensive wildland-urban interface.

Known as community wildfire protection plans (CWPPs), these documents lay out how governments will strategically reduce the wildland fire risk around a community. Communities create their plans with support and technical input from Wildland Fire Management representatives that include members of the Yukon Fire Centre's Prevention and Mitigation unit and local fire centre staff. Each plan includes prioritized areas where fuel management should take place and recommendations to reduce the chances that wildland fires will damage structures.

The Minister of Community Services, through their mandate letter, is responsible for ensuring that six CWPPs are signed by 2024. The first one, for the Village of Teslin, was signed this August. A second was presented for public review in Haines Junction this summer.

Once a plan is signed, it gives communities significant leverage to apply for funding to treat areas identified by the CWPP while Wildland Fire Management continues to develop a cutting-edge hazard reduction program that will support them with strategic tools like landscape-level fuel breaks.

The boreal forest that covers most of the Yukon has a special relationship with fire. Forested areas are replaced by natural cycles of disturbances like windstorms, insect invasion and wildland fires every 50 to 200 years. As these disturbances remove mature trees, herbs and shrubs grow on newly exposed ground before giving way to young trees. Mufasa of The Lion King might refer to this as the "circle of life." We call it succession.

Some factors that affect wildfire behaviour - like weather and the broader terrain - are outside our control. Instead, we manage vegetation to reduce fire risk. Dense forests have a higher chance of catching fire and burning more intensely, so human processes have to stand-in for natural processes like wildfires.

Since fires can quickly do significant damage in the wildland-urban interface, we try to put out every fire near a community. This work keeps people and our homes safe, but it interrupts the succession process and leaves some places surrounded by dense forests.

Community wildfire protection plans combine local knowledge and socio-cultural priorities with technical wildland fire expertise. Each plan is created by a community working group made up of local government representatives and natural resource experts that decide which parts of the forest within several kilometres of a community need to be managed to reduce wildfire risk. 🔥





The aspen advantage

This year the Government of Yukon took the first step in a major multi-year silviculture project that will help protect Whitehorse from wildfires.

In total, Wildland Fire's Prevention and Mitigation Unit planted 78,000 aspen saplings in 2022. Planting contractors placed the trees in the ground as soon as the frost receded and snugged them in with boreal soil. Eventually these tiny trees – no more than a twig at time of planting – will grow into the fire-resistant forests of tomorrow.

"So Aspens just aren't designed to burn as well as conifers that carpet much of the boreal forest," explained Milan Lapres, the fuels management technician who coordinated this year's tree planting effort.

Aspen tend to get scorched during wildfires, but seldom actually contribute fuels to a wildfire

unless the conditions are very extreme," said Lapres. "Their fuel moisture content is much higher than that of conifers, the leaves and thicker branches of broad-leaf deciduous trees retain much more moisture than pine or spruce needles. They also do not have the lower branches that act as ladder fuels, allowing surface fires to travel up into the canopy."

The types of trees in an area can be just as important for fire prediction as weather and topography. A strategic stand of aspens could buy wildland fire officers more time to plan for and respond to an approaching wildfire.

Aspen planting is one part of a larger fuels management strategy used by Wildland Fire, and one of three fuel treatment strategies advocated by FireSmart Canada.

Sourcing the trees started over two years prior.



Aspen are native to the Yukon, but not all seeds are created equal. In order to survive North of 60, Yukon foresters needed a source of hardy saplings. Seeds were sourced from Fort Nelson, British Columbia, and sent to a nursery to grow for one year. The trees then travelled to the Yukon on a refrigerated truck and were stored in a special warehouse before being doled out to contracted planters.



“There are a lot of logistics involved in getting the trees up here in the proper condition for when we feel that the ground is most receptive to planting. There is a short window for planting in the spring where the ground is thawed out enough, while still giving the trees enough growing time to establish themselves before the winter,” said Lapres.

Encouraging aspen growth in a formerly spruce dominant forest is called “stand conversion.”



First, crews FireSmart wooded areas by thinning the forest of woody debris. Following that process, professional tree planters put the new trees in the ground to promote aspen growth.

“In most sites there is a component of aspen already in there. We're just encouraging it,” said Lapres.

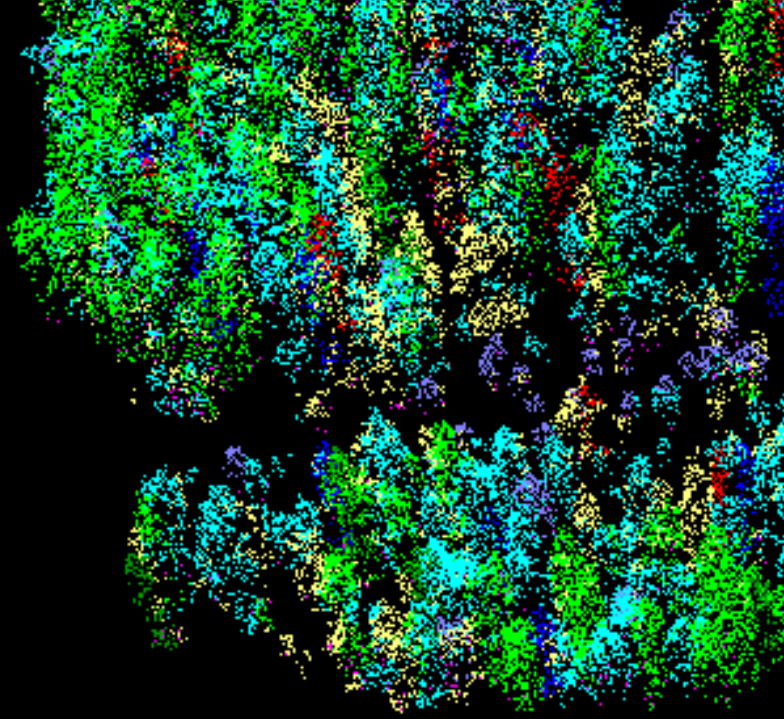
This year, planters worked in a number of areas around town, including throughout the Mary Lake Shaded fuelbreak, Marsh Lake, Copper Ridge, Wolf Creek, Pine Ridge and Kookatsoon Lake.

As the temperatures drop this autumn, mature neighbouring aspen trees will turn yellow while those 78,000 saplings will go back into frozen dormancy for the next six months. But come spring, they won't be on their own. The Wildland Fire fuel management team will be watching them closely.

“Going forward, we are hoping to plant many more aspen around the communities in the years to come,” said Lapres. “We are very interested to see how aspen will grow in a variety of different stand types, including our fuel breaks that have been treated with prescribed burns.” 🔥

Wildland Fire's Prevention and Mitigation Unit planted 78,000 aspen saplings in 2022.

Photos by Haley Ritchie



Next generation maps: LiDAR scans forests in 3D

There are lots of angles to fuel management. LiDAR technology is helping us get a closer look below the boreal canopy.

LiDAR stands for Light Detection and Ranging. It's a high-tech scanning tool that uses lasers mounted on aircraft to map complete landscapes with a high level of detail.

Think of it as echolocation, but with light instead of sound. The LiDAR receiver sends a beam of light towards a target and measures the time for the reflected light to return. Together, these measurements create a three-dimensional model of their target that can then be viewed and analyzed on a computer.

LiDAR has all kinds of uses, from archaeology to automated vehicle navigation. Wildland Fire's Prevention and Mitigation Unit is using LiDAR data to map and assess forest fuel loading and fire exposure close to communities.

The level of detail in LiDAR mapping helps predict how a wildfire could act in a forested landscape – and how homes and businesses can be better protected.

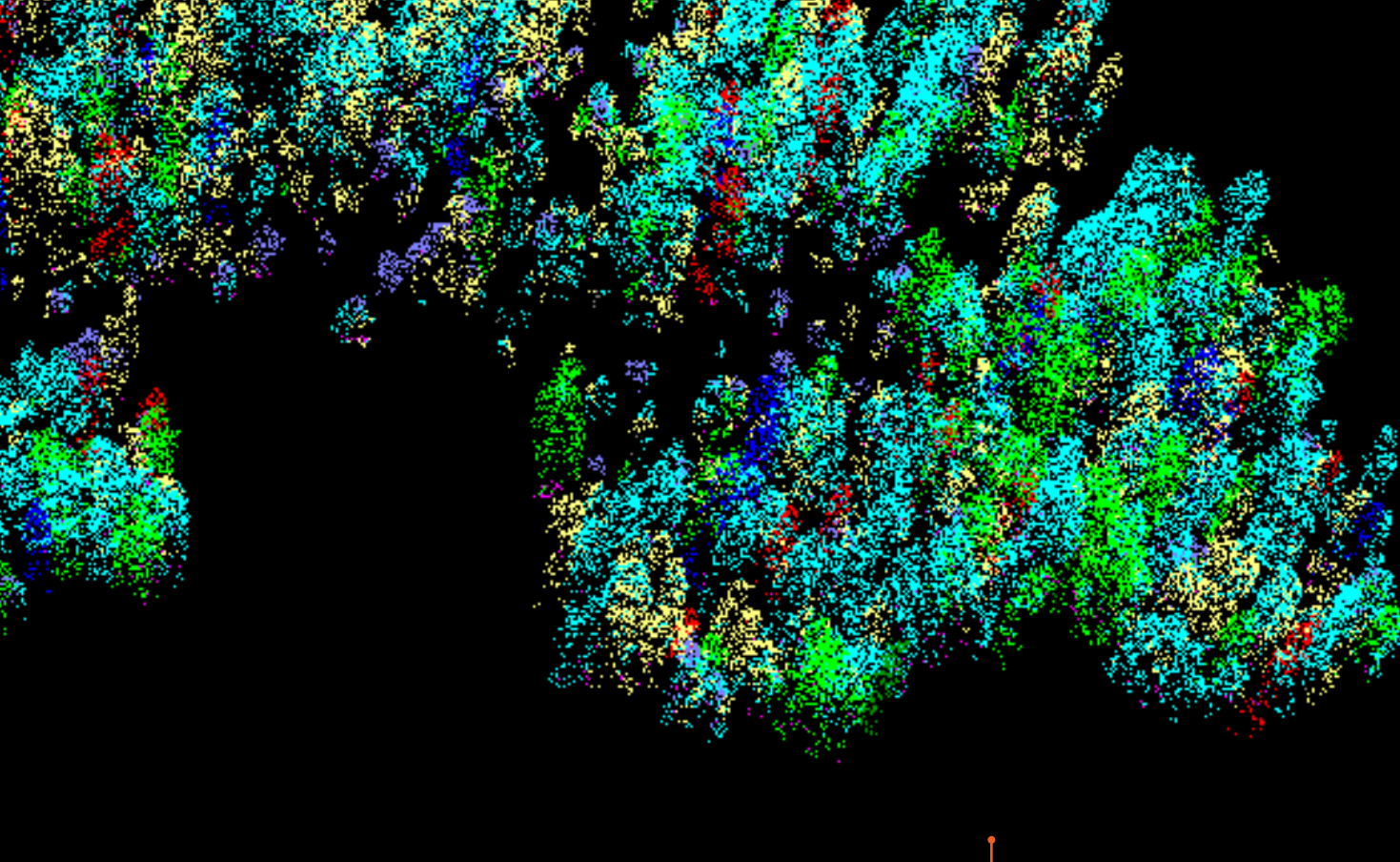
“With LiDAR, you end up with a sort of heat map of the forest, and you'll be able to see where fuel loading – or different fuel characteristics – stand out as being more problematic,” said Prevention and Mitigation Manager Luc Bibeau.

Traditionally, FireSmart maps are overhead satellite visuals of forests, and the canopy view allows stands to be loosely labeled among the Canadian Forest Fire Behaviour Prediction System's 16 fuel types.

LiDAR maps can be viewed from multiple directions – including a traditional overhead and a side profile. Unlike the human eye or an aerial photo, the lasers can “see” through the treetops – helping identify what kinds of fuel might be built up on the forest floor.

This awareness can help identify FireSmart project priorities, since a build-up of fuel close to the ground can promote intense fire growth.

“In the case of us going in and doing a FireSmart treatment, we'd be able to target parts of stands at a really surgical level, which is a fundamental shift from how things had been done in the past,” said Bibeau.



“You can say, ‘Inside of this particular stand, there’s a quarter-hectare area that either got missed, or wasn’t done as well, or is a different forest type. Maybe it needs a different prescription or revisit.’ It allows us to focus our efforts where they’re most effective. In a place with fewer resources, and a large landscape to protect, that becomes really important.”

LiDAR is a cutting-edge wildland fire management resource. In 2022, Wildland Fire worked with two companies specializing in forest and wildfire management, Ember Research Services Limited and Forsite, to analyze LiDAR scans of areas around Haines Junction that were commissioned by the Department of Highways and Public Works in 2014 and 2020.

In the future, LiDAR analysis will help Wildland Fire select project areas to make sure fuel management efforts and resources are applied where they are needed the most.

Right now, reliant on airplanes, the use of LiDAR mapping remains expensive. But Bibeau hopes, as the technology improves, Wildland Fire will be able to make wide use of it across the territory to support effective FireSmart work. 🔥

Imagery generated from LiDAR maps. Courtesy Forsite Consultants Ltd.

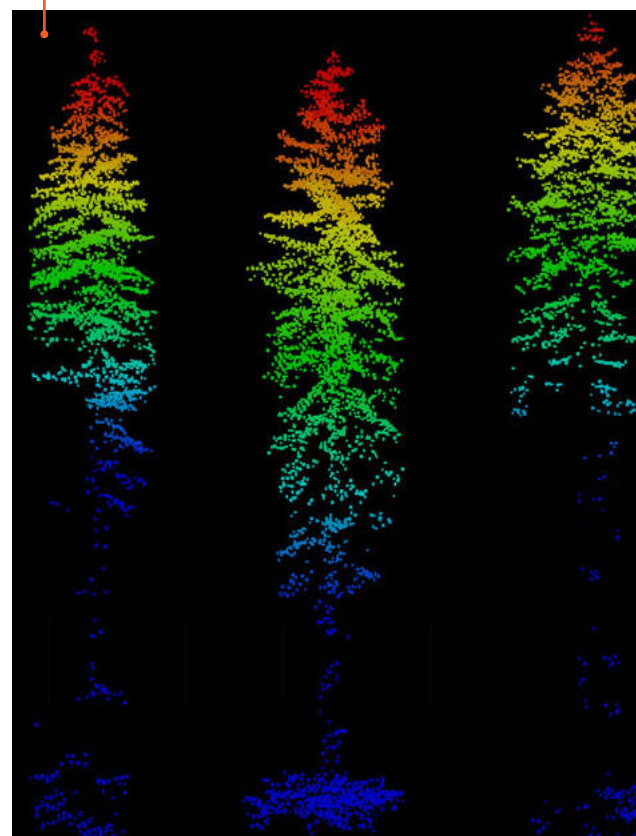






Photo contest winner

Wildland Fire Management's monthly photo contest encourages submissions from crewmembers, crew leaders and fire staff during the fire season. This year's overall first prize went to Berdoe crewmember Jesse Globensky for his smoky capture of Will Sternbergh and Joseph Powell working CA-027 above Stepping Stone.

Submitting a photo in 2023? Send your best pictures during the season to YukonFireInfo@yukon.ca with the subject "Photo contest submission" and your name, position, description of photo and date it was taken. Winners will be entered to win prizes and be credited in Fireline.

Runners-up

Below left

"Bucketing Ops" Darin Arthurs

Ironrust crewmember Darin Arthurs' photo of bucketing ops on MA-004.

Below right

"Northern Tutchone firefighters" Kissel Reid

Regional Finance and Administration Assistant Kissel Reid's photo of Northern Tutchone firefighters (L-R: Adam Gemmink, Jeff Rideout, Joaquin McWatters, Lee Barrett-Lennard) and some of the many, many pumps used during the July fires.





Yukon pilots new fire forecasting tool

Computers are changing the way fire behaviour analysts predict fire growth.

They said a computer could never beat a grandmaster at playing chess. But year after year, computers got better at predicting moves and choosing strategies, until software eventually won.

Wildfire experts won't need to worry about being replaced by robots anytime soon, but fire modeling software is offering second opinions at an unbeatable speed.

During the 2022 fire season Yukon Wildland Fire Management was one of the first agencies in Canada to operationally test FireCast, an automated wildfire predictive modeling software.

The program was developed by Alberta-based Heartland Software. Its calculations are powered by the open-source "Wildfire Intelligence Simulation Engine" of which the Government of the Northwest Territories is the custodian.

"Automation is the future of fire modelling. It takes the fire behaviour analysts away from mundane tasks such as the need to gather the data from various sources, then building a project to model, and instead lets them focus on what the models are telling them. This way, they can spend more time analysing and making the right decisions," said company president Dr. Robert Bryce.

"With climate change, we're seeing larger, bigger fires. So these tools are going to be important in that aspect as well," he added.

Predicting fire - with any automated software - isn't easy, according to Bryce. Fire is a force of nature with many variables. The company has not begun to capture suppression activities in the modeling either.

Heartland began development on the project during an incredibly busy fire season in 2021 when Bryce recognized a need to automate more of the fire prediction process. The software works off the Canadian Forest Fire Behaviour Prediction System, which was published in Canada in 1992 and is used by Fire Behaviour Analysts (FBANs) across Canada.

Analysts use a variety of tools to predict how a fire will behave and spread. But as soon as something changes, like the predicted weather, they need to redo the calculations.

"FireCast is very good at doing these calculations," said Senior Emergency Response Officer Kris Johnson, who has 37 years of experience as a fire analyst.

On June 18 FireCast modelled its first Yukon wildfire. Within ten minutes of the Grand Valley Fire's assessment by fire crews, the program provided a three-day fire growth prediction.

Using inputs like forecasted weather, the type of forest and terrain, FireCast produced 21 different possibilities for how the fire would spread.

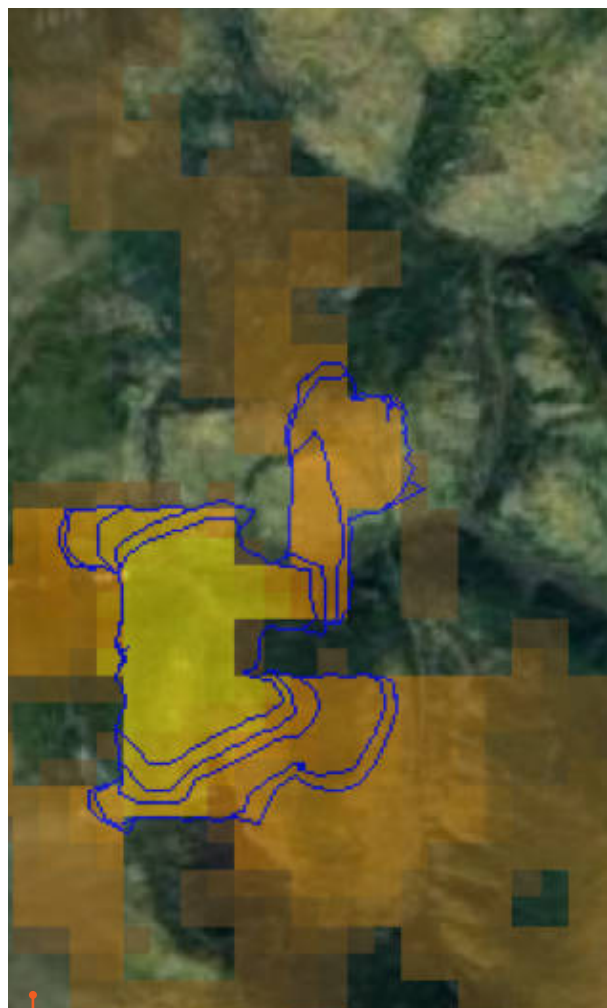
"Did FireCast get it right? No; but neither would an FBAN," said Johnson. "Looking at the outputs, it did pretty well. In some circumstances, the model predicted a dramatically larger fire. Not very likely - but still a possibility."

"These scenarios were tied to hotter, drier windy weather that never happened. Am I glad that they were included? Absolutely, as a duty officer I need to know both the best and worst case scenarios to make appropriate decisions. I would rather be proactive and have structure protection in place and not use it than to lose a cabin because most fire growth simulations said the fire would not reach it."

Like computers in the world of chess, automated real-time fire growth models will get keep getting better.

Johnson said there are some unique challenges with modelling fire in the Yukon. Weather stations are far apart, fuel type maps are approximations and extended daylight can skew fire behaviour predictions.

"We have to educate ourselves, and the public, about what the FireCast results mean - and do not mean. Sure, humans are better at analysing the environment, but the sheer brute strength of FireCast cannot be ignored. It can model over 900 wildfires 21 times, faster than an FBAN can complete one prediction. I am excited to see how this tool will be adopted operationally nationally," said Johnson. 🔥



Above

A screenshot from a FireCast report.

Opposite page

Senior Emergency Response Officer Kris Johnson.

Photo by Haley Ritchie



Documentary filmmakers turn the lens on Canadian fire lookouts

Where there's smoke, there's fire. And where there's a fire lookout, there's probably a good story.

That's what Whitehorse-based filmmaker Tova Krentzman discovered while working as a cook at a northern Alberta wildfire camp in 2019.

"They stayed in our camp for a few days or a week as they were heading out, so I got to meet and talk to them a lot," said Krentzman. "I was really fascinated by the different types of people they were and what they were doing. And the changes that the whole industry was going through in terms of lookout structures and technology."

Three years later, Krentzman and videographer Emily Sheff embarked on a summer project to interview as many fire lookouts as possible in the Yukon and Alberta for a documentary that considers wildfire, lookouts and the nature of isolation.

They travelled to meet four of the Yukon's six long-time lookouts Robert Stitt, Bobby Gage, Markus Lenzin and Brian McDonald. Other interview subjects included Alberta Wildfire staff and former lookouts from both jurisdictions.

"All of these people are so committed, they care so much. You know it kills them if they're not the first one to spot a smoke. They do take it seriously," said Krentzman.

It was also a busy fire season, which allowed the two women a behind-the-scenes look at wildland fire operations. They found themselves in the middle of the action as they traveled the smoky Klondike Highway during the Crystal Creek fire near Stewart Crossing and entered Clearwater County in Alberta in the midst of evacuation orders.

"It only exemplified the importance of lookouts and the entire fire detection and firefighting network," said Krentzman.

In the Yukon, that network includes a robust remote detection system that includes almost real-time satellite heat mapping and lightning detection devices. With the advent of smartphone technology, members of the public also actively share details about smoke columns.

While the summer has offered plenty of footage of fires and smoke, Krentzman said the film's subjects also reflect on isolation and distraction in a COVID-19 world.

"Lookouts are interesting in the sense that, in a world where people are not often comfortable being alone and must be endlessly distracted, these people have that unique quality. They're able to find reward and happiness in their own company and in nature. It's a different kind of connection that we often, in the modern world, distract ourselves from."

The film will also offer a glimpse into the larger world of wildland fire, beyond the most visible wildfire operations, and the way lookouts fit into the complex machine that manages wildfire and protects communities.

“Even though they're alone, they're part of the community in a way that the community doesn't even know about,” she said. “It's really the first line of protection. This is something I wanted to document before it's gone. But also, even while it continues to take place, it's such an amazing part of the network of fire detection and firefighting.”

“Many people don't realize what goes on to protect them. It's a really special world of people.”

Krentzman received grants for her film project from the Yukon Film Society and the Canada Council for the Arts. The documentary is planned for release in September 2023. 🍷

Dawson City fire lookout Markus Lenzin surveys the landscape through binoculars during the 2019 fire season.

Photo by Mike Fancie



2022 Wildfire Crews



Klondike

1. Taiga Crew

(L-R): Guy Couture, Carl Gaumond, Oliver Flagel

2. Eagle Crew

(L-R): Julia Staudt, Lulu Bartholomeus, Charles Antoine-Leblanc

3. White River Crew

(L-R): Alex Klubi, Aiden Kyikavichik and Eagle crew leader Lulu Bartholomeus

4. Tombstone Crew

(L-R): Brandon White, Maya Cairns-Locke, Cedric Borchert



Northern Tutchone

5. Group Photo

Office staff:
Brad Hoogland, Cate Taylor, Dave Trudeau, Kissel Reid, Randy Mitton

6. Firestone Crew

Firestone (L-R): Adam Leary, Lee Barrett-Lennard

7. Grey Hunter Crew

Greyhunter (L-R): Adam Gemmink, Joaquin McWatters, Devin Moses;
Bonus: Dora

8. Iron Rust Crew

Ironrust (L-R): Jeff Rideout, Ronan Hopkins, Darin Arthurs

Tatchun

1. Little Salmon Crew

(L-R): Jordan Vallevand,
James Snyder, Mikiaiah Ladue

2. Berdoe Crew

(L-R): Joseph Powell,
Jesse Globensky,
William Sternbergh

3. Pelly Crew

(L-R): Gavin Albert Joe,
Duran Simon,
Samual Christopherson



Shirley Domingo

Regional Finance and
Administration Assistant



Jeffrey Melnychuk

Ross River Regional
Protection Officer



Bobby Gage

Lookout

Yukon Fire Centre



(L-R) (1st row) Mark Hill, Carl Cibart, Shawn Kinsella, Mike Fancie (2nd row) Jeff Lister, Nicole Charbonneau, Lisa Walker, Jocelyn Thompson, Brent Stokes, Dan Baikie, Mike Smith, Haley Ritchie, Pat Howell, (3rd row) John Wright, Kris Johnson



Clint Wheeler

Carmacks Regional Protection Officer



Gerry Trudeau
Regional Protection Manager



Emmanuel Ribao
Regional Storeperson

Faces of WFM

1.

Airtanker personnel (L-R): Tom Hutchings, Chris Boland and Walter Nehring) photographed June 24, as one group was landing and the other leaving for a mission.

Photo by Ted MacDonald



2.

ERO Ted MacDonald working on a prescribed burn operation outside the Mary Lake subdivision.

Photo by Ted MacDonald



3.

Wildland Fire's Safety and Training Project Manager Hyder Bos-Jabbar left Whitehorse for Seattle on Aug. 11 to join firefighters in Washington as a safety officer trainee.

Photo by Haley Ritchie

4.

RPO Jim Kathrein enjoying some celebratory chicken after a successful prescribed burn operation.

Photo by Ted MacDonald



5



6



7



5. Manager of Program Delivery Mark Hill and Senior Emergency Response Officer Kris Johnson survey wildfire activity in the Watson Lake district.

6. Tombstone crew were well-equipped to deal with the bugs this year. From (L-R): Maya Cairns-Locke, Cedric Borchert and Brandon White.

7. Aisek crew (L-R: Sam Turcotte, Frank Parent and Ryan Dumkee) pose during an in-territory export to Watson Lake.

Photo by Clint Walker/
White Saddle Air

Photo by Brandon White

Photo by Kris Johnson



A massive column of smoke rises above the Klondike Highway during the Crystal Creek fire in early July.

Photo by Gerry Trudeau



READY FOR A WILD FIRE JOB?

Apply to become a wildland firefighter.
Learn more: Yukon.ca/wildfires

**Yukon**

