



Coastal Fire Centre

hot topics in *Wildfire on the Coast*

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Wildfire news

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This issue of *Wildfire News* focuses on the aircraft used by the BC Wildfire Service, such as fixed-wing and rotary-wing aircraft that assist with fire suppression efforts. Fixed-wing aircraft include “bird dogs”, airtankers and other types of planes. A bird dog is a small airplane carrying a pilot and a BC Wildfire Service air attack officer who directs the activities of airtankers. Rotary-wing aircraft include a variety of helicopters.

Airtankers are used to drop fire retardant, water or foam to help slow the growth of a wildfire or control the direction of its spread. (For more information about how airtankers and helicopters assist with fire suppression by dropping various substances onto wildfires, see Page 2.)

Helicopters and bird dogs assist in a variety of ways. For instance, they can serve as “eyes in the sky” on wildfires, which is important for a number of reasons. (For details, see Page 3.)

Helicopters are the most versatile type of aircraft used by the BC Wildfire Service. They can be used to:

- **transport crews**
 - *Where no road access exists, helicopters can transport Initial Attack Crews to new fires and Unit Crews to larger fires.
 - *Firefighting crews trained to do “hover-exits” can exit a helicopter while it is hovering just above ground level, if there is no suitable landing area.
 - *Rapattack crews can rappel out of helicopters on a rope to access fires in remote areas.
- **assist with transporting injured patients**
- **transport gear for firefighting crews**
 - *A helicopter pilot can attach a “longline” to the underside of a helicopter, to which a cargo net is attached. Crews can then load gear (that would otherwise be difficult to move) into the net so it can be transported to a new location
- **deliver water to crews**
 - *In addition to releasing water onto a wildfire from a “bucket” or a “belly tank” (see Page 6 for photos), helicopters can bring a water supply to a specific site for firefighting crews to use.
 - *A “stillwell” can be attached to a longline under a helicopter to deliver water to crews, who can extract the water from the stillwell with a pump and hose.
 - *Helicopters can also bucket water into “bladders” (large water containers) and then crews can extract that water with a pump and hose system.
- **assist with controlled burning operations**
- **provide a platform to carry out thermal imaging operations on a wildfire**
- **provide a platform to carry out GIS and GPS mapping operations on a wildfire**



Above: Stillwells filled with water.
Right: A helicopter bucket releasing water into a bladder.
Photos courtesy of Jon McCuaig



Water, fire retardant and water with an added surfactant

Helicopters and airtankers can drop water, fire retardant and what's sometimes referred to as "foam" (water with an added surfactant that allows the water to better penetrate forest fuels) to slow the spread of a wildfire. It's important to remember that helicopters and airtankers do not put out fires; rather, they are used to cool down fires and slow their spread. This supports the efforts of ground crews to contain them.

In order for a wildfire to ignite and burn, fuel (such as trees and other vegetation), oxygen (in the air) and heat (from lightning or human-caused sources) must all be present in sufficient amounts.

Fuel, oxygen and heat together form "the fire triangle". In order to extinguish a wildfire, one of the three sides of this triangle must be eliminated. Water, fire retardant, and water with an added surfactant work in different ways to target one or more sides of the fire triangle.



Water:

- Water works primarily by cooling down a fire. Helicopters can drop water on a fire from buckets or belly tanks. Airtankers can drop water on a fire from onboard tanks.
- Helicopters and amphibious airtankers can both replenish their water supplies without having to land. Airtankers can "scoop" up water while flying along the surface of a natural body of water, such

as a lake. Helicopters can collect water from much smaller bodies of water, since they can hover in place while a bucket is lowered into the water to refill it.

Fire retardant:

- Fire retardant contains chemical compounds that inhibit the combustion process. They contain ammonium salts, which affect the burning process of forest fuels.
- When flames come into contact with fire retardant, the resulting reaction releases a combination of water and carbon dioxide that cools and suffocates the fire.
- Retardants are essentially water-soluble, industrial-strength fertilizers. Their distinctive red colour allows fire crews and airtanker personnel to see where the retardant has landed.
- In the vast majority of cases, retardants are delivered to wildfires by airtankers. In certain circumstances, "mud pits" (pits filled with fire retardant) may be created to allow helicopters to load retardant into a bucket or belly tank.

Water with an added surfactant (sometimes referred to as "foam"):

- A surfactant is a compound that reduces the surface tension of water, allowing fuels to better absorb the water. Water with an added surfactant can be thought of as "wet water" (because of its increased wetting properties) and it can penetrate deeper into fuels.
- Both helicopters and airtankers can deliver water with an added surfactant to fires. They have supplies of the concentrated ingredients located within the bucket, belly tank or water tank of the aircraft.
- After the aircraft collects water from a natural body of water, the pilot can control how much concentrate is injected into that water. The concentrate mixes with the water while the aircraft is flying to create "wet water".

Aviation Resources: eyes in the sky

Helicopters and bird dog aircraft allow BC Wildfire Service crews get a birds-eye view of a particular fire, which is important for a number of reasons.

When an Initial Attack Crew is sent to a new wildfire, it may travel there either by truck or by helicopter. If the crew travels by helicopter, the crew members will be able to see the fire from the air — greatly improving their situational awareness. This can make their initial assessment of the fire much easier, particularly if the fire is large. Being dispatched by helicopter can also be advantageous for the crew because the helicopter may be able to remain at the fire to bucket water on it, if needed.

If the crew has been dispatched by truck and finds that the fire cannot be accurately assessed from the ground, the crew leader may request a reconnaissance flight. The crew leader may be sent a helicopter to conduct the reconnaissance flight or a bird dog aircraft may be dispatched. In the latter case, the Air Attack Officer flying in the bird dog will assess the fire, relay the information to the crew leader on the ground and help the crew develop a plan to fight the fire.

Initial assessments from the sky can be essential for large fires and for fires of any size that are complex in some way, such as those that do not have an obvious water source nearby. An aerial assessment allows the crew leader to see the whole fire at once, instead of having to walk through a potentially thick forest over a great distance, to get a better idea of the fire's perimeter. The level of fire activity (particularly at the head of the fire) may make an assessment of the entire perimeter from the ground unsafe and impractical.

Depending on the size and complexity of the fire, seeing it from the air can also be essential for planning how to fight it. The crew leader will be able to assess:

- whether any additional resources are required, either in the form of equipment or extra personnel
- whether there are bodies of water nearby from which they could pump water or a helicopter or

- whether there are any values (such as structures) or hazards (such as oil and gas operations) in the vicinity of the fire

Such a flight also gives crew members a better overview of the fuel types present in the area. They'll be able to see whether there's a risk that the fire will move into a fuel type that's different than where the fire is currently burning. A change in the fuel type is a concern for the crew, because it could prompt a change in fire behaviour.

Some fires that are accessible by road can still be extremely difficult to find. If the crew members have been dispatched by helicopter, they will take that opportunity to figure out road directions to the fire, which is much easier to do from the air than from the ground. This will allow additional crews or other resources, such as heavy equipment, to drive directly to the fire.

If Coastal Fire Centre staff determine that a new fire will need to be actioned by airtankers before a crew can get there, they will ask for an airtanker group to be dispatched. In that case, an Air Attack Officer flying in a bird dog would be the first person to get a good look at the new fire. The Air Attack Officer will update the fire centre on the fire's status and take photos to send back to the fire centre. A ground crew will also take photos during its initial fire assessment.



A bird dog aircraft

Eyes in the sky cont.

When there are sustained fire suppression actions on larger fires, it's not uncommon for a number of helicopters to be assigned to the fire. To ensure that the helicopters work safely and effectively in that area, a Helicopter Coordinator (HLCO) may be assigned to the fire. This BC Wildfire Service staff member is experienced in aviation activities and acts in much the same way as an Air Attack Officer does for airtankers. Directing the activities of helicopters from his or her own helicopter, the Helicopter Coordinator may also be designated as a lookout for crews working on the fire.

Designating a lookout person to watch for changes in fire activity that could potentially threaten crews is one of the steps the BC Wildfire Service takes to ensure that crews stay safe. A lookout is an experienced staff member who has a good vantage point, knows what to watch for and knows where trigger points are located.

Small and relatively straightforward fires often don't require "eyes in the sky", but large and complex fires almost always need to be viewed from above to develop an effective fire suppression plan.

NOTAMs vs. automatic restricted airspace

Some people may not realize that the airspace above a wildfire is considered to be part of the worksite during wildfire suppression activities. Firefighting aircraft need to be able to move freely without interference.

The airspace around a wildfire, even before firefighting resources arrive on site, is considered to be "flight restricted" under the authority of the Canadian Aviation Regulations (CAR 601.15) and is closed to all aircraft that are not directly involved in firefighting operations: "This covers the wildfire and any airspace within five nautical miles of the fire at an altitude of less than 3000 feet above ground level."

If additional airspace is required for the BC Wildfire Service to work safely and effectively, it may apply for a Notice to Airmen (NOTAM). The NOTAM system was officially adopted in 1947. A NOTAM is filed with an aviation authority to alert personnel to "the establishment, condition or change in any aeronautical facility, service, procedure or hazard en route or at a specific location." A NOTAM is issued when normal air traffic is in danger or if air traffic in the area could potentially endanger personnel working on wildfire suppression.

Aerial Patrolling 100 Years Ago



On September 4, 1918, the first airplane to patrol for forest fires in the province was commissioned from Hoffar Brothers of Vancouver by the British Columbia Forest Branch. The flying boat was designed by the Curtiss Aircraft Company and built for the price of \$8,000.

The maiden flight was piloted by Lieut. V.A. Bishop, a resident of Vancouver who was on leave from his duties as a flight instructor in England.

Unfortunately, the plane plunged from a height of over 450 metres and crashed into a house in West Vancouver just half an hour into its first run. As a result, airplanes were not used to patrol for wildfires until 1920. - Research by John Parminter

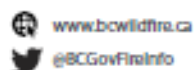


WE CAN'T FLY.

When you fly a UAV or drone near or over a **#BCwildfire**, you're breaking the law and endangering firefighting personnel.

The restricted airspace includes a radius of five nautical miles around the fire and to an altitude of 3,000 feet above ground level. Transport Canada and the BC Wildfire Service explicitly prohibit the use of UAVs or drones of any size near a wildfire.

Learn more: www.tc.gc.ca/SafetyFirst



www.bcwildfire.ca

@BCGovFireInfo



BC Forest Fire Info



ProvinceofBC



Ministry of
Forests, Lands and
Natural Resource Operations



From top to bottom, left to right: An air tanker dropping retardant on a wildfire; a helicopter ‘bucketing’ water onto a wildfire; a type of air tanker commonly referred to as a ‘skimmer’ dropping water on a fire; a net loaded with gear that can be attached to a longline beneath the helicopter and transported.

Skimmers and helicopters can refill from natural bodies of water whereas air tankers like those shown in the top left photo have to land at a tanker base to be refilled with retardant.

This video shows crews practicing hover exiting and helicopters bucketing: <https://www.youtube.com/watch?v=F8B-1rF9MKI>

To watch a video about air tankers that includes air tankers dropping retardant on fires, click on the following link: https://www.youtube.com/watch?v=ZYBj_54hHL4

Prince George Fire Centre Parattack



Photo credit: <https://smokejumper.ca>

This article appeared in the Prince George Fire Centre's most recent newsletter and is courtesy of smokejumper.ca. If you want to learn more about the Parattack program click the link above.

The concept of delivering personnel to wildfire by parachute grew out of the need to reduce the length of time required to adequately mobilize resources to wildfire, thereby reducing the cost associated with fighting wildfire. The United States Forest Service considered smoke jumping as early as the mid 1930's. Foresters in the American northwest had begun successfully free-dropping equipment and food to ground crews from fixed-wing aircraft. Progressive thinking foresters soon envisioned dropping highly trained parachutists from these fast moving, long-range planes.

Smokejumping proved so successful that soon all areas of the continental United States employed smokejumpers as their primary initial-attack resource. The quick response time, large payload, low cost and impressive safety record of fixed wing aircraft has ensured that smokejumping remains the dominant initial attack resource in the United States.

Canadian firefighting authorities were also confronted with limited funding, large distances and very fast moving fires. In 1949, Canada's first smokejumping base was founded in La Ronge, Saskatchewan.

Between 1967 and the early 90's, smokejumping programs in Canada were very intermittent. Smokejumping was introduced to the North West Territories in 1974 by contract crews where it operated for only three years. In 1984, a smokejumping base was created in the Yukon where it operated for 12 years.

In BC, the Parattack program has been in operation since 1998. The program began in Smithers and moved to the Fort St. John in 2000. The North Peace Smokejumping program has expanded over the past five years and now includes three smokejumping crews based out of Mackenzie, BC.

The Fire Call

Forest fires started by lightning or by human activity are a common occurrence in Northern BC. Fire calls occur at anytime during the daylight hours, between the months of April and October. The initial fire report can be made by members of the public, industry, or patrol planes. Crews are deployed in three-person teams, with a maximum of two crews per Twin Otter load and four crews per a DC-3 load. Once deployed on a fire, the crews are self sustainable with water food and fuel for a 48 hour period. The fire size and location will determine the amount of time a crew will stay out on a fire. Camping overnight on a fire is part of the Parattack experience and allows for the work to begin at daylight and end at sundown. Extraction from the fire can be done by two methods:

1. Pick up by a helicopter, or,
2. "Pack-out" where all crew members hike out to a road or access point for vehicle pickup.



Photo credit: <https://smokejumper.ca>



Photo credit: <https://smokejumper.ca>

The DC-3 was first signed on as a second jumpship in 2013. The DC-3, dubbed Jumpship 1, can hold 12 jumpers and all their gear. It is also very rugged and can take off and land on dirt or grass runways.

Aircraft

A DeHavilland Twin Otter aircraft, known as Jumpship 2, can support six smokejumpers and a command spotter. The DeHavilland DHC-6 Twin Otter is a Canadian STOL (Short Takeoff & Landing) Aircraft.



Photo credit: <https://smokejumper.ca>

Parachute

The FS-14 Parachute is a product of 50 plus years of forest service canopy innovation. It is a parabolic, single porosity, steerable round canopy with 18" anti-inversion netting extending from its lower lateral band. A reserve parachute is worn on the chest of the jumper in case of a malfunction in the main parachute.



Photo credit: <https://smokejumper.ca>



Photo credit: <https://smokejumper.ca>

Parachute Loft

The parachute loft is an area of the NPSB where parachutes are hung to dry, inspected, repaired, and re-packed. Certification is required for those involved in these processes and training continues throughout the season. Strict policies are also implemented to ensure the safety and lasting dependability of the parachutes.

Para Cargo

Jumpers are responsible for maintaining and packing all the gear required to work on a fire. Water pumps, hose, chainsaws, sleeping gear, food and water are all carefully packed in bags with protective armour. These bags are clipped to cargo parachutes and dropped from the plane after jumpers have landed.



Photo credit: <https://smokejumper.ca>

Fires to Date

Total **144**

Lightning **54**

Person **87**

Number of fires since last Newsletter (July 20)

Total **48**

Lightning **26**

Person **22**

Fire Danger Rating today



Current Prohibitions (within BCWS jurisdictional area)

All open fires, including campfires, Category 2 and Category 3 open fires, as well as a number of other activities including the use of fireworks, are prohibited throughout the Coastal Fire Centre with the exception of Haida Gwaii and the Fog Zone, where campfires and some other activities are allowed. For full details, visit gov.bc.ca/wildfirebans

Wildfire news

Coastal Fire Centre

About Coastal (August 3, 2018)

Provincially, August is off to a busy start due to widespread lightning that has sparked many new wildfires. On Wednesday, August 1 alone, 171 new wildfires started. Since April 1, 2018, the BC Wildfire Service has responded to 1,323 wildfires and 452 are currently active. There have also been a number of new lightning-caused fires in the Coastal Fire Centre in the past week, mainly in remote areas.

As we head into the B.C. Day long weekend, the BC Wildfire Service is asking the public to do everything they can to prevent wildfires and to help firefighters and staff get their job done.

"The men and women of the BC Wildfire Service are working long hours in sometimes very difficult conditions, so I'm asking everyone to do their part to prevent wildfires and not add to their workload," said Doug Donaldson, Minister of Forests, Lands, Natural Resource Operations and Rural Development. "Be careful

when you're out in the backcountry. Follow the rules and avoid any activities that could start a wildfire."

The month of August is generally the most active part of B.C.'s wildfire season. Human-caused fires are preventable and unnecessarily divert crucial firefighting resources from naturally occurring wildfires.

Although temperatures here on the coast have decreased and we have experienced some cloudy days, the fire danger rating remains high to extreme in many areas because there has been

very little rain. Please continue to report anything you see (*5555 or 1-800-663-5555) and respect the prohibitions in place.



Weather-issued August 3, 11:30 am

SYNOPSIS: (Today-tomorrow) The marine cloud layer moved in again last night but at times is already showing signs of clearing. Certainly over Vancouver Island as about a third of the area is breaking. The mainland valleys did show a few breaks earlier but the clouds have thickened again. A slightly stronger and more active frontal band has crossed Haida Gwaii but only allowed a spit or two of rain and is now dissipating along the outer Mid-coast. A second much more active front now lies just west of Haida Gwaii and will bring periods of rain and moderate to strong winds there by late afternoon. This approaching system is not forecast to drift any further inland this evening that the eastern border of Tweedsmuir Park and then largely dissipates along the outer coast overnight. In the meantime an upper ridge pattern grows stronger today and tomorrow over southern zones helping to clear the clouds later today. Some marine layers invade again tonight but

likely clear quite quickly Saturday morning. Only limited instability expected this afternoon (and that mostly east of the mountains) with a chance of a brief light shower most zones and then a slightly more unstable band drifts across eastern sections on Saturday with a risk of isolated thunderstorms, especially Whistler and east or southeast. However, the pressure gradient tightens today with inflow winds increasing to 20 to 25 km/h. Winds ease overnight and as the pressure gradient slackens tomorrow the winds will not be as strong.

OUTLOOK: (Sunday-Tuesday) The ridge grows stronger each day with warming temperatures and falling humidities. By Tuesday afternoon high reach the 28 to 30 degree mark for the warmer interior valley locations while relative humidity falls to around 20 percent.