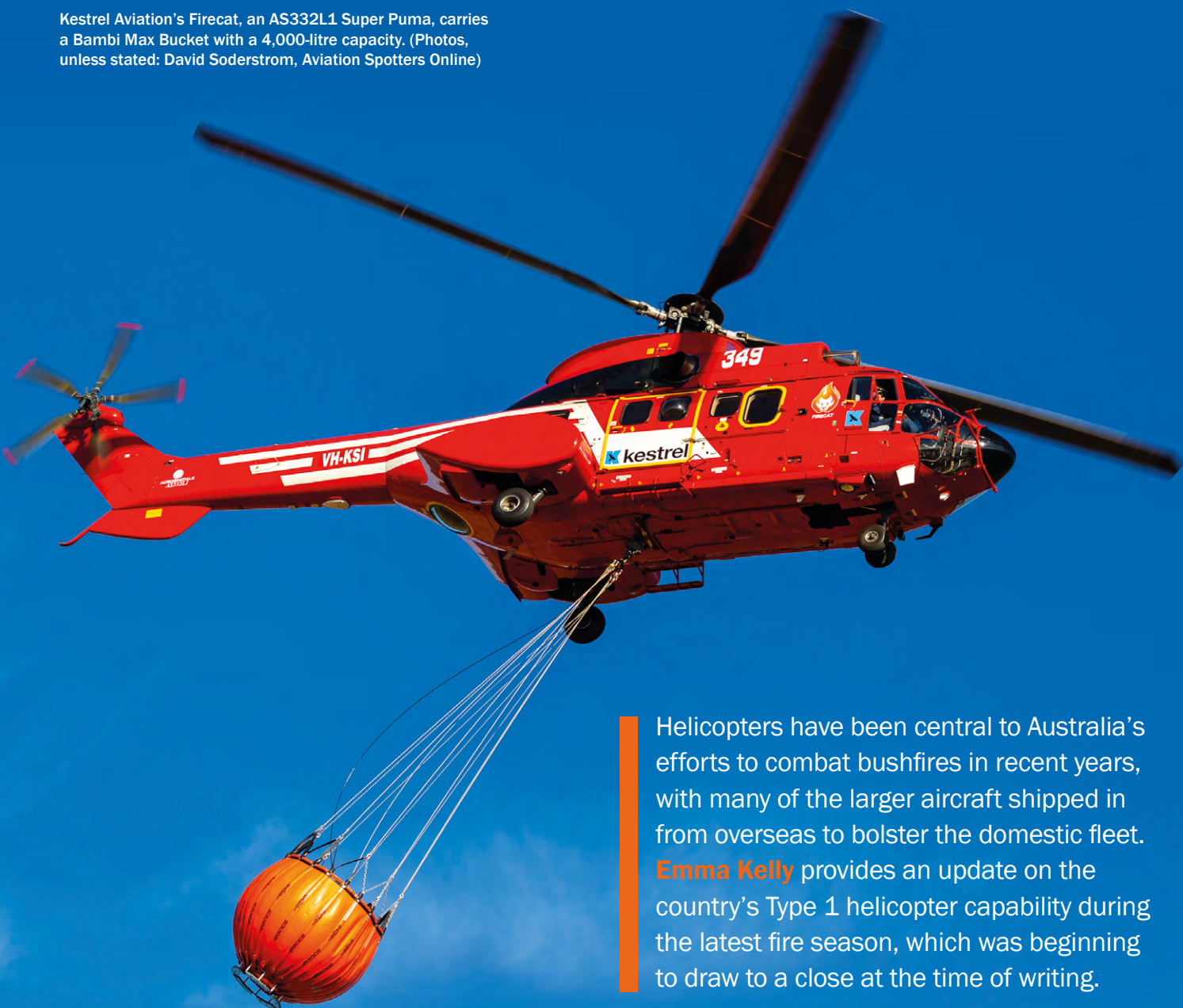


SENDING IN THE BIG GUNS

Kestrel Aviation's Firecat, an AS332L1 Super Puma, carries a Bambi Max Bucket with a 4,000-litre capacity. (Photos, unless stated: David Soderstrom, Aviation Spotters Online)



Helicopters have been central to Australia's efforts to combat bushfires in recent years, with many of the larger aircraft shipped in from overseas to bolster the domestic fleet. **Emma Kelly** provides an update on the country's Type 1 helicopter capability during the latest fire season, which was beginning to draw to a close at the time of writing.

The orange Erickson S-64 Air Cranes with their cute monikers of Elvis, Georgia Peach, Gypsy Lady, Jerry, Delilah and Marty are familiar sights and sounds across Australia in the summer months as they battle bushfires. This year, however, there are an increasing number of new kids on the block, with Type 1 helicopters including Boeing CH-47 Chinooks, an Airbus AS332L1 Super Puma and more Sikorsky UH-60A Black Hawks than ever before joining the rotary-wing army Australia is using to save lives, wildlife, property and ecosystems.

Australian states and territories manage their own aerial firefighting fleets, comprising leased and owned aircraft, while a national fleet is managed by the National Aerial Firefighting Centre (NAFC). The NAFC aircraft are allotted to each state and territory, but available to move to other parts of the country when needed. Additional aircraft are contracted under a call-when-needed (CWN) or casual hire arrangement.

This year, the NAFC's fleet comprises almost 150 fixed- and rotary-wing aircraft, including more than 80 helicopters, while states and territories have also bolstered their arsenals. The NAFC has contracted more Type 1 fire-bombing helicopters than ever before, including two CH-47Ds, a single Super Puma, five Black Hawks, an Erickson S-64F Air Crane (called Bubba) and a Sikorsky S-61.

Heavy hitters

At the top end of the scale, Coulson Aviation Australia is operating the largest-volume firefighting helicopters in the country in the form of two CH-47D Chinooks – with a massive 11,000-litre capacity – based in Victoria and New South Wales (NSW). In addition, it has a 4,000-litre-capacity S-61, which has previously seen several years of successful service in Australia.

The Chinooks are contracted through the NAFC for a three-year period, which can be extended by a further two under a typical three-plus-one-plus-one contract. One CH-47D is based at RAAF Base Richmond in NSW and the second at Essendon Fields Airport in Victoria. This is the first time a tank-equipped CH-47D has been used in the country, says the operator. A bucket-equipped CH-47D was contracted on a CWN basis for Victoria several years ago.



Coulson Aviation has been contracted by the NAFC to provide two CH-47D Chinooks for at least three years.

“The CH-47Ds have an approximately 11,000-litre-capacity internal fire-bombing tank, with an approximate range of 530 km and an operational endurance of 2.2 hours, depending on the fire weather conditions,” says Coulson. The helicopters are fitted with Coulson's RADS-L Retardant Aerial Delivery System, an internal tank system with controllable doors that can disperse the desired quantity of firefighting fluids at a constant flow rate through the belly of the aircraft.

“The system is capable of delivering discrete quantities of fire retardant or water, depending on the duration that the doors are activated open. The tank can be filled either by ground filling or by a retractable snorkel system designed to allow for rapid refilling while the helicopter is in hover,” explains Coulson. The touchscreen control system provides the flight crew with flexibility when setting up each drop.

At the time of writing, thankfully, the CH-47Ds have seen limited fire action. The Victorian aircraft has been operational, including responding to a grassfire in Clarkefield, north of Melbourne, in January. During a 60-minute flight, which included the time taken to get to and from the incident, the helicopter dropped 75,000 litres, Coulson reports. The NSW-based CH-47D has been repositioned several times

from RAAF Richmond to Wagga Wagga during extreme fire weather conditions.

Also operating in the east of the country is the Super Puma, which is owned, maintained and operated by local company Kestrel Aviation. Known as Firecat, the Ballarat, Victoria-based helicopter is the first Australian-registered Super Puma to be contracted for the fire season in the country, says Justin Charlesworth, Kestrel's general manager. The aircraft is contracted by the NAFC for operation in Victoria under a three-plus-one-plus-one arrangement.

Firecat carries a Bambi Max Powerfill bucket with a capacity of 4,000 litres, and has a range of 546 nm, flight endurance of over four hours and a cruise speed of 130 kt. The Super Puma is a welcome addition to the firefighting fleet, according to Charlesworth. It has been deployed to some fires, and Kestrel has received good feedback on its performance, he reports.

Adaptable asset

The Super Puma was formerly operated by the Tokyo Fire and Disaster Management Agency and features a multi-role configuration. It is air transport certified, with seating for 19 passengers, and is equipped for winching and rappelling.

“It's a game changer over here [in Australia],” says Charlesworth. “Its ability to carry passengers opens up a whole new ▶

capability for agencies.” Outside of the fire season, there will be lots of opportunities for the helicopter, he notes, pointing to its 4,500 kg external cargo lift capacity.

Since it entered the sector in the mid-1990s, Kestrel has been a pioneer in Australia when it comes to aerial firefighting, in terms of both the types of helicopters it has deployed and their operation. From 2013, it has worked with Erickson, bringing the S-64 to Australia, New Zealand and the Pacific. Over the years, up to six Air Cranes have operated in Australia.

This year, Kestrel is contracted to operate just one, Bubba, an S-64F featuring a glass cockpit, composite main rotor blades and a 10,000-litre capacity with a water/retardant tank or a 7,600-litre capacity with a bucket. The company also has several Bell medium types on firefighting duty, based in Victoria and NSW.

Kestrel’s fleet also includes two Black Hawks under a joint venture with US-based Firehawk Helicopters, one of which is currently in the US. Kestrel operated one Black Hawk in Queensland during the 2019-20 season.

This year, Black Hawks are operating across the country, with the NAFC contracting five of the type for the entire summer. Two are based in South Australia (SA), owned and operated by Aerotech; a further two are in Western Australia (WA), arranged and operated by United Aero



Bubba has been the only Erickson S-64 Air Crane helicopter performing firefighting duties in Australia during the latest fire season.

Helicopters; while a single machine, operated by Touchdown Helicopters, is based in NSW. All five are equipped with the FT4500 underbelly fire suppression tank from Australian company Helitak, following US Federal Aviation Administration approval for the tank on the Black Hawk.

The owner of the SA helicopters, Aerotech, is a local operator based at Parafield Airport on the outskirts of Adelaide. It purchased the ex-US Army and National Guard Black Hawks in response to Australia’s worsening bushfire situation and calls after the devastating 2019-20 fire season for a sovereign fleet to reduce the reliance on overseas-based aircraft.

“They are the only VH-registered Black Hawk helicopters in Australia and have no affiliation or commitments to overseas firefighting contracts. Hence, they are very much a sovereign capability,” explains Chris Boyd, Aerotech’s chief pilot and commercial manager.

Robust and reliable

As well as being the first Black Hawks operated by Aerotech, they are also its first Type 1 helicopters, with the company operating 11 helicopters – AS350s, EC130s, Bell 206s and EC135s – as well as 18 fixed-wing aircraft. Its Black Hawks are contracted to the NAFC and SA’s Country Fire Service for at least three years under three-plus-one-plus-one agreements that secure their use for 84 days each year.

Outside of the fire season, Aerotech will utilise the helicopters for aerial crane operations, taking advantage of the type’s 3.6-tonne external load capacity for infrastructure and construction projects.

Aerotech believes the Black Hawks are a game changer for aerial firefighting in Australia. “The characteristics of the aircraft make them especially suited,” notes Boyd.

“Even though they are large, multi-engine helicopters, they are relatively simple and very robust, which is necessary for this work. They were originally engineered for a hostile environment that needs reliability and redundancy, which is exactly what we require too.” Additionally, they can be operated for long periods away from their base with minimal support or maintenance compared to other large helicopters.

READINESS RECOMMENDATIONS

Australia has reassessed its bushfire response since the devastating fires of 2019-20, which burnt more than 24 million hectares in eastern Australia, resulting in the loss of 33 lives, the destruction of over 3,000 homes and the death or displacement of nearly three billion animals.

The subsequent royal commission made a raft of recommendations designed to improve the country’s response, including aerial firefighting. The 2019-20 bushfire season placed an extreme strain on the shared aerial fleet and also exposed the danger of Australia relying on overseas-based aircraft as fire seasons in the northern and southern hemispheres become

more severe and longer, causing them to overlap.

“This warrants a reassessment of Australia’s current reliance on overseas-based aviation services and a focus on developing its sovereign aerial firefighting capability,” stated the commission.

It recommended the development of an Australian-based and registered national aerial firefighting capability, including a “modest” fleet of large/very large air tankers and Type 1 helicopters; ongoing research and evaluation to assess the capability needs of states and territories, and to explore the most effective strategies; and the adoption of measures to support the development of the Australian aerial firefighting industry.



A joint venture with US-based Firehawk Helicopters has meant that Kestrel has been able to add the Black Hawk to the aircraft types in its fleet.

With Helitak's FT4500 tank system, the Black Hawks can refill via a snorkel in just 35 seconds, but they can also be reconfigured to operate with a Bambi Bucket. "The tank capacity is 4,500 litres – however, realistically, the aircraft will carry up to about 4,000 litres maximum to

remain within maximum weight limitations," explains Boyd.

Aerotech has eight Black Hawk pilots on staff over the fire season and has taken on three experienced engineers, with more technicians due to come on board during the winter to help with heavy maintenance.

Boyd says the aircraft can be airborne within a couple of minutes as they are prepared each morning for rapid dispatch, including all pre-flight checks. Once airborne, they have a flying time of between two and two and a half hours and a range of around 300 nm.

"While it has been a quiet fire season so far in South Australia, the Black Hawks performed impressively during the recent fire at Mount Gambier," reports Boyd. "With a close water source, they were excellent at delivering large volumes of water quickly into the hilly and densely vegetated terrain. Even though this fire was outside of the normal areas that the Black Hawks operate in, they can ferry at high speeds – 135 kt – to assist other regions."

In contrast, the west of the country has experienced one of its hottest summers on record, with high temperatures, and often high winds, meaning the two Black Hawks based in WA have been put to good use across the vast state – the largest single fire jurisdiction in the world at 2.5 million ►




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square kilometres – since they arrived late last year.

By late February, with the fire season not yet over, the Black Hawks had already attended 22 incidents, flying for a combined 128 hours and delivering 734 drops totalling 3.3 million litres of fire suppressant, according to the WA Department of Fire and Emergency Services (DFES).

WA's Black Hawks have been supplied by United Aero Helicopters and are working for DFES through to April each year under a three-plus-one-plus-one contract, says Sam Borg, United Aero's chief pilot. One of the aircraft, ex-US Army, is owned by United Aero, while the second is the result of a partnership with New Zealand operator Kahu. Each helicopter has five pilots and three engineers based in WA.

The two Black Hawks operate from Serpentine Airfield to the south of state capital Perth. They are equipped with the 4,500-litre Helitak belly tank, although they can also use a 3,400-litre Bambi Bucket on a 150 ft line, and can be deployed in as little as five minutes with a two-hour operational window.

Rapid response

The Black Hawks have been a welcome addition to WA's 37-strong fixed- and rotary-wing firefighting fleet. They are the only Type 1 helicopters operating in WA this season and have "integrated seamlessly into the state's aerial firefighting fleet", according to Gary Gifford, assistant commissioner operations capability for DFES. "The Black Hawks have added increased flexibility to DFES's aerial fleet with their ability to drop large volumes of water, retardant and foam in areas often inaccessible to firefighting units on the ground," he states.

"One of the Black Hawks' greatest strengths – their rapid flying speeds – has meant that they have been able to respond quickly to regional fires, including incidents in Denmark, Bridgetown and Narrogin," says Gifford, who notes that ground crews have provided excellent feedback about their effectiveness and agility.

The Black Hawks are new to WA, but not to United Aero. "We have had the Black Hawk on our AOC for the past three years, since the 2019-20 fire season, but due to quiet years since, this is the first season ►

LEVERAGING LOCAL TECHNOLOGY

Queensland-based Helitak Fire Fighting Equipment has designed retractable, underbelly tanks for many helicopter types. At the time of writing, one for the Super Puma is going through the flight testing and approval process in the United States.

The company's operations manager, Paul Blundell, says Helitak fire tanks are already available for 29 different helicopter types, including the Airbus H125/AS350 Squirrel, Bell 412, Bell 212, Bell 214ST, Kawasaki BK117 and Black Hawk. The five Black Hawks operating under contract with the NAFC in Australia this season all feature the

FT4500 tank, while Squirrels, 212s, 412s and BK117s operating in the country are also fitted with Helitak tanks.

Following the Super Puma, next off the rank will be a tank for the Sikorsky S-92. Helitak has also completed new designs for the Bell 429, Leonardo AW139 and Chinook, but Blundell says these will only proceed with customer commitments, while talks are under way with a potential joint-venture partner for the Chinook tank.

The Helitak Fire Tank is the product of more than a decade of research and development, and that work will continue. "We're constantly looking at innovations and improvements," notes Blundell.

Helitak's FT4500 tank in action. (Photo: Helitak)



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Aerotech's Black Hawks previously belonged to the US military. (Photo: Aerotech)

we have been able to bring them into Australia and work them," explains Borg. United Aero's firefighting operations cover the country, with a fleet of Bell 412s, Kawasaki BK117s, AS350 Squirrels and a Bell 206L3 Long Ranger operating in NSW, SA, the Australian Capital Territory and the Northern Territory.

The Type 1 helicopters could also see action at night. Over the last three years,

night-time fire suppression trials have been conducted in Victoria and NSW by Coulson and Kestrel.

Coulson has received approval from Australia's Civil Aviation Safety Authority (CASA) to conduct NVG operations in Australia using the CH-47D, with the NSW and Victorian fire authorities. The company previously operated NVG-equipped S-61 helitankers in Victoria's night fire

suppression trials and has considerable experience operating the CH-47D and S-61 at night in North America. Both of the Chinooks in Australia were contracted to fly day and night in the California basin region during the northern hemisphere fire season and were successfully deployed numerous times after dark, according to Coulson.

Meanwhile, late last year, Kestrel received CASA approval to conduct unrestricted night fire suppression without the need for a supervising aircraft, with the Super Puma included in that approval.

Both Aerotech and United Aero say they are prepared to seek approval for night operations for their Black Hawks when required by fire agencies, with the ex-US military machines utilised for NVIS operations in their former lives.

"They are not currently certified for night firefighting, but are capable of being equipped for these types of operations," says United Aero's Borg. "We plan to develop this capability with the fire agencies where it is required." ■

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