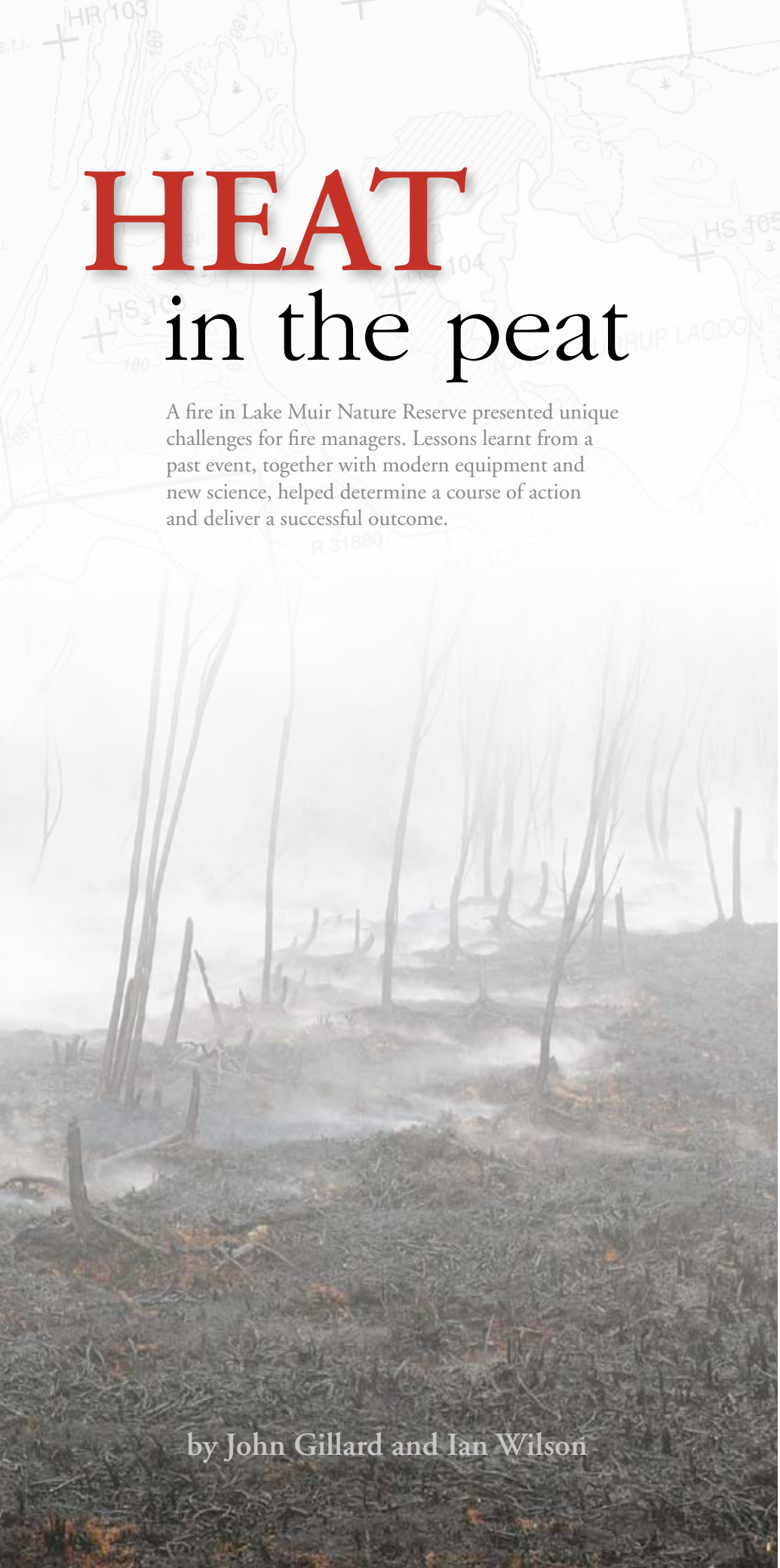
HEAT in the peat

A fire in Lake Muir Nature Reserve presented unique challenges for fire managers. Lessons learnt from a past event, together with modern equipment and new science, helped determine a course of action and deliver a successful outcome.



by John Gillard and Ian Wilson

On 5 October 1987 fire escaped from private property and burnt through 300ha of Tordit-Gurrup Lagoon within Lake Muir Nature Reserve on the State's south coast. Even though the lagoon was under water at the time, dry rushes over the water surface carried the fire. Initial attempts to extinguish it were unsuccessful due to wet conditions and an inability to safely access the area. Officers from the then Department of Conservation and Land Management (CALM) examined a number of ways to stop the fire spreading and prevent it from burning through extensive areas of peat during the upcoming summer months. These methods included constructing a trench by machines or by hand, installing a sprinkler system or burning out a much larger area that would control the fire but not prevent the peat burning. Then, on 25 February 1988, 30 CALM employees began constructing 3km of trench by hand, under very arduous conditions. The trench worked and the fire was successfully controlled.

HISTORY REPEATS

Fast forward to 4 November 2013, when thunderstorms in the Lake Muir area resulted in a lightning-caused fire in the reed bed within Tordit-Gurrup Lagoon. The ignition point was in an inaccessible part of the wetland and, once again, conventional bushfire suppression techniques were not suitable. Parks and Wildlife crews used fixed-wing aircraft and helicopters to drop water to stop the initial fire and contain it to the peatland, while on the ground heavy earthmoving equipment was deployed to prepare firebreaks around Tordit-Gurrup Lagoon. These firebreaks would link to Lake Muir in case the burning peatland could not be extinguished.

While the water bombers had contained the fire, the next challenge was to extinguish the burning peat or, at least, safely control it for the summer. After much discussion among senior Parks and Wildlife fire managers, and after a review of the techniques used in the 1987 fire, it was decided that mini excavators would be used to construct a trench down to the watertable along the fire edge. This would contain the fire within the trench line and

give fire managers the best opportunity for controlling it. Two mini excavators were sourced from local contractors and the trenching work began.

PUTTING A PLAN INTO ACTION

To avoid the heavy equipment sinking into the peat, it was necessary to lay marine plywood sheets on the ground for the machinery to drive on. Moving the sheets to keep pace with the trenching work was a very strenuous task but one managed well by local Parks and Wildlife staff.

More than meets the eye

Tordit-Gurrup Lagoon and Lake Muir are part of the internationally significant 'Muir-Byenup system' Ramsar-listed wetland. The area has a variety of values, including old-growth jarrah forest; a high diversity of native plants and animals (including 10 threatened flora and 14 threatened fauna species); Aboriginal sites of mythological, ceremonial, cultural and spiritual significance; sites associated with early European settlement and the agricultural and forestry industries; and visitor facilities at the Lake Muir Observatory. The 10,630ha Muir-Byenup wetland is located within Lake Muir Nature Reserve and was listed under the Convention on Wetlands of International Importance especially as waterfowl habitat (also known as the Ramsar Convention) in January 2001.

What is peat?

Peat is made up of decaying vegetation and has a high carbon content that makes it susceptible to ignition by bushfires when it is dry. Peat occurs in wetlands throughout Western Australia, and the seasonal nature of our climate means that most peat deposits are dry for a period each year. Peat fires can be ignited by lightning, accidental causes and by bushfires burning in adjacent dryland vegetation. Once ignited, peat fires can smoulder for months – well after the initial fire front has passed. In some parts of the world, peat has smouldered (sometimes undetected) for months, years, and even decades.

As peat burns it releases carbon monoxide and organic gases that can be very odorous and unpleasant. Smoke from peat fires can also cause health issues in people who are predisposed to respiratory issues. Fire managers carry out monitoring of peat fires to avoid any flare-ups but, where the fire is close to residential areas, air quality monitoring is also carried out.

Once the trench was complete there was still a section along the southern boundary of the fire in stands of *Melaleuca* paperbarks and fringing jarrah vegetation that continued to smoulder and contained areas of burning peat. These pockets were close to the containment line so posed a serious risk to the integrity of the fire boundary. Parks and Wildlife staff were deployed each day to 'wet down' these areas and extinguish the burning peat using water they accessed from a waterhole that was constructed adjacent to the fire boundary. They continued this until 21 November. The department also engaged a local farmer to supply and install an irrigation system with a travelling irrigator that was connected to the waterhole to flood the areas of smouldering and burning peat during December 2013. The irrigator worked for several days and was successful in extinguishing the burning peat.

WASH-UP

This successful fire suppression effort relied on the collaboration of 40 firefighters from Parks and Wildlife, local volunteer bushfire bridges and the Forest Products Commission as well as input from local landowners and contractors. Twelve fire trucks, two earthmoving machines, two mini excavators, as well as two fixed-wing aircraft and one helicopter were involved in the operations. The management of this incident used modern, sophisticated technology and new knowledge in fire-related science. However, just as important were the lessons learnt from the fire that occurred in the area in 1987. The effective work carried out by crews almost 26 years before was crucial in determining the course of action for the recent event, showing that history has a place in our future management. The result: the fire was contained to 80ha and was declared safe on 15 January 2014, 73 days after it started.

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Main Smouldering peat during the 2013 fire.

Above left Marine plywood sheets were placed over the peat for the machinery to drive on.
Photos – Peter Bamess/Parks and Wildlife

Above The peatlands of Lake Muir.
Photo – Marie Lochman

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