Fires, karst damage and cave management discussions at Yarrangobilly

Andy Spate and John Brush

A. Bushfire - a very effective means of removing unsightly rillenkarren from your limestone!

"A" above was the subject line of an e-mail that John sent to me a few days ago after a visit to Yarrangobilly. The image he attached is fabulous, showing what fire can do to surficial karst forms (Figure 1). Figure 2 shows some undamaged rillenkarren at Yarrangobilly. It was taken in a different part of the area and it is not known how well that site survived the recent fire.

I have previously written about fire and karst in both ANDYSEZ 44 and 45, and karren in 57. And elsewhere in our Journal about fire impacts. There is also a piece in Helictite - accessible from the ASF website (Holland E, 1994, The Effects of Fire on Soluble Rock Landscapes, Helictite, 32(1)3-90).

The fire must be 'hot' to start calcining (turning limestone to lime) - more than 600° C.

But over to John now for comments on his visit to Yarrangobilly (**Parts B and C**).

Figure 1 (above) Rillenkarren damage in the West Deep Creek area caused by the January 2020 bushfire.

Figure 2 Below) Rillenkarren near Jillabenan Cave. Photo taken in 2013. It is not known how this site fared in the January 2020 bushfire.

B. Cave cleaning and maintenance at Yarrangobilly

Cave cleaning and Maintenance, that was the title of a brief article I had proposed to do for the Journal. I had envisaged a few words on cave cleaning accompanied by lots of photos of Yarrangobilly staff wielding scrubbing brushes, spray bottles and tweezers (used for lint picking). However, such is the nature of life in this COVID-19 world, that things do not always turn out as planned.

At the end of May 2020, I spent two days in the Yarrangobilly area, along with other members of the Kosciuszko Speleological Reference Group (KSRG). The KSRG is an advisory group for identifying, assessing and managing cave and karst issues across the seven (or eight, depending how you count them) karst areas in the Kosciuszko National Park. Complications arising from the January bushfires and COVID-19 restrictions meant that a normal meeting was not feasible. Instead, Bernadette Zanet (Yarrangobilly Caves Supervisor) and I discussed the possibility of convening a socially-distanced workshop and demonstration of cave-cleaning and maintenance techniques for Yarrangobilly staff.

Bernadette saw benefits in improving the knowledge and understanding of staff, especially among recent recruits, and in expanding and formalising the current cave-cleaning activities, a large part of which has been a personal initiative of the remarkable Regina Roach.

At the time of writing, Yarrangobilly remains closed to the public, but some staff are rostered on each day to service Caves House, which has been fully occupied by workers associated with the Snowy 2.0 project, so there were already a few staff in the area. In addition, Bernadette juggled rosters to maximise staff participation in the workshop. As a result, it was a sizeable group that assembled outside the Yarrangobilly Visitor Centre for the initial discussions. Later in the day, the group continued discussions in appropriately spacious areas around and in South Glory and Jersey Caves.

It soon became clear that Yarrangobilly staff are passionate about the area; are very observant in their caves; and have a thirst for information on cave and karst issues and management strategies that extended well beyond mere cleaning and maintenance activities in caves. It also became apparent that some of the sites we had initially identified as being suitable for demonstrations were not large enough to accommodate the whole group safely at the one time. As a result, progress through the caves - and the intended program - was slower than anticipated. This meant there was less scrubbing, water spraying and lint picking than intended.

The intensity of the discussions also meant that nobody (including me!) remembered to pull out a camera and take a photo or two. Despite there being a lesser focus than envisaged on demonstrations of cleaning techniques, I believe the wide-ranging discussions addressed an apparent need and were beneficial in expanding the knowledge base of staff.

The following day, we were able to continue the discussions in a more informal manner during a walk through an area burnt in the January 2020 fire.

C. A walk across the blackened Yarrangobilly Karst

The primary purpose of the walk was to provide KSRG members with an opportunity for examining the impacts on the caves, the karst and the vegetative cover of the January 2020 fire, which essentially burnt the whole of the Yarrangobilly karst area. It appears only a few small patches escaped.

As the Yarrangobilly area remains closed to the public, I acknowledge the assistance of NPWS in permitting KSRG members to visit the area. Obviously, there would have been advantages in visiting much earlier in the year, but that was not possible given public safety concerns and the COVID-19 travel restrictions.

On the walk, our party went from the Snowy Mountains Highway down to the Yarrangobilly River and back in an area some three to four kilometres north of the show caves area towards West Deep Creek Cave and beyond. Most of the area we covered was previously burnt, to a greater or lesser extent, during the fires in January 2003 and, before that, in 1966. Just two weeks after the January 2003 fire, Andy and I (and also Jess Spate and Marjorie Coggan) did a similar walk and photos taken at the time provided a useful basis for comparison. Even though the recent KSRG visit was nearly six months after the January 2020 fire and the bush (including blackberries!) was starting to bounce back, it possible to make some observations about the intensity and extent of the two fires - and the severity of damage inflicted on the limestone surface.

In 2003, a series of dry lightning strikes resulted in a string of fires in mountainous country extending from the Victorian Alps to well north of Canberra. In the Yarrangobilly area, which had remained unburnt for nearly 40 years, the fire was at its hottest in the Yarrangobilly Gorge area, in the show caves area and around Yarrangobilly village. However, much of the limestone, as well as the adjoining catchment areas to the east, was only lightly burnt. Some of this was due to low-intensity back-burning operations supervised by Andy and carried out by NSW RFS volunteers.

This time around, the fire was more widespread, and the bush appears to have been more evenly burnt than in 2003. The unburnt and very lightly burnt areas are smaller and less common than in the previous fire. On the other hand, I came away with the impression that the severity of the fire in the show cave area and along parts of the Yarrangobilly River Gorge was lower than in 2003. That said, there have been significant impacts on some exposed limestone surfaces, especially where the rock was in close proximity to fallen logs that burnt. Large areas of outcrop are now white-coloured (Figure 3), resulting from obliteration of lichen and algae and by calcination. Where the heat was intense, rock fracturing and spalling is common (Figure 4). As noted above, the spalling has damaged surficial features, most notably rillenkarren.

Looking on the bright side, the temporary absence of undergrowth makes for easy walking and for finding or relocating natural and cultural features. Indeed, on our walk we came across several cave entrances, two mine shafts, the foundations of a hut near one of the mines, several artefacts associated with the mining and the remains of an old weir. The weir was used for karst hydrology studies by Dr Joe Jennings and was constructed in early 1975 by a team of volunteers that included both Andy and me. Even though I had passed very close to the site a number of times over the last decade or so, I had not noticed the weir through the thick undergrowth and had long assumed the weir and associated gabions had been removed. Perhaps it is now a good time to tidy up the site?

Once the Yarrangobilly karst reopens for public access, most likely sometime in spring, there will be a window of opportunity for easy surface investigations before the bush once again closes in. It will be a busy summer.

Figure 3 (above) Regina Roach in an area of fire-damaged limestone

Figure 4 (below) Heavy spalling in close proximity to a burnt log.