

Popularly visited caves can often have badly muddied spots in specific areas regularly used for a 'hand hold' whether using gloves or not. Sometimes surface contact is unavoidable; for support one can use an elbow, or just one gloved finger or the back of your gloved hand. Gloves that are well muddied can be washed if a pool is available and suitable.

For some cave visits, carrying a spare pair of gloves would be good practice. Obviously contact with cave surfaces occurs often whilst climbing, however one should always consider the impact and try to minimise this. My Karstcare volunteers spend countless hours cleaning up visitor impacts in both show caves and 'wild' caves.

Wearing gloves also aids in keeping your hands clean when expecting to use photographic equipment and protects your hands from rough surfaces. Perhaps, on a single day trip, this protection may not be thought important – however, on a multi-day expedition, gloves would be considered essential! Gloves also offer some protection from insect bites: there are some very nasty mites and fleas in caves regularly habited by animals (e.g. those in Western Australia's Kimberly region).

#### **Choice of gloves**

Cotton and other natural materials often shed lint, so are not considered suitable for use in a cave environment. Latex gloves are often thin, easily torn and very sweaty – again not very suitable. Latex gloves are often based on natural rubber that can shed proteins which can provide an unwanted nutrient source for cave biota. Some also have powders to help with sweating, another extraneous material that can be deposited in a cave. (Hildreth-Werker V & J 2006 )

Generally leather gloves and many synthetic materials are more robust, shed less material and protect hands well, particularly when using ropes and climbing tapes. In very wet environments, I have observed that many cavers wear a long sleeve plastic coated glove. I find these seem to develop holes and tears too readily and I am un-

sure how well the plastic coating lasts not to shed into the cave environment.

I have found 'riggers gloves' made from pig skin to be reasonably durable but harden uncomfortably if dried too quickly. The market is flooded with a huge variety of modern 'working gloves', some specialised to certain activities like 'anti-vibration' for chainsaw use and some coated with harder wearing materials. Many of these I find very suitable for caving; it is a matter of trying out several brands to see if they will be comfortable even when wet and that they are adequately durable to justify the cost.

I go through about six pairs of gloves a year: working with tools or chainsaws and going caving, but that's a small price to pay to both protect cave surfaces and my hands.

I have observed many cave guides, during their initial presentation to their clients, hand around a 'sacrificial' speleothem to visitors to satisfy their need to touch something. I believe this is good practice as it gives the guide an opportunity to educate as to why cave surfaces should not be touched.

Just as we currently often judge past practices as being poor regarding cave conservation, so too will we be judged poorly in the future.

I predict sometime in the future show cave managers will insist on some method of de-linting or clothes covering, shoe cleaning, hair nets and gloves. We must protect cave environments for future generations. Our tiny impact to the cave environment on each caving trip may not be much, however multiplied by many more cave visitors over many years results in outcomes such as that shown in photo 1.

#### **Reference**

1. <https://www.ncbi.nlm.nih.gov/pubmed/1848930>

**Hildreth-Werker V & J** 2006 Cave Conservation and Restoration. 433-435

## **Tau Caves of Fiji**

### **Kent Henderson**

In February 2020, my wife Rasyll and I undertook a 14 day cruise to Noumea, Vanuatu and Fiji – none of which we had visited before. Happily, we got back to Melbourne before the coronavirus really hit...

In Fiji, whilst berthed at Lautoka, I took a full day tour to the Fiji Zip Line and Tau Cave, which proved to be both very energetic and fascinating!

The limestone caves in Fiji have long been interwoven with Fijian culture. According to an article in the Fiji Times, the Oho ('occupied') Cave, near Tau village, was one of the first Fijian settlements – dating back 4000 years. In 'pre-European contact' times, tribal warfare was common – I had heard that Fijians were cannibals. The cave offered a secure, defensible site – where women and children could hide as necessary. It even came equipped with bats that were useful as an early-warning sign when intruders were approaching the cave. As the times became more peaceful, the Tau people moved their village out of the cave but, until modern times, the villagers maintained it as a 'refuge cave'.

Carbon dating of recent archaeological finds has indicated that Tau was one of the first places humans settled when they arrived in Fiji and clearly the cave would have made a great home for people newly arrived.

A view of Pacific islands as havens for karst does not immediately spring to mind and, indeed, the vast majority of the islands I visited, particularly Fiji, are volcanic in origin. The karst that does exist is largely situated at the 'top of mountains' forced up through volcanic uplift - and this is the case with the Tau caves located high in a mountainous area.

The principal tourist attraction is not, in fact, the caves but the zip line. There are 16 concurrent zip lines up to the cave and back. On the way up, significant rising stairways (a total of over 1000 steps) join the end of one zip line to the start of the next. The whole trip is not for the faint-hearted! The youngest in my 'group' was a 6 year old. Reputedly, the oldest to have done it was a 94 year old woman. I have to say that, after a few 'zips', one quickly gets the hang of it. That said, everyone was very glad to get to the top. Incidentally, the whole tour (including lunch back at the bottom) takes about 4 hours.



Zip line gear greets you at the entrance to the site

So, to the cave itself... There are three chambers in fact - all linked, of course. The Main Cave is huge - one of the largest in the South Pacific. Our guide explained that 'three Boeing 747 jets could fit inside' - an exaggeration, but... Main Cave has a huge chamber with a roof collapse, allowing considerable light in. The chamber is approximately 100 metres deep and 220 metres wide. The last Zip Line coming up the mountain finishes just outside the cave entrance; whence the group enters the spacious entrance area. There is talk of the Zip Line company developing zip lines inside the cave in the future. Oh dear...

One can do a separate tour just to the cave/s, involving proper caving - their *Abseil Tour*.

There is another leg of the cave that goes deep underground and, apparently, features expansive speleothem areas. Aside from a significant bat colony in the cave, it is also the repository of thousands of Swiftlet nests in the cave ceiling.

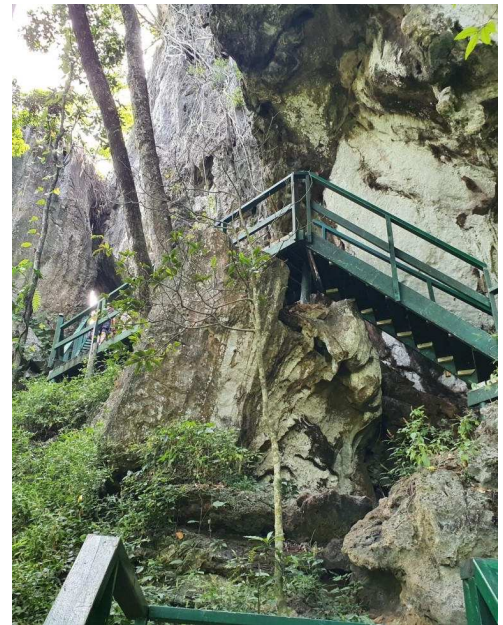
Three species of microbats are assumed to use the caves -- the Fijian Blossom Bat (*Notopterus macdonaldi*) - listed as vulnerable (Fiji represents the global population of this species); the Pacific Sheath-tail Bat (*Emballonura semicaudata*) - listed as critically endangered; and the Fijian Free-tailed Bat (*Tadarida bregullae*) - listed as endangered. Bat monitoring is intermittent, at best.

There is another cave/chamber just below the main cave. This Lower Cave (30 metres from top to bottom) is much smaller and round in shape. It too has a central 'skylight'. Below the Lower Cave is the third cave/chamber - Secret Cave. It is actually more of a cave passage, and is filled with speleothems. The Secret Cave leads into Hidden Valley; a section that apparently hasn't been fully explored but has at least six other chambers leading off it.

### Management?

The infrastructure for the Zip Line (all wooden construction) and safety equipment is first rate and the guides clearly are highly trained. The infrastructure took over a year to complete with tours starting in 2008. The idea of zip lines in the caves themselves is of concern, particularly given the extra bat disturbance this would involve. However, there are no immediate plans, it would seem.

So, I would most certainly recommend the experience; it is a great deal of fun - with interesting karst scenery and a cave at the end! But it is not cheap. The Zip Line Tour is currently \$245 per person and the Abseil Tour inside the caves is \$165 per person. Full details are at: <http://www.zip-fiji.com/>



Walkway constructed through the karst leading to the cave entrance (above)

Zip line platform with tie-off post and zip line in the centre (below)

