

SHOW CAVES of HAWAII

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Hawaii is renowned for its luxury resorts, huge surf, Macadamia nuts (a Hawaiian native, or so many locals would have you believe) and volcanic eruptions but it is not widely known for caves. However, as any self-respecting speleo could tell you, Hawaii has many note-worthy caves, including the longest, deepest, and arguably the most spectacular and colourful lava caves in the world. And also some of the youngest.

The Hawaiian Islands are essentially volcanic and formed as the Pacific tectonic plate moved in a northwesterly direction over a mantle hot spot. This is an upwelling of superheated molten rock from the mantle that is expressed at the surface as volcanic eruptions. The result is a chain of islands that become successively younger to the southeast and it is on the two youngest islands - Maui and Hawaii (the "Big Island") that most of the lava caves, effectively drained lava flows, can be found.

Although many lava caves are known, mostly on the Big Island, only a handful are accessible to the general public, usually as commercial show or adventure caves but there are also a few well-known public access caves. These are noted below. It is not an exhaustive list but was believed to be complete at the time of writing. In February 2016, Marjorie and I had an opportunity to experience most of these caves while visiting Hawaii for a meeting and symposium of the IUS (International Union of Speleology) Commission on Volcanic Caves.

For the sake of completeness, I have also included details of a cave that has formed in aeolian calcarenite (dune limestone) on Kauai, which is one of the oldest islands in the Hawaiian chain.

The Big Island (Hawaii)

Kula Kai Caverns

Kula Kai Caverns is the only 'conventional' show cave operation on the island - conventional in the sense that guided tours along formed paths are offered into sections of the cave that have been lit. Several off-trail adventure trips for which light, helmets, knee pads and gloves are provided are also available. Tour prices range from \$US20 for the 30 minute on-trail tour to \$US60-95 for the adventure trips. All tours must be pre-booked, partly because the cave is located within a gated housing development in the Ocean View area of southwestern Hawaii and an access code is required for entry onto the estate. For more information, see: www.kulakaicaverns.com

The Kula Kai operation is owned by Ric Elhard and Rose Herrera (who helped organise the recent Vulcanospeleology symposium) and day to day operations are managed by Gary Gura.



Marjorie at the end of the show cave route (and the starting point for adventure tours) in Kula Kai Caverns.



Admiring the roof along the adventure tour route in Kula Kai Caverns, part of the extensive Kipuka Kanohina system.

Kula Kai is part of the huge Kipuka Kanohina system, a complex system of interconnected passages (think in terms of braided streams) that are believed to be about 1000 years old. With more than 45 km of passage on multiple levels, it is the second longest lava cave system, and one of the most complex, in the world. The Kanohina system was the major focus for field trips during the 2016 symposium. Marjorie and I did two trips into the Kula Kai part of the system: a self-guided trip along the formed pathways and an extensive off-trail through trip led by Ric Elhard that included some of the route used on his adventure trips. So while we did not experience the commercial tours as such, we did get a taste of what they offered.

Depending on what is required for easy passage, the show cave pathways are surfaced with fine scoria, concrete or lava blocks. Timber is used for a short ladder to an upper level section, for two viewing platforms and for handrails in the odd place that requires them. The ISCA guidelines now frown on the use of wood in caves, but the local Ohi'a timbers used in the cave do not seem out of place as roots of Ohi'a trees occur naturally throughout the system. The lighting is simple but aesthetic and while we thought the path lighting was a bit dim in a couple of places, necessitating the use of our caving lights, we were told that on normal tours it is fine as the pace is slower and so visitors' eyes have time to adjust.

The adventure route heads off across a rough a'a lava floor from the end of the upper level branch of the formed trail. In fact, much of the adventure route involves walking, scrambling or



Are we lost? A map is handy for showing visitors exactly where they are in the complex Kula Kai system.

crawling along a'a lava or across loose breakdown. Put simply, it is not cave for those who have ankle problems or who forgot to pack their knee pads or gloves (both of which are thoughtfully provided on the adventure trips). Along the way, the relatively short sections of smooth/ pahoe-hoe floor are a welcome change. White and cream-coloured secondary mineralisation (calcite or gypsum) and bacterial colonies are common and do much to brighten up what would otherwise be very dark passages. The off-trail route is in excellent condition and there are few signs of previous visitation, apart from trespassing notices - presumably along the line of a surface property boundary, a few faint footpad marks on smooth floors, survey markers and artefacts. The artefacts include charcoal fragments and triangular rock arrangements that were used to support gourds for collecting drip water, indicating the caves were an important source of water to indigenous inhabitants in a very dry part of the island.



Rough walking across an a'a lava floor in Kula Kai Caverns.



Marjorie and a large lava ball in Kula Kai. Lava balls are stranded lumps of rock that were carried along in a lava stream and now 'welded' into place.



Typical passage section, Kazumura Cave, Pit Room trip – note the “tide-marks” or lava benches along the walls.

Ric is very concerned about protecting his cave and was careful to steer visitors away from sensitive features. He also gave us a lot of information about the cave and its pre-European history. The cave is well worth a visit, especially for a longer trip if time and circumstances permit.

Kazumura Cave

For those who would like to experience the world’s longest lava cave, several adventure trip options are available. The statistics for Kazumura Cave are impressive. It has over 65 km of passage and has an elevation difference of 1100m, making not only the longest, but also the deepest lava cave in the world and the deepest cave in the USA. The straight line distance between its highest (most westerly) point and the lower end near the east coast of Hawaii is a staggering 32 km. It reputedly has more than 40 entrances and underlies more than 100 separate properties – much of the cave is beneath low density residential subdivisions. During the vulcanospeleology symposium, field trips were offered into a section near the upper end and to passages in a section towards the lower end. However, some of us also signed up for commercial ‘adventure’ trips operated by Harry Shick. Harry has been running trips into a central section of the cave for about 20 years and estimates that over that time he has guided about 7000 people through the 500 year old cave.

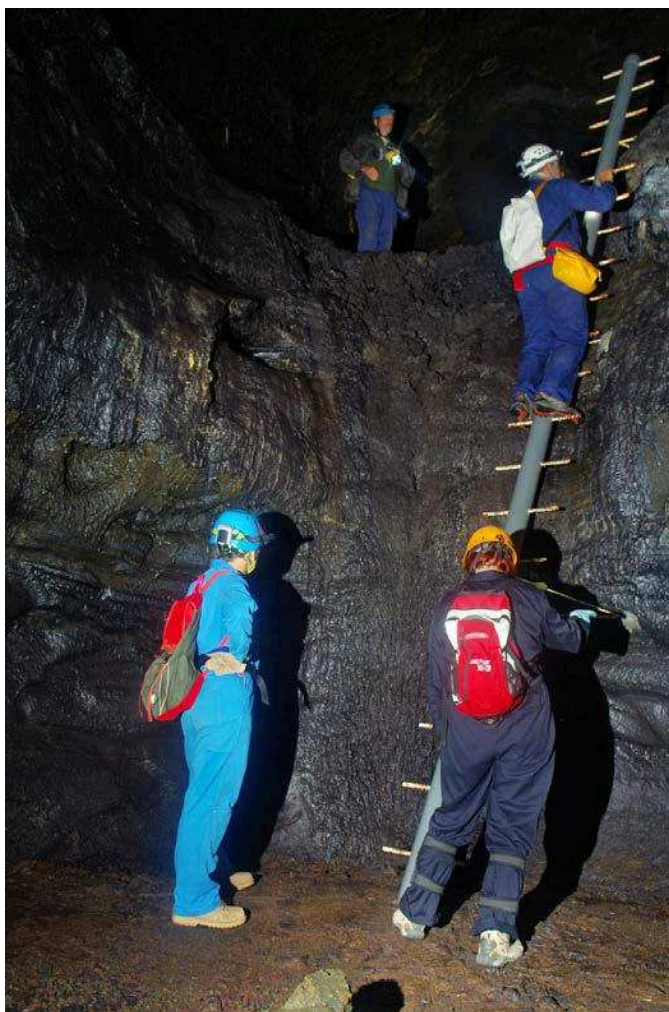
Harry offers 3 trips: an easy 2 hour trip to a set of lava falls; a longer 4 hour “Pit Room” trip that progresses further up-slope (mauka, to use the Hawaiian term) and involves more scrambling and climbing; and a 6 hour “Maze” trip in the opposite (down-slope or makai) direction and for which (your own) SRT gear is required. Prices are \$US30 for the short trip, \$US50 for the Pit Room and \$US75 for the SRT trip. The

nominal party size limit is 6 for the 2 shorter trips and 4 for the Maze trip. However, Harry will allow a slightly larger party size if group members know each other and/ or are experienced cavers. For further details see: www.kazumuracave.com.

Before entering the cave for the Pit Room trip, Harry briefed our group (Dirk Stoffels, Lilly Petrovic, Matt and Niki from England and Marjorie and me) and ensured that we were suitably equipped with helmets, lights and gloves. As we were all cavers, we had our own equipment, but Harry normally provides these things. He also made sure we had sturdy, enclosed footwear and were wearing long pants or overalls.



At the Pit Room, end point of the Kazumura 4 hour adventure trip.



Climbing one of Harry's home-made ladders at a set of falls on the Pit Room trip, Kazumura Cave.

All Harry's trips enter and leave Kazumura Cave through an entrance in his backyard. A strategically placed toilet provides the last opportunity for a comfort stop before descending into the cave on a series of rigid, home-made ladders. Each ladder comprises a single length of thick-walled PVC pipe, drilled to accept lengths of re-bar for rungs, filled with concrete for added strength and to hold the rungs in place, and then bolted to the cave wall. After a short ladder at the entrance pitch, there is a short section of upper level passage and then a drop of about 8m on 2 separate ladders to the floor level of the main passage.

For the next couple of hours, it was easy walking along smooth lava floors in a spacious passage, interspersed with several climbs up lava falls and cascades and over a couple of breakdown piles. Harry has installed ladders on all the falls and where necessary, has handlines on the cascades. The pace was quite leisurely and there was plenty of time to take photos, admire the lava features and also view all the cave biology, most of which was pointed out by Harry - he certainly has a good eye for cave bugs. There was also ample time to listen to some of Harry's philosophies on cave formation and the like.

The turn-around point of our trip was the Pit Room, an enlarged section of passage at the base of a lava fall about 6 m high. The widened passage and a plunge pool are erosional features resulting from turbulent flow of lava as it plunged over the falls, much in the same manner as would happen with a waterfall. Later on in the cave formation process, when the flow of lava declined and temperatures started to fall, the lava pool crusted over and subsequently, when it lost the support of molten lava



Clusters of fine roots in Kazumura Cave.

below, the crust collapsed to form a shallow circular pit, hence the name Pit Room. On the walls and roof above the falls, spray - or more correctly lava spatter - has created a dense forest of lava stalactites. A most spectacular place to end our mauka journey.

The 1.5 km return trip to the entrance was faster, but still not unduly hurried. Harry was still eager to point out things of interest and was very particular about ensuring we kept within the marked trail - he uses flagging tape (which looks to be due for replacement) to mark off sensitive or delicate areas. He was also most insistent that we never touched any rock surface with bare hands to avoid contaminating the cave.

Two days later, Dirk and I returned to Harry's to do the 6 hour Maze trip. It was a 90 minute drive from where we were staying in the Ocean View area and we arrived about 45 minutes early. No problem, and as nobody else had booked to do the trip, Harry was happy to head into the cave as soon as we were ready.

At the base of the entrance ladders we turned left and headed makai. Around the corner we were rather surprised to find a large concrete tank almost blocking the passage. The tank had a sealed corrugated iron top and there was a vertical PVC pipe leading into it from the cave roof. We were even more surprised to learn that this was Harry's septic tank. It seems that when the family home was being built, an excavator digging a pit for the septic system broke through into the cave. As the bottom of the pit was suddenly about 15m down, the builder decided to



Dirk picking his way along a brightly coloured section of Kazumura - note the wide lava benches, partly collapsed along the walls.



Negotiating a low section of the main passage, Kazumura Cave.

construct a tank on the cave floor. We did not care to ask where the treated waste water went. There was no return pipe to the surface that we could see and fortunately, there was no odour. This arrangement was somewhat at odds with the 'tread-softly' approach to the cave that Harry espouses. This is not to criticise Harry specifically, but it does highlight the challenge of maintaining a pristine environment in cave that underlies non-sewered residential areas. Avoid drinking any drip water, is the simple message.



Dirk and Harry on the collapsed crust of a plunge pool (or lava lake) below Eureka Falls, Kazumura Cave.

Moving swiftly along, it was easy going in the main passage. There are some small breakdown areas and a couple of short vertical climbs but mostly it was a casual amble on relatively smooth lava floors. At every cluster of tree roots we stopped to look for invertebrates such as tiny blind, white fantail bugs that were fairly easy to spot once we knew what we were looking for.

Much of this section of Kazumura is very dark (black, grey, deep brown rock), but some sections are a bright rust-red colour – usually on the lower walls and floor. The red colour is usually just a thin skin and indicates the presence of Haematite, reflecting a different oxidation state of the iron compounds as the lava cooled.

After a short stooping section, the passage opened out and then dropped over the 11 metre high Eureka Falls. At the base there was a 16-17m wide plunge pool, or as some call it, a collapsed lava lake – reminding me of a favourite story of rangers in the nearby Hawaiian Volcanoes National Park. Some of their public lectures include reference to Kazumura and its lava lakes, occasionally prompting questions about whether it is possible to snorkel in the lava lakes. "Only if you had been there 500 years ago and had a very thick asbestos wet suit" is the response rangers wished they were able to give.

From the base of the falls we continued makai to the top of the spectacular Red Column Falls then retraced our steps back to a point where we could climb into an upper level. Here we skirted around a jungle-filled pit entrance and entered a complex of crawl-sized passages. A bit unnecessary, Dirk and I thought, until we saw the main attraction – bright red lava dribbles, multi-coloured clusters of lava straws up to about 40cm long and tall lava stalagmites, which are relatively rare. After crawling around and taking photos for about an hour, we used our SRT gear to abseil back to the main passage and then



Dirk Stoffels and Harry Shick (guide) emerging from Kazumura Cave after the 6-hour Maze trip.

ascend the rope we had left hanging at Eureka Falls. We were then heading mauka and on the homeward journey.

As we were making good time, there was ample opportunity for taking more photos on our return trip and we reached the surface just on 6 hours after entering the cave. All in all it was a relaxed, interesting and thoroughly enjoyable trip.

Another outfit running adventure tours into a section of Kazumura is called Kilauea Caverns of Fire. Little is known about the operation but according to its website (www.kilaueacavernsoffire.com), it offers 1 hour underground walking tours for groups of up to 20 people and 3 hour adventure trips for groups of 8. Tickets cost \$US29 and \$US89 respectively.

Thurston (Nahuku) Lava Tube

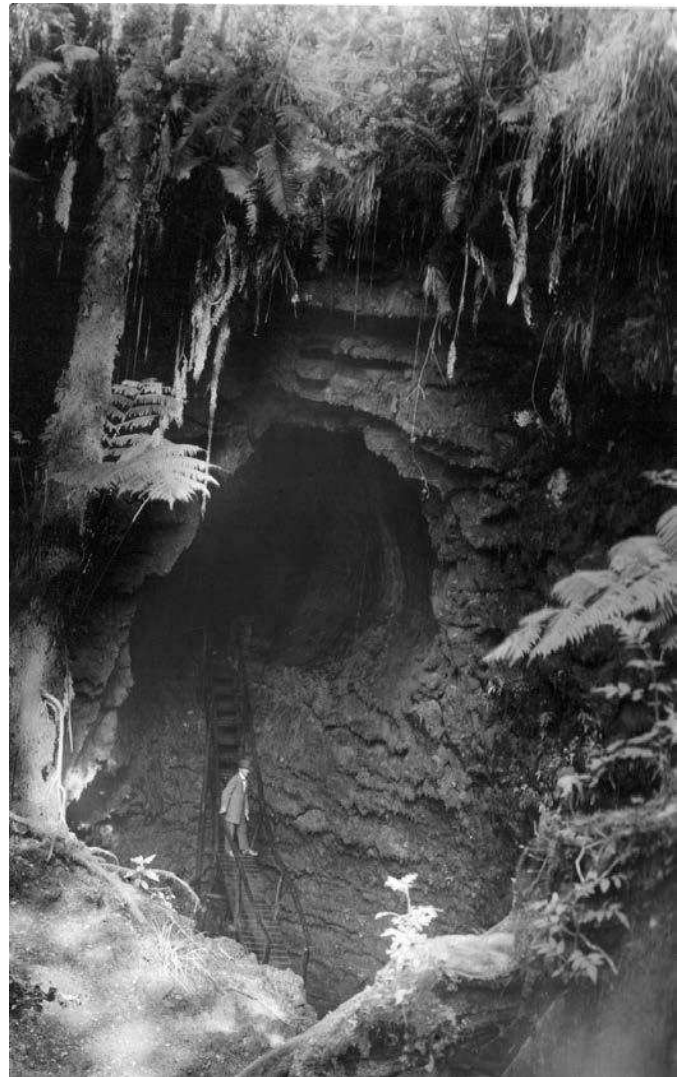
Thurston lava tube, in the Hawaiian Volcanoes National Park, is undoubtedly the most widely known and visited cave in Hawaii. The cave is electrically lit and a well-formed trail leads to the entrance from a nearby carpark. Although the cave is short (not much more than 100 metres long), and has been vandalised over the years, it is still interesting and worthy of a visit. It also has an important educational role in that it is the only lava cave that many of its visitors will ever experience. The cave was named after Lorrin Thurston, a local newspaper publisher, who is credited with discovering it in 1913. Today, use of its Hawaiian name (Nahuku) is becoming more common.

The cave can be visited at any time and there is no entry fee apart from the National Park entrance fee (\$US20/vehicle, valid for 7 days).

Airport Lava Tubes

This system is located near the main coastal highway (Hwy 19) about 5 kilometres north of Kona airport. It comprises several short sections of passage separated by roof collapses. Much of the passage is walk-through sized and, with some fascinating features and a large entrance right beside the highway, it is a pleasant introduction to the lava caves of Hawaii after a long flight.

As the main walk-in entrance can be clearly seen from the highway, the cave attracts many casual visitors and there is some graffiti and a little rubbish. The official access status to this cave is not clear, but as there are no "access prohibited" signs, and there is a pull-off area for vehicles next to the entrance, it seems safe to assume it can be regarded as a public access cave.



An historic postcard image of the Thurston lava tube, the most commonly visited lava cave in Hawaii.



Looking out towards the highway entrance of Airport Lava Cave.

Kaumana Cave

Kaumana Cave is a very popular public-access cave located about 6 km from Hilo on the highway (Route 200) heading west and into the interior of the island. The main entrance is on a small reserve maintained by the County of Hawaii, which has provided picnic and toilet facilities and a concrete staircase leading into the cave. There is no installed lighting and so a good light is necessary to explore the cave passages mauka and makai from the entrance steps. It is worth going for a couple of hundred metres in both directions to see some spectacular lava features on the walls and floor. These include bright red ropey ("pahoe-hoe") and smooth brown lava floors, tube-in-tube structures, very rough ("a'a") lava floors, lava shelves and levee banks. In addition there are curtains of fine tree roots and extensive areas of white or gold-coloured bacterial colonies.

Most of the cave looks very fresh, almost as if the lava has only just cooled, which in geological terms it did. From contemporary reports it is known that the cave formed over a period of just a few weeks during eruptions in 1881. Indeed, it is one of the youngest lava caves that can be visited anywhere.

With easy access to the cave, it is hardly surprising that vandals have left their mark with spray paint and by chipping graffiti into smooth floor lavas near the entrance. However, there was surprisingly little rubbish in the cave at the time of our visit.

The cave is several kilometres long and extends beyond the boundaries of the County Park and under private property. A warning notice at the entrance advises that under state law, permission is required to enter sections beneath private property but notes that there are no markers in the cave to indicate where the boundaries are.



At the main entrance to Kaumana Cave.

Maui

Hana Cave / Ka'eleku Cavern

The only show cave on Maui is Hana (Ka'eleku) Cave. It is a self-guiding show cave operation located several kilometres northwest of the town of Hana on the eastern side of the island. The cave has handrails and interpretive signs and although it is not electrically lit, torches are apparently provided for visitors. We have not visited the cave, but according to its website (www.mauicave.com) it is "Maui's greatest natural wonder" and is "the world's premier lava show cave". These are very bold (and somewhat typical US-style) claims indeed, but from images on the website, it does appear to have some interesting features including lava stalactites and stalagmites and a huge lava ball. The cave is open every day of the year and is billed as being an incredible family adventure that is safe, fun and free of mosquitoes and bats.

Wai'anapanapa Caves

Several short lava tubes, some with pools, can be visited in the Wai'anapanapa State Park along Maui's east coast. It is a popular walking and swimming area and the ability to swim in or explore the caves is an added bonus.

Oahu

Kaneana (Makua) Caves

Kaneana Cave is a large and obvious walk-in entrance beside the Farrington Highway about 60km northwest of Honolulu and there is a convenient parking area across the road. The cave appears to be a raised sea cave that has been considerably modified by breakdown and erosion. Several other caves, collectively known as Upper Kaneana Caves, occur in the rock faces high above the main entrance. According to information on the Web, they can be reached by following informal tracks up steep scrambles and across exposed traverses.

The Kaneana Caves are the least interesting of all the caves listed here.

Kauai

Makauwahi Cave

Makauwahi Cave is a limestone cave located close to the south coast of Kauai where beach sands have blown a short distance inland and accumulated and lithified in a similar manner to the calcareous dune sand accumulations in coastal regions of southern Australia.

I have not visited the site, but it is claimed to be Hawaii's largest limestone cave (see: www.cavereserve.org/). Its principal feature appears to be a large collapse doline some 30m across. Passages containing some decoration lead off from the doline and there is a small underground freshwater lake.

The cave is on private property but is managed by a not-for-profit organisation that has opened the cave for public inspections, constructed walking trails around the area and developed an ambitious program for removing weeds and re-establishing native vegetation. The facilities and on-going work have been made possible through funding assistance from the Hawaii Tourism Authority, private donations and the help of volunteers.

Research work on sediment deposits in the cave is providing valuable insights into climatic, flora and fauna changes in the area over the last 10,000 years.

The cave attracts about 20,000 visitors a year. Guided tours of the cave and sinkhole area are available several times a week and at other times, it is usually open for self-guided trips. Tours are free, but donations are welcomed to help with on-going rehabilitation and research efforts.

Concluding remarks

The Hawaiian Islands have an amazing range of easily-accessible caves that will captivate anyone with an interest in caves. Most of those mentioned above have spectacular or unusual features, are very close to parking areas, require no special equipment or skills and, depending on the cave, can be visited with a guide or on a self-guided basis. Some can even be seen free of charge. Be sure to set aside sufficient time to visit at least a couple of them if you have the opportunity of visiting in Hawaii.