Cave and Karst Management in Australasia 16
Proceedings of the 16th ACKMA Conference, Westport, NZ, 2005

Background to the redevelopment of Ruakuri Cave, Waitomo, New Zealand

Greg Martin

Waikato Conservator, Department of Conservation
Private Bag 3072, Hamilton, New Zealand, gmartin@doc.govt.nz

The Ruakuri Cave is situated in the Ruakuri Scenic Reserve, a 130 hectare block of lowland podocarp forest about 3 km southwest of the Waitomo Glowworm Caves. The reserve is a "showcase" area for the Waikato Conservancy of the Department of Conservation.

Ruakuri Cave was discovered c.1900, subsequent to the discovery of the Waitomo Glowworm Cave in 1887, and opened as a tourist cave by James Holden senior, a local landholder. In 1904 the Government considered the cave to be a valuable visitor and tourism resource and consequently moved to protect the land under the Scenery Preservation Act instructing that the Cave be surveyed and reserved for the public good. The survey was carried out in 1905, however the surveyor at the time only captured the entrance of the cave and some 60 metres of passage within the cave under his definition of the reserve. As a consequence much of the cave remained under the adjoining public road and the adjacent private freehold land owned by the Holden family.

At that time history records that there was mummified body of a Maori woman with red hair in a small alcove at the bottom of the escarpment at the entrance to the Ruakuri Cave. It seems that early visitors started to interfere with these remains and so James Holden senior removed the body from the site and burnt it (presumably with local consultation and sanction).

Waahi Tapu Site

The traditional entrance to Ruakuri Cave was a site that had provided shelter for the early Maori inhabitants of this land. High up on the escarpment above the original tourist cave entrance are a number of smaller caves and open caverns in the limestone. These caves were used as burial caves and it was known that the body of Tanetinorau, a local chief, and other members of his family were placed in the burial caves.

The exterior faces of the limestone adjacent to these burial caves is coloured with kokowai which is still clearly visible today. The marking was used to indicate a sacred burial site. The red ochre colouring was made from deeply weathered or burnt limestone which was dried and powdered and mixed with shark oil.

Another significant and unusual feature of this site is the presence of some large karaka trees at the old entrance to the cave and immediately below the burial caves. These trees are large and likely to be centuries old.

It is evident that they have been planted as they prefer a coastal habitat and are a long way from the coast in this location. Today the karaka seedlings germinate beneath the trees but they rarely grow more than 200mm high and do not survive in this sub-optimal habitat.

The traditions of the local Maori people suggest that the plantings were made for two reasons. Firstly to grow the trees close to the cliff face to provide access to the burial caves and secondly as a source of food for the tupuna, the spirits of the ancestral beings or koiwi placed in the burial caves or urupa. The karaka produces a very fibrous and fleshy berry which is an attractive food source for some birds such as kereru (woodpigeon). However, it is highly toxic to human beings unless prepared correctly in the traditional way which involves immersion for several days in flowing water to leach out the toxicity.

About ten years ago, some remains from the burial cave were dislodged, probably after an intense storm event, and fell to the entrance area of the tourist cave. These remains (koiwi) were re-interred at another location by kaumatua (elders) of the local Maori people.

These are but some of the traditional, spiritual and cultural aspects that make this a significant waahi tapu site.

Recent History

In February 1988 Jimmy Holden, the adjacent landowner, placed a trespass notice in the cave at the position he believed was the underground boundary of his property. He then entered negotiations seeking compensation from the Government entity, the Tourist Hotel Corporation, who were operating the cave. The Tourist Hotel Corporation obtained legal advice and decided to close the cave for tourism while negotiations continued. The traditional tourist cave entrance has remained closed to this day.

Subsequent to the closure of the entrance, the traditional Maori land owners sought advice and information about the site. On 28 September 1989, an archaeological investigation was carried out on an ash pit site near the entrance to the cave at the request of the New Zealand Historic Places Trust. This work was carried out by the Department of Conservation's archaeologist. The excavation found that the ash pit contained the jaw bones of a minimum of 20 kiore (Polynesian rat) and that the site was estimated to be between 200 – 400 years old. The kiore was an early protein food source for Maori. The rats were encased in clay and baked on the fire. When the clay case was broken open and peeled back it revealed the flesh for eating. The jaw bones, being the strongest part of a kiore skeleton, have been preserved from major decay in the ash pit site.

On 3 May 1991, the New Zealand Historic Places Trust (Pouhere Taonga) declared the land at the entrance to Ruakuri Cave to be a traditional site under Section 50 of the Historic Places Trust act 1990.

The Department of Conservation received control of the Ruakuri Caves and Bush Scenic Reserve in 1991 following the sale of the Tourist Hotel Corporation as part of the Government's sale of State Owned Enterprises. The proposed sale activated the mediation of a land claim (WAI 51) under the Waitangi Tribunal by local Maori for a number of sites in the area, including part of the Waitomo Glowworm Caves and some land in the Waitomo Village including the Waitomo Hotel and the Waitomo Domain. The consequent mediated settlement of this claim was the first of its type in New Zealand and it took effect from 14 June 1990.

Pressure on the Department of Conservation to see the Ruakuri Cave re-opened for tourism continued throughout this period from the community and local businesses. In April 1992, the Department drew a team together to prepare plans for the recognition and protection of the waahi tapu site for presentation to Hapu Trusts, now the representatives of the wider Maori family members with a traditional interest and connection with these lands.

Some plans were prepared by the Department's staff with a concept that involved the creation of a board walk and deck at the entrance to the cave. This concept was to provide a gathering place for visitors where their feet could be elevated off the sacred ground. It was envisaged that appropriate protocols such as karakia (prayer) could be observed before visitors commenced the tour of the cave. A memorial plinth or appropriate plaque was also envisaged in this location.

This concept was presented to the Hapu Trusts and debated and discussed at some length. Reverend Canon Rua Anderson, a respected and senior kaumatua and tribal spokesperson, found that the concept did not sit comfortably with him and he advised his people accordingly. This site was of great spiritual significance and sacredness and it needed to be respected and given sanctity as the significant burial site for his families' forebears. Arising from those deliberations, the Department of Conservation agreed to re-position the track through the reserve, away from the traditional Ruakuri Cave entrance and the waahi tapu site. The old track has now completely overgrown and the entrance to the cave has been replanted and obscured from view.

Site meetings were held with Canon Rua Anderson to determine the physical extent of the waahi tapu and pegs were placed in the ground to facilitate a survey of the land involved. Traditionally this site would have been simply a "known respected place" but a land survey was required to enable the area to be demarcated and declared as a Maori Reservation and vested in the local Maori people as a Waahi Tapu site.

Development of a new Cave Entrance to Ruakuri

As the future of the Waahi Tapu site and its ultimate land status was being determined, planning and work was occurring simultaneously

on the proposition of creating a new tourist entrance to Ruakuri Cave. This work, which initially focussed on the Rimrock passage lying beneath Holden property, ended up evaluating the engineering options for developing an entrance known as "The Drum Entrance" - so named as it was formed by the placement of several 44 gallon drums end to end with the bottoms cut out to provide an access route. This structure had been excavated and installed by cavers after the discovery of a high level passage above the main streamway in 1968. It was situated just inside the boundary of the Ruakuri Scenic Reserve.

This proposed development went through a number of iterations with various developers and consortiums, including the Holden Family Trust, until the development proposal was sold to the Tourism Holdings Limited (operators of the Waitomo Glowworm Cave and Aranui Cave) as a part of a composite acquisition involving the purchase of the assets of the Legendary Black Water Rafting Company.

Designs were refined, engineering plans drawn up and a comprehensive planning process undertaken for a new entrance, which would involve the construction of a 15 metre deep, 10 metre diameter vertical concrete shaft (or caisson) from the bottom of which a 22 metre horizontal tunnel was to be thrust to intersect with the top end of the Drum passage. The planning for this project required a complex Resource Consent under the Resource Management Act, a concession from the Department of Conservation as well as a Building Consent for the engineering and construction aspects issued by the local authority, the Waitomo District Council.

The placement of sediment traps to control run off arising from the large amount of excavation to be carried out was a critical part of site preparation. In the cave a comprehensive monitoring programme was instituted to record the environmental and atmospheric parameters pre-construction, a critical consideration given that an entirely new entrance was to be created, and specific construction methods were adopted to ensure air locks were incorporated to preserve and keep stable the pre-existing environment.

A seismograph was also installed in the initial cave chamber to monitor significant tremors and activity particularly through the pipe thrusting part of the construction. Black polythene drop sheets were also placed at strategic locations on the cave floor to monitor and detect any falling particles or speleothem fragments. An ultrasonic anemometer was positioned to detect any changes in the velocity or direction of airflow patterns; speleothems in the main passage adjacent to the pipe thrusting break-through zone were surveyed, measured and recorded as part of the total monitoring package. Advice and review of the monitoring programme throughout the project was provided through an independent assessment and evaluation by Professor Paul Williams of the Geography Department of the University of Auckland and scientists from the Cave Environmental Advisory Group (set up to specifically assist in monitoring and managing the Glowworm Cave).

A small digger situated in the centre of the shaft site excavated the ground in 1.5 – 1.7 metre stages. At the end of each excavation stage, reinforcing steel and geotechnical grid drainage "chimneys" were installed and sprayed with shotcrete to form a solid cylindrical wall lining 3-400mm thick. This process was completed six times to achieve a 15 metre depth. At that point, part of the wall opposite the surveyed entry point of the horizontal inter-connecting tunnel was reinforced with a substantial concrete abutment. This was constructed to enable the hydraulic thrusting machine to leverage against the wall liner as it thrust a succession of 2.4 metre diameter concrete pipes for a total length of 22 metres whereupon they intersected with the underground passages of Ruakuri Cave. Once the thrusting operation commenced, the operation had to run continuously 24 hours a day, 7 days a week as the surface friction on the pipe becomes too great if the movement of the pipe ceases. As the thrusting progressed, the spoil was excavated continuously from the core of the pipe until the ultimate destination of the cave passage was reached. The bed rock geology was quite varied and challenging and at one stage the ground collapsed where it passed directly beneath the original Drum entrance.

Once the final breakthrough had been established, about 200 cubic metres of in-fill silt had to be excavated from within the first section of the Drum cave passage. This was done by hand and the material barrowed out into a skip that was then lifted by crane to the surface. The floor of the shaft was concreted and a 3 metre high top to the shaft shuttered, reinforced and poured. This entire structure was then roofed in and the walls and

entrance and exit vestibules themed with sprayed and carved gunite to look like limestone outcrops. The final concrete "outcrop" was then covered with spoil and planted with native seedlings that will ultimately grow to blend in with the surrounding bush.

During the course of the construction of this new entrance, work continued on the preparation of the pathways through the cave. Much of the new access has been formed in a very challenging construction environment on suspended galvanised steel gantries fixed to the cave walls and ceiling by stainless steel cables and a variety of purpose designed fittings, clamps and fixtures. Removal of the old structures and general clean-up of the cave was also a significant aspect of the work required to prepare the cave for re-opening after 17 years of closure. Much of this material has been strapped and sensitively stockpiled waiting to be taken out at a latter date.

Visitor Experience

The development of the new entrance required some special effects to recognise the spiritual dimensions and traditions of the cave. Consultative meetings were held with local kaumatua and kuia associated with the cave so that an ambience could be created that was befitting of the resource. The concept evolved to include a theme focussing on droplets of water from the roof of the vertical entrance chamber which would be subtly illuminated as it cascaded to the chamber floor where it would splash onto a large limestone centre piece. The ramp in the vertical chamber is designed to be inclined at a 1:10 gradient resulting in a very even slope suitable for wheelchair access. The entrance chamber is proposed to be lit with low level LED track lighting with the central water feature dominating the visual experience on the journey of descent into the cave.

This project has been a major engineering feat and a massive undertaking by Tourism Holdings Limited. The project is estimated to cost in the order of 4 million dollars and is scheduled for an official opening in July 2005.

Part of the project has also involved the commissioning of a documentary film by Tourism Holdings Limited. The documentary has been filmed and recorded by Fresh Media of Auckland, and has captured the history of the Ruakuri Reserve from the perspectives of the many key people in the community with a close association or affiliation with the reserve and its history and has included the construction right through to the proposed formal opening. THL are to be commended for this initiative to record the remarkable history of this very special place.