

Show Caves of Southern Spain

A comparative study of the applications and outcomes of three different approaches to the triple bottom line

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Abstract

This paper looks at the management and presentation of three show caves situated in the south of Spain: Cueva de Pileta, near Benaolan; Gruta de las Maravillas, in Aracena; and Cueva de Nerja, on the Costa del Sol. It examines how the managements' varying focuses on the triple bottom line affect both the caves themselves and the visitor experience. The Gruta de las Maravillas sits in the heart of the community and is valued as "Aracena's most cherished treasure", a source of local pride, employment opportunities and a significant tourist attraction. Here the three aspects of the triple bottom line seem to be all given due consideration. The Cueva de Pileta is a listed National Monument for its superb prehistoric cave art, but it remains a family concern. Fortunately for the cave and its visitors, the Bullon family is totally dedicated to the preservation of the cave and the education of visitors. Cueva de Nerja is also famous for its cultural worth as a prehistoric site. However, at Nerja the profit focus is detrimental to the natural features of the cave, which in turn impacts badly on the general visitor experience.

Introduction

In November 2012 the author visited three show caves in southern Spain with two seasoned cave tourists, one of whom is, like the author, a show cave

guide. The caves were visited on consecutive days; as time was limited each cave was visited only once, and impressions from the earlier ones were still fresh as the later caves were experienced. At two of the caves, Gruta de las Maravillas and Cueva de la Pileta, informal discussions were held with the cave guides and manager. At Cueva de Nerja the staff declined the request for information, directing the author instead to their website. Each site clearly had a different focus regarding the triple bottom line. At Gruta de las Maravillas the focus was fairly balanced, though people and place were apparently of more primary concern. At Cueva de la Pileta the focus was strongly on place, with visitors also a priority. At Cueva de Nerja profit was, without doubt, the *raison d'être*. The resulting outcomes for the cave environments, the staff and the visitors at each site have implications for how cave managers in general should view and balance the triple bottom line.

Gruta de las Maravillas

The Gruta de las Maravillas is a highly decorated cave of great beauty, situated in the heart of the town of Aracena, directly underneath the medieval castle-fortress which crowns the town. Aracena itself is located in an agricultural area of Andalucia; a region known as the Sierra de Aracena y Picos de Aroche Nature Park. It is in the province of Huelva, about 50 km from the Portuguese border and off the main tourist circuit.



Gruta de las Maravillas is located beneath the castle ruins

The caverns are formed in 570 Myo Pre-Cambrian marble (Durán, 15 December 2012, pers. comm.). This rock originated in an ocean separating the super continents of Laurasia and Gondwana (García, 2011, p 25). The length of the cave is about 2130 metres (García, 2011, p 25).

The cave discovery related to intensive mining activity in the region during the nineteenth century. The first reference to it is in the Sevillian newspaper 'El Porvenir' in 1850 (García, 2011, p11). However local tradition is that the caverns were discovered by a shepherd looking for a lost lamb (García, 2011, p13). The free access that local people had to the cave in this early period led to the removal of many formations and damage to others (Durán, 15 December 2012, pers. comm.).

Due to the great tourism potential of the cave, the Marquis of Aracena, Francisco Javier Sanchez-Dalp, and the mayor of Aracena, Juan del Cid, initiated the development and lighting of the cave between 1912 and 1915; visits officially began in September 1914 (García, 2011, pp15-16), making 2014 the centenary of the cave as a tourist attraction. As more sections of cave were discovered these were gradually developed and added to the tour (Durán, 15 December 2012, pers.comm.).

Royal visits from King Alfonso 13th and Queen Victoria Eugenia of Spain cemented the popularity of the caves domestically, and the rise of international tourism to Spain in the 1960s brought an influx of visitors from Europe and around the world (Durán, 15 December 2012, pers. comm.). The cave featured in several blockbuster movies, including 'Tarzan in King Solomon's Mine', 'Journey to the Centre of the Earth' and 'Clash of the Titans', bringing further attention to the site.

In the 1970s increased visitor numbers started to cause management issues and geologists from Malaga experimented with different lights, in order to reduce the incidence of lampenflora. It was found that the amount of time lights remained on had more impact than the type of lights used. Guides are now responsible for lighting maintenance and cleaning the cave with bleach, following strict maintenance guidelines (Durán, December 15 2012, pers. comm.).

Ongoing research and consultancy with the Department of Geology of the University of Granada began in the early 90s (García, 2011, p21). As a result the number of daily visitors was restricted to 1000, with between 20-40 visitors per tour and a total of about 150,000 visitors per annum (Durán, 15 December 2012, pers. comm.). Tour times are

flexible, with tours running when enough visitors arrive, and wait times of no more than an hour. Tours last between 45 minutes and one hour. Audio guide iPods are available with cave commentary in four languages – English, French, German and Portuguese.

Gruta de las Maravillas is managed by the local Town Hall. Sixteen people are employed at the cave:

- Six permanent guides
- Four casual guides
- Two tourist officers
- Two ticket sellers
- Two managers



Aracena town square features images of Gruta de las Maravillas on decorative seating

The town square features seating decorated with hand-painted tiles showing images from within the cave. From here the approach to the cave precinct is also very attractive, by foot up a cobbled street, with water feature, shade trees and restaurants. Adjacent

to the visitor centre are a few souvenir shops. The visitor centre includes a ticket office, an information centre and an interpretation centre. The cave entrance, on the other side of a small square, looks like a large office entrance.



Aracena information centre and interpretation centre

The welcome from staff at the cave was warm and genuine. Our tour included a Spanish coach group, which is quite common at the site. Large tour groups in Spain are very boisterous, making the guide's job

quite difficult. The guide used a small personal amplifier to assist voice projection, which worked well.



The entrance to Gruta de las Maravillas

The cave itself is richly decorated and in very good condition, though with occasional lampenflora in evidence. The tour is over two of the three known levels of the cave and includes a lake and large rim-pools. The floors are cobbled in places and frequently wet and slippery. The few handrails are stainless steel. The cave is nicely illuminated, with

water features lit particularly effectively. The overall presentation of the cave is of a very high standard. However the passages between chambers are narrow and platforms fairly small, making the guide's job more difficult, particularly in combination with noisy, sociable groups.



Painted image of Gruta de las Maravillas, Aracena town square

The tour proceeds through the Shell Chamber, with fossil deposits; the Diamond Chamber, featuring glittering crystals; the Shawl Chamber; the Grand Hall, about 50 metres high; up the Ascent to Heaven, where there are lovely views of the Great Lake, to the Cathedral; past the Sultana's Bath, a delicate rimpool;

then the Chamber of God's Crystal, with aragonite and many helictites reflected in the Emerald Lake; through the Chickpea Chamber; and the aptly, if coyly, named Nude Chamber and, finally, the Lake Passage.



Gruta de las Maravillas cave manager, Eva Jiminez and cave guide, Amparo Durán with Richard and Sasa Kennedy

Our guide, Amparo Durán, was very knowledgeable about the cave's geology and history and very entertaining and lively in her presentation. She incorporated an English translation for her three English-speakers, alongside her Spanish commentary. Though her English was not fluent it was possible to follow the information easily. Safety and minimal impact was repeatedly emphasised, which was necessary due to the lack of engagement from the group as a whole. A strange divergence from the environmental emphasis otherwise in evidence on site was the proud displaying of a fern growing adjacent to a light towards the end of the tour.

The audio tour was a little less successful; the information was relevant and succinct, but the only indication when to turn on various segments was the name of the chamber, which was not always obvious in the cave, causing confusion and distracting from the cave itself. This could be remedied with simple

numbered posts corresponding to information segments. There was low-level mood music running through the audio tour, which was irritating when trying to take in English commentary from the guide parallel to the audio guide commentary. Another problem with the audio tour was a lack of instructions as to how to use the iPod – probably obvious to most people these days, but not all people.

Photography is not allowed in the cave, which is understandable given the difficulty of managing the clients, even without cameras. It is, however, unfortunate, as there is so much to take in during the tour that it is impossible to retain a clear memory of the cave's many highlights. A photo is taken as you enter the cave, which is ready to purchase on departure from the tour, at extra cost. This in no way makes up for the lack of photographic opportunities during the tour, with the background of the shot not at all representative of the beauty of the cave.

Gruta de las Maravillas is a very special cave experience, with the outstanding level of decoration, high standard of presentation and quality interpretation all contributing to a great tourism experience.

Cueva de Nerja

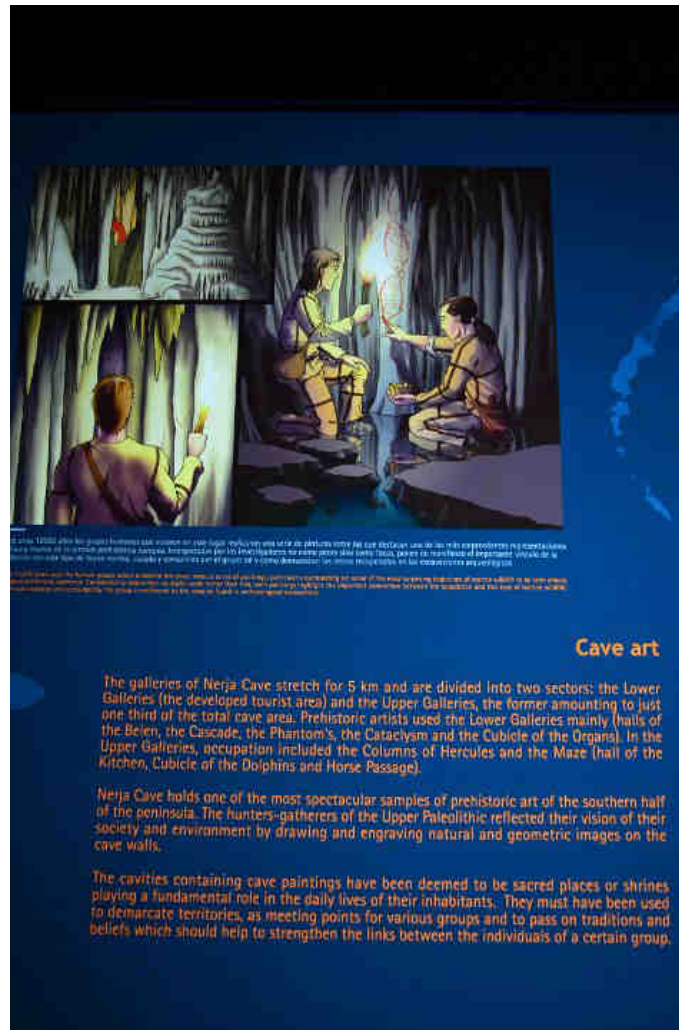
The Cueva de Nerja is situated a few kilometres outside the town of Nerja, in the province of Malaga. It is close to the coast, on the Costa del Sol, and located on the lower part of the Sierra Almajara. It was originally known as the Cave of Wonders. The name Nerja comes from an Arabic word meaning 'spring of water' (Hierro, 2012, p 4). The cave extends over 7,200 metres from North to South (Hierro, 2012, p 10). There are three known levels to the system, the Lower Galleries, the Upper Galleries and the New Galleries. Of these the Lower Galleries are open to the general public, with the other areas reserved for scientific study.

The caves are formed in marble from the Triassic period, 200 Mya, with the caverns believed to be formed about 5 million years ago during the Pliocene and Pleistocene periods. The warm period of the Quaternary is when scientists believe the formations

were produced (Hierro, 2012, pp 6-11). A massive earthquake 800,000 years ago led to the devastation which gives the Cataclysm Chamber its name (Hierro, 2012, p 14) and in 4000 BP water deposited rocks and sediments into the cave entrance, blocking it until its discovery by modern humans (Hierro, 2012, p10).

The cave was discovered by three local youths, 'catching bats for fun', in 1959 (Hierro, 2012, p4), who first entered the Cataclysm Chamber. The Upper Galleries were discovered later in the same year and the New Galleries in the 1970s.

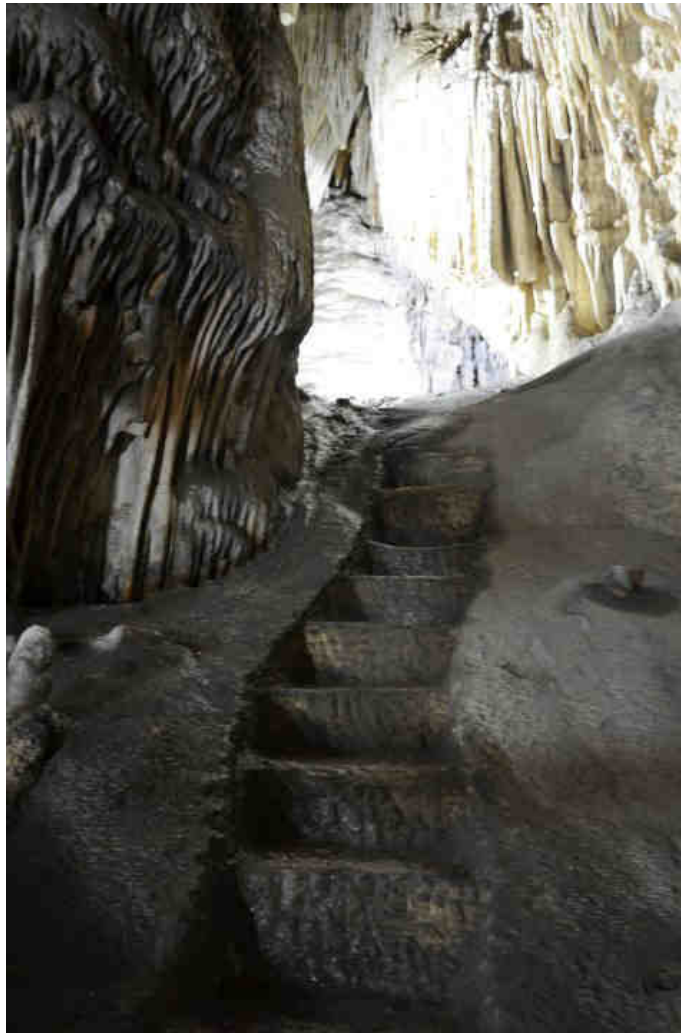
In June 1961 the cave was declared an Artistic National Monument (Hierro, 2012, p6). Since its discovery the cave has been the subject of continuous excavations and detailed study relating to its geology, ecology and prehistoric significance (Hierro, 2012, p 6). It is known to have been occupied from the Upper Palaeolithic period until the Chalcolithic, or Copper Age. It is believed to have served as a living place, sanctuary and burial ground (Hierro, 2012, p 20). There are over 600 paintings and engravings on the cave walls, and remains include marble bracelets, underground stores, ceramics, bone fish hooks, painted stones, engraving tools, jewels, loom weights and group burials (Hierro, 2012, pp 20-24).



Cave art interpretation board, Christmas Crib Chamber, Cueva de Nerja

The Committee for Archaeological Excavation at Malaga was responsible for opening up a visitors' entrance to the cave and building infrastructure to facilitate visitation and scientific investigations (Hierro, 2012, p 6). The cave was officially opened on June 12, 1960. Being located in a popular tourist area, the cave has high visitation, with 527,096 in 2001

dropping to 376,518 visitors in 2011 (The Nerja Caves, 2013). It provides employment in a range of positions from ticket sellers, restaurant workers, retailers, photographers and photo developers, parking attendants, managers and cave guides. Neither the guide book nor the website names the managing body.



Early infrastructure (circa 1960) includes steps cut into crystal, Cueva de Nerja

The cave is a popular venue for artistic performances. Every summer the 'International Festival of the Cave at Nerja' is held, with performances of ballet, flamenco and music featuring, and up to 600 spectators attending in the Cascade Chamber (Hierro, 2012, p14). At other times visitors are free to view the cave unguided and at their own pace. Locals can visit the cave free of charge on Sunday mornings (The Nerja Caves, viewed 3 April, 2013).

The cave precinct is approached via the car park, where (on the occasion of our visit) a bored-looking attendant was in attendance for no apparent reason, and a collection of retail venues included a gift shop, a large restaurant and a photographic studio. A statue of the boys who discovered the cave is prominent near the cave entrance. There are also extensive gardens behind the commercial precinct.



The approach to Cueva de Nerja

The ticket office staff were very offhand and appeared uninterested in either visitors or the site. When a request was made to discuss the cave and its management they referred the author to their website, which was in contrast to the personal assistance provided at other cave venues visited. The ticket office has audio guides available (at extra cost), but these were not offered to us. The only rule we were given when collecting tickets was that no flash photography was allowed in the cave. Photos are available for downloading on the Nerja website, with most being very amateur shots (out of focus and badly framed), but their availability was not mentioned.

The approach to the actual cave is down a stairwell, past a currently blocked off section of the cave. As we stepped into the first chamber we were greeted by the flash of the professional photographer! On departure from the cave the print is proffered for purchase immediately. It would appear that only clients' flashes have an impact on the cave...

The first chamber in the cave, the Christmas Crib Chamber, contains displays of archaeological remains and interpretive material on both the geology and occupational history of the cave. The English translations, at least, are riddled with inaccuracies. However, the interpretive material is visually well presented and interesting, particularly in relation to the use of the cave by prehistoric peoples.



Visitors absorbed by interpretation of early cave dwellers, Cueva de Nerja

The chamber is marred by many broken formations, unsympathetic infrastructure and lampenflora. Sadly, this is just a hint of what is to come in terms of cave damage.

The cave is generally underlit, with the flat lighting dimming the sense of drama that the enormous caverns and potentially spectacular formations should provide. The stairs and platforms are cemented, with wooden and occasionally rope handrails. Large painted arrows point the way on. Signage is largely

limited to named maps of the various sections of the cave, which, on a positive note, include audio guide segment numbers. The signs have been vandalised and remain unrepaired. At the time of our visit we did not see any visitors using audio guides and comments in TripAdvisor indicate that they are only infrequently offered to visitors ([TripAdvisor](#), viewed 9 April 2012). Visitors are given a brochure to guide them through the cave, but it merely contains directions through the cave and names of features.



Cave signage, Cueva de Nerja

At the Cascade or Ballet Chamber is the first indication of minimal impact regulations; a large sign indicates that pets are not allowed in the cave, smoking and eating are not permitted, nor is flash photography or touching the formations. The sign also indicates that there are stairs in the cave, perhaps a little belatedly. This was the only obvious measure taken to protect the cave from visitor damage.

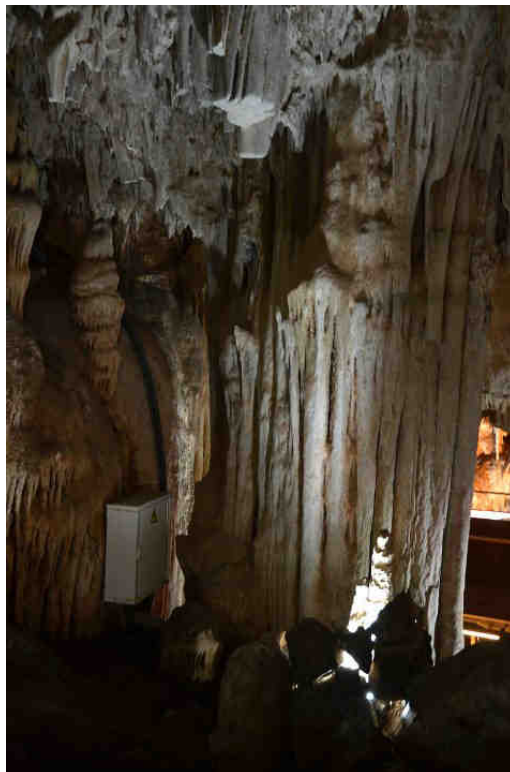
Apart from the initial chamber there was no guide or security presence in the cave and no indication of remote cameras to keep check on visitors. In the first chamber the guide was occupied in discussion with the photographer, showing no interest in the visitors

or the cave. In the Cataclysm Chamber a female singer yowled, unrestricted, during our entire tour. She only ever completed one or two lines of each song before moving on to the next, showing absolutely no respect for the cave or other visitors. At no time did any member of staff try to restrict her, or even explain her presence – maybe she was practising for a cave performance, but we will never know (and I hope not, for the sake of visitors!).

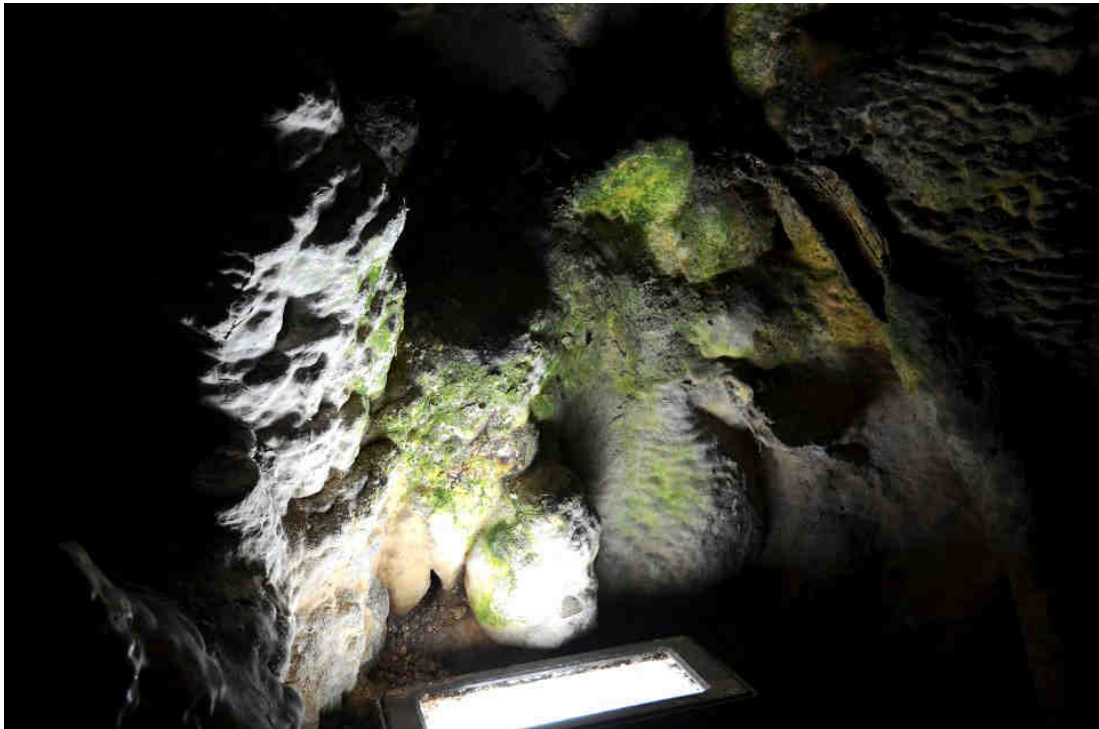
The Cascade Chamber is dominated by an enormous, two-tiered bank of about 100 theatre seats, permanently fixed to the platform. Unprotected formations are within easy reach of the seating.



Theatre seating, Cueva de Nerja



Electrics box fixed to formation, Cueva de Nerja



Moss adjacent to lights, which are left on throughout the day, Cueva de Nerja

Throughout the cave infrastructure is poorly sited, often fixed to crystal formations. Formations are dull and dirty. Broken formations can be seen throughout.

The most dominant feature of the cave is the omnipresent lampenflora. The cave positively glows green. Nearly every light has a forest of moss nearby.

In the Cataclysm Chamber is the most dramatic feature of the cave, the Great Column, said to be the largest in the world at 32m high and measuring 13m x 7m at the base (Hierro, 2012, p 14). Whether or not it is the largest column known, there is no disputing the magnificence of this feature.



The Great Column, Cueva de Nerja

The tragedy of this cave is that it has all once been so very beautiful, with enormous crystal formations, rich and varied decorations and chambers of grand proportions. It should be a premier show cave, but instead is a terrible disappointment – uninspiring and largely uninterpreted.

Cueva de la Pileta

The Cueva de la Pileta is set in a rugged and majestic landscape, comprised of jagged limestone peaks and valley farms. It is located on the small Harillo Farm, not far from the village of Benaolan, in the province of Malaga. It was declared a National Monument by the Spanish government on 25th April 1924, in recognition of its archaeological significance (Bullón J, 2005, p39).



The approach road, Cueva de la Pileta

The cave is formed in Jurassic limestone and shows evidence of damage from the Lisbon earthquake of 1755 (Bullón T, 16 December 2012, pers. comm.). It contains over 3000 artworks from the Upper Palaeolithic through to the Bronze Age. There are figurative paintings in the French and Cantabrian styles, Palaeolithic engravings and schematic art from the Neolithic era (Bullón R, preface to Bullón J, 2005, p9). Inside the cave is what appears to be a Neolithic cemetery; when discovered it contained fifteen skeletons laid out in the foetal position (Bullón T, 16 December 2012, pers. comm.). There is also potential evidence of human sacrifice; at the bottom of a 72m hole lie the remains of three animals and one human (Bullón T, 16 December 2012, pers. comm.).

The cave was discovered by José Bullón Lobata in 1905. The cave 'Las Grajas' was known locally as the 'Cave of the Bats', due to the swarms of micro-bats heading out to feed of an evening, but the deep drop at its entrance had deterred locals from entering the cavern. José was motivated to enter by his need for

fertiliser to use on his farmlands. His initial exploration led to the discovery of skeletal remains, pottery shards and markings on the walls and gradually he continued his solitary explorations of the cave, discovering more artefacts and a variety of pre-historic artworks in the new passages and chambers he traversed (Bullón J, 2005, pp12-24).

Rumours of hidden gold led to unending attempts to infiltrate the cave and plunder its treasures, and José's family began their quest to preserve the cave, learn more about the treasures it contained and share them with the public in a responsible and respectful manner (Bullón J, 2005, p25).

The cave has been the focus of sustained scientific study. Unfortunately, many of the specimens taken from the cave in earlier times have ended up in private collections, or disappeared without trace (Bullón J, 2005, pp28-29).



The Cueva de la Pileta is located in rugged country

Meanwhile José Bullón began to create some rudimentary steps in the cave in order to improve access to scientists and interested parties (Bullón J, 2005, p 23). Four generations of the Bullón family have continued in his work of protecting, preserving and promoting the cave, often at great personal expense (Bullón J, 2005, p 31, 34). Tomás Bullón García developed the current entrance in 1924 and in

the same year the government declared him the official guardian of the cave, to facilitate its protection (Bullón J, 2005, p38). He also improved the internal stairs and constructed the stone approach steps and iron railings in this year. The family continued to make further discoveries in the cave up until 1993 (Bullón J, 2005, pp 40-41).



The approach to Cueva de la Pileta is up some rustic steps

The Cueva de la Pileta remains in the care of the Bullón family, who are proud of the fact that they are backed neither by big business nor major institutions (Bullón J, 2005, p26). The breath of visitors is considered to be the major threat to the artworks in the cave and visit times are strictly controlled (Bullón T, 16 December 2012, pers. comm.). Tours are

conducted by paraffin lamp and torchlight, with a minimum of infrastructure to assist access; some cut steps, a few concrete stairs and a few galvanised handrails. Only a small portion of the cave is shown, in order to protect its integrity. Tour length is about 500m each way (Bullón T, 16 December 2012, pers. comm.).



Tomás Bullón Almagro, guide, Cueva de la Pileta

About 9000 visitors experience Cueva de la Pileta each year. A maximum of 25 per hour visit in summer and holiday periods; in the low season the number is about 20-25 per day. It is open from 10am-1pm and 4pm-6pm daily (Bullón T, 16 December 2012, pers. comm.).

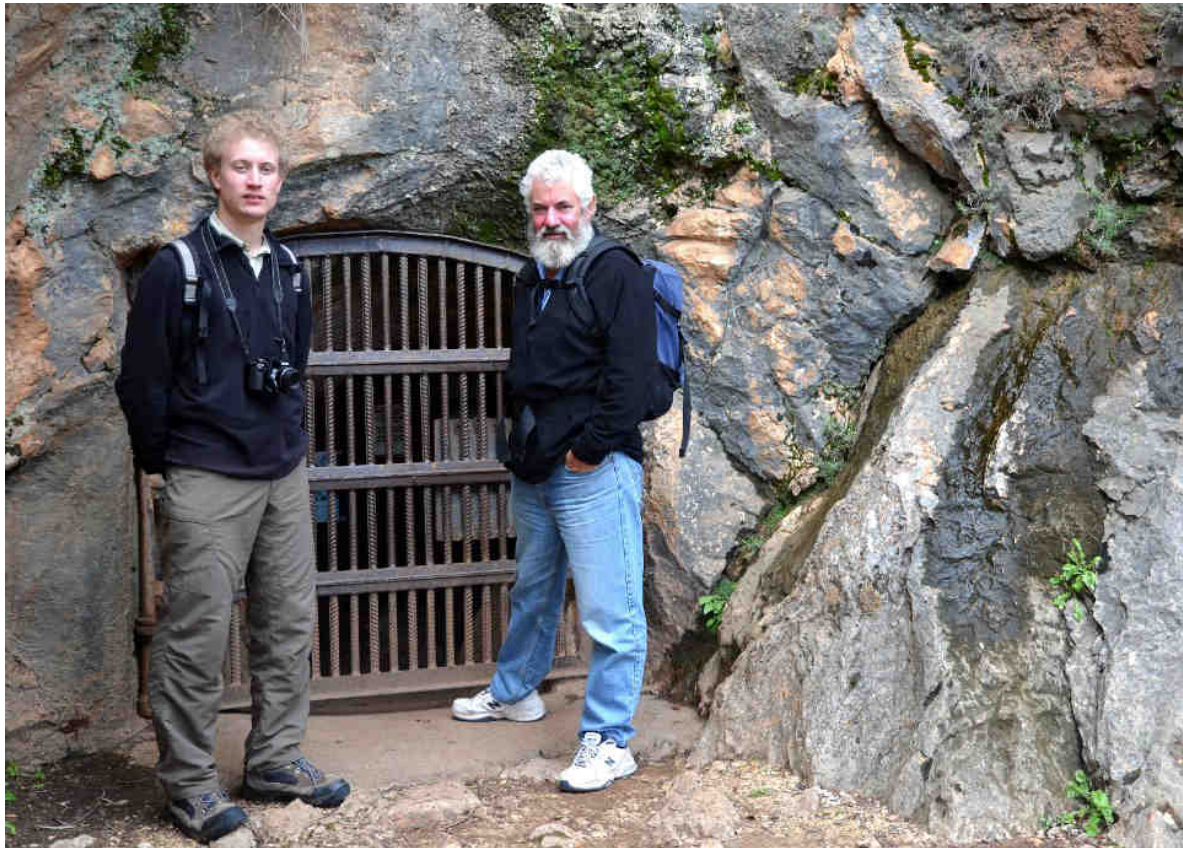
Four members of the Bullón family make up the staff of the cave, with other family members working in town in occupations such as teaching (Bullón T, 16 December 2012, pers. comm.). The guides are highly trained and dedicated.



Information board, Cueva de la Pileta

A sign leads to the small car park above the Bullón family farm, which must have the best views of any car park in Spain. At the car park is an information board with an excellent cave map and a short history and description of the cave. From here rustic stone

steps climb the steep hillside to the simple waiting area. A wooden shelter shed incorporates the kiosk, open briefly as the guide arrives. A sign on the cave gate requests that visitors wait for the arrival of the guide, but it is not clear when this might be.



Richard and David Kennedy at the entrance to Cueva de la Pileta

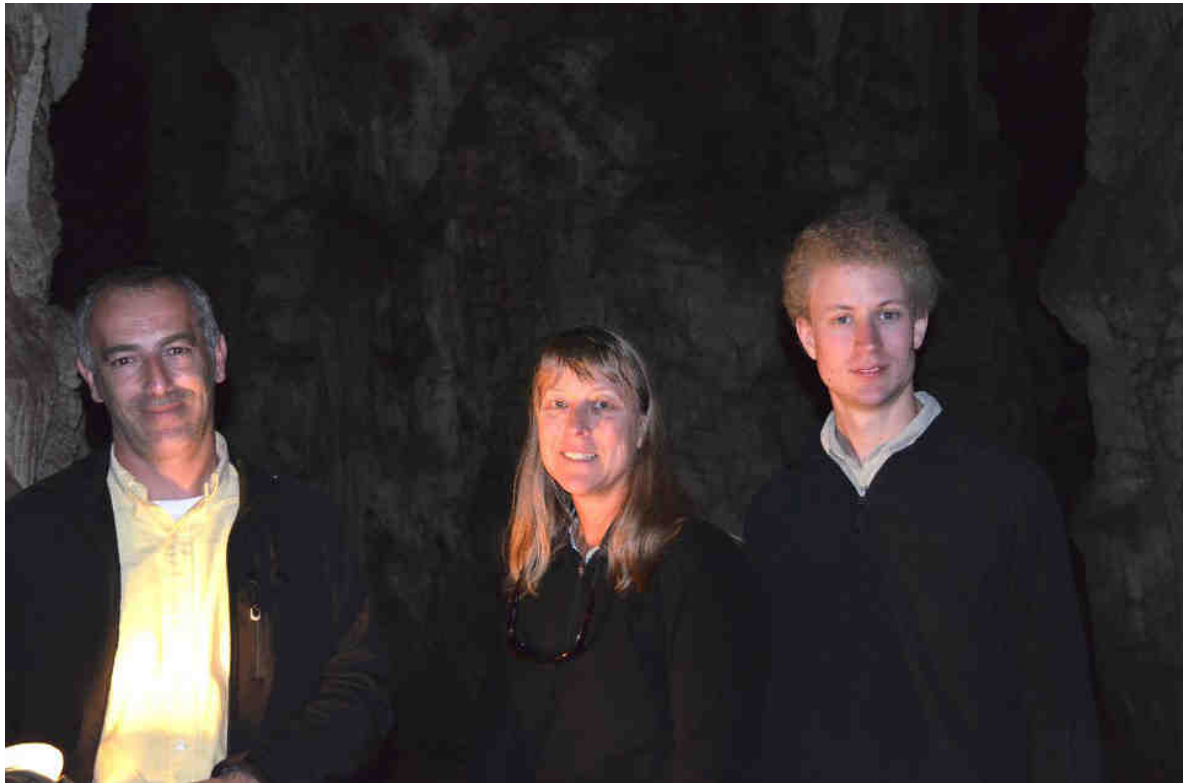
On entry to the cave, through a small gateway, the first chamber serves as the ticket booth and souvenir stall. On the wall are certificates honouring the work of the Bullón family in developing and conserving Pileta Cave. This is also where the guide collects his paraffin lamp and visitors are given one battery-powered lantern between four to light their path.

With minimal infrastructure and slippery, uneven floors, moving through the cave with only one diffuse light between four visitors is quite difficult. For any visitors with mobility or sight issues this could provide major problems and safety issues. Though safety warnings are delivered little assistance is offered.

The paintings and engravings throughout the cave are in pristine condition, are varied in style and content and of high quality. The main themes are animals, including a beautifully executed pregnant mare, a large fish sketch and goats; and a series of symbolic line

drawings, which are believed to be shamanic calendars (Bullón T, 16 December 2012, pers. comm.). The crystal formations in the cave are also in good condition, but are not outstanding examples, though minerals in the cave (including iron oxide, manganese and copper) provide a range of colour. Prehistoric fires have dulled the crystal in many areas (Bullón T, 16 December 2012, pers. comm.).

This is one of the best and most atmospheric guided tours ever experienced by the author, in a cave or anywhere else. Our guide, Tomás Bullón Almagro, was very knowledgeable about the cave's history and significance, being the great grandson of the discoverer, a co-owner of the site and an archaeology graduate. He delivered a completely bi-lingual tour, being very fluent in English as well as his native Spanish. The low light was sufficient to see the paintings easily and clearly but also contributed greatly to the atmosphere.



Tomás Bullón Almagro with Sasa and Richard Kennedy, Cueva de la Pileta

Though geology and cave fantasy comprise part of the tour, the focus is on the prehistoric artworks and the lives of the artists. The interpretation is delivered clearly, with authority and passion. The stories are fascinating and detailed, with the added intimacy implied by the guide's links to the site and the history of its exploration and development. In addition to interpretation of the artworks themselves, visitors are told of the human cemetery located in the cave, the possibility of human sacrifice having taken place here, the different family and tribal groups who occupied

the cave at different periods, the pottery shards and other finds, including a hollowed out stalagmite used as a mortar for the grinding of pigments.

The protection of the cave and its artefacts is clearly the priority, with all aspects of cave and tour management stemming from this central concern. One of the seven people on our tour requested a private tour, where she could sit for longer and sketch the cave. Tomas explained that as the major risk to the artworks came from human breath a longer viewing was not an option.



Recognition for the dedication of the Bullon family in protecting Cueva de la Pileta

This tour is a unique experience. Though the sections of the cave included in tours do not contain particularly memorable formations, to be able to enter a cave with such high quality prehistoric artworks and have the cave and its prehistory interpreted with such passion and knowledge is a rare honour.

Visitor Impressions of the caves

To obtain a broader impression of the visitor experience at each of the cave sites a survey of TripAdvisor ratings and reviews was completed on April 9, 2013. This website covers tourist attractions and accommodation worldwide and, while it cannot guarantee a balanced view of visitor experience, it is at least a fairly reliable site, where operators can reply to visitor comments and complaints. In addition it applies the same ratings system across the cave sites, allowing a fair comparison. The overall ratings are listed as raw numbers in Table 1 and as percentages in Table 2.

The figures show that Gruta de las Maravillas was rated highest of the three show caves, though the caves were all rated very highly and the results were quite close. At Gruta de las Maravillas 95.8% of visitors rated the experience as either excellent or very good, Cueva de Pileta rated 91.9% in these two bands and Cueva de Nerja 88.8%. The figures were also similar between the caves at the bottom end of the satisfaction scale.

TRIP ADVISOR – Ratings raw numbers			
Rating/Cave	Aracena	Nerja	Pileta
Excellent	63	285	37
Very Good	31	181	18
Average	2	47	5
Poor	1	7	1
Terrible	1	5	0
TOTAL	98	525	61

Table 1. Trip Advisor raw ratings figures

TRIP ADVISOR – Ratings by percentage			
Rating/Cave	Aracena	Nerja	Pileta
Excellent	64.2	54.3	60.6
Very Good	31.6	34.5	31.1
Average	2.0	8.9	8.2
Poor	1.2	1.3	1.6
Terrible	1.0	1.0	0.0
TOTAL	100%	100%	100%

Table 2. Trip Advisor ratings by percentage

Visitor reviews on TripAdvisor provide more detailed feedback on how the general public experiences the cave sites (TripAdvisor, viewed 9 April 2013). A brief

overview of the major positives and negatives for each site is presented in Table 3.

TRIP ADVISOR FEEDBACK		
Cave	Positives	Negatives
Gruta de las Maravillas	Most beautiful cave	Slippery floors
	Friendly guides	Waiting for tour to fill
	Wonderful experience	Ban on photography
Cueva de Nerja	Sheer size and beauty of caverns	Ban on flash photos
	Nice restaurant with good views	Pushing of professional photos
	Alternative to heat/sun	Cost of tickets
		Cost of audio guide
Cueva de la Pileta	Non-commercial atmosphere	Ban of photos was lamented but understood
	Quality of artworks	Slippery floors
	Guide's knowledge	Waiting time for tours
	Custodian's devotion	

Table 3. Summary of the most common feedback on Trip Advisor

Many posts regarding Gruta de las Maravillas describe it as the most beautiful cave they have ever seen and many comment on the friendly guides. The complaints are about slippery floors, having to wait for tours to fill before departure and the ban on taking photographs. But all visitors agreed the glories of the cave made it a wonderful experience (TripAdvisor, Gruta de las Maravillas, viewed 9 April 2013).

Even with all the drawbacks cited above, most of the reviews describe the experience at Nerja in very positive terms; the ban on flash photography in combination with photo sales being pushed seemed to be the major irritant. Another regular complaint was the cost of tickets and additional cost for an audio guide. One visitor complained that the security guards throughout the cave (not in evidence on the occasion we visited) would not be engaged in conversation. However, it seems that the grandeur of

the caverns and the sheer majesty of the formations were enough for most visitors. A major positive for visitors was the contrast to the heat and bright sun (or sometimes rain) to be found outside. While other sites drew comment on the quality of the guides, there was little comment on the lack of this at Nerja. It is likely that the demographic visiting this cave makes them a less discerning group of visitors than those at the caves in areas lacking highly developed mass tourism (TripAdvisor, Cueva de Nerja, viewed 9 April 2013). However, the complaints about cost of tickets indicate that visitors do not consider they are getting value for money. Given the price is a reasonable €8.50 per adult, the same as Gruta de las Maravillas and slightly higher than Cueva de la Pileta at €8, and that neither of these sites had complaints about their cost, it seems that there is something lacking in the experience, though visitors do not specify what it is.



Visitor, Cueva de Nerja

At Pileta visitors generally appreciated the non-commercial atmosphere of the caves and were impressed by the paintings and guide's knowledge. Negatives noted include the problem of slippery floors combined with low light levels, and the issue of having to wait for tour numbers to build prior to a

tour departing. Visitors lamented the lack of photographic possibilities, but were understanding of the reasons for this (TripAdvisor. Cueva de la Pileta, viewed 9 April 2013). Many noted with approval the dedication shown to caring for the cave.



Kiosk and waiting area, Cueva da la Pileta

Overall, the visitor feedback for each site was as positive as the ratings would indicate. In light of this, further study would be required to clarify the factors leading to the large and steady downturn in visitor numbers at Nerja, which will have had a significant impact on the profit margin of the caves.

Conclusion

At each of these three cave systems the tourist experience and the caves themselves have been shaped by their location, the circumstances and timing of their discovery and the history which has led to the particular bottom line focus of each managing authority.

The Gruta de las Maravillas was discovered in the nineteenth century, a time of scientific discovery and fascination with the natural world. Located in the heart of the town, it is also close to the hearts of the local population, as demonstrated by its unofficial title of 'Aracena's Treasure'.

The bottom line focus becomes clear on reading the introductory section of *La Gruta de las Maravillas*, the tourist booklet available at the cave:

To work for the caves is a delight. Our daily challenge and responsibility is to conserve and take care of this

jewel of nature so future generations can continue coming. Our other responsibilities are to offer the best high-quality service to all those who honour us with their visit, and to attract more visitors through frequent promotional campaigns...

Generations of tour guides, managers, office staff, tourist agents, town councillors, investigators and conservationists have all treated Aracena's star attraction with care and affection for nearly one hundred years...

... We cannot forget the local inhabitants of Aracena, who show off their rich patrimonial legacy with pride and modesty... We cannot forget our visitors either, who, through word of mouth, have recommended Aracena to others, and we would like to thank them for their fidelity over so many years.

The purpose of this guide is to make your visit to the Maravillas cave a unique experience. It is also a way of showing our appreciation and gratitude to all those who, directly or indirectly, have been working for the Cave for nearly a century (Garcia, 2011, p 5).

The priorities here are quite clear – environment, closely followed by people, including staff, visitors and the local population. From this profit will follow.

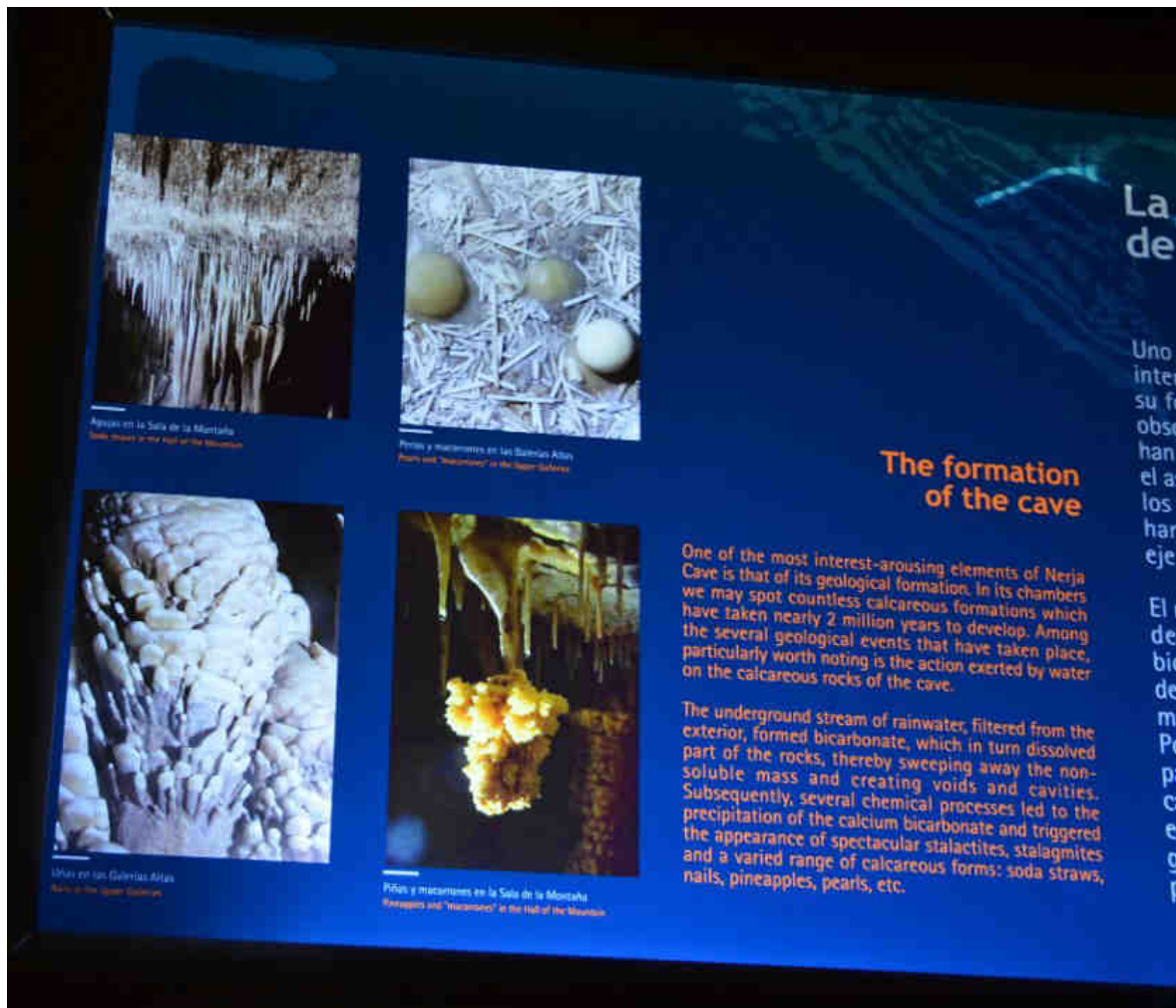
This ethos was also quite clear at Aracena – from the guide’s commentary, through to the warm welcome and generous assistance which the author was offered. The passion felt for the caves was evident; cave protection was emphasised, but in an easygoing manner; a range of interpretive strategies were in place, from guides and tour translations to an interpretation centre. Locals are obviously proud of their ‘star attraction’, as evidenced in the attractive seating in the main square of the town, which features tiles painted with images of the cave formations.

The cave is protected by regular, monitored maintenance, considered infrastructure and watchful guides. Though visitation is high, and groups may not all be environmentally focussed, the cave, open for nearly a century, is in remarkably good condition. The only negatives to the experience were the lack of

photographic opportunity and the occasional lampenflora in difficult to access places.

All of this contributed greatly to the extremely positive visitor experience, which is reflected in the reviews and ratings seen on TripAdvisor, the most widely viewed tourism ratings site on the web. These, in turn, contribute to word of mouth, assisting the bottom line aspect of profit.

Cueva de Nerja was discovered at a time when tourism was about to boom in Spain, and the Costa del Sol, where it is located, was to play quite a part in that boom. The mass resort and beach tourism which dominates the economy of the area was bound to influence the development of the cave as a tourist site. The typical visitor is less likely to appreciate the environmental and archaeological intricacies of a cave and more likely to look at it in a superficial manner.



Inaccurate signage, Cueva de Nerja

The cave is managed and presented accordingly, seemingly as a cash cow and certainly with little care for the environment, apart from the pre-historic

paintings and artefacts, which are out of bounds to the average visitor.



Broken formations, Cueva de Nerja

As the guidebook to Cueva de Nerja states:

The cave at Nerja is an important element in the promotion of this coastal zone of the Axarquía as a tourist destination (Hierro, 2012, p4).

The first impression on arrival at Cueva de Nerja is of a small retail centre and this illustrates the bottom line focus at this site; profit is paramount. While the majority of visitors to the site seem to cope well with

this and, indeed, many enjoy their visit to a high degree, the cave is suffering gross neglect and environmental degradation as a result. The decision to allow untimed, unguided access to the cave means that lights are on constantly, creating an extreme degree of lampenflora to flourish throughout the cave. The unsympathetic placement of infrastructure has also contributed a degree of damage.



Moss in Cueva de Nerja

The author's experience at this cave was one of extreme disappointment in the presentation of the cave and anger at the level of environmental damage and disregard. Though generally the reviews for this cave on TripAdvisor were positive it seems possible that, with a steady drop in visitation of 28.6% over ten years, and the lowest satisfaction rating of the three caves on TripAdvisor (especially notable in the excellent category), perhaps other visitors are not entirely satisfied either.

If Nerja is to turn its fortunes around, a rethink of its bottom line priorities may be in order.

Cueva de Pileta was fortunate to be discovered by, and on the farm of, José Bullón Lobato. Though a simple farmer he quickly understood the importance of the cave and its artworks. He worked tirelessly to protect it and instilled in his family the importance of their ongoing custodianship of the site.

The location of the cave in a more remote and wild area, along with low-key publicity, also helps protect the cave from undue visitor pressure.

Again, the bottom line focus is evident in the guidebook available at the cave:

Despite the deterioration caused by the activity of prehistoric man, the beauty of the rock formations found in the cave is almost boundless. There are still virginal areas which astound even the most experienced geologists...

After a century in the custody of the Bullón family, the rock paintings in the Pileta are amongst the best preserved in the world. The scientific community testifies to this and it can be appreciated by any visitor who cares to compare it with other, similar caves. The microclimate found inside the cave has been undisturbed by the strictly controlled regime of visits. Evidence of this are the colonies of bats which still inhabit its interior, something that is rarely seen in other caves open to the public. (Bullón R, 2008, pp 9-10)

The booklet concludes:

When you leave this cave, dear reader, it is with the assurance that when next you return you will find it still the same.

Visitors are welcome, but not at the expense of the cave. It might seem that visitors would be put out by their clear relegation to second place in the list of priorities, but from comments in TripAdvisor it would appear that, on the contrary, they appreciate the devotion shown to the cave by its custodians and are happy to co-operate.

Due to the minimal infrastructure in the cave, minimal maintenance is required, and with the small-scale operation, restrictions on numbers and the low-key nature of the site few staff are required. Profit does not appear to be a major consideration; 9000 visitors per annum are enough to keep four people employed. The impression is that if less were required this would be fine by the family; they would find employment elsewhere.

The clear focus on the environment actually enhances the visitor experience and certainly benefits the cave, its biota and the important archaeological artefacts it contains. Positive visitor word of mouth will help ensure that profit continues to flow.

The evidence from these caves suggests that if the bottom line focus is primarily on the environment and people, then, with reasonable planning and management, the third aspect of the triple bottom line, profit, will follow (see Table 4). However, if the focus is primarily on profit, this will potentially have detrimental effects on the cave environment, staff and visitors. This, in turn, may well lead to declining profit.

TRIPLE BOTTOM LINE OUTCOMES			
CAVE	Gruta de las Maravillas	Cueva de Nerja	Cueva de la Pileta
Bottom line, with apparent focus	Planet, people, profit	Profit, people, planet	Planet, people, profit
Cave condition	Very good	Very poor	Excellent
My experience rating	Very good/excellent	Poor	Excellent
TripAdvisor rating - very good/excellent	95.7%	88.7%	91.7%
Bottom line result	Success	28% drop in visitation over 10 years...	Success

Table 4. Triple bottom line outcomes

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