Yagul and Mitla in the Central Valley of Oaxaca (Mexico)
No 1352

Official name as proposed by the State Party:

Prehistoric Caves of Yagul and Mitla in the Central Valley of Oaxaca

Location:

The Central Valleys of Oaxaca

Brief description:

Surrounded by the Mixe Mountain Range, the property lies on the northern slopes of the Tlacolula valley in sub-tropical central Oaxaca. Two pre-Hispanic archaeological complexes and a series of pre-historic caves are surrounded by land that is farmed to varying degrees. In the central part of the property are 147 caves and rock shelters, a few of which are said to have provided compelling archaeological and rock art evidence for the progress of nomadic hunter-gathers to incipient farmers. 10,000 years old *Cucurbitaceae* seeds within one cave, Guilá Naquitz, are considered to be the earliest known evidence of domesticated plants in the continent, while corn cob fragments from the same cave are said to be the earliest documented evidence for the domestication of maize. In part of the property are the remnants of low-lying deciduous forest that are said to represent the type of natural resources available to early man. The remainder is farmed or grazed to various degrees. To the south-west are the pre-Hispanic archaeological complexes of Yagul and Caballito Blanco.

Category of property:

In terms of categories of cultural property set out in Article 1 of the 1972 World Heritage Convention, this is a *site.*

In terms of the *Operational Guidelines for the Implementation of the World Heritage Convention* (January 2008), paragraph 47, this is also a *cultural landscape.*

1. BASIC DATA

Included in the Tentative List: 20 November 2001

International Assistance from the World Heritage Fund for preparing the Nomination: None

Date received by the World Heritage Centre: 30 January 2009

Background: This is a new nomination.

Consultations: ICOMOS has consulted its International Scientific Committees on Cultural Landscapes and Archaeological Heritage Management. ICOMOS has also consulted several independent experts.

Comments on the assessment of this cultural landscape were received from IUCN on 18 February 2010 and are related to the following issues:

- Significance of natural values
- Intensive agricultural use
- Integrity and encroachment

The information was carefully considered by ICOMOS in reaching its final decision and recommendation in March 2010, and IUCN has also reviewed the presentation of its comments as included in this report by ICOMOS.

Literature consulted (selection):

Bautista, Jorge, Jose Luis Tenorio, y Enrique Martinez y Ojeda, 2002, "Yagul: patrimonio arqueológico y natural" in *Sociedad y patrimonio Arqueológico en el valle de Oaxaca. Memoria de la segunda Mesa Redonda de Monte Alban,* Nelly Robles editora, CONACULTA-INAH, pp 279 – 306.

Flannery, K.V., and C. Earle Smith jr., 1983, "Monte Alban IV Foodstuffs in Guila Naquitz", in Kent V. Flannery and Joyce Marcus (eds), *The Cloud People. Divergent Evolution of the Zapotec and Mixtec Civilisations*, New York Academic Press, p.206.

Hastorf, Christine, 2009, "Rio Balsas most likely region for maize domestication", in *Proceedings of the National Academy of Sciences of the United States of America*.

Smith, Bruce D., *Reassessing Coxcatlan Cave and the early history of domesticated plants in Mesoamerica*, Proceedings National Academy of Sciences, USA vol 102(27), 2005.

Zizumbo-Villarreal, D., & Colunga-García Marín, P., Origin of agriculture and plant domestication in West Mesoamerica, *Journal of Genetic Resources and Crop Evolution*, February 2010.

Technical Evaluation Mission: 11-18 October 2009

Additional information requested and received from the State Party: ICOMOS sent a letter to the State Party on 18 December 2009 on the following issues:

- Caves linked to plant domestication: Provide an inventory of caves with details of how they have been surveyed and recorded in order to demonstrate how they have yielded evidence for plant domestication or changes from nomadic to sedentary lifestyles.
- Justification for Outstanding Universal Value: provide a rationale for including Yagul as part of the property; and further evidence to substantiate for the way the property is said to demonstrate the earliest domestication of corn.

- Comparative analysis: augment the comparative analysis to compare the nominated site to other properties that demonstrate evidence for plant domestication over time, particularly in the same geo-cultural Region.
- Boundaries: provide a more detailed justification for the suggested boundaries in terms of relating them clearly to the key sites associated with plant domestication and early agriculture and to natural topography.

The State Party sent a reply on 18 February 2010. The analysis of this supplementary material is included in the present evaluation.

Date of ICOMOS approval of this report: 17 March 2010

2. THE PROPERTY

Description

Lying to the east of the Central Valleys of Oaxaca on the lower slopes of the dry mountainous uplands of southern Mexico, the property covers some 1,515 hectares, with a buffer zone of an additional 3,860 hectares, between the municipalities of Tlacolula, Diaz Ordaz and Mitla.

The boundaries mark out a rectilinear area on the northern slopes of the Tlacolula valley above the main road that runs between Oaxaca and Mitla.

Some two to three hundred metres above the floor of the valley within volcanic rocks are some 147 caves, rock shelters or open sites, a few of which are seen to have provided archaeological and rock art evidence for hunter-gatherers and their transition to farming. The evidence extends back some 10,000 years. In one cave, Guilá Naquitz, botanical remains are considered to be the earliest known evidence for domesticated squash plants on the continent and to demonstrate that domestication of maize from *teosinte*, a wild local plant, took place in Oaxaca. In other caves are rock paintings.

At the western extremity of the property are the archaeological complexes of Yagul and Caballito Blanco.

The landscape that combines these archaeological elements is mainly farmed and grazed, with in some places remnants of low-lying forest, which is seen to reflect the type of natural resources that would have been available to early man.

These four elements are considered separately:

- Prehistoric caves
- Yagul
- Caballito Blanco
- Landscape

Prehistoric Caves

One hundred and forty-seven caves and rock shelters have been indentified that were used in prehistoric times. These are scattered over the cliffs and outcrops of the lower slopes of the Mixe Mountains. Three caves were excavated in the 1960s – see History below – the remainder have been surveyed and recorded. The most significant caves are:

Guilá Naquitz
This small cave located at 1,926 metres above sea level was the key focus of the excavations in the 1960s. The dry conditions within it allowed the survival of botanical evidence. The excavation by Flannery (see History below) produced corn cobs, the seeds of squash and beans, and rind fragments of bottle gourds, as well as evidence that the site was occupied several times intermittently between 8,000 and 6,500 BC, by hunter-gatherers.

The wide range of plant food recovered within the cave deposits, including the wild forms of bottle gourd, squash and beans, are said to be evidence of early cultivation of these plants.

Analysis by AMS radio-carbon dating indicates that the seeds of squash, bottle gourds and beans date back to around 8,000 BC and are the earliest dated evidence for domesticated plants in the continent, while the three corn cobs from around 4,200 BC are the earliest dated samples of cobs, and thus, it is suggested, provide evidence for the domestication of corn earlier than that suggested by the previous finds from Tehuacán (2,700 BC).

Although not reported in the nomination dossier, since these excavations were undertaken, yet earlier evidence has been found for the domestication of corn from Rio Balsas from around 6,700 BC– see History below - and it is now clear that Naquitz does not present the earliest evidence of domestication of corn nor the evidence for it being the locus of the earliest spread of domestication on the continent. However the finds from Rio Balsas relate to grains and phytoliths rather than to cobs.

Cueva Blanca
This cave was also excavated in the 1960s and provided evidence of Pleistocene animals and stone tools.

Martinez Rock Shelter
Excavations of this shelter in the 1960s produced projectile points and small amounts of ceramics.

Cueva de la Paloma
On the ground of the cave is unexcavated sediment. On the walls are two rock paintings, one of two anthropomorphic figures and the second of a dove.

Abrigo Banco de Silex
This rock shelter shows evidence of flint working. Nearby is evidence of quarrying – the date of which is not given.

Cueva de los Machines
This cave has many red rock paintings illustrating a face, feline designs, corn, aquatic patterns and images of hands.

Caves around Caballito Blanco
Within rock shelters are paintings and petroglyphs, including a 'candelabra' and a white horse after which the ruins were named.

Gheo Shih site
An open encampment, located at low level near the river, has provided evidence for seasonal use of the abundant summer resources of fruit and small mammals. The site includes two parallel lines of small boulders and perforated stones have also been found on the site. (This is outside the nominated area, within the Buffer Zone.)

Yagul

The site of Yagul reflects the break-up of Zapotec hegemony in the Oaxaca valley, with the abandonment of Monte Alban (inscribed in 1987), and the subsequent diffusion of power and development to smaller urban centres, such as Yagul. It is suggested that these states would not have reached such levels of socio-cultural sophistication had it not been for agriculture. Yagul thus represents a different stage in the development of the valley.

The remains built mainly of stone and mud mortar consist, principally, of the Palace of Six Patios or 'labyrinth', the classically designed Ball Court facing east-west; a U-shaped building on one of the highest points of the site; the Council Room, built on a platform; five further patios and the Fortress following the natural, almost circular form of the highest hill.

Caballito Blanco

Southeast of Yagul lies the archaeological complex of Caballito Blanco (Little White Horse) in the upper portion of the field of the same name, with pre-Hispanic ruins of the pre-classical period, and several caves with significant examples of rock art - both paintings on cave walls and engravings on the cave floor – possibly used for the celebration of public rituals. The complex of Caballito Blanco has three small, low pre-Hispanic buildings with well defined rock walls, defining a central space or plaza.

Surrounding the site are caves that were occupied in different pre-Hispanic periods. The site itself is dated to Monte Alban II – which corresponds to the period when there was an urban revolution in the Oaxaca valley and in other Mesoamerican sites. The ruins comprise the remains of three low structures around a central space or plaza, a further small structure that has been interpreted as a steam bath, and an arrow shaped building that could be an observatory.

Landscape

In the plain around Yagul the landscape is intensively cultivated, while on the higher slopes there is some cattle grazing but otherwise minimal exploitation, as a result of the recent diminution of agriculture. In small pockets there are remnants of low-level forest. Pollen analysis carried out by Flannery on the material from Guilá Naquitz cave and on the current vegetation indicate that almost all species represented in the cave are still extant today.

The nomination dossier indicates that the landscape is valued in two ways. First the remnant forests are seen as places that reflect the type of vegetation that would have been available to pre-historic man. Secondly the general abandonment of the higher reaches of the overall landscape with its almost minimal agricultural use is seen as an opportunity to create a recreational landscape that attracts tourists for its aesthetic appeal.

The nomination dossier includes extensive documentation on the significance of corn in Meso-American culture and mythology. It is stated that *'corn, whose origin is found in the Prehistoric Caves of Yagul and Mitla provided the basis for development of the civilisations that began in Mesoamerica. It provided the economic incentive and the nutritional basis for this to be able to occur. It also became a central element in the culture and that of its descendants both of indigenous blood and those Mexicans of mixed blood who still today claim it as a part of their national identity'.* As set out in History below, it is now known that modern maize comes from one type of wild teosinte, and the type found in Oaxaca is not ancestral to domesticated maize. Genetic evidence from Guerraro, in the Rio Balsas, has shown that maize was domesticated there from a different type of teosinte and at a much earlier date than found at Naquitz cave. The corn cob from Naquitz cave dates to about 1,000 years after the first known domestication at Rio Balsas.

The large polygonal buffer zone surrounding the nominated property varies in size, according to its specific protective role. On the south it runs along the Oaxaca-Mitla highway to prevent unauthorised urban growth from the Tlacolula area; to the north it protects an extensive basin-shaped terrain with natural springs.

History and development

Hunter-gatherers followed nomadic lives in the area up to the end of the Ice Age, some 10,000 years ago, and, with the improvement in climate gradually moved towards a more settled way of life. Evidence of this gradual evolution, with the progressive domestication and improvement of plant species leading to an eventual agriculture-based society, and evidence of this gradual change has been preserved in two of the perpetually dry caves and one open site.

Sixty caves and rock shelters were surveyed in the 1960s by Kevin V Flannery. He excavated four sites: Guilá Naquitz and Cueva Blanca caves, the Martinez rock shelter, and also the open site of Gheo Shih (outside the nominated area). This work was seen to have produced evidence of the shift from nomadic to semi-sedentary lifestyles. Only three sites out of all the 147 caves and sites have provided botanical evidence. These are, Guilá Naquitz, Cueva Blanca and Gheo Shih. Some of the finds from Flannery's excavation are deposited in the Museum of the Cultures of Oaxaca, in Oaxaca City. Others were subjected to destructive testing and no longer exist.

In 1996 further exploration produced an inventory of plants on the property and in 2001 surveys identified caves not recorded in the 1960s.

Work was undertaken by the University of Michigan between 1970-80 on the cultural ecology of the Valley. The caves and rock shelters were further studied in 1995 by Victoria Arriola. From 1996 intensive research has continued, in particular, through the efforts of the National Institute of Anthropology and History. Finds from the Naquitz cave have been also been re-assessed by the Smithsonian Institution through accelerator mass spectrometry (AMS) radiocarbon dating, along with finds of early domesticated plant assemblages that were recovered in the 1950s and 1960s from four other caves in Mexico: Tamaulipas (Romero's and Valenzuela's Caves), and Tehuacán (Coxcatlan and San Marcos Caves).

In Oaxaca, evidence for the beginnings of plant domestication and settled agriculture during the period between 8,900 and 2,000 BC has been divided into four phases: Naquitz, Jicaras, Blanca and Martinez, after three of the four sites that provided evidence.

In the Naquitz phase (8,900-6,700 BC) within the Paleo-Indian period, evidence from Guilá Naquitz cave has been found for domestication of local plants including gourds, squash, beans and corn.

The Jicaras phase (5,000-4,000 BC) is related to evidence from Gheo Shih site, an open encampment, which seems to have seen seasonal and temporary use.

The Blanca phases (3,300–2,800 BC) relates to finds of projectiles from the Cueva Blanca cave linked to more permanent settlements.

The gradual shift from social groups based primarily on hunting to ones that were primarily based on settled agriculture took place in multiple areas at the same time across the Mesoamerican region.

The nominated property at the time it was excavated produced some of the earliest examples of domesticated plants. Although the evidence is acknowledged as being fragmentary, it is seen to outline this complex process.

In the 40 years since some of the caves on the property were investigated, further research at the Rio Balsas lowlands in south-west Mexico has revealed extensive evidence for the sequence from hunter-gathers gathering a variety of teosinte, the wild ancestor of maize, (7,000 BC), to its domestication and dispersal into the highlands of Oaxaca and other areas. One material difference between the two areas is that the evidence in Rio Balsas for the domestication of corn was based on seed evidence, whereas what was found in Oaxaca was a corn cob. However the seed evidence is much earlier than the corn cob.

The site of Yagul reflects one of a series of small city-states that emerged following the decline of the urban State of Monte Alban (remains inscribed on the World Heritage list in 1987) with its smaller satellite societies across the Valley, such as at the settlement at Caballito Blanco, a network of sites spaced at approximately 5km intervals.

The Yagul site was explored from 1954-61.

With the 16th century Spanish conquest in Oaxaca, land use moved away from the indigenous systems. The village governors were able to retain their lands and did not resist the invasion. Hernán Cortés, who was named the first marquis of the Valley, protected it from the huge changes endured in the Mexico Valley. Few Spaniards were at that stage interested in land acquisition however, by 17th century, large haciendas and labors (small farms with employed labour) had appeared, providing local markets with animal products and grains. Close to Yagul stand the remains of the Soriano hacienda including a decorated chapel.

In the early 20th century, major land and agrarian reforms occurred in Mexico. The community of the Union Zapata in the Valley is an example. It emerged in the 1930s as an *ejido,* with the former ranch, after considerable struggle, divided among 20 families of landless peons. There was not enough land for the community, it was minimally productive and issues arose over the common land 'the Fortress' with the Mitla community. Resentments continue between the landowners.

3. OUTSTANDING UNIVERSAL VALUE, INTEGRITY AND AUTHENTICITY

Comparative analysis

In the nomination dossier, the nominated property is compared to a number of properties already inscribed on the World Heritage List – but not to properties that might in the future be inscribed. The analysis aims to demonstrate similarities rather than to demonstrate that there is no similar property on the List. It is stated that a considerable number of inscribed sites are comparable to the property in terms of aesthetics, settlement patterns and cave drawings.

The inscribed sites listed include Tassili n'Ajjer, Algeria, Cueva de las Manos, Rio Pinturas, Argentina, Gobustan Rock Art Cultural Landscape, Azerbaijan, and 15 other rock art properties; Neolithic Flint mines at Spiennes (Mons), Belgium, Kuk Early Agricultural Site, Papua New Guinea; and the conclusion drawn is that these share diverse elements with the nominated property.

As set out, this comparative analysis does not justify how there is room on the World Heritage List for the nominated site, nor does it set out to demonstrate that there are no other properties that might be nominated in the future with similar attributes.

As the focus of the nomination is evidence for the early domestication of crops and settlement formation, combined with the way the overall cultural landscape shows evidence of later state formation and the persistence of endemic species, ICOMOS considered that the comparative analysis needed to start from this combination of attributes. The State Party was therefore asked to provide further comparisons in a letter ICOMOS sent on 18 December 2009.

In the supplementary material submitted, the comparisons are linked only to sites that could be considered as the source of domesticated maize. The property is compared to the Tehuacán Valley only. This comparison shows that both sites demonstrate the development of agriculture and semi-settled communities. However the Tehuacán valley has a longer sequence leading to settled communities, with the Coxcatlan Cave being occupied over a span of nearly 10,000 years and providing *'one of the most extensive and detailed early records of human cultural history in Mesoamerica'*, while Oaxaca has the earliest botanical evidence for domestication of two plants in Guilá Naquitz. It is this one cave that thus sets apart the nominated property from the Tehuacán site.

What this extra material has not demonstrated is how the property as a whole with all its caves and monumental sites, together with endemic species surviving in the landscape – as put forward in the nomination – can be said overall not to have comparators.

However ICOMOS considers that if the three key sites only were to be compared with other possible sites, then a stronger case can be made for showing that their contribution cannot be precisely paralleled elsewhere.

ICOMOS considers that the comparative analysis does not currently provide justification of the consideration of this property as nominated for the World Heritage List. ICOMOS considers that the analysis needs to be modified to reflect the significance of the three key sites.

Justification of the Outstanding Universal Value

The nominated property is considered by the State Party to be of Outstanding Universal Value as a cultural property for the following reasons:

The Prehistoric Caves of Yagul and Mitla in the central valley of Oaxaca constitute a cultural landscape of Outstanding Universal Value made up of extraordinarily rich places that provide evidence that the earliest domestication of plants, especially of corn, took place among a compendium of plants that are used for human survival. They constitute the most integrated example of a cultural landscape that maintains the components of the original lifestyle of human groups in the region. The cultural landscape of the Prehistoric Caves of Yagul and Mitla demonstrate the link between man and nature that gave origin to the domestication of plants in North America, thus allowing the rise of Mesoamerican civilisations.

The Outstanding Universal Value is considered to be reflected in a cultural landscape that is comprised of a series of caves and rock shelters, the natural framework of conserved low deciduous forest and the remains of monumental important post-classical cities that demonstrate the development of Mesoamerican cultures in the periods close to the Spanish conquest.

ICOMOS considers that the claim that the earliest evidence of the domestication of maize/corn is found in the caves of Oaxaca has been challenged, particularly following the identification in the Rio Balsas region in 2009 of the entire sequence from hunter-gatherers exploiting the wild ancestor of maize in around 9,000 BP (7,000 BC) to its domestication and dispersal into the highlands (to Oaxaca) and to the coast via the Isthmus of Tehuantepec. The argument cannot be sustained that Oaxaca is, through the birth, rather than the development, of corn, the cradle of Mesoamerican civilisation.

ICOMOS also considers that Yagul cannot be considered to be one of the most important post-Classical cities. Yagul was the capital of one of a number of city states along with Lambityeco, Mitla and Uxmal, that flourished after the abandonment of Monte Alban. Although the State Party acknowledges this implicitly it argues that by integrating Yagul as part of the property they can convey to visitors the importance of monumental as well as non-built cultural properties in the different stages of development in Mesoamerica. They also argue that Yagul is the result of the long process of plant domestication that took place in the nearby caves and that by including it the site may be *'conceptualised as part of an integrated whole'.*

ICOMOS considers that many civilisations may be said to have been built upon developments in the domestication of plants and that Yagul is no more special in this regard than the remains of the Zapotec

civilisations that preceded it, some of which are already represented on the World Heritage List.

Overall the property is nominated as a cultural landscape that is said to demonstrate the way the domestication of corn underpinned the whole subsequent cultural development of Mesoamerican civilisation, and that this process is manifest in the caves, the endemic plants and the monumental remains of Yagul that represent pre-conquest cultures.

The early evidence for plant domestication was found in one cave excavated in the 1960s. This was related to corn, gourds, squash and beans. In two other caves and an open site were found evidence for earlier hunter-gathering and later informal/ seasonal settlements. The significance of the site in terms of its role in plant domestication thus rests on the one cave – which is set into context by the three other sites, thus demonstrating a long time sequence for use of the area in the pre-historic era. However since the 1960s the process of corn domestication has become clearer and particularly the precise species of wild plants that were cultivated. It is now known that corn was domesticated elsewhere and that the evidence in Oaxaca relates to a period some 1,000 years after the first evidence for the domestication of corn. As for the evidence for the early domestication of gourds, squash and beans, the remains are still the earliest so far recovered. However they relate to one cave and cannot be related to any known dispersal or later development.

ICOMOS considers that the overall cultural landscape as nominated cannot be said to be the site from which the domestication of corn spread around Mesoamerica, nor can its caves and the monumental site of Yagul together be said to show how the domestication of corn led to the flowering of Mesoamerican culture. The one cave, Naquitz, is of importance for the remains that were found of the early domestication of gourds, squash and beans, but this significance cannot easily be spread across the whole nominated area. The remaining caves have not all been investigated: those that have show evidence for pre-historic use, but not botanical evidence, and as a group are of importance but can be paralleled by many other groups of habitation sites in the region.

ICOMOS thus considers that the Naquitz cave could be said to be outstanding for its contribution to our understanding of plant domestication and with Cueva Blanca and Gheo Shih could be said to be a small group of sites that are exceptional in terms of the way they add to our understanding of the link between plant domestication and the beginnings of semi-settled groups of people.

IUCN noted that *"while the nominated property provides important archaeological evidence of the evolution of man's relationship with nature through the early domestication of plants, such as corn, the present landscape itself is not particularly significant in regard to a contemporary interaction of man and nature."*

Integrity and Authenticity

Integrity

Within the boundaries of the nominated property of the Prehistoric Caves of Yagul and Mitla lie all the elements to sustain the Outstanding Universal Value as presented by the State Party. Its size, extent and content are sufficient to ensure the complete representation of its attributes. However ICOMOS does not consider that the justification for Outstanding Universal Value has been made in terms of the whole nominated cultural landscape being associated with the development of corn in Mesoamerica. If Outstanding Universal Value is linked to a much smaller range of attributes: the group of excavated sites, then the integrity relates to a much smaller area.

Authenticity

The claim that the earliest evidence of the domestication of maize/corn is found in one of the caves of Oaxaca has been challenged. The authenticity of this aspect of the nomination is thus questioned. The rest of the caves, the wider landscape and Yagul were all put forward as complimentary attributes to the evidence from this one cave. However ICOMOS considers that Naquitz cave, together with Cueva Blanca and Gheo Shih can be seen to convey sites where early man at an early dates is known to have domesticated certain wild plants and taken putative stapes towards semi-settled lives. For these small number of sites, authenticity can be said to be intact, even though the evidence on which our knowledge is based is no longer physically extant in the caves and sites.

ICOMOS considers that the conditions of integrity and authenticity might be considered to be met for a much smaller area than that nominated and related to a different justification for Outstanding Universal Value.

Criteria under which inscription is proposed

The property is nominated on the basis of cultural criteria (ii), (iii) and (iv).

Criterion (ii): exhibit an important interchange of human values, over a span of time or within a cultural area of the world, on developments in architecture or technology, monumental arts, town-planning or landscape design;

This criterion is justified by the State Party on the grounds of the property demonstrating the ability of early man to select the most desirable plants and affect genetic changes to adapt them to the uses and environment in which they found themselves. This resulted from the interchange of knowledge and experience between nomadic groups over a long period of time, during which they were able to adapt environmental conditions for their own benefit and the

domination of agriculture that made civilisation possible all over the world.

ICOMOS considers that although the squash seeds *(Curcubita Pepo)* found in the cave of Guilá Naquitz date back 10,000 years and are some of the oldest signs of plant cultivation in North America, it cannot be argued that the property is the cradle of plant domestication, particularly corn domestication, which subsequently spread out around the region and underpinned pre-Hispanic culture; nor that the advances in Oaxaca made civilisation possible around the world. Further research at other sites has now led to an understanding that the domestication of corn took place elsewhere and spread to Oaxaca; and the squash and bean seeds have not been linked to an understanding of how squash and bean domestication spread from Oaxaca elsewhere.

ICOMOS does not therefore consider that the property, on the basis of seeds and other botanical evidence from one cave, can be seen to demonstrate an important interchange of ideas in relation to plant domestication. Although the property also provides evidence of the transition from hunter-gatherers to settled agriculturalists, such evidence is also found elsewhere and that from Oaxaca cannot be said to be related to an interchange of ideas.

ICOMOS considers that this criterion has not been demonstrated.

Criterion (iii): bear a unique or at least exceptional testimony to a cultural tradition or to a civilisation which is living or which has disappeared;

This criterion is justified by the State Party on the grounds that corn, which has documented origins in the Prehistoric Caves of Yagul and Mitla, was not only a food that made the rise of Mesoamerican civilisation possible; this element also became a fundamental part of life, in rites, beliefs and myths and influenced the ways that people saw themselves.

As the plant became more cultivated, it was used over a multitude of geographic areas. It became an important part of whatever culture grew it.

There are many pre-Hispanic myths and legends that contain corn as a central element and that have endured more than five hundred years of European colonisation.

Further, it is stated that the economic and ideological import of this plant is such that cultures are known as "cultures of corn" as opposed to the "cultures of wheat" of the Mediterranean, and the "cultures of rice" of Asia.

ICOMOS considers that the idea of culture of corn is a very broad category that could be said to apply to many societies in Central America. As it has not been demonstrated that the domestication of corn can be linked directly to Oaxaca, the way that the property can be seen to be an exceptional testimony to the culture of corn has not been demonstrated.

However ICOMOS considers that the evidence from Guilá Naquitz cave related to the domestication of other plants – squash, gourds and beans, linked with the evidence from Cueva Blanca and Gheo Shih can together be seen to be an exceptional testimony to a very specific aspect of prehistory in central America.

ICOMOS considers that this criterion could be justified for a much smaller area than that nominated.

Criterion (iv): be an outstanding example of a type of building, architectural or technological ensemble or landscape which illustrates (a) significant stage(s) in human history;

This criterion is justified by the State Party on the grounds that the cultural landscape contains the most compelling evidence of the transition of nomadic hunter-gatherers to settlements in the western hemisphere. This is important both regionally and universally. The extensive use of the site for medicine and foods for survival resulted in a profound knowledge of the area and made possible the following domestication of plants. The extraordinary beauty of the site (with the caves and rock shelters surrounded by native plants and small fields), combined with monuments of different periods, yield a vision of a place of universal importance.

The continuity of agricultural activity from prehistoric times until now is demonstrated through a gamut of archaeological evidence denoting different stages of cultural complexity. The natural border of low growing, deciduous jungle has fortuitously been conserved and presents an incomparable landscape. It contains many species with different uses including some found only in this area, and reflects a sustainable ecological equilibrium between man and nature over many periods of time.

ICOMOS considers that although the assemblage of sites within the landscape including the caves, the endemic species used by early man and the post-Classic and Pre-classic architectural ruins of Yagul and Caballito Blanco respectively, reflects some aspects of the transition from nomadic hunter-gatherers to settled agriculturalists making use of local natural resources, and then to the development of centralised pre-Hispanic societies, this evidence cannot be related to any significant stages in human history. The transition from hunter-gatherers to settled agriculturalists is demonstrated at other sites, some of which such as Rio Balsas demonstrate a much more detailed sequence. The link between settled agriculturalists and centralised societies is also not linked through the evidence to any specific periods in human history - the transition is better demonstrated at other earlier sites that reflect the beginnings of Zapotec culture rather than its break-up as demonstrated by Yagul.

ICOMOS considers that this criterion has not been demonstrated.

ICOMOS considers that criterion (iii) and Outstanding Universal Value could be demonstrated for a much smaller number of sites than has been nominated.

4. FACTORS AFFECTING THE PROPERTY

Development pressures

The primary factor that threatens the site is rapid urban growth from Tlacolula, specifically the Duvil-Yasib area and the Tres Piedras neighbourhood to the southwest of the site area. Officers patrol this area to identify and prevent new invasions into the buffer zone of the property. The government is relocating families that have moved into the site's protected area. The nominated area itself is almost uninhabited with only a few isolated houses in the vast extent of land. The federal highway is close by and is the reason for constant inspections to see if any archaeological rescue needs to be carried out in the area. From the information from the 2000 Census of Population and Housing, the socio-economic indicators reveal immense social problems in the relevant communities, from lack of security, lack of education and lack of adequate income.

IUCN noted that: *"The area proposed for inscription is mainly dedicated to intensive agriculture and grazing. The more natural landscapes are in the buffer zone on the northern side of the property where a small ecological reserve is proposed to protect a watershed characterised by springs, intermittent streams, and a low lying deciduous forest. The natural values of the area appear to be of local or national significance. It is noted, however, that this portion of the nominated property serves to buffer the larger area from extreme weather events and to protect aesthetic values. The nomination provides little information on the integrity of the site, except to note the progressive encroachment of the urban periphery on the agricultural components of the site."*

Tourism pressures

The tourist influx in Yagul is not massive; to date it is not a relevant factor in the deterioration of the site. The site has adequate resources for patrols to protect it from any harm from visitors. Visitors are not permitted into the caves.

Environmental pressures

The sites have been exposed to the elements which slowly degrade them, possibly over thousands of years. While the damage is not drastic, it creates salt build up which may cause cracks, fissures and rock falls, all requiring preventative action. It is possible that further acidification of the atmosphere will worsen this effect. Monitoring of these risks and action plans are in place. Corrective actions such as treating the area with substances that feed on the damaging phenomena or replacing infected elements to avoid propagation are the usual solutions to retard deterioration.

Natural disasters

If potential or actual damage occurs to the archaeological structures by earthquake, fire or hurricane, applications may be made to the National Fund for Natural Disasters (FONDEN) to help protect or restore damaged buildings. Fortunately, this has been unnecessary for this site, unlike the neighbouring sites of Monte Alban, Mitla and Lambityeco that suffered extensive damage. After Hurricane Stan, in 2005, damaged the central plaza of Monte Alban, FONDEN funded the restoration.

Impact of climate change

ICOMOS considers that the property could be vulnerable to changes in climate that impact on the vegetation of the area. For instance changes in rainfall could lead to over-grazing and erosion of soil which could impact on the remaining archaeological deposits.

ICOMOS considers that the main threat to the property is from urban development.

5. PROTECTION, CONSERVATION AND MANAGEMENT

Boundaries of the nominated property and buffer zone

The boundaries to the property are clearly defined inside a polygonal outline that encloses 1,515.17 hectares, with an extent of terrain included for its potential to reveal further information under study. The defined area coincides with existing protected cultural and natural areas. However the boundaries are drawn across natural features and the property does not form a coherent geographical unit.

The buffer zone boundaries add a further 3,859.74 hectares, giving a total area for the property and buffer of 5,374.91 hectares. The buffer zone includes not only natural protected areas but also several sectors to protect the property from expanding urban areas or rural enterprises.

The buffer zone is appropriate in extent, delineation and land use zoning to protect the nominated property from specific pressures from neighbouring developments.

ICOMOS considers that the boundaries of the nominated property and its buffer zone might be considered appropriate if re-drawn to reflect geographical features. They also need to be reduced, in line with the

recommendations relating to Outstanding Universal Value.

Ownership

The ownership of the property is complex. It is made up of some communal land ownership, *ejidos*, private and government ownership corresponding to the municipalities of Tlacolula, Mitla and Diaz Ordaz. Agrarian centres and agencies include:

- Communal Property of Diaz Ordaz
- *Ejido* Diaz Ordaz
- Communal Properties of Mitla
- *Ejido* Union Zapata
- Communal Properties of Tlacolula
- *Ejido* Tlacolula
- Tanivet Agency
- Private property
- Nationally held lands

Protection

Legal Protection

The Yagul part of the property has protection as follows:

- Presidential Decree, declaring Zone of Archaeological Monuments in the Yagul Area, located in the Tlacolula de Matamoros Municipality, Oaxaca State (2001), covering 1,076 ha.
- Presidential Decree, declaring the Zone of Archaeological Monuments in the Yagul Area as Protected Natural Area and Natural Monument (1999).

However the remaining archaeological and landscape areas do not currently have national or municipal protection.

There are ongoing specific projects to protect these parts of the property. The nomination dossier states that *'The protected site area of the caves is in the process of being decreed. Also, the zone is in the process of registration as a protected municipal site for its use as part of ejidos (common lands) and communities'.*

Traditional protection

Under the Management Plan, in the major *Zone B – Controlled Use* on the nominated property, only traditional methods of farming, with indigenous plant species is permitted.

Effectiveness of the protection measures

The National Institute of Anthropology and History has a local delegation in Oaxaca with different branches. The Yagul Archaeological Monuments Zone is taken care of by these branches and several actions to protect and conserve the site are being undertaken. This occurs for all cultural elements throughout the nominated area and buffer zone. The National Commission for Natural Protected Areas (CONANP) is in charge of the same procedures for the natural elements in the area.

ICOMOS considers that although the staff of the National Institute for Anthropology and History work with the property, there is a need for adequate legal protection to be put in place, not just for Yagul.

Conservation

Inventories, recording, research

The supplementary information provided by the State Party states that, following a bibliographic review of published and unpublished materials, an archaeological survey of the region was begun. This project is still ongoing. The aim is to record all previously unknown caves and rock shelters that can still be found in the area.

All visible archaeological evidence is recorded on record sheets for each site, together with mapping and photographs.

All documents, photographs and bibliographies that refer to the nominated property are held in the Centre for Documentation and Research of World Heritage Sites under the supervision of the Administration of the Archaeological Zone of Monte Alban, itself supervised by the National Institute of Anthropology and History.

Present state of conservation

The state of conservation of the caves differs markedly in relation to their location. Caballito Blanco has suffered the greatest deterioration. Some graffiti has even over-written prehistoric cave drawings. There is also rubbish present and impact from grazing cattle. This level of damage is caused by the site's accessibility through proximity to the urban encroachment from Tlacolula.

In contrast, the caves and shelters in the area of Guilá Naquitz are in good condition, with only one exception - graffiti on a single element. Trash is minimal. The main problem is waste from the cattle which shelter here. The good state of conservation of the site is because of its distance from population centres and the difficulty of access – over an hour's walk. The properties are *ejidos* (common lands), with a watch committee to protect them from outsiders or prowlers. This has contributed significantly to conserving the abundant archaeological relics which have contributed the most significant information on the site.

With regard to pre-Hispanic architectural remains, Caballito Blanco has suffered major losses, as the area

was for many years used to grow corn and maguey. It is impossible to know how many structures were originally present. Three original structures have been described during restoration and their current state is relatively good. Some monuments of Yagul show signs of deterioration from their prolonged exposure to the elements. To counter this, in 2007, the *Integrated Program for Conservation of the Cultural and Natural Resources in the Yagul-Mitla Zone* was established to restore the most damaged structures. These include the Palace of Six Patios, the Council Room and the east building of the fourth patio.

In the Palace of Six Patios, patios C, E and F have been levelled and waste removed in critical areas. In the Council Room much of the building was replaced, modelling the original construction and stabilising it. In patio 4, the main staircase was uncovered and cleared of the debris from historical ransacking. All these projects are complete with documentation of the restorations, before and after, to keep control on the completed work. While it is necessary to continue to work on the site, past interventions have conserved much of it and it is now in a good state of conservation.

With regard to the landscape, the nominated area of the property is mainly dedicated to intensive agriculture and grazing. The more natural landscapes are in the buffer zone on the northern side of the property.

ICOMOS considers that overall the conservation of the caves relates more to whether or not they are remote than to a strategy of active conservation. Those readily accessible either to people or animals are suffering. This leads to concerns about the impact of increased visitor access to the property and the need to regulate grazing. ICOMOS considers that a more active conservation policy is needed to ensure that undisturbed remains are conserved.

Active Conservation measures

The principles guiding conservation policy for both cultural and natural elements of the property were agreed in 2007 by the two principal authorities, the National Institute of Anthropology and History (INAH) and the National Commission for Natural Protected Areas (CONANP). The principles are to:

- conserve the cultural landscape;
- assess the nature and condition of ecosystems;
- survey the presence and typology of monumental architecture;
- study the prehistoric evidence of human activities;
- survey present activities and uses of land;
- survey the ownership of land and how it is used;
- investigate the history of management practices and the interaction between people and the environment;
- research historical values and the present state of biodiversity.

Although these principles are sound, active conservation on the ground seems to be limited to some parts of the property.

ICOMOS considers that many elements could benefit from more regular conservation and protection.

Maintenance

The only regular cleaning and maintenance is carried out at the monuments of Yagul, on the structures of the monuments themselves and on the areas surrounding them. The side of the Archaeological Zone facing the highway is kept cleared, in order to be visible from surrounding areas. This has increased public awareness of the cultural landscape that the site represents.

Effectiveness of conservation measures

The general condition of conservation across the property is fair for both cultural and landscape aspects. While the state of conservation of Caballito Blanco remains the greatest concern, the conservation team has been successful in removing graffiti. Nevertheless ICOMOS considers that a full and sufficient conservation and maintenance regime is not in place for all the caves and archaeological sites, nor for the overall landscape.

ICOMOS considers the conservation and maintenance needs to be improved to ensure that they address the needs not only of the readily accessible monumental remains but the collection of caves and the wider landscape.

Management

Management structures and processes, including traditional management processes

The principal authorities responsible for the management of the property are the National Institute of Anthropology and History (INAH) concerned with all archaeological and cultural sites – including support for research and the preparation of inventories - and the National Commission for Natural Protected Areas (CONANP), both of which have state and local branches or departments. CONANP is responsible for the conservation of natural species and scenic spots in the Yagul area. In conjunction with INAH it establishes agreements with communities, favouring traditional land use practices.

Policy framework: management plans and arrangements, including visitor management and presentation

In 1999, a Management Plan was approved for the Oaxaca Valley Archaeological Corridor (CAVO), attached to the existing management plan of the Monte Alban Archaeological Zone. It established a corridor, to extend protection and management to the archaeology

of the whole Oaxaca Valley, including the significant Yagul – Mitla region. A program to survey the region was based on the evidence from Flannery´s research.

The Plan was established for 10 years (2005 – 2015) with the following goals:

- Long term preservation of cultural, natural and scientific values and resources into open areas and zones of archaeology and nature reserves.
- Provide to the general public the use of the assemblage of archaeological sites in the Valley for educational and recreational purposes, stressing the importance of the place as a "cultural corridor" through time.

The management plan considers three basic issues:

Social Factors: The regional socio-economic situation is one of the most depressed in the country, where most of the population has a salary of less than $10 US per day. The Management Plan seeks to increase the quality of life for people associated with the property - with benefits in education and cultural advancement but mainly to increase income through the rational use of property as a cultural resource, with gradual training and extended employment.

Technical Aspects: The technical aspect must respect the vulnerability of both cultural and natural components of the property. This will be assessed for a plan that estimates the carrying capacity of the property for sustainable public access. A separate scientific project will explore the thematic potential of each component of the area.

Cultural Issues: The Management Plan will support the continuity of local cultural traditions within the property, such as traditional agriculture activities which are still alive and significant for the local and national identity. Other related cultural practices will be re-activated, such as rituals around corn and other traditional plants and the rich local gastronomy attached to traditional agricultural practices.

Four land use zones have been established across the nominated property and the buffer zone to regulate developments and activities. They are:

- Zone A: to be used exclusively for scientific investigation
- Zone B: for compatible uses only
- Zone C: as ecological reserve and basin protection
- Zone D: to contain urban growth.

The Management Plan also endorses joint projects with Municipalities, State and Region to:

- Stimulate traditional agricultural practices of basic food products
- Encourage the sustainable reproduction and exploitation of applicable native plants (medicinal, ornamental)
- Promote activities and services for ecological tourism through community agencies.
- Support interpretation centres and improved services in local towns surrounding the property, to encourage greater visitation to the region.

The Management Plan is to be governed by a Site Commission of representatives from the different levels of government and a Scientific Commission of representatives from appropriate scientific research institutions.

Risk preparedness

No information is provided on this question.

Involvement of the local communities

Local communities have diverse access and ownership of the land in the property - communal land ownership, *ejidos*, private and government ownership through the municipalities of Tlacolula, Mitla and Díaz Ordaz. Their participation in the planning, management and work on the nominated property is actively encouraged by both INAH and CONANP. The World Heritage project, in seeking to further involve the communities in the management and conservation of the site, includes consideration of their economic welfare.

Resources, including staffing levels, expertise and training

The principal funding agency is INAH, which supports most of the budget for research, conservation, restoration and management of the archaeological sites. Other sources have been CONACULTA for specific projects or foreign universities or agencies, supporting projects lead by external researchers. Funding and administration for the natural landscape is from CONANP with an annual budget for conservation and management with the communities.

The expertise and training of the staff is of a higher level. Most archaeologist, anthropologist, curator, conservator or lawyer come from institutions such as the Escuela Nacional de Antropologia e Historia, Universidad Veracruzana, Escuela Nacional de Conservación or Universidad Benito Juarez de Oaxaca.

Management specialists come from the archaeological zone of Monte Alban (INAH), a site for which strategies have been developed for the management of archaeological sites all over Mexico and in other countries in Latin America. Technical, legal and management staff operate under the standards of INAH.

Effectiveness of current management

ICOMOS considers that the Management Plan presented is complete, adequate and innovative, and has the basic resources to be achieved. The proposition for joint management by two strong national agencies, as INAH and CONANP, provides a strong institutional presence, with skills to guarantee the effectiveness of actions to conserve and manage the property and its values.

ICOMOS considers that the management system for the property overall is adequate, although newly implemented and thus still being proved. It should be extended to include provisions for risk preparedness.

6. MONITORING

The archaeological sites, particularly in the region of caves but also the pre- and post-Hispanic ruins, have been exposed to the elements which slowly degrade them, over thousands of years. Further acidification of the atmosphere may worsen the situation. Regular monitoring of these risks is in place. Similarly, the site itself is patrolled to monitor incursions.

The State Party has identified key indicators for the regular measurement of the property's state of conservation. These are grouped under the headings: urban, socio-economic yields; natural; rupestrian elements; management; judicial department; and diffusion. It is not made clear who is responsible for this monitoring system.

ICOMOS considers that the monitoring system is satisfactory but needs to be linked to the management system.

7. CONCLUSIONS

The property has been nominated as an extensive cultural landscape with caves and shelters that are said to be associated with earliest evidence for plant domestication and in particular with evidence of the early domestication of corn, which is said to underpin the whole cultural development of Mesoamerica, as demonstrated by the monumental remains at Yagul.

Although the Guilá Naquitz cave has provided the earliest known botanical evidence of bottle gourds, beans and squash and the earliest known maize cobs, and, with two other sites, has provided evidence to demonstrate the evolution from hunter-gathering to more settled communities, what has not been demonstrated is how the complex of caves as a whole and the entire landscape within which they are set, together with the Yagul remains, can be said to have exceptional value. Other sites such as Tehuacán and Rio Balsas also demonstrate a sequence from hunter-gathering to more settled communities, and have longer and more complex evidence, and specific evidence for plant domestication which in the case of Rio Balsas pushes the date for maize cultivation back much further than at Oaxaca.

The one distinguishing feature of the nominated property is the evidence discovered within the Guilá Naquitz cave that gives it precedence in terms of it having provided the earliest known date in the Americas for one type of domesticated plant and the earliest dated maize cob (although not the earliest evidence of domesticated maize and not evidence for the transition to settled agriculture). ICOMOS does not consider that this single cave justifies consideration of the extensive cultural landscape for inscription on the World Heritage List.

ICOMOS recognises that plant domestication practices are diffuse and occur across regions, and while the Guilá Naquitz cave provides an excellent example of a site from which extraordinarily well preserved botanical evidence was retrieved, it cannot be seen as the exemplar site in terms of demonstrating a fundamental shift in our understanding of the beginnings of settled agriculture and society; nor a significant link to the domestication of corn that is not found in other areas or sites; nor a fundamental link between the domestication of corn and the development of centralised societies in Mesoamerica – which are better demonstrated elsewhere. Nevertheless Guilá Naquitz cave, together with the Cueva Blanca and Gheo Shih sites do provide a valuable testimony to very specific aspects of pre-history related to the beginnings of agriculture and semi-settled life.

ICOMOS considers that in time with the results of more research into other caves in the area, a much smaller area than has currently been proposed could be nominated to reflect only the caves, shelters and early sites. These would however need to be very well conserved, have legal protection and carefully controlled access that allowed an understanding of their full significance.

Recommendations with respect to inscription

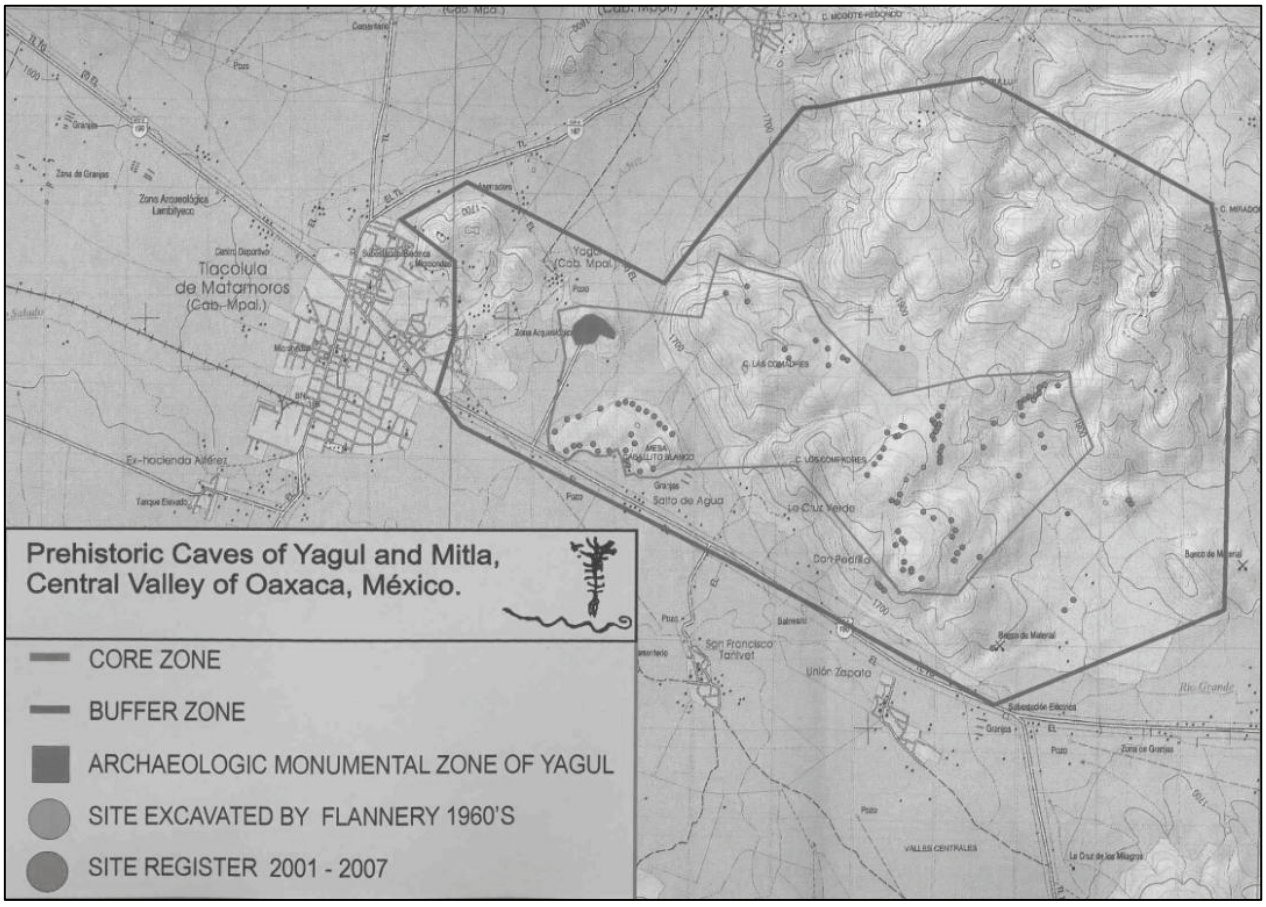
ICOMOS recommends that the nomination of the Prehistoric Caves of Yagul and Mitla in the Central Valley of Oaxaca, Mexico, be ***referred back*** to the State Party to allow it to:

- Define a much smaller area based on the Guilá Naquitz, Cueva Blanca and Gheo Shih sites;
- Put in place a revised comparative analysis to reflect the reduced area;
- Put in place legal protection for the whole nominated area;

- Put in place an active conservation policy to ensure grazing and access are controlled, and risk preparedness measures;

- Put in place a sustainable access strategy based on the carrying capacity of the nominated area;

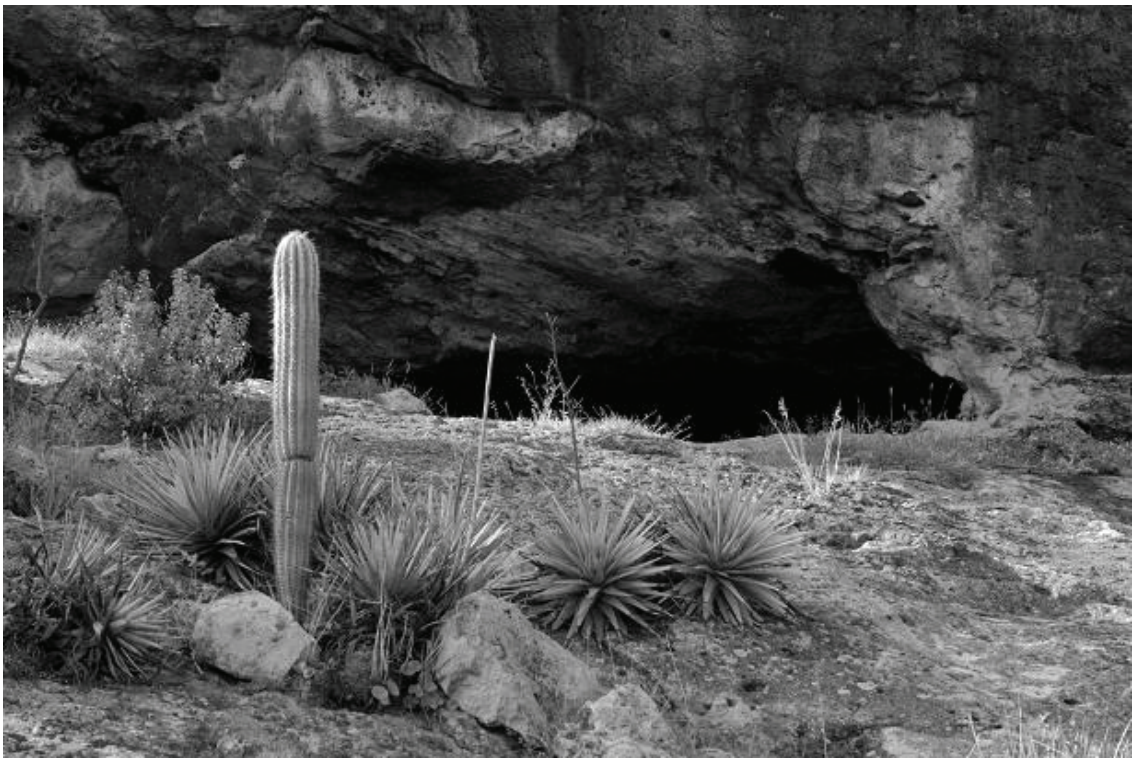
- Promote a research programme to consider whether in time more substantial evidence might be uncovered that could allow the landscape of Oaxaca to be seen as having been a focus for the domestication of plants and the transition to settled agriculture that is exceptional in the context of its geo-cultural region.



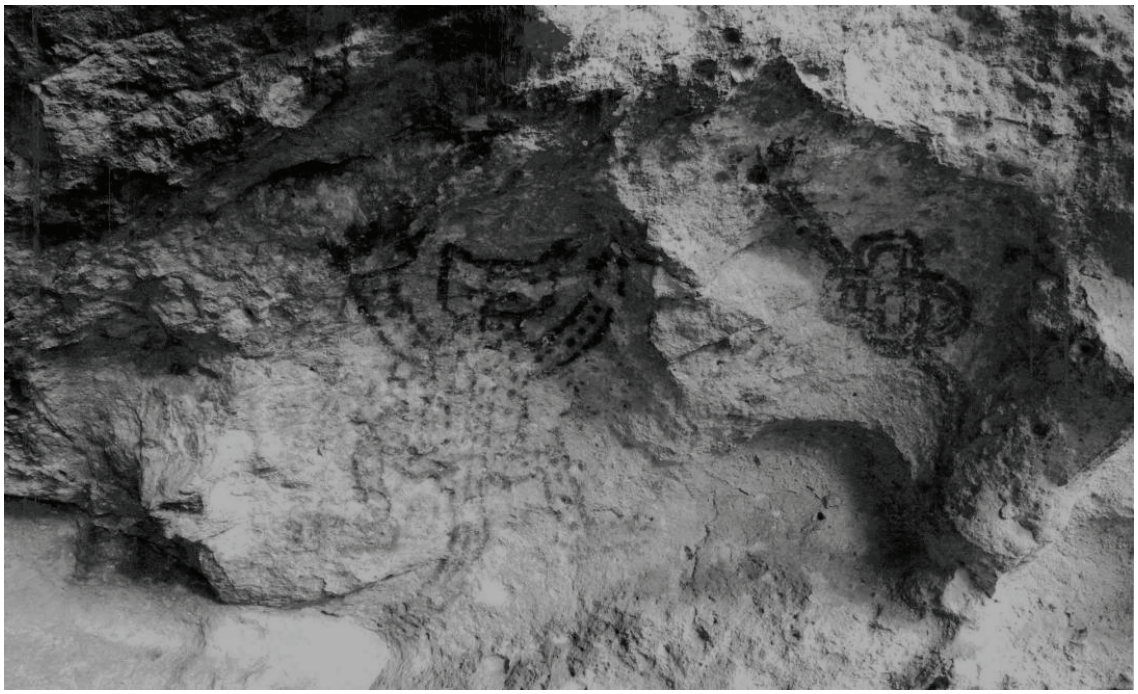
Map showing the boundaries of the nominated property

Landscape within the nominated property

Archaeological complex of Caballito Blanco



Guila Naquitz cave



Rock paintings in Cueva de Los Machines