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Tesis de Master:

Standing with Stones: A Musealization based approach for the preservation and conservation of Megalithic Monuments.

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Abstract

This work will explore Megalithism (prehistoric large stone constructions) in the Iberian Peninsula from a conservation and preservation standpoint. This will be achieved by developing a rating scale and applying that scale to a curated group of 33 Megalithic monuments to assess their state of preservation, conservation and musealization. This work will propose a crowd-sourced monitoring system for European Megaliths that can be implemented with minimal costs. This data-based foundation can be combined with low-carbon footprint touristic interventions such as hiking/biking maps to incentivize and encourage tourism authorities to fund the preservation, conservation and musealization of their megalithic monuments. In addition to building public support for conservation of our Megalithic heritage, the data gathered from tourists and interested amateurs can provide an objective basis for the funding authorities to allocate scarce resources to the most urgent projects. An example of a low-carbon footprint tourism focused Megalithic monument hiking/biking map will be generated as part of this work.

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1. Introduction

1.1 Megalithism Overview

Megalithism is the use of large stones for monumental and ceremonial structures prominent in continental and island Western Europe. According to Paulsson (2017) there are approximately 35,000 surviving megaliths in Europe, and most were constructed in coastal zones during the Neolithic and Chalcolithic (Paulsson, 2017). They were constructed along the Atlantic façade and the Mediterranean, including Spain and Portugal and the islands of Britain, Ireland, Corsica, Sardinia and the Balearics as well as Scandinavia and the Western European mainland (Paulsson, 2017). Megaliths were one of the most distinctive features of Neolithic communities in Western Europe between the 5th and 2nd Millenia BCE (Vicens, 2010). In addition, Megalithic constructions were present in Western Asia much earlier at Gobekli Tepe in Anatolia circa 10-9,000 BCE and persisted in India until historical times after a late arrival in the Iron Age (Wunderlich, 2021), but these are not the focus of the present study.

The Megalithic expansion occurred in Europe at or just after the transition from Hunting and Gathering (H-G) to food producing, a time of social and cultural upheaval (Scarre, 2020). The Megalithic building phase of European history coincided roughly with the Neolithic, Chalcolithic and the Bronze ages in Western Europe dating from ca. 4700 BCE to ca. 2000 BCE. (Paulsson, 2017) (Paulsson, 2019). However, by 4000 BCE most megalithic monuments had been erected, even if many would be the subject of later modifications and additions.

The megalithic building phase in Western European culture began according to Paulsson (2017) with the Paris Basin east of the Brittany peninsula. The Brittany peninsula, based on Paulsson's (2017) analysis of 14C dates from hundreds of Megalithic sites, is the earliest European source from which Megalithism spread throughout much of western Europe. The Portuguese megalithic landscape appears to be the second oldest by Paulsson's (2017) reconning. Portugal has some of the most important sites, the Almendres Cromlech for example is one of the oldest and most impressive megalithic sites in Europe. The Almendres complex is a group of about 95 Neolithic standing stone Menhirs and is the largest collection of megaliths in the Iberian Peninsula (Cerrillo-

Cuenca et al., 2019). The construction of the monument dates back to the 5th Millenia BCE during the Early Neolithic(Cerrillo-Cuenca et al., 2019). The Almendres Standing

stones monuments were erected over several thousand years and used until the Late Neolithic and into the Chalcolithic, circa 3rd Millennium BCE (Cerrillo-Cuenca et al., 2019).

Figure 1- Almendres Cromlech, Evora District Portugal, Photo by Dan O'Brien.

The Western Europe megalithic phenomenon was pan European and had its beginnings in Europe with early farmers and herders during the 6th and 5th Millennia BCE (Paulsson, 2017). The erection of large monuments required mobilization of a large labor force as well as management and construction expertise (Lozano, 2014). This was made possible by the increasing sedentism enabled by the shift from foraging to the location-based technologies of farming and herding (Lozano, 2014).

The earliest and some of the latest known examples of Megalithism are in Asia. Gobekli Tepe in southeastern Anatolia is the earliest known example of Megalithism or possibly more accurately Proto-megalithism (Schmidt, 2008). In Anatolia, Megalithic building began in the 10th millennium BCE and persisted for several thousand years (Schmidt, 2008). Gobekli Tepe is in the northern area of the fertile crescent and was a key gathering site for hunter-gatherer groups during the transition from the Epipaleolithic to the Neolithic (Schmidt, 2008). In terms of later examples, India has examples of Megalithic cultures which have survived until historic times (Moorti, 2008). In India Megalithic building arrived in the Iron age and persisted in places for several thousand years into the 20th Century (Moorti, 2008).

Iberia, the focus of this work, has a wide variety of megalithic constructions with many common elements, elevated placement in the landscape being one of the primary ones (Paulsson, 2017). Paulsson (2017) notes the importance of placement in the landscape for a large group of megaliths, it is common to be on the highest ground which would have made them landmarks visible for many kilometers. However, there are some exceptions, primarily for later constructed megaliths that are smaller and may not be located in highly visible locations (Criado, 1989). This may indicate a shift in function where visibility was no longer desired or needed (Criado, 1989).

Megalithic tombs in Iberia are most dense in the South, the Alentajo (Portugal), Andalucía (Spain) and the Northwest of Spain (Criado, 1989)(Clary, 2018). One enigma is the lack of identified settlements in proximity to the megalithic monuments (Scarre, 2020) (Oosterbeek, 1993). Scarre (2020) posits that this could be due the more mobile life ways of the middle Neolithic people who built megaliths widely. This could be explained if they were pastoralists who were mobile to take advantage of natural grazing opportunities. Evidence from an exemplary site analyzed in this work, Anta 1 do Vale do Laje, in central Portugal provides some evidence to support the theory that the lack of settlements represented a people with mobile lifeways (Stojanovski, et al. 2020) (Scarre, 2020) (Oosterbeek, 1993). The results of analysis of lipid residues by Stojanovski, et al. (2020) in potsherds was consistent with a diet consisting of meat from both ruminants and non-ruminants, ex. sheep, goats, cattle and pigs along with milk products. Combined with the lack of settlements this information is consistent with pastoralism and potentially transhumance. Stojanovski, et al. (2020) posit that the lack of settlement sites

and the evidence developed from the excavation at Anta 1 supports the theory that the neolithic people used the Megaliths as a gathering places (Stojanovski, et al. 2020). These gatherings for feasting and construction could have served as a vital link between their scattered mobile or semi-mobile communities (Stojanovski, et al. 2020).

The erection of large monuments required management and construction expertise to mobilize, provision and direct a large labor force likely gathered from a regional area (Lozano, 2014). This could indicate some labor specialization as well as organizational hierarchy (Lozano, 2014). The larger monuments required mobilization of a particularly large labor force, estimated as high as 500 laborers in some cases (Deitrich, 2012). These large, complex building projects would have required a very high level of skill and experience in management and construction (Lozano, 2014). This high level of expertise required juxtaposed with the standardization of building techniques may indicate a shared knowledge base and or a specialist "architectural" role (Lozano, 2014) (Deitrich, 2012).

In the earliest examples at Gobekli Tepe small bands of hunter gatherers came together annually to harvest grain, hunt gazelle and organize feasting and construction parties (Deitrich, 2012). Megalithic constructions had many common elements from the very beginning that persisted to the end in Western Asia. Consistent with the insights of Paulsson (2017) the 33 monuments analyzed for this work demonstrate the importance of placement in the landscape. As was typical of most megalith builders they chose the high ground to insure visibility and dominance of the surrounding territory. Gobekli Tepe demonstrates that this characteristic of megaliths, dominance of the landscape, was a key element from the very beginning of the phenomena in the PPNA (Deitrich, 2012). Common elements that persisted throughout the megalithic building phenomena included, the use of high ground or location near pathways to ensure visibility, construction that was co-incident with feasting, megaliths that functioned as territorial markers and demonstrated power (manpower) or the high status of the sponsoring clan or group (Deitrich, 2012) (Wunderlich, 2021). India's more recent megalithic monuments have many of the same common elements seen in Europe that include the uses noted by Paulsson, but also have stylistic variations that distinguish one clan-based group from others, within the unwritten set of rules (Wunderlich, 2021).

I.3 The Landscape Dimension of Megalithism

Wheatley, et al. (2010) make the case that siting of megaliths on prominent points in the landscape served an essential purpose in Neolithic society. Specifically, Wheatley, et al. (2010) make the case that megaliths served as landmarks that connected people with their environment, their territory. They also posit that they served as "waypoints", aids to moving animals and goods around in their environment (Wheatley, et al. 2010). Wheatley, et al. (2010) opine that the Neolithic societies used landscape features to "…convey notions of time past and cultural memory." Paulsson (2017) supports these concepts by saying that Megaliths were part of the memory and ritual culture of pre-literate societies. Paulsson (2017) further states that humans have difficulty with events that occurred in the distant past i.e., over 80 years in the past. Paulsson (2017) says that research on oral history indicates that beyond this threshold symbols and rituals are needed as memory aids. Paulsson (2017) supports the notion of megaliths as way markers, stating that they allow people to store large amounts of geographical information in memory using visual cues from the landscape.

As symbols megaliths allow members of the same community to share a common understanding of themselves, ancestors or events that shaped and defined their society, providing an anchor for their collective memories (Wheatley, et al. 2010). Wheatley, et al. (2010) further use the example of Menga/Antequera, which will be discussed in greater detail in the Results section, as connecting people visually with conspicuous features in their environment. For example, anthropomorphic landscape features like the Pena de los Enamorados mountain. See figure 2.

Figure 2- Pena de los Enamorados – Recumbent Ancestor/Deity? As seen from the entrance passageway of Menga Dolmen, Andalucia, Spain, Photo by Dan O'Brien.

To test this hypothesis, Wheatley et al. (2010) analyzed known transhumance routes from early historical times on the assumption that those pathways were "energy optimizing" routes. Wheatley, et al. (2010) assumed that it was likely Neolithic herders would have made similar calculations and used the same pathways. Wheatley, et al. (2010) found that as "waypoints" megaliths tended to be placed along these identified transhumance routes. They opine that the Neolithic societies used landscape features to "…convey notions of time past and cultural memory" (Wheatley, et al. 2010).

I.4 Precursors or Proto-Megalithism?

The Natufian culture in the Levant set the social and cultural stage for the Neolithic and possibly the much later development of the megalithic building cultures (Olszewski, 2008). According to Olszewski (2008) the Natufian began ca. 10-11,000 BCE and marked very significant changes from the prior hunter-gatherer lifeways. At this time period, we see the first examples of small villages and investment of time and effort in human burials by hunter-gatherers/foragers (Olszewski, 2008). We have examples of art from this period, they are primarily figures of animals with occasional representations of humans, with carving materials including stone and bone (Olszewski, 2008). There were numerous stone tools used for grinding wild cereals and acorns.

The primary focus of hunting was on gazelles (Olszewski, 2008). These are all elements of the pre-neolithic culture that built the first megalithic structures, referred to as temples, at Gobekli Tepe (Olszewski, 2008).

Olszewski (2008) reports that by ca. 8,000 BCE there seemed to be some regression to simpler, less labor intense forms of monuments at Gobekli Tepe with the small villages all but disappearing. There is archaeological evidence of this change at Gobekli Tepe where the buildings become square rather than circular or spheroid, smaller and less elaborately decorated (Olszewski, 2008). At the end of this period Gobekli Tepe was decommissioned by burying the complex (Olszewski, 2008). Olszewski (2008) speculates that this deterioration of the culture may be due to the changes brought about by the cooling event of the Younger Dryas.

Figure 3- Gobekli Tepe: overhead view of the main excavation area (photograph: N. Becker DAI). (Deitrich, 2012).

Gobekli Tepe was one of the seminal forces in shaping the period leading up to the Neolithic. (Wunderlich, 2021) (Halklay, 2020) (Schmidt, 2008) The cultural groundwork established at Gobekli Tepe could have left a legacy that broadly influenced the megalithic cultural phenomena. The converging of small bands of hunter gatherers regularly at Gobekli Tepe facilitated the formation of larger than familial groups for construction activities (Wunderlich, 2021). These

gatherings could have solidified into what, based on the archaeological evidence, seems to be a proto-clan structure. Based on the Uniformitarianism principal, the historical ethnographic research supports the theory that clan structures could have been a key cultural driver of communal construction like megaliths (Halklay, 2020). This hypothesized feasting/work party proto-clan structure may have built communal structures at Gobekli Tepe. It would have functioned to build a sense of community, supra-tribal relationships and fostered interdependency and interrelatedness' on a regional scale (Wunderlich, 2021) (Halklay, 2020) (Schmidt, 2008). Halklay (2020) concludes that Gobekli Tepe represented what is known as a paradigm shift, a quantum leap in the architectural and cultural capabilities of hunter-gatherers. This leap forward was the foundation of new lifeways that would evolve into the Neolithic. (Halklay, 2020)

I.5 Definitions

Types of Megaliths

There are two general types of megalithic structures (Reinosa, 2015). The first is the **Monolithic** type which typically are single standing stones, often referred to as a menhir or stelae. The sizes vary considerably with a squared shape that typically tapers toward the top as the most common. They can appear as single stones, or in groups set in circles or less commonly straight rows. There are many standing stone circles in Britain and Ireland (as seen in the Almendres Menhir, Evora District, Portugal Pictured here, Figure 4).

Figure 4- Almendres Menhir, Photo by Dan O'Brien.

A particularly striking example of the straight row alignment configuration is the Carnac alignment in Brittany, France which may be one of the earliest examples of massing of standing stones (see Figure 5) (Reinosa, 2015).

Figure 5- Photo by Brittany Tourism https://www.brittanytourism.com/destinations/the-10-destinations/southern-brittany-morbihan-gulf/carnac/.

The second type is the **Polylithic** type which is a combination of single large stones assembled into one of several types of structures without the use of mortar (Reinosa, 2015). The most common is the Portal tomb, referred to as Dolmens or Antas consisting of two or more upright stones (orthostats) with one or more large flat capstones that form a roof (Reinosa, 2015). See the example of Dolmen Barrocal in Figure 6.

Figure 6 - Dolmen Barrocal, Portugal, Photo by Dan O'Brien.

Many Dolmens contain human remains but there is some disagreement as to whether they were primarily used as burial sites (Reinosa, 2015). Most were originally covered with an earthen mound or smaller stones to form a protective covering (in many cases eroded away) sometimes referred to as a "barrow" (Reinosa, 2015). Another common example of the Polylithic type is the passage grave which is characterized by a circular or cruciform inner chamber accessed by a long straight passageway sometimes oriented toward an important celestial event such as the solstice (Reinosa, 2015). Frequently the entire structure is surrounded by a circular mound of earth that may include a stone edging (kerb) at times of decorated stones (Reinosa, 2015).

Common Terms (Paulsson, 2017)**:**

Dolmen – The simplest most common grave form, usually with four side stones, a capstone and a door stone. Other names used include Anta and Mamoa in Portugal.

Passage grave – (in France and Spain may also be referred to as a Dolmen a couloir or, a corridor, respectively) – Accessible graves with side stones, cap stones and a corridor. Most of the time covered with an earthen or stone tumulus. Also known as a portal tomb.
Gallery grave – structures with an extended chamber which may have inner compartments.
Tumulus – a long or round mound of earth covering a stone grave.
Standing stone (Menhir) – an erected stone which may represent a memorial stone, territorial marker, ritual meeting place, or astronomical marker. The largest recorded is the Grand Menhir in Brittany which was 21 m tall and weighed 270 tons.

I.6 Megalithic Building – Origins and Diffusion

Several theories have been put forward as to Megalithism's origin and diffusion. Traditionally scholars have attributed the origin to the Levant with diffusion from there along the Mediterranean into western Europe (Paulsson, 2017). This Oriental Diffusion Theory held sway until the 1970s when an alternative theory developed of regional independent development in Europe (Paulsson, 2019). The alternative theory was put forward in the late 20th Century that argued for regional independent developments in multiple regions of Europe (Paulsson, 2017). This seems to have been based on the theory that disparate human groups when confronted with the same problem can independently invent a solution that is very similar. However, a comprehensive analysis of radiocarbon dates by Paulsson (2017) undermined both the orientalism and the parallel development theories. Paulsson (2017) analyzed 2410 available radiocarbon dates from megalithic monuments as well as some pre megalithic and Neolithic non-megalithic burials. Paulsson (2017) used Bayesian modeling and concluded that that the maritime diffusion model is correct undermining the parallel development model. Also, her analysis indicated that the source was unlikely to be the Near East, undermining the orientalists model (Paulsson, 2017). Based on her modeling the source was most likely the Paris basin in western France with diffusion along Atlantic and Mediterranean coasts (Paulsson, 2017).

The map Paulsson (2017) created from the radiocarbon dates (Figure 7) shows the progression from Brittany in western France radiating out over the millennia. This work adds generic hypothetical arrows to Paulsson's map for emphasis. As seen in the probability map in Figure 7,

Bayesian modeling of Paulsson's radiocarbon dates support the maritime diffusion model for megaliths in Europe (Paulsson, 2019). Paulsson (2019) based on her C14 data analysis, validates the maritime diffusion model as the most likely explanation for the pattern she identified in her data.

Her results suggested that the megalithic movement emerged in a period of two to three hundred years in the second half of the 5th millennium BC (Paulsson, 2019). Paulsson (2019) posits that the movement developed in Northwest France and spread along the Mediterranean and the Atlantic coast of Iberia during this period (Paulson, 2019).

Paulson cites Northwest France as the likely earliest source of the phenomena as there are large earthen constructions in the Paris basin that predate the megaliths (Paulson, 2019). These monumental earthen graves seem to establish the monumental trend and are the earliest dateable finds in Europe (Paulson, 2019). The earliest dates are circa 5000 BCE (Paulsson, 2019). Burial mounds subsequently appear in Britanny, Sardinia and in Catalonia with dates near the middle of the fifth millennium BCE (Paulson, 2019). Based on the data Paulson posits that the pre megalithic monumental earthworks found in the Paris Basin in France are the likely predecessor to the European megalithic movement that swept across Western Europe in the fifth and fourth millennium BCE (Paulson, 2019).

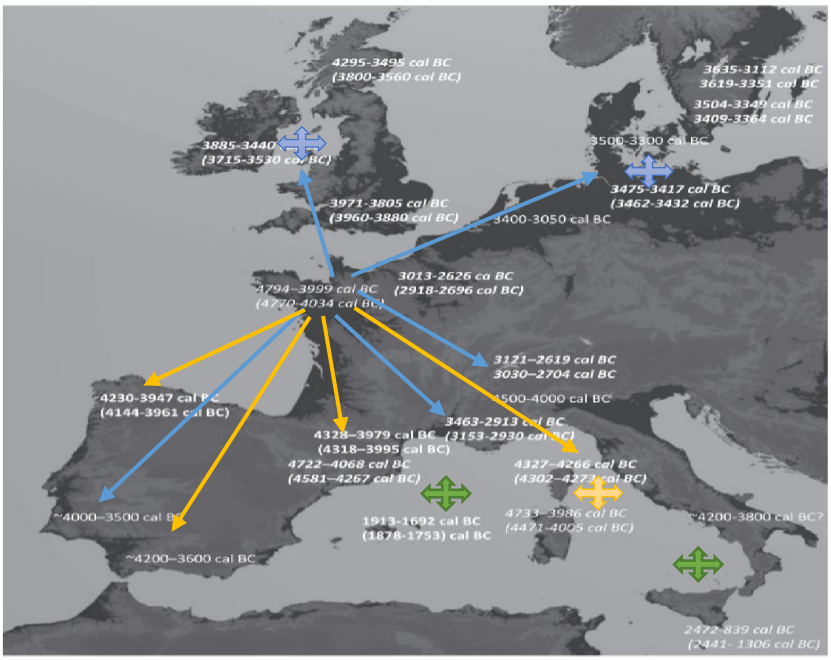


Fig. 3. Map showing dates estimated for the start of megaliths in the different European regions, with 95% probability (68% probability in brackets). Italic bold type is used for date ranges of the posterior density estimates based on samples from megalithic contexts, regular bold type is used for simple calibrated radiocarbon dates from megalithic contexts, and regular italic type is used for the probabilities of the posterior density estimates associated with the earliest cultural material in the megaliths.

Figure 7- Probability Dates for start of Megalithism, Paulsson (2019) (Hypothetical diffusion arrows added by this author to highlight possible diffusion based on Paulssons probability dates (inter-regional diffusion is an equally likely possibility after the in

Paulsson (2019) reports that the Megalithic phenomenon likely developed in three stages approximated by this author in an overlay of the Paulsson map by the addition of yellow (5th millennium), blue (4th millennium) and green (3rd and 2nd+ millennia) arrows on Paulsson's (2019) probability map.

The first evidence, representing the earliest dates in the 5th millennium BC, was of small structures also known as dolmens covered by a mound (Paulson, 2019). Paulsson (2019) describes this earliest megalithic stage in the 5th millennium BC following the earthen mound building phase as involving construction of small stone chambers without access passages. She posits that they were accessed from above by removing the roofing material which may at times have been wooden rather than stone (Paulson, 2019). These emerged in the second half of the 5th millennium BCE in Northwest France the Channel Islands, Catalonia, Corsica and Sardinia (Paulson, 2019). Using

the cultural material found in Galicia and in Northern Italy, where C14 dates were not available, Paulson posits that they also belong to this first stage (Paulson, 2019).

Later, towards the end of the fifth Millennium the earliest chambers appear with access passages, according to Paulsson (2019). These are referred to as Dolmen's, Anta's or Passage Graves (Paulson, 2019). These appear to have been added to allow repeated access and reopening to facilitate the reuse of graves (Paulsson 2019). Paulson (2019) also cites the earliest dates for reusable Megalithic monuments in the Alentejo in Portugal to approximately 3600 BCE.

Megalithic expansion may have started in the northern British Isles near the end of the fifth Millennium but primarily spread in the fourth Millennium to Britain, Scotland and Ireland (Paulson, 2019). Later in the fourth Millennium it spread in Northern Germany and Scandinavia (Paulson, 2019). In this phase, the second half of the fourth Millennium BCE, the megalithic tradition spread to the areas of what is now Holland, Belgium, and Germany (Paulson, 2019).

These two initial phases were followed by a period of what Paulson calls stasis (Paulson, 2019). During this phase or quiet period there's no obvious pattern of large mound building or megalithic construction or new regions added in Western Europe (Paulson, 2019). This quiet period was followed by a revival of megalithic building in the second Millennium BC in the Mediterranean (Paulson, 2019). This third phase occurred particularly in the Balearic Islands, and in Italy, Sardinia, Puglia and Sicily primarily in the second millennium BCE but some activity persisted into the first Millennium BCE (Paulson, 2019).

I.7 What do we know about the Societies that Built the Iberian Megaliths?

According to Scarre (2020) the first Iberian farmers were primarily of western Asian descent. The patterns reported based on DNA analysis and isotope analysis fit with the standard explanation of leapfrog colonization (Scarre, 2020). Scarre (2020) reports that after several hundred years there appeared to be some merging of the pre-existing hunter-gatherers and the colonist farmer-pastoralists populations. Haplogroup analysis supports the theory that males from the H-G groups

were overrepresented in the admixture (Scarre, 2020). This would support the hypothesis that males from the H-G groups were moving to the farmer-pastoralist group rather than females (Scarre, 2020).

The megalithic building cultures were a pan-European movement which seems to have been fostered or supported by extensive Neolithic trade networks (Paulsson, 2017). Paulsson points out that most of the locations with megalithic monuments had green stone artifacts found of jadeite or variscite (Paulsson, 2017). They were decorative and used as grave goods such as beads and display axe heads (Paulsson, 2017). The Can Tintorer mine in Catalonia was one of several sources for Variscite in the Neolithic and Jadeite was also traded throughout Neolithic Europe from sources in the Italian Alps (Paulsson, 2017). The early adoption of Megalithism in Catalonia may be accounted for by the desirability of variscite as an early type of currency and the connections with other Neolithic communities that its extensive trade engendered (Paulsson, 2017). There was an extensive Europe wide trade in variscite and jadeite that were highly valued trade items (Paulsson, 2017). This trade tied together a Western European wide network of Neolithic communities, creating links that could have facilitated the transmission of knowledge such as the techniques required to build lasting megalithic monuments (Paulsson, 2017).

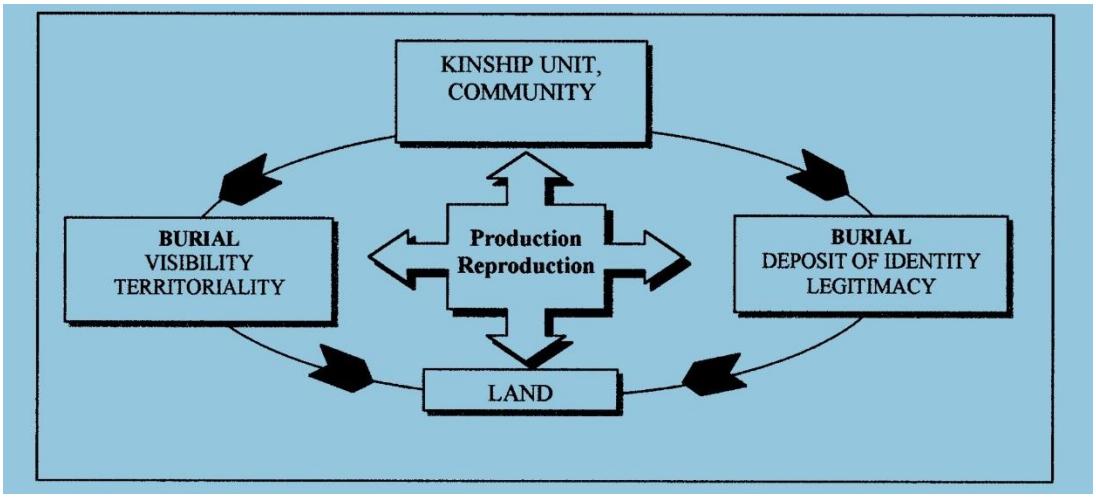


Figure 8- Schematic of Megalithic Use Cases from (García Sanjuán, n.d.).

Halklay's work (2020) adds to the evidence that the groundwork for the Neolithic cultures that migrated west, and at a later time built the megaliths, was the Natufian culture that built Gobekli Tepe. Gobekli Tepe according to Halklay (2020) represented what is known as a paradigm shift,

a quantum leap in the architectural and cultural capabilities of hunter-gatherers that set the stage for the Neolithic. This cultural leap forward was the foundation of new lifeways that would evolve into the Neolithic (Halklay, 2020). At Gobekli Tepe the buildings have distinct engravings and sculptures of different animals leading researchers to speculate that each building was possibly built by a different association, tribe or clan (Halklay, 2020) (Schmidt, 2008). See Figure 9, picture of a possible clan totem, a boar sculpture found at Gobekli Tepe.

Figure 9- Sculpture of a boar discovered near one of the central pillars of Enclosure C – Gobekli Tepe (photograph: K. Schmidt, c DAI). (Deitrich, 2012).

They drew this conclusion based on the dominance of particular animal representations, which they assumed may have been the totem for the clan or tribe (Halklay, 2020) (Schmidt, 2008).

Paulsson (2017) also ties megaliths with rituals and their capacity to form and reinforce group identity. For example, burial rituals, ancestor worship and possibly initiation ceremonies could have been performed at the later megalithic sites to reinforce group identity and pass on shared memories (Paulsson 2017). Feasting related to these activities would have been another example of group activities that would foster collective consciousness and group cohesion (Paulsson 2017). These shared memories would have been frequently reinforced by the visual reminder of the megalith constantly visible at a highpoint in the environment, as a beacon in the landscape (Paulsson 2017). There is also evidence that feasting was an important part of the ritual culture at Gobekli Tepe many thousands of years earlier (Schmidt, 2008).

The distinct decorations of the Gobekli Tepe buildings may indicate that they were built by proto-clans dedicated to a specific totem animal spirit. The feasting and related construction activities would have served the function of building and strengthening these social bonds (Schmidt, 2008). Indeed, Gobekli Tepe could have been one of the seminal forces in shaping the pre-megalithic cultural phenomena (Schmidt, 2008). The converging of small bands of hunter gatherers regularly at Gobekli Tepe necessitated the formation of larger than familial groups for construction activities (Schmidt, 2008). These gatherings could have solidified into what appears to be a proto-clan structure (Schmidt, 2008). This feasting/work party/proto-clan structure (see figure 10) that built communal structures at Gobekli Tepe may have functioned to build a sense of community, supra-tribal relationships and fostered interdependency and interrelatedness' on a regional scale (Wunderlich, 2021) (Halklay, 2020) (Schmidt, 2008).

Figure 10– Possible Clan totem from Gobekli Tepe - Pillar 27 in Enclosure C with the sculpture of a predator in high relief (photograph: D. Johannes, c DAI). (Deitrich, 2012).

These same social benefits could and probably did provide some of the sustaining cultural drivers of the megalithic phenomenon throughout its long history from proto-Megalithism at Gobekli Tepe in the 10th millennium BCE to the south Asian megalithic cultures in historical times, as recently as the 20th century.

A similar clan structure to what Halklay (2020) and (Schmidt, 2008) posit for Gobekli Tepe is supported by the ethnographic data from historical megalithic cultures in South Asia. A similar

clan based social structure seen in the South Asian Megalithic cultures functioned in much the same way as Halklay (2020) and Schmidt (2008) posit for Gobekli Tepe. The clan structure functioned to support the construction of megaliths as late as the mid-20th century (Halklay, 2020) and a similar cultural structure could have facilitated the labor-intensive construction in the Neolithic period. While we cannot know the form and function of the Neolithic cultural units, the evidence from analysis of Gobekli Tepe from late pre-history and historical examples suggest that similar organizational strategies could have been employed.

Sánchez-Quinto et al. (2019) add support to the possibility that Megalithic tombs were linked to a kindred-based, clan centric society. Sanchez-Quinto et al. (2019) indicate that paleo genetic as well as archaeological data show that the neolithic spread into Europe around 9,000 BCE from the fertile crescent, reaching northwest Europe in the fifth Millennium BCE. Sanchez-Quinto et al. (2019) explore the societal structure associated with the megalithic building phase in Europe that started in the fifth Millennium BCE. Sanchez-Quinto et al. (2019) looked at genetic information from five megalithic sites in northwest Europe with 24 individuals represented. They also reviewed genomic data from several other sites in western Europe.

Sanchez-Quinto et al. (2019) found a higher proportion of males than females buried in the megalithic sites they analyzed. They also found a sex biased admixture of farmer and hunter-gatherer DNA, i.e., the H-G DNA that was present was dominated by male H-G lineages (Sanchez-Quinto et al. 2019). They postulate that the megalithic tradition could be linked to male dominated, socially stratified farming societies with significant influence from male migration from H-G groups to Farmer-Pastoralist groups based on a small DNA sample (Sanchez-Quinto et al. 2019). Therefore, more research is needed to validate these preliminary findings. (Sanchez-Quinto et al. 2019)

The aforementioned analysis resulted in some intriguing findings. There was a strong genetic connection across the Western Europe megalithic populations (Sanchez-Quinto et al. 2019). They found the strongest connection between Scandinavia and the British Isles (Sanchez-Quinto et al. 2019). To a lesser extent they found a genetic connection between the British Isles and the Iberian Peninsula. This writer would speculate, that this could be explained if the British Isles-Iberia

connection was significantly older than the British Isles – Scandinavia connection. Of course, there are other possibilities as well that could be narrowed with further research.

Based on the genomic and archaeological evidence Sanchez-Quinto et al. (2019) opine that the Megalithic building farmers were part of a European wide stratified culture that may have been male dominated. Sanchez-Quinto et al. (2019) posit that the megalithic monuments may have been designed to contain the remains of a patrilineal elite which, however, did include a significant minority of women of the lineage.

I.8 Construction: Forms and Function of Megalithic Monuments

Iberia, the focus of this work, has a wide variety of megalithic constructions with many elements that are common to the Western European megalithic culture and constructions (Scarre, 2019). According to Scarre (2019) western Iberia has the highest density of megalithic chambered tombs in western Europe.

Megalithic monuments in Western Iberia include standing stones, Cromlechs (grouped standing stones) and chambered tombs including Tholos (corbelled chambers) (Scarre, 2019). Most of the megalithic tombs were built during the fourth Millennium BCE (Scarre, 2019). There is evidence that standing stones, were sometimes reused as part of later built chambered tombs (Scarre, 2019). Scarre (2019) distinguishes three different types of passage tombs. Firstly, passage tombs with polygonal chambers formed of overlapping offset orthostats (Scarre, 2019). Secondly, passage tombs with circular chambers with orthostats placed edge to edge in a circular or oval pattern (Scarre, 2019). Thirdly, Tholos tombs which typically have corbelled vaulting, or mud brick domes (Scarre, 2019).

The most common design in Iberia is the polygonal chamber tomb formed of overlapping orthostats (Scarre, 2019). The largest number in Portugal and Northern Spain, from Galicia to the Pais Vasco, are seven orthostat tombs with the seven orthostats overlapping slightly and the first two leaning on the back orthostat and the rest leaning on each other (Scarre, 2019). The design is very consistent and calls for a rear orthostat that is vertical and placed in a deep socket in the

ground and then stabilized with infill of soil and rock (Scarre, 2019). Two orthostats are placed in a socket leaning slightly inward against each side of the first orthostat and the remaining four orthostats follow the same pattern, two more on each side for a total of seven (Scarre, 2019). This design is very consistent and widespread in Western Iberia. In the opinion of this writer this "shallow socket/leaning on neighbor design" seems to benefit the builders by reducing the labor required when compared to construction methods that require a deep prepared socket for each orthostat. The sizes of these chambers can be quite varied with the largest being Anta Grande Zambujeiro in the Alentejo region of Portugal (Scarre, 2019). See Figure 11.

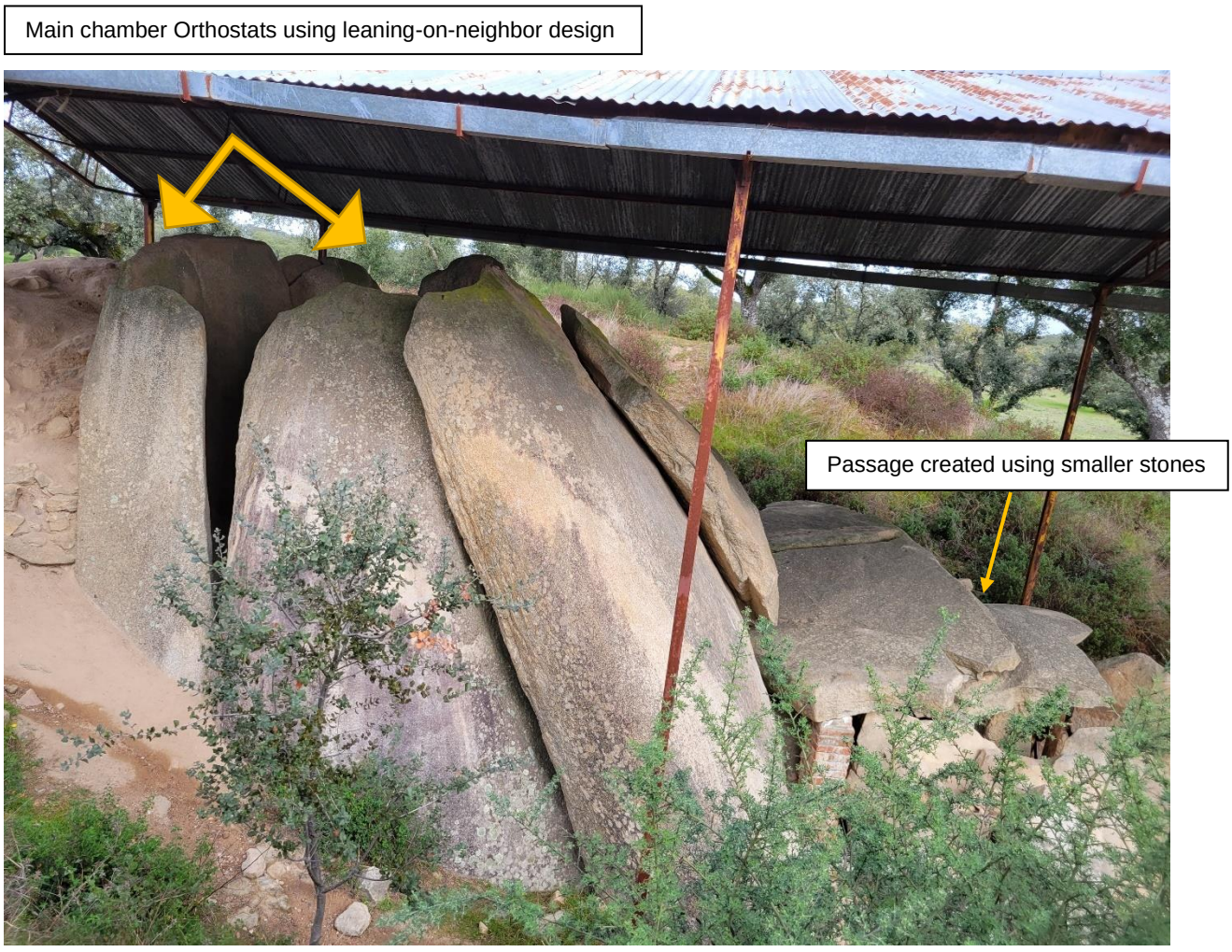


Figure 11- Zambujeiro Dolmen, Evora district, Portugal. Example of leaning Orthostat design. Largest known Dolmen in Western Iberia. Photo by Dan O'Brien.

When the chamber itself was complete the passage was added using smaller stones (Scarre, 2019). A mound was then built up against the orthostats and when it reached the tops of the orthostats, the cap stones were hauled into position (Scarre, 2019). While the seven stone orthostat design is most common in Western Iberia, there is some variation within the type with a few with one or two more orthostats (Scarre, 2019).

Scarre (2019) notes that the addition of a passage was not Included in the oldest type with a round chamber. Scarre (2019) speculates that the entrance might have been made from the top by removing the roof of wood or stone that was covering it. Some of the older chambers that didn't have passages show evidence of later additions of passages (Scarre, 2019).

Scarre (2019) posits that this seven-orthostat design with few variations implies a regional knowledge base that was shared. Scarre (2019) states that of 177 seven stone megaliths in western Iberia and parts of Spain all of them faced eastward toward the midwinter or midsummer sunrise. The 33 megalithic monuments reviewed for this work were consistent with the finding that tracking the rising or setting sun at the midwinter and/or midsummer solstice was an important function of the monuments.

The second most common type of passage tombs were the passage tombs where the orthostats are placed edge to edge, not overlapping (Scarre, 2019). In southern and eastern Spain, the design is typically of a chamber with vertical walls with the orthostats each set in a deep foundation. This design is also typical of the rest of Western European megaliths in addition to central and Southern Spain (Scarre, 2019). Sizes of the round chambers are typically three to five meters in diameter and consists of a larger number of orthostats than the seven-orthostat design typically from 9 to 14 orthostats (Scarre, 2019). Typically, the mounds that surround the chamber would be enclosed with a ring of slabs of stone, the kerb, that hold an infill of smaller stones and dirt (Scarre, 2019). In this design, the uprights are set in deep sockets dug into the underlying subsoil and the orthostats placed edge to edge (Scarre, 2019). Sometimes the orthostats have decoration but the majority in Iberia do not show evidence of original decoration (Scarre, 2019).

There are a few variations in design. There are some tombs that are more of a V-shape, rather than the more typical round or orthogonal chamber, without a clear distinction between the chamber and the passage (Bueno Ramirez, 2005). See the illustration Figure 12.

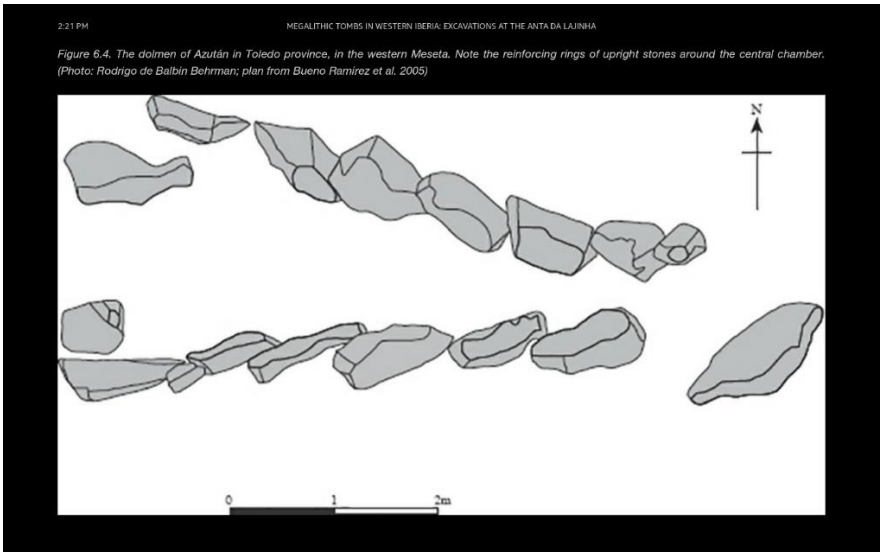


Figure 12- Example of V shaped tomb (Bueno Ramirez 2005).

They are generally of the design where the orthostats overlap and lean against their neighbor with all side orthostats dependent on their neighbor and the backstone for support (Scarre, 2019). There are a few of the earlier type, chamber only Megalith's, that do not have passages but are just a single closed chamber (Scarre, 2019). Some did not have any side openings, leading to the conjecture that they were entered from above after removing the roof (Scarre, 2019). Some of the older, chamber only type, had an opening on one side (Scarre, 2019).

I.9 Issues, Concerns and Assumptions

Issues: Some of the 33 megaliths reviewed for this work were individually well marked and included detailed educational material but are not linked to the larger regional history. By linking groups of monuments and telling the larger regional story with links to exhibits at local museums we can better educate the public and put each site in a larger context. Concerted efforts need to be made to preserve and promote the important place Megalithism and Megalithic monuments had in the Neolithic revolution in Europe. This work intends to make a small contribution to that end.

Statement of Concerns: Megaliths are endangered, the loss of their presence and the information they convey about our ancestors and history is irreplaceable. The conservation of the 35,000 +/- Megaliths of Europe is a tremendous challenge (Carrera, 2003). Given the permanent outdoor location of megaliths, climate and anthropogenic activities pose a constant threat. National and regional heritage laws have proven to be insufficient to protect the vast numbers of Megalithic monuments in Europe (Carrera, 2003).

Assumptions:

1) Tourism authorities and government entities are more likely to provide necessary funding for preservation and conservation of cultural heritage, i.e., megaliths, if the approach is likely to lead to improved local economic conditions. Specifically, tourism supported local infrastructure such as hotels and restaurants, taxis, guide services, bicycle rental, and other touristic services can contribute to a low-carbon future and have tourist revenue enhanced through encouraging megalithic centric walking and biking tours as proposed in this work.
2) Low-carbon demanding tourism modalities such as hiking and biking will be increasingly desirable, and likely will be the focus for enhanced local and national government funding as well as from the private sector as Europe moves toward a lower carbon footprint future.
3) Touristic maps that encourage low-carbon biking and hiking tours of Megalithic and other heritage sites will likely attract increasing tourist interest to support this model.

I.10 Theoretical Approach

Megalithic monuments represented the development of hierarchies or elites that would seem to be required to create and organize a social consensus and the requisite cohesion. That elite/hierarchy would have been required for the organizing and directing of the enormous amount of labor needed to design, excavate, decorate and erect the monuments (Ramirez, 2019). Ramirez (2019) hypotheses that megalith building by "recuperating ancestral representations" represented megalithic memory devices to preserve memories and status of the ancestors. The consistent pattern across the megalithic monument area of Europe is the selection of prominent points with the clear intention of erection of the stones in a place with long distance visibility as if to mark the surrounding territory (Paulsson, 2017). The building of a Megalith requires the community to invest a tremendous amount of social energy and talent in the production and erection of the

monuments in what would have been the most labor-intensive location, a high point in the landscape. This choice of the most difficult landscape point would have signaled power and determination to dominate the surrounding territory (Ramirez, 2019). Implicit in the size and prominent presence of the monuments is the "social relevance" projected through the evident capacity to organize the significant social labor needed to locate, excavate, decorate, transport and erect the large stones required (Ramirez, 2019).

Ramirez (2019) Identifies two turning points in the time between the 6th Millennium BC and the first Millennium BC in the Iberian Peninsula. This time period represents the transition from the Mesolithic to the Neolithic and a significant period of rapid evolution of the social structures in human societies (Ramirez, 2019). This period may represent an increased status differentiation that represented one of the most significant changes during the evolution of society from foraging to farming. The area Ramirez focuses on, roughly the Castelo Branco district in Central Portugal, represents a microcosm of the changes embodied in the megalithic movement in western Europe (Ramirez, 2019). Key elements include the continued use and reuse of the megalithic monuments of the entire time span and their association with stelae, menhirs and small human images (Ramirez, 2019).

Sequences of monuments and reuse patterns as well as common techniques argue for threads of continuity over space and time in the Iberian Peninsula and potentially across western Europe. They mark the desire to honor or memorialize "accumulated pasts" and ancestors through repeated patterns and reuse of stones and images over time (Ramirez, 2019). Ancestor worship could be a tool for elites to enhance their power and status as part of a lineage (Ramirez, 2019). The Megalithic cultural area in Europe is rich in metal deposits which may partially account for its significant megalithic remains (Ramirez, 2019). Megalithic building according to Ramirez is associated with mining or quarrying, particularly flint in southern France, salt in central Europe, copper in the Islands of the Mediterranean and in Iberia gold, copper and tin (Ramirez, 2019). Scarce valuable minerals also create conditions which can be used by elites to consolidate power and wealth (Ramirez, 2019).

Recent studies (Ramirez, 2019) have emphasized the materialist/Marxist aspects of the megalithic building cultures. Megalithism was potentially an early sign of the development of a class structure and division of labor (Ramirez, 2019). Surplus labor was available based on a shift in the means of production from foraging to food production (Ramirez, 2019). The shift in the means of production led to an increase in population density and consequent pools of labor that could be engaged or conscripted for community/corporate purposes (Ramirez, 2019). Resources and the available labor needed to be organized, possibly by elites or other nascent hierarchies and directed on a large scale for "community" building projects like the Megaliths.

I.11 Research questions

1. Can a standardized crowdsourced focused assessment tool be used to evaluate the state of conservation and preservation of megalithic sites?
2. How can a standardized assessment tool for the crowd-sourced evaluation of megalithic monuments' conservation and preservation be utilized in directing funding for musealization efforts?
3. Can touristic based musealization methods be employed to preserve Megalithic monuments using public engagement and education as the operative factors?
4. Can touristic based conservation strategies improve local and regional connection with and care of monuments as well as public partnership through increased contact and education of the public on Megalithic monuments?
5. What are the most effective musealization methods that can be employed to preserve Megalithic monuments using public engagement and education?

I.12 Study Objectives

Objective 1 – Create an assessment tool to evaluate the state of preservation and conservation of European Megalithic Monuments

Objective 2 – Test pilot the assessment tool on 33 sites in Iberia.

Objective 3 – Develop a proposal for use of the revamped assessment as part of a Megalith public engagement tool that includes low-carbon hiking and biking visitor maps.

Objective 4 – Articulate next steps that describe the potential use of the crowdsource methodology as part of an "Adopt a Megalith" program by tourism authorities to enhance conservation and preservation of Megalithic monuments.

2. Methodology - Materials and Methods

Geography and landscape issues are related most prominently to the competition for land both for farming and development uses (Carrera, 2003). Megaliths are generally viewed as taking up land that could be put to "productive use" (Carrera, 2003). Carrera and Fabregas (2003), based on their work in Galicia, recommend a process to preserve Megalithic Heritage that can be applied in other areas of Europe. This work describes an effort to develop a template, considering Carrera and Fabregas' work (2003) that can be applied in other areas of Europe.

The process Carrera (2003) outlines includes three critical steps.

- It begins with monitoring anthropogenic activities that could threaten the monuments, such as public construction, agricultural and forestry activities. Following this recommendation this work proposes a crowdsourced methodology using a simple survey as tested and finalized as part of this work.
- Identifying and communicating with local cultural organizations and local neighborhood organizations. This would be the second step in a developing a local constituency for preservation and conservation of megalithic heritage. The local groups could spearhead the completion of surveys and presentation to local authorities.
- Identifying and communicating with local councils to encourage their intervention to preserve their cultural heritage. Once crowdsourced data is available local advocates for preservation and conservation can present needed work to local authorities.

This work proposes a methodology, informed by these three steps, for documenting the conservation and preservation needs of megalithic monuments in Europe.

This work proposes a prototype methodology for documenting the conservation and preservation needs of megalithic monuments in Europe. This work will attempt to draw some broad conclusions from examining a curated sample of 33 megalithic monuments in Iberia. In addition, this work will go into greater detail some important examples. This work will describe the state of preservation and conservation of the curated sample of 33 monuments in Iberia using a rating

scale developed for this work. The in-depth discussion of some of the 33 monuments will go into details that will give the reader deeper insight into Iberian and European Megalithism.

The core methodology for this work is the development of a rating scale for the preservation and conservation status of Megalithic monuments. The scale was designed based on review of other examples of heritage ratings processes such as the HERITY rating system for museums and the Megalithic specific scale from the Megalithic Portal https://m.megalithic.co.uk. The scale was designed to be crowd-sourced and completed by tourists and amateur megalith hunters. The rating process will provide the key tool to engage the touring public in the current condition and need for preservation of the European Megalithic heritage. Once developed for this work the rating scale was tested on a curated sample of 33 Megalithic monuments in the Iberian Peninsula. The scale was revised and finalized and used to analyze the state of conservation and preservation of the 33 selected monuments. The results are summarized for each of the 33 Megaliths in the Results section. The scale can be used as a public engagement tool and made available through open use portals such as the Megalithic Portal https://m.megalithic.co.uk and Megalithhunter.com This methodology will demonstrate how musealization through public engagement and education can be an effective method to preserve existing megalithic monuments through engaging both the public and Tourism authorities.

2.1 Problem Statement, Goal and Research Questions

Problem Statement: The conservation of the 35,000 +/- Megaliths of Europe is a tremendous challenge. Given the permanent outdoor location of megaliths, climate and anthropogenic activities pose a constant threat. National and regional heritage laws have proven to be insufficient to protect the vast numbers of Megalithic monuments in Europe. (Carrera, 2003). Megaliths are endangered, the loss of their presence and the information they convey about our ancestors is irreplaceable.

Goal: To contribute to the public engagement needed to support preservation and musealization of Megalithic heritage by developing a form-based assessment tool that can be implemented by interested amateurs and the local public. This form will be tested on 33 representative Megalithic

monuments in Iberia to document the state of conservation, preservation and musealization in order to test and refine the methodology.

Research questions

1. Can a standardized assessment tool be developed to evaluate the conservation and preservation of megalithic sites?
2. How can a standardized assessment tool for the evaluation of megalithic monuments' conservation and preservation be utilized as a tool for public engagement and musealization with the support of Heritage and Tourism authorities?
3. Can Tourism funding and particularly low-carbon footprint tourism funding be utilized in Megalithic preservation and musealization efforts by emphasizing hiking and biking Megalithic tourism?

2.2 Tasks and Process

Tasks:

- **i.** To develop a documentation process, a rating scale, to review and document the state of conservation, preservation and musealization of 33 representative Megalithic monuments in Iberia.
- ii. To select 33 representative Megalithic monuments in central and southern Portugal and southern Spain as well as Catalonia Spain based on information from Google Maps, the Megalithic Portal https://m.megalithic.co.uk and Journal Articles.
- iii. To visit the 33 selected Monuments and create a digital photographic record.
- iv. To apply the proposed conservation rating scale to the 33 curated Iberian Megalithic monuments.
- v. To analyze the data gathered and draw preliminary conclusions that can inform a touristic based musealization strategy.
- vi. Develop an example of a touristic hiking and biking map as an example of low-carbon footprint tourism for Heritage and Tourism authorities.

Future tasks:

vii. Explore the development of a QR code with a web-based version of the rating scale to automate the recording, storage and analysis of the data collected.

viii. Explore the creation of an online database to collect and store the results of the surveys as well as supplemental information needed to musealize the monuments.

ix. To distribute the links to the finalized scale and website to the Megalithic support community and tourism authorities.

Process:

- Develop an assessment tool.
- Visit and photograph a curated sample of 33 Megalithic monuments in Iberia.
- Apply the assessment tool to the 33 monuments.
- Based on the test completion of the tool, revise and finalize the tool.
- Summarize the survey results and publish them in the TFM for the 33 observed and photographed Megalithic monuments in Portugal and Spain.
- Define a set of common issues based on the summary ratings of the 33 curated Megalithic monuments.
- Develop an example of a touristic hiking and biking map as an example for Heritage and Tourism authorities in order to encourage them to support low-carbon tourism related funding for the preservation of the megalithic monuments.

Future steps:

- Explore the development of a QR code with a web-based version of the tool in order to automate the collection, storage and analysis of the collected data.
- Promote the use of the finalized rating scale by tourists and amateur archaeologists through websites such as the Megalithic Portal and MegalithHunters.com.

2.3 Description of Site Selection Process

Areas to be studied

Three areas were selected for study, Portugal, Southern Spain and Catalonia in Northeastern Spain. These three areas were selected as they contain large numbers of Megaliths and they were

accessible by car for this author from the two Universities where the studies were initiated from, URV in Tarragona, Catalonia, Spain and IPT in Tomar, Portugal.

Areas of study – Portugal, Andalusia, and Catalonia

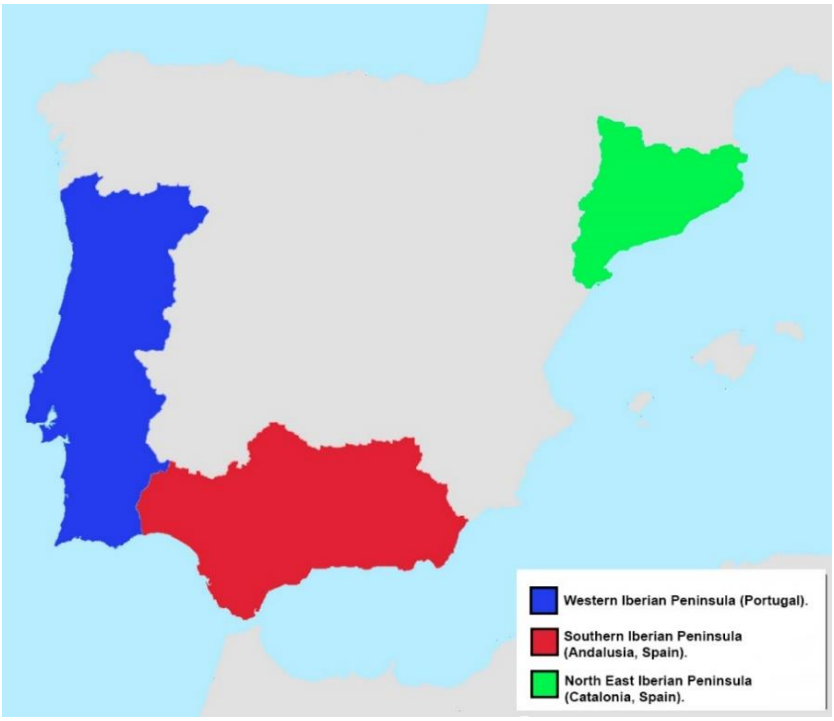


Figure 13- Study area, Gomez (2022).

Megalithic Monuments that are part of this study by Area

Western Iberian Peninsula (Portugal) – 16 sites selected, visited, photographed, and analyzed.

Dolmen de Antelas, Antelas, Portugal.

Mamoas da Cumeeira, Oliveira de Frades, Portugal.

Dolmen da Carnicosas, Figuera da Foz, Portugal.

Anta da Capela dos Mouros, Aveiro, Portugal.

Dolmen Cerqueira, Oliveira de Frades, Portugal.

Dolmen Capela Igreja de Sa Maria Madelana, Alcobertas, Portugal.

Dolmen Barrocal, Evora, Portugal.

Dolmen de Alcalar, Portimao, Portugal.

Almendres Cromeleque, Evora, Portugal.

Almendres Menhir, Evora, Portugal.

Anta da Foz do Rio Frio, Ortiga, Portugal.

Great Dolmen of Zambujeiro, Evora, Portugal.

Anta do Vale da Laje, Tomar, Portugal.

Anta do Penedo Gordo, Gaviao, Portugal.

Great Dolmen of Comenda, Montemoro-o-Novo, Portugal.

Anta da Cerquereira, Aveiro, Portugal.

Southern Spain (Andalusia) – 12 sites selected, 11 visited, photographed and analyzed, one (Pozuelo #5) could not be located.

Dolmen de Viera, Antequera, Málaga, Andalusia, Spain.

Dolmen de Menga, Antequera, Málaga, Andalusia, Spain.

Dolmen de Soto, Huelva, Andalusia, Spain.

Dolmen de El Pozuelo #1, Huelva, Andalusia, Spain.

Dolmen de El Pozuelo #2, Huelva, Andalusia, Spain.

Dolmen de El Pozuelo #3, Huelva, Andalusia, Spain.

Dolmen de El Pozuelo #4, Huelva, Andalusia, Spain.

Dolmen de El Pozuelo #5 – unable to locate

Dolmen de El Pozuelo #6, Huelva, Andalusia, Spain.

Dolmen de El Pozuelo #7, Huelva, Andalusia, Spain.

Dolmen de El Pozuelo #8, Huelva, Andalusia, Spain.

Dolmen de El Pozuelo #9, Huelva, Andalusia, Spain.

North East Spain (Catalonia)– 7 sites selected, visited, photographed and analyzed.

Cista Carretera de Calonge, Girona, Catalonia, Spain.

Cova d'en Daina, Girona, Catalonia, Spain.

Menhir de la Murtra, Girona, Catalonia, Spain.

Dolmen de Can Gol II, Barcelona, Catalonia, Spain.

Pedra de les Orenetes, Barcelona, Catalonia, Spain.

Roca foradada de Can Gol, Barcelona, Catalonia, Spain.

Dolmen de Sant Jordi de Puigseslloses, Barcelona, Catalonia, Spain.

2.4 Site Visit Methodology

Site visits involved using Google maps to plan visits to several sites each day of field work. Notes were made and photographic evidence collected as to directional signage between the main roads and the site, i.e., whether signage facilitates finding the site for the visitor. Upon arrival at the site any facilities were noted for visitor services, parking, toilets, benches, etc. Then photographic evidence was collected regarding the condition of the Orthostats as well as any potential engravings or art in evidence. Photographic evidence was collected of the educational and informational signage that puts the Megalith into context, temporally, socially, and culturally. Data was entered into the Megalithic Rating form discussed in the next section. After the initial use and revisions were made to the form and the final version was created and the data entered.

Data from the forms was transferred to an Excel spreadsheet. The report generator function in Excel was used to generate several summary graphs and charts for this work. The results are presented in the following Results section. The Results section presents an initial graph that summarizes all the overall scores and compares them across all sites. It is followed by two regional charts comparing overall scores for the two regions with large enough samples to allow comparison. Following those general charts, three charts, one with overall scores compared followed by the two regions compared, with overall scores for each of the 8 survey items are presented and a short narrative highlighting the findings.

2.5 Megalithic Monument Rating Form described

The form asks for the formal name of the Megalith, the map coordinates and the date of the visit as well asking eight questions to establish the condition and conservation status of the monument. The full version of the form is attached as an addendum 2.6 at the end of this section.

Each of 8 questions is rated using a version of this three-point scale:

Yes (Y) – meets all criteria (score 2 points)
Partial (P) – meets at least one criterion (Score 1 point)
No (N) – Meets none of the criteria or is unknown (Score 0 points)

- Question 1 asks about access issues. It asks three questions related to access by road, signage to ensure the visitor can find the site and one question about wheelchair accessibility.
- Question 2 asks about visitor services with three questions about parking, toilets, and places to rest.
- Question 3 asks about conservation issues such as reconstructions, maintenance of surrounding landscape and monitoring and signage that protects the site.
- Question 4 asks about preservation including the condition of the Orthostats, protective structures and environmental threats.
- Question 5 asks about communication including information on the construction of the site and the people who built it as well as where any artefacts can be found and whether the signage is in any of the EU working languages (English, German or French).
- Question 6 asks about musealization status through educational efforts including whether there is a related website and signage information available, as well as any hands-on educational activities at the site.
- Question 7 asks about the local, national, and international recognition.
- Question 8 asks about specific threats to the site from construction, agriculture, or forestry.

2.6 Addendum – Copy of Rating Form

Megalithic Monument Rating Form

Site Name _____ Map Coordinates _____

Inspection Date _____

Ratings (Check/Tick the answer, Y, P, or N after each criteria)
Yes (Y) – meets all criteria (score 2 points)
Partial (P) – meets at least one criterion (Score 1 point)
No (N) – Meets none of the criteria or is unknown (Score 0 points)

Access criteria - Total score = a + b + c = ____

(a) The site is accessible by public transport, car, bike and walking. __Y(2), __P(1), __N(0)
(b) There is signage for all the turns off the main roads (within the last 5 kms). __Y(2), __P(1), __N(0)
(c) The site is accessible by wheelchair. __Y(2), __P(1), __N(0)

Services criteria - (Yes or No answers only) Total score = a + b + c = ____

a) Parking is available within +/- 500 m of the site. __Y(2), __N(0)
b) Toilets are available within +/-100 m of the site. __Y(2), __N(0)
c) There are places to sit within +/-100 m of site. __Y(2), __N(0)

Conservation – (Cambridge Dictionary – "protection of … important structures …from the damaging effects of human activity") - Total score = a + b + c = ____

a) Site has clearly marked reconstruction that enables tourists to appreciate the original form and function of the monument. __Y(2), __P(1), __N(0)
b) The immediate (+/-10 meters) surrounding landscape is maintained: i.e., weeds managed, walking paths maintained, trash managed and parking maintained __Y(2), __P(1), __N(0)
c) Site has signage to discourage climbing on the sensitive monuments and is monitored or fenced to prevent unauthorized access. __Y(2), __P(1), __N(0)

Preservation – (Cambridge Dictionary – "the act of keeping something the same or preventing it from being damaged.") - Total score = a + b + c = ____

a) Most Orthostats are in original positions with minimal weathering and no obvious environmental threats to their remaining in position. __Y(2), __P(1), __N(0)
b) A protective structure (roof or mound) has been erected and is being maintained. __Y(2), __P(1), __N(0)
c) Environmental threats that may undermine standing stones/orthostats are controlled. __Y(2), __P(1), __N(0)

Communication - Total score = a + b + c = ____

a) Signage describes how site was built and puts the monument in a regional landscape, temporal and cultural context. __Y(2), __P(1), __N(0)

(d) Signage explains the site and where excavated artefacts were found and can be viewed, QR codes on signage link to more information. __Y(2), __P(1), __N(0)

b) Information on signage is presented in at least two of the three EU working languages (English, German or French) __Y(2), __P(1), __N(0)

Education - Total score = a + b + c = ____

a) Website available with details of history and artifacts found at the site and the region __Y(2), __P(1), __N(0)

b) Educational videos available online with QR codes linking to them on site signage. __Y(2), __P(1), __N(0)

c) Site has facilities for hands-on educational activities during the tourist season. __Y(2), __P(1), __N(0)

Value/Relevance - (Yes or No answers only) Total score = a + b + c = ____

a) Local or regional recognition**.** __Y(2), __N(0)

b) National recognition. (Yes or No answers only) Total score = a + b + c = _____Y(2), __N(0)

c) World Heritage or other international recognition. __Y(2), __N(0)

Direct Threats – (scores are reversed for threats with 0 for yes and 2 for no) Total score = a + b + c = ____

a) Construction encroaches on perimeter. __Y(0), __N(2)

b) Agriculture encroaches on perimeter. __Y(0), __N(2)

c) Forestry work threatens monument. __Y(0), __N(2)

Summary score = _____

3. Results

33 Iberian Megalithic Monument Sites

The three study areas – Portugal, Andalucia and Catalonia in Spain.

Megalithic Monuments selected by Study Area

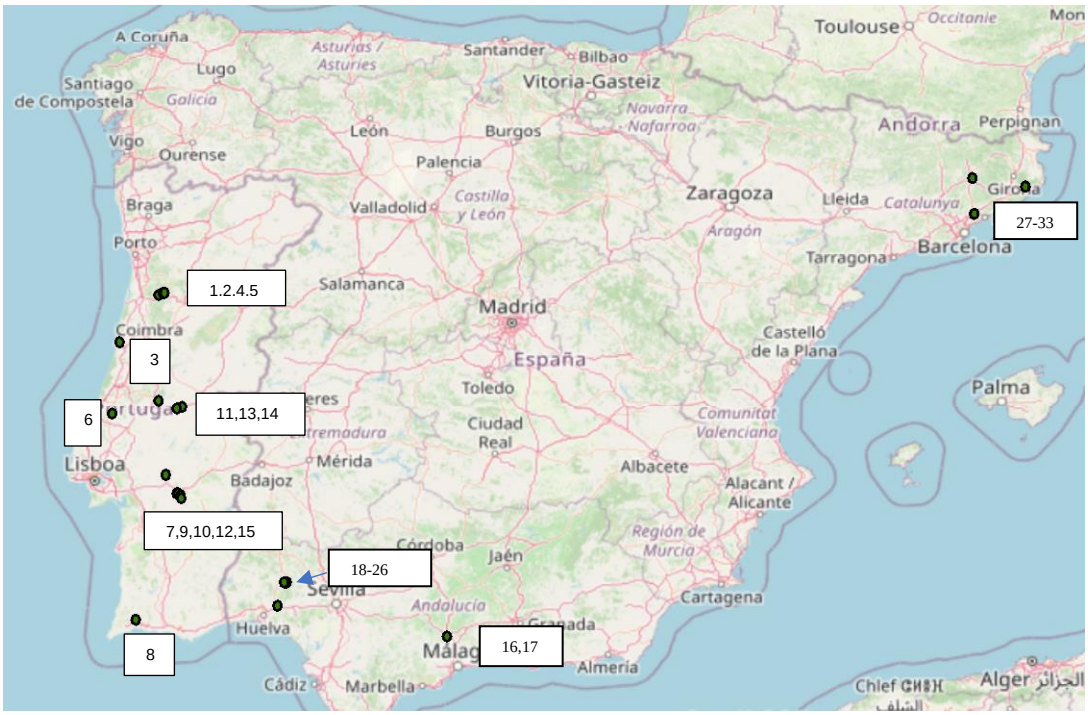


Figure 14 – Study area with sites numbered. Dan O'Brien with ArcMap, ArcGIS.

Western Iberian Peninsula (Portugal) – 16 sites selected, visited, photographed, and analyzed.

1. Dolmen de Antelas, Antelas, Portugal.
2. Mamoas da Cumeeira, Oliveira de Frades, Portugal.
3. Dolmen da Carnicosas, Figuera da Foz, Portugal.
4. Anta da Capela dos Mouros, Aveiro, Portugal.
5. Dolmen (Anta) da Cerqueira, Aveiro, Portugal.
6. Dolmen Capela Igreja de Sa Maria Madelana, Alcobertas, Portugal.
7. Dolmen Barrocal, Evora, Portugal.
8. Dolmen de Alcalar, Portimao, Portugal.
9. Almendres Cromeleque, Evora, Portugal.
10. Almendres Menhir, Evora, Portugal.
11. Anta da Foz do Rio Frio, Ortiga, Portugal.
12. Great Dolmen of Zambujeiro, Evora, Portugal.
13. Anta do Vale da Laje, Tomar, Portugal.

14. Anta do Penedo Gordo, Gaviao, Portugal.
15. Great Dolmen of Comenda, Montemoro-o-Novo, Portugal.

Southern Spain (Andalusia) – 12 sites selected, 11 visited, photographed and analyzed, one (Pozuelo #5) could not be located.

16. Dolmen de Viera, Antequera, Málaga, Andalusia, Spain.
17. Dolmen de Menga, Antequera, Málaga, Andalusia, Spain.
18. Dolmen de Soto, Huelva, Andalusia, Spain.
19. Dolmen de El Pozuelo #1, Huelva, Andalusia, Spain.
20. Dolmen de El Pozuelo #2, Huelva, Andalusia, Spain.
21. Dolmen de El Pozuelo #3, Huelva, Andalusia, Spain.
22. Dolmen de El Pozuelo #4, Huelva, Andalusia, Spain.
23. Dolmen de El Pozuelo #6, Huelva, Andalusia, Spain.
24. Dolmen de El Pozuelo #7, Huelva, Andalusia, Spain.
25. Dolmen de El Pozuelo #8, Huelva, Andalusia, Spain.
26. Dolmen de El Pozuelo #9, Huelva, Andalusia, Spain.

North East Spain (Catalonia)– 7 sites selected, visited, photographed and analyzed.

27. Dolmen de Can Gol II, Barcelona, Catalonia, Spain.
28. Cista Carretera de Calonge, Girona, Catalonia, Spain.
29. Cova d'en Daina, Girona, Catalonia, Spain.
30. Menhir de la Murtra, Girona, Catalonia, Spain.
31. Pedra de les Orenetes, Barcelona, Catalonia, Spain.
32. Roca foradada de Can Gol, Barcelona, Catalonia, Spain.
33. Dolmen de Sant Jordi de Puigseslloses, Barcelona, Catalonia, Spain.

Individual Megalithic Site Ratings and Comparison with the Average of all ratings. Photos to document Musealization status.

1) Anta do Vale da Laje - Tomar, Portugal, Coordinates 39.55642, -8.30216,

Date of analysis 10/1/2022, Dating ca. 5,500-4500 BCE.

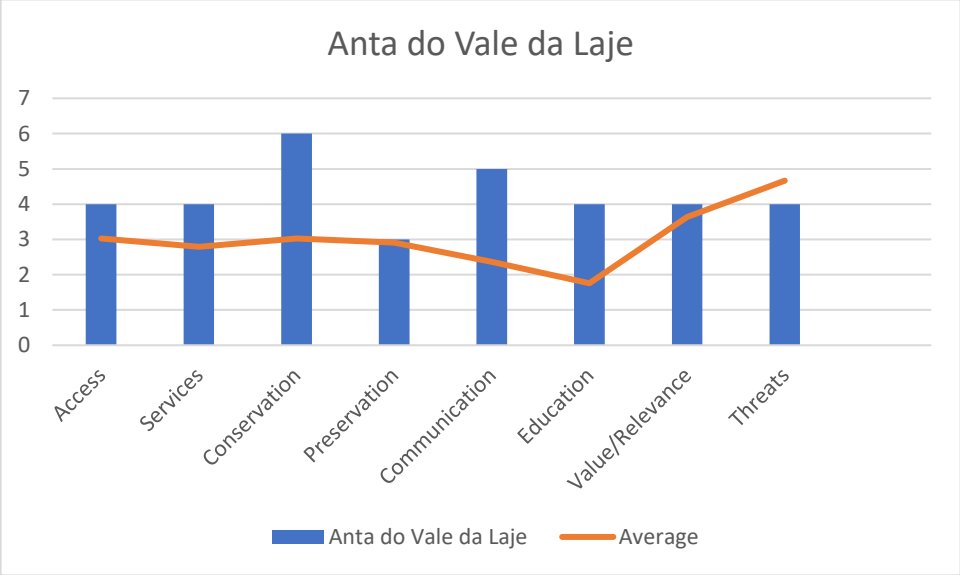


Figure 15- Summary of Ratings with comparison to Average for the sample for Vale do Laje.

Anta do Vale da Laje is one of the oldest sites, ca. 5500 BCE, in the central area of Portugal comprising the Alentajo and Centro regions. The site is accessible by paved roads with good directional signage and is easily accessible by bike, car and walking. Wheelchair access might be somewhat difficult, but it seems possible to view the site from a rough but paved pathway.

Parking is available at an adjacent Church, but there are no other facilities such as toilets or benches but some potential to sit on the adjacent wall seen in Figure 19. The site is well tended, grass is mowed, and litter removed, it is fenced, and boundaries delineated, signage is clear. Orthostats are largely intact but weathered and most are in place, no protective structure is in place however the lower part of the original covering mound is still in place. Construction activity is encroaching on boundaries of site but has not damaged the main structure. Signage has outstanding detail on temporal, cultural and symbolic background for the site. Signs describe details of construction and

architecture. Signage is in Portuguese and English. Excavation and artefacts are described in detail in published material with brief summaries on signage at the site with detailed information provided on construction and for artefacts found at the site. No onsite educational activities were evident. Vale da Laje is recognized locally and nationally through excavations and publications and represents one of the oldest megalithic sites in central Portugal (Scarre and Oosterbeek, 2020). The primary threat to this monument is from construction which has encroached on the perimeter of the site. Dated at 7500 years BP the Anta do Vale da Laje represents an exemplar of Musealization of Iberian Megaliths in a number of aspects, including its age, its preservation, the high quality of its excavation and the communication with the public of the important facts about the site and people who built it. Professor Luiz Oosterbeek at IPT excavated this site and was instrumental in the exemplary musealization of this site.

Figure 16 - Clearly marked road signs, Photo by Dan O'Brien 2022

Figure 17 - Passageway and Chamber with remains of protective mound, Photo by Dan O'Brien 2022.3

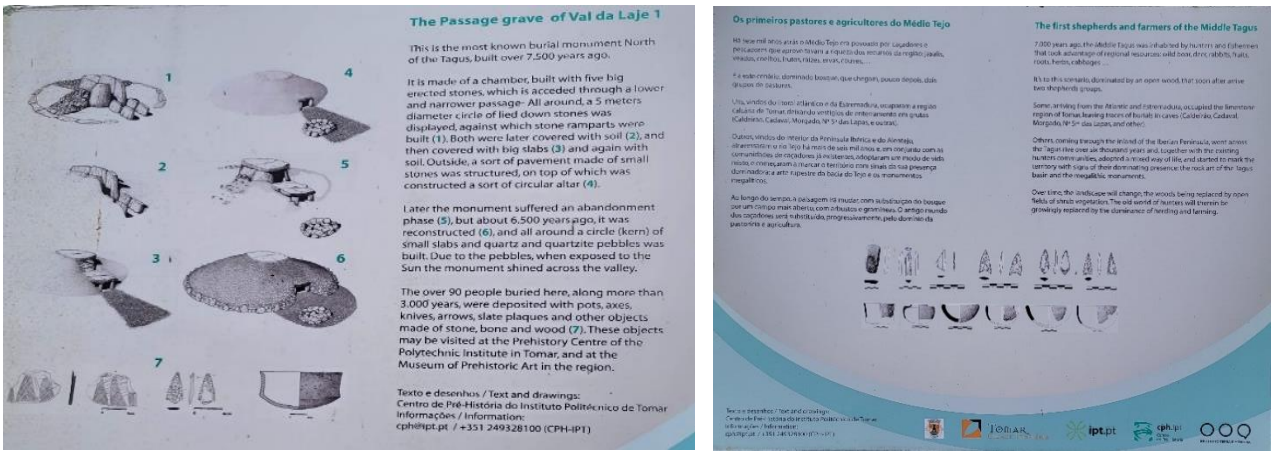


Figure 18 - Informational Signage with detailed graphics and history. Photo by Dan O'Brien 2022.

Anta do Vale da Laje is an example of a Dolmen being encroached on by development.

Figure 19 - Encroachment of Construction. Photo by Dan O'Brien 2022.

2) Anta do Penedo Gordo, Gaviao, Portugal, Coordinates 39.49253, -7.99505

Date of analysis 15/1/2022, Dating - Neo-Chalcolithic.

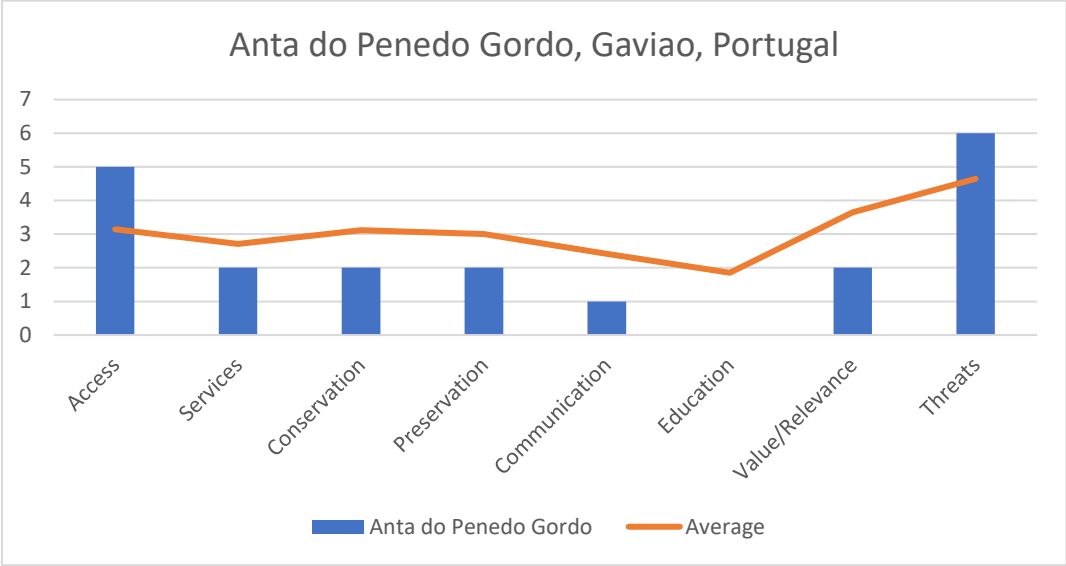


Figure 20- Summary of Ratings for Penedo Gordo with comparison to Average for the sample.

Access issues for Penedo Gordo included lack of directional signage from the main paved road making it difficult to find without GPS directions. However, there was good signage once the guest turns off on to unpaved side roads, an example of the signage is in the photo that follows, see figure 8.

Figure 21Good signage from unpaved road. Photo by Dan O'Brien 2022

There is no easy wheelchair access. There were no visitor services at the site, no toilets, no parking other than on the road and no benches. The site had not been recently tended to, weeds were about a meter tall and encroaching on the Orthostats. Access to site is not controlled. Orthostats that remain are weathered and partial but in place, no protective structure is in place, a tree is growing up against one of the orthostats and may undermine it. Signage lacks good detail on temporal, cultural and symbolic background for site. Signage is only in Portuguese. No detailed information is provided for artefacts found at the site, no website information appears to be available for additional information. There is no evidence of educational activities for visitors. Site is locally recognized and maintained, no evidence of national or international recognition or significance. There were no major direct threats other than a tree growing closely against the stones that might undermine one or more orthostats.

Figure 22- Passageway and Polygonal Chamber. Photos by Dan O'Brien 2022.

3) Anta da Foz do Rio Frio, Ortiga, Portugal, Coordinates 39.47429, -8.06258, Date of analysis 10/2/2022, Dating ca. 4000 BCE.

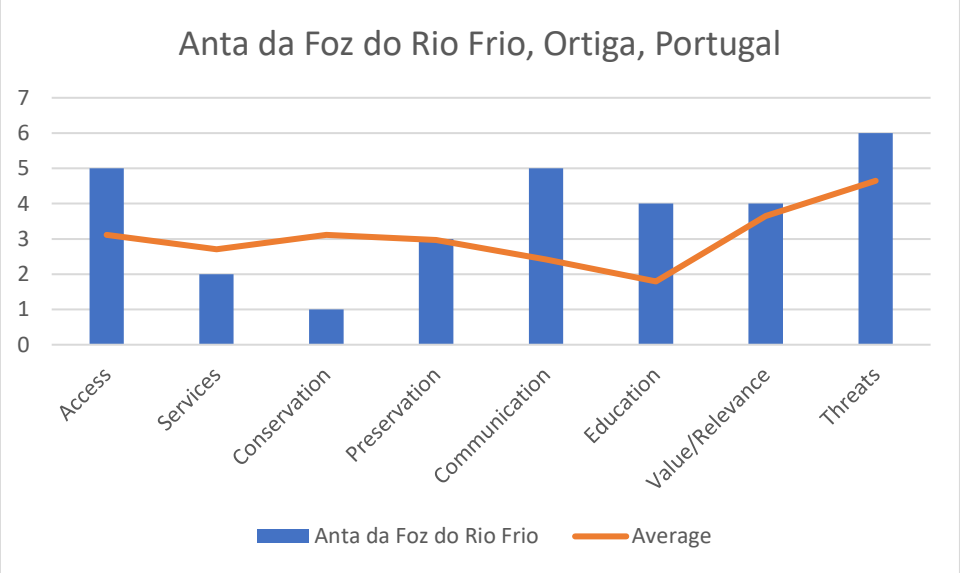


Figure 23- Summary of Ratings for Foz do Rio Frio with comparison to Average for the sample.

Anta da Foz do Rio Frio is dated ca. 4000 BCE in the Municipality of Ortiga in the Central area of Portugal. Directional signage to the site is very good from the main roads and access is by a short gravel road. The site is incorporated in the Rotas de Macao heritage hiking trail system, see Walking Trails - Mation Routes (rotasdemacao.pt). There were no visitor services at the site, no toilets, and no benches. Parking was on the circular road that encircles the site, which also would allow viewing from all sides by mobility impaired individuals, site is not wheelchair accessible. The site had tall weeds which were encroaching on the Orthostats. Access to site is not controlled, however one of the neighbors noticed the visitors and stopped to check, which indicates good community support for protecting the monument. Orthostats that remain are weathered and partial but in place, no protective structure is in place the original mound is completely eroded. Signage has very good detail on temporal, cultural and symbolic background for the site. Signage is in Portuguese and English. Signage directs visitors how to obtain more information and where to view artefacts at the Museum of Prehistory in nearby Macao, Portugal. An example of thorough musealization of the site in addition to the detailed background information is the code of conduct for visitors on the signage. No onsite educational activities were evident. Site is locally and nationally recognized and maintained, no evidence of international recognition. There were no obvious direct threats other than weeds growing closely against the stones that might undermine one or more orthostats.

Figure 24- Signage is very informative and directs visitor how to get more information, left pane shows markers for Rotas de Macao heritage hiking trail and right pane shows online information on Rotas de Macao. Photos by Dan O'Brien 2022.

.

Figure 25- Polygonal Chamber - Photo by Dan O'Brien

Figure 26- East facing passageway leading to Chamber photos by Dan O'Brien 2022.

4) Dolmen da Carnicosas, Figuera da Foz, Portugal. Coordinates 40.187, -8.806, Date of analysis 20/2/2022, Dating – ca. 3000 BCE.

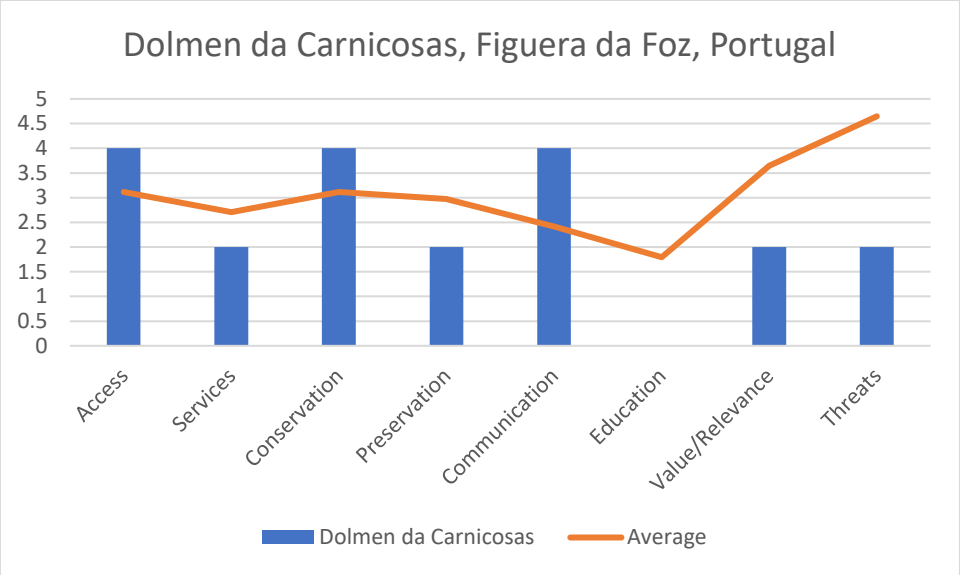


Figure 27- Summary of Ratings for Carnicosas with comparison to Average for the sample.

Dolmen da Carnicosas is dated ca. 3000 BCE in the Municipality of Figuera da Foz in the central coastal area of Portugal. Signage to the site is good from the main roads except for the final turn and access is by a road. OR The site is accessible by paved roads with good directional signage and is easily accessible by bike, car and walking. There is no wheelchair access. There were no visitor services at the site, no toilets and no benches. Parking is along the access road. The site is well tended, grass is mowed and litter removed, it is not fenced. Access to site is not controlled, the lower portion of the mound is in place providing some protection for the monument. Several orthostats are missing with placeholder stone and the orthostats that remain are weathered and partial but in place. Signage has very good detail on construction techniques used and the dating as well as background for the site. Signage is in Portuguese and English. No onsite educational activities were evident. There is no evidence of educational activities for visitors. Artefacts are described in brief summaries on signage at the site with detailed information provided on construction. Site is locally and nationally recognized. There were no major direct threats to preservation other than anthropic threats from a high volume of tourist interest from the nearby resorts.

Figure 28 - Directional and informational signs -Photo by Dan O'Brien.

Figure 29– Carnicosas Passageway - Photo by Dan O'Brien

Figure 30- Carnicosas Chamber - Photo by Dan O'Brien

5) Dolmen Capela Igreja de Sa Maria Madalena, Alcobertas, Portugal. Coordinates 39.419, -8.904, Date of analysis 18/2/2022. Dating – Late Neolithic.

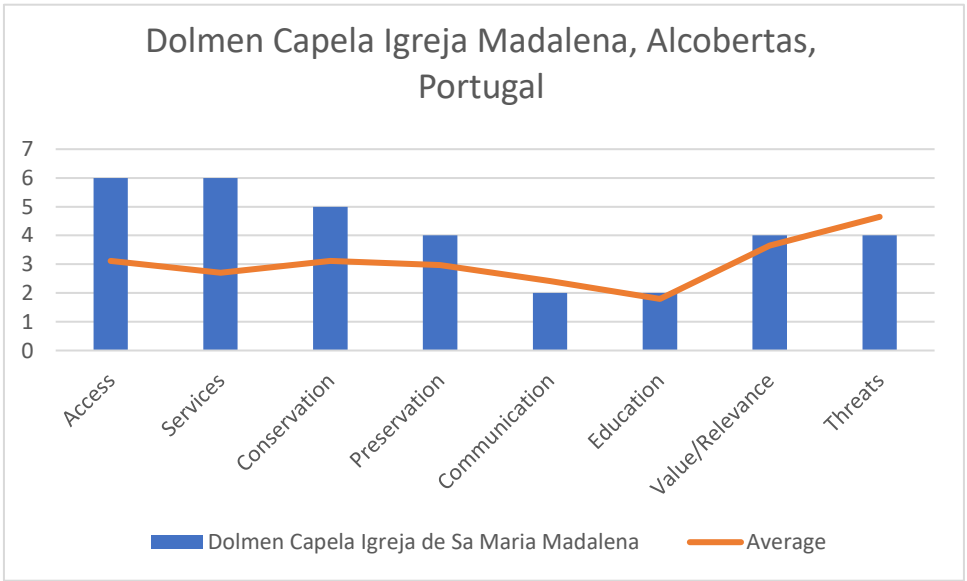


Figure 31- Summary of Ratings for Maria Madalena with comparison to Average for the sample.

Dolmen Capela Igreja de Sa Maria Madalena is dated to the late Neolithic in the Municipality of Alcobertas in the Santarem region of Portugal. It is one of the largest Dolmens in Portugal and is an example of christianization of a pre-christian monument. Signage to the site is very good from the main roads and accessed directly off the main road through the village and is easily accessible by bike, car and walking. The site is wheelchair accessible as it is a side chapel off the main sanctuary of the Church which was built around it.

Parking is available in the church parking lot and there are facilities such as toilets and benches. The site is well tended. Access to site is controlled by the opening hours of the church which provides the only access to the monument

Orthostats appear to be intact and are a good example of the "leaning on neighbor design" common in Portugal, where side stones are partially supported by leaning against the neighboring Orthostat. The capstone has been replaced with glazing that admits natural light into the chamber. Signage lacks good detail on background for the site.

No onsite educational activities were evident for visitors. Site is locally and nationally recognized and it is well maintained as part of the church. There were no major direct threats other than the damage caused by incorporating the monument into functioning church as a side chapel.

Figure 32- Minimal signage with QR codes for more information. Photos by Dan O'Brien 2022.

Figure 33- Four views of Dolmen - Photos by Dan O'Brien 2022

6) Anta da Capela dos Mouros, Aveiro, Portugal. Coordinates 40.692, -8.303, Date of analysis 22/2/2022. Dating – n.d.

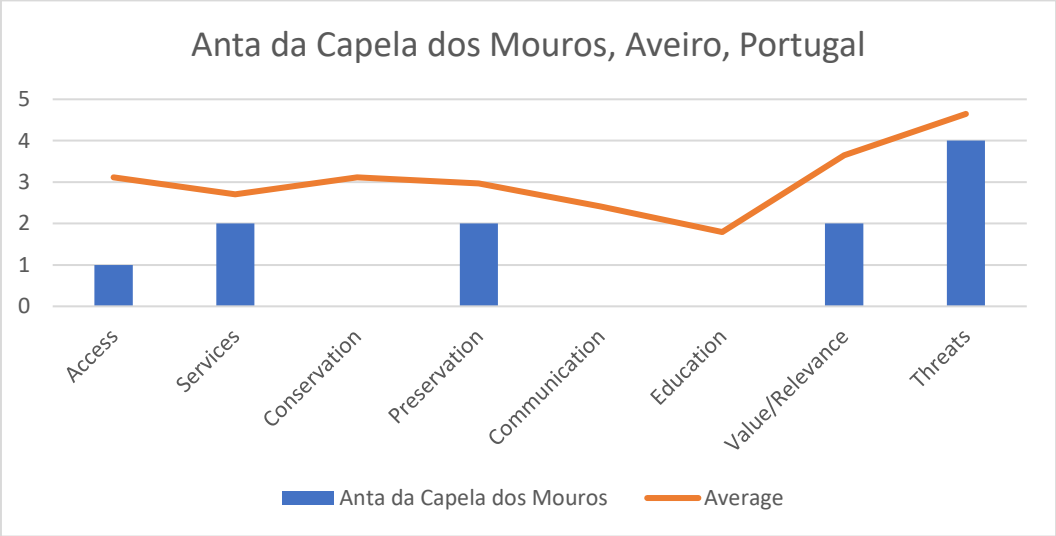


Figure 34- Summary of Ratings for dos Mouros with comparison to Average for the sample.

Anta da Capel dos Mouros near Viseu in the the Aveiro district of central Portugal. Signage to the site is minimal and access is by a rough unpaved road. The Dolmen (Anta) is an unusual site that presents the visitor with a restored passage grave, allowing the visitor to experience it much as the ancestors did. The site is accessible by foot on a rough unpaved road the last .5 km from the last paved roads. There is no signage at the site itself to inform the visitor about the history and structure of the site. Wheelchair access would be impossible. There were no visitor services at the site, no toilets, no parking other than on the road .5 km away and no benches. The site is overgrown and appears not to be maintained. Orthostats are in place and the Dolmen has its protective mound in place. No onsite educational activities were evident. Site is locally recognized but is not maintained. There appears to be forestry work going on in the area that could present a direct threat to the Dolmen (Anta).

Figure 35- Four views of dos Mouros - photos by Dan O'Brien

7) Dolmen de Antelas, Antelas, Portugal. Coordinates 40.713, -8.244, Date of analysis 22/2/2022. Dating – ca. 4000 BCE.

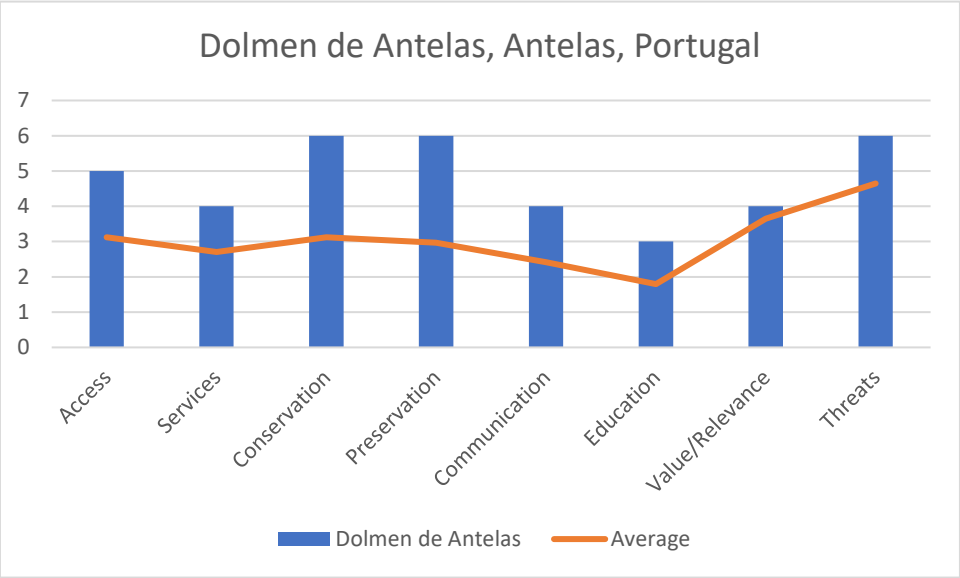


Figure 36- Summary of Ratings for Antelas with comparison to Average for the sample.

Anta de Antelas is dated ca. 4000 BCE in the Municipality of Antelas in the Viseu district of Portugal. The site contains rare Neolithic paintings and engravings. The site has been restored to its original appearance to the extent known. Orthostats are intact and the mound is in place over the orthostats to protect them. Signage to the site is very clear from the main roads and access is by a short well maintained dirt road. The site is accessible by bike, car and walking. Wheelchair access might be somewhat difficult. Parking is available around the dolmen, but there are no other facilities such as toilets. The site is well tended, grass is mowed and litter removed. The Dolmen has an intact mound protecting it and the interior is only viewable by appointment with a guide. Signage has good basic detail on symbolic art in the interior of the Dolmen. The signs are presented in both Portuguese and English. However, signage lacks detail on the construction methods and cultural background for site. No onsite educational activities were evident other than tours of the interior provided by the guide. There is no evidence of educational activities for visitors. Site is locally, nationally and internationally recognized. Additional information was available at the local museum according to the guide, but no

details on construction, excavation, restoration or cultural context were presented at the site for the education of the visitor.

Figure 37- Four views of Dolmen Antelas - Photos by Dan O'Brien 2022.

8) Mamoas da Cumeeira, Oliveira de Frades, Portugal, Coordinates 40.716, -8.225, Date of analysis 23/2/2022, Dating – ca. 1000 BCE.

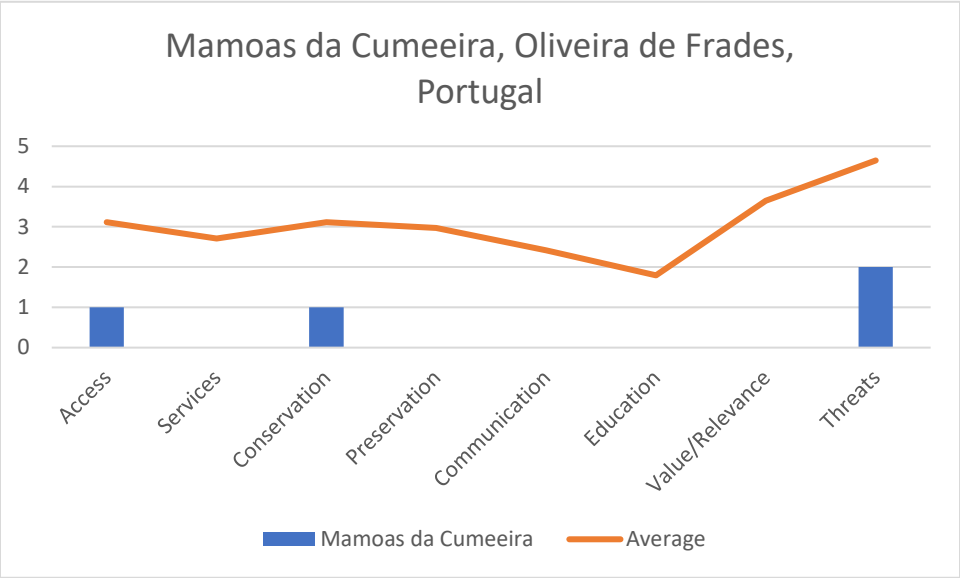


Figure 38- Summary of Ratings for Cumeeira with comparison to Average for the sample.

Mamoas da Cumeeira is dated ca. 1000 BCE in the Municipality of Oliveira de Frades in the Viseu district of Portugal. This site is the latest example in this study and dates to the Bronze age. The signage clarifies that the Mamoa type grave represented an individual grave as distinct from the more community burials represented by the megalithic sites from the Neolithic. The site was recently discovered (2020) and is under active excavation. The site is accessible by paved roads but is currently not signed to encourage public access. Rather than being built with orthostats the Mamoa was built with smaller stones and rubble to create a central burial chamber. Site is locally recognized and is maintained but access is by tour guide from the nearby Antelas Dolmen. There were major direct threats from construction and forestry which created the need for excavation in 2020 according to the guide.

Figure 39- Dolmen da Cumeeira - Photos by Dan O'Brien 2022.

9) Dolmen de Soto, Huelva, Andalucia, Spain, Coordinates 37.353, -6.752, Date of analysis 1/3/2022, Dating – ca. 3000 BCE.

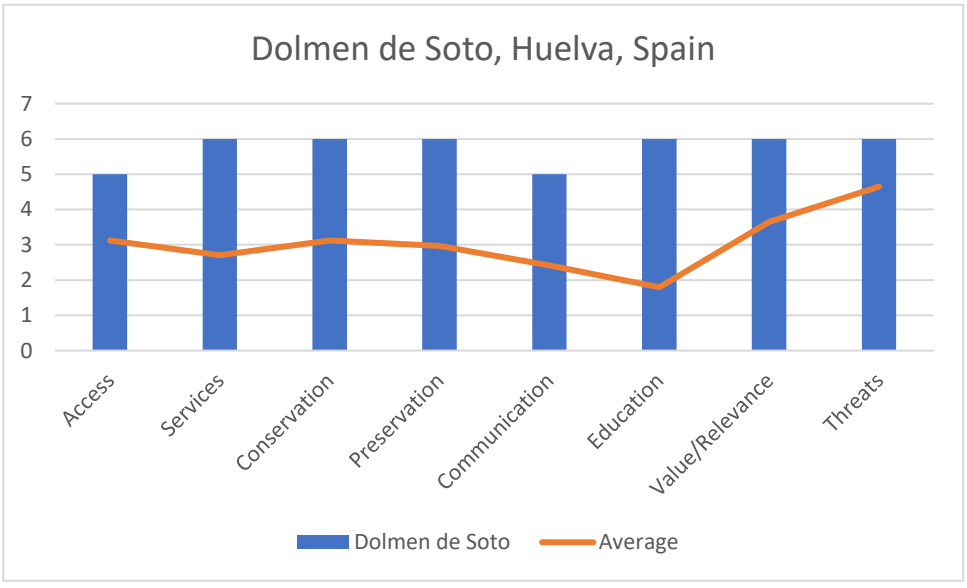


Figure 40- Summary of Ratings for de Soto with comparison to Average for the sample.

Dolmen de Soto is dated ca. 3000 BCE in the province of Huelva in Andalucia, Spain. Signage to the site is good from the main roads but there are only two long gravel roads, in very poor condition, that

access the site for the last few kilometers. Access by car appears to be the default option, biking (unless using a mountain bike) or walking to the site would be difficult over the rough gravel road. Wheelchair access appeared to be possible once the site is reached from the parking lot. Visits must be scheduled in advance and a small parking lot is available at the entrance.

Visitor facilities are excellent. There is a visitor center with video presentations in multiple European languages on the history of the site and the Neolithic context. There is a small bookstore in the staffed visitors center with toilets and benches. The site is fenced and gated, grass is mowed and litter removed, boundaries delineated, signage is clear. The site has been restored to best estimates of its original condition with orthostats in place, the protective mound is also in place. Signage has extensive detail on temporal, cultural and symbolic background for the site. Signage is in Spanish and English, but videos cover much of the information in multiple European languages.

Excavation and artefacts are described in detail on signage and in videos. Site is recognized locally and has national or international significance.

There were no major direct threats to the monument. The Dolmen de Soto is one of the best examples in this study of successful Musealization of a megalithic monument. An examples includes, in addition to information presented above, the careful lighting within the monument that highlights the multiple engravings, see figure 43.

Figure 41- Five views of entrance area to Dolmen De Soto. Photos by Dan O'Brien 2022.

Figure 42- Careful lighting highlights the world class neolithic art. Photos by Dan O'Brien 2022.

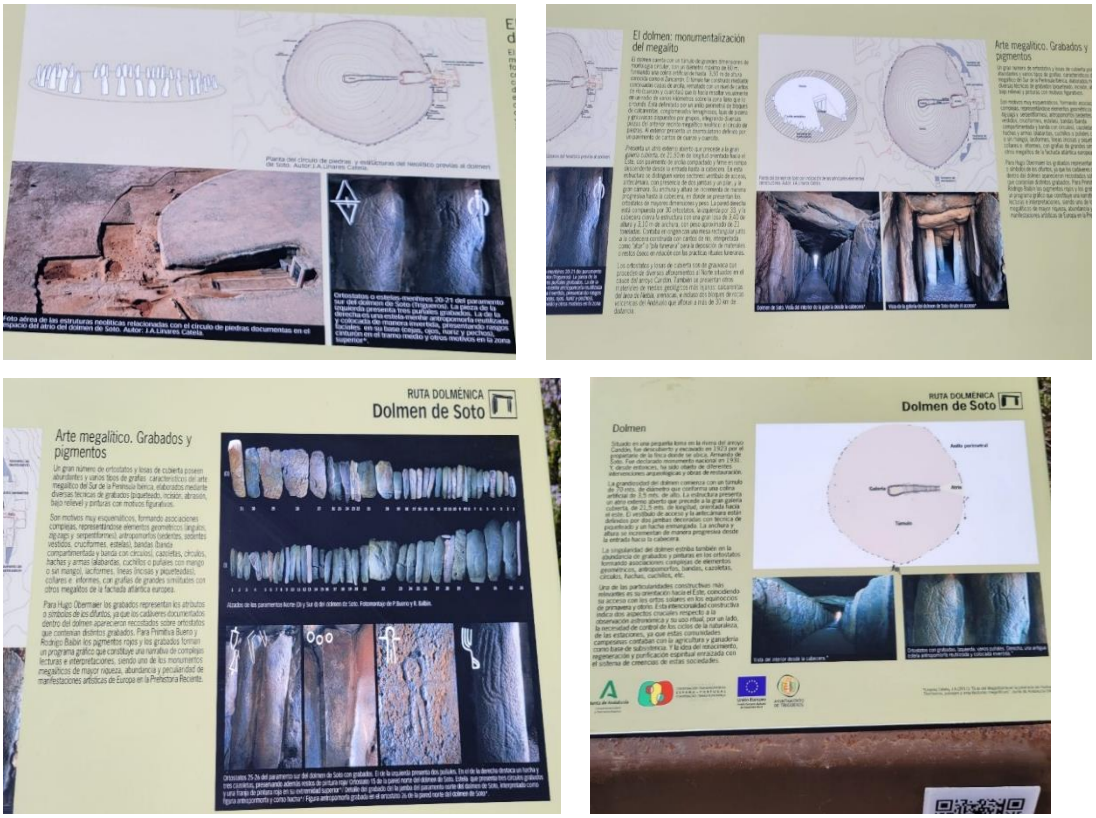


Figure 43- Exemplary Musealization with detailed information on construction. Photos by Dan O'Brien 2022.

10) Dolmen de Viera and 11) Dolmen de Menga Antequera, Andalucia, Spain, Coordinates 37.024, -4.547, Date of analysis 28/2/2022, Dating: Menga – ca. 3700 BCE Viera - ca. 2000 BCE.

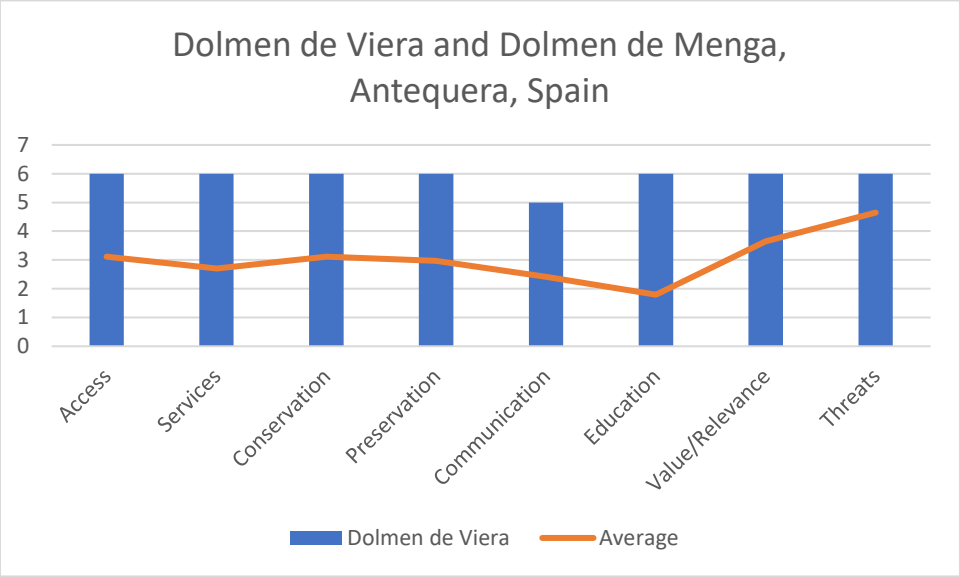
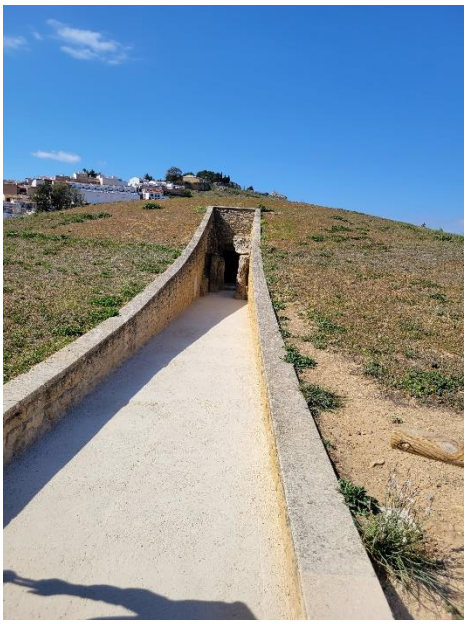
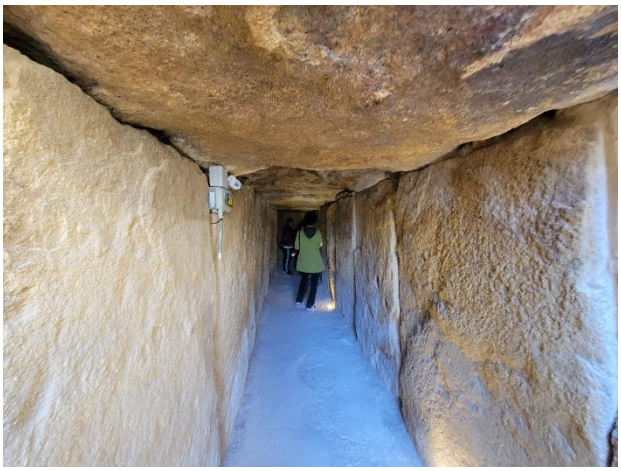


Figure 44 - Summary of Ratings for Dolmens Viera and Menga with comparison to Average for the sample

Menga and Viera share a single site and are within several hundred meters of each other. The ratings above apply to both megaliths and the initial musealization discussion that follows will highlight the shared musealization infrastructure. Signage to the site is excellent from the main roads which go right near the site in the built-up area of the city. The site is easily accessible by bike, car, public transportation, and walking. Wheelchair access is excellent with paved and gently graded slopes throughout the site. There are very well developed visitor services at the site, including toilets, extensive parking and rest areas. There is a museum and visitors center with films and literature in multiple European languages. The films broadcast at the visitors center graphically tell the story of the Neolithic ancestors who built the site. The site is well tended, grass is mowed and litter removed, it is fenced and boundaries delineated with guards to protect the site. The site is recognized nationally and internationally and is a UNESCO World Heritage site. The Menga site is one of the outstanding examples of Musealization discussed in this work.

Figure 45- Above map of site and QR codes for more information. Below - Viera entrance, passageway, and chamber. Photos by Dan Brien 2022.






13) Almendres Menhir, Evora, Portugal, Coordinates 38.564, -8.048, Date of analysis 25/2/2022, Dating – Early to Middle Neolithic.

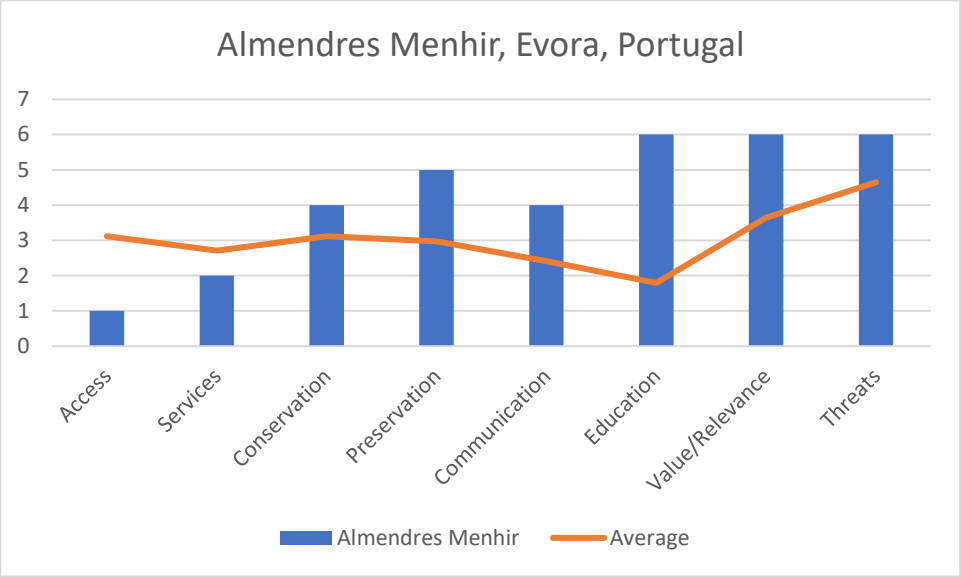


Figure 46- Summary of ratings for Almendres Menhir with comparison to Average for the sample.

The Almendres Menhir is dated to the early to middle Neolithic and is located in the Evora district of Portugal. Signage to the site is clear from the main roads with access from the side of a paved two lane road. The site is easily accessible by bike, car and walking. Wheelchair access would be impossible given the deteriorated state of the long earthen pathway to the site. There were no visitor services at the site, no toilets, no parking other than on the road and no benches. The site is well tended, grass is mowed and litter removed, boundaries are delineated, signage is clear. The 4-meter-high Menhir is in good condition and appears to be stable. Signage has minimal details on the monument. There is a shepherd's crook engraved on the Menhir. Also, the Menhir and the nearby Almendres Cromlech align on the sunrise at the summer solstice. Signage is in Portuguese and English. No information was provided on the site signage on construction and or artefacts found at the site. The site is locally and nationally recognized.

Figure 47- Eroded path Almendres menhir, photo by Dan O'Brien (2022).

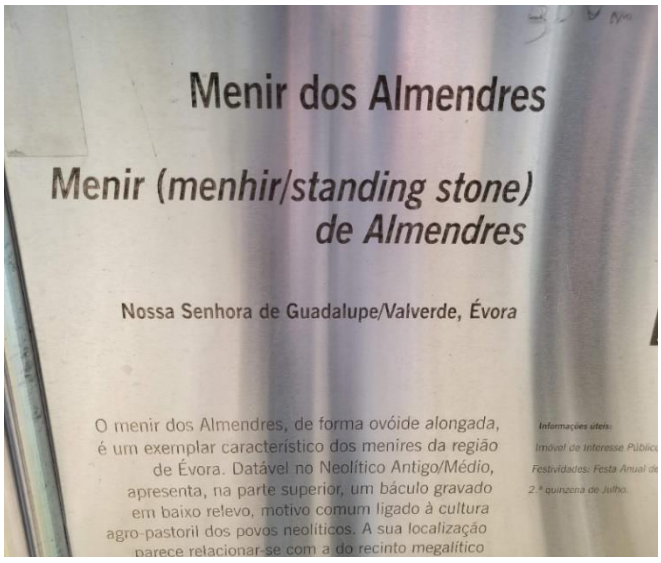


Figure 48- Path, Signage and 4 m tall Almendres Menhir. Photos by Dan O'Brien 2022.

14) Almendres Cromeleque, Evora, Portugal, Coordinates 38.557, -8.061, Date of analysis 25/2/2022, Dating – Early to Middle Neolithic, 6000-4000 BCE.

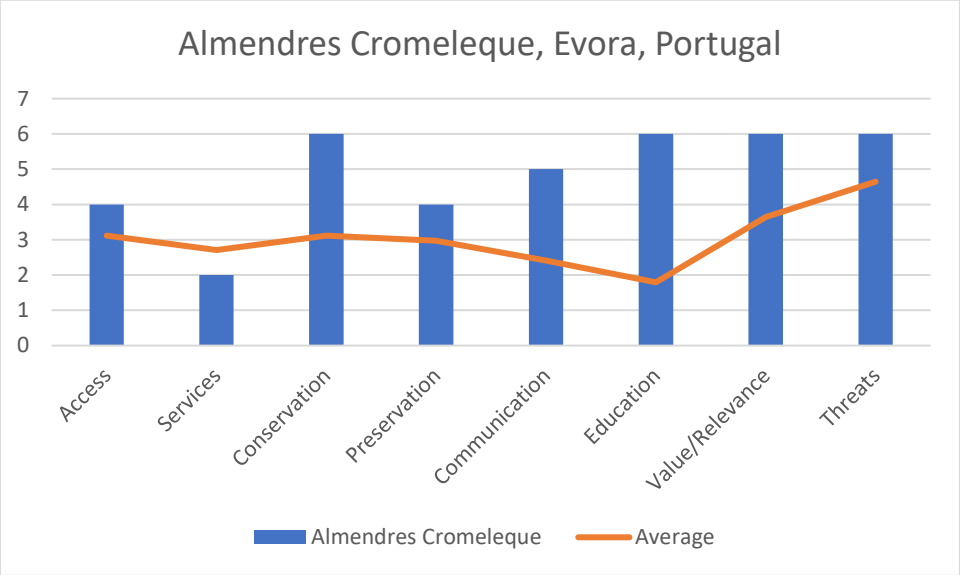


Figure 49- Summary of ratings for Almendres Cromeleque with comparison to Average for the sample.

The Almendres Cromleque is dated ca. 6000-4000 BCE in the Municipality of Evora in the Alentajo region of Portugal. Signage to the site is very clear from the main roads and access is by a side road about 4 km from the visitors center in the village Nossa Sra. De Guadalupe. Wheelchair access would be somewhat difficult, as the parking lot and access path is rough. There is a visitors center in the town with toilets, parking, a gift shop and demonstrations of Neolithic housing and crafts. Limited parking is available at the site and there are no visitor facilities at the site. The site is well tended, grass is mowed, and litter removed. Access to site is not controlled there is no fencing or gate. Signage has good information on the site with details on the carvings and the astronomical alignments of the Menhirs. Signage is in Portuguese and English. The individual standing stones are weathered but intact, carvings are worn and difficult to discern except with proper lighting.

The site is locally, nationally, and internationally recognized and protected. The major direct threats appear to be from the effects of weather and anthropic damage from touching and trampling of the bare soil at the bases.

Figure 50- Almendres Cromlech Menhir arrangement. Photos by Dan O'Brien 2022.

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Figure 51- Almendres Cromlech - Solar alignment stones. Photos by Dan O'Brien 2022.

Figure 52 - Almendres Cromlech Menhirs with art. Photos by Dan O'Brien 2022.

15) Great Dolmen of Zambujeiro, Evora, Portugal, Coordinates 38.539, -8.014, Date of analysis 25/2/2022, Dating – ca. 3200 BCE.

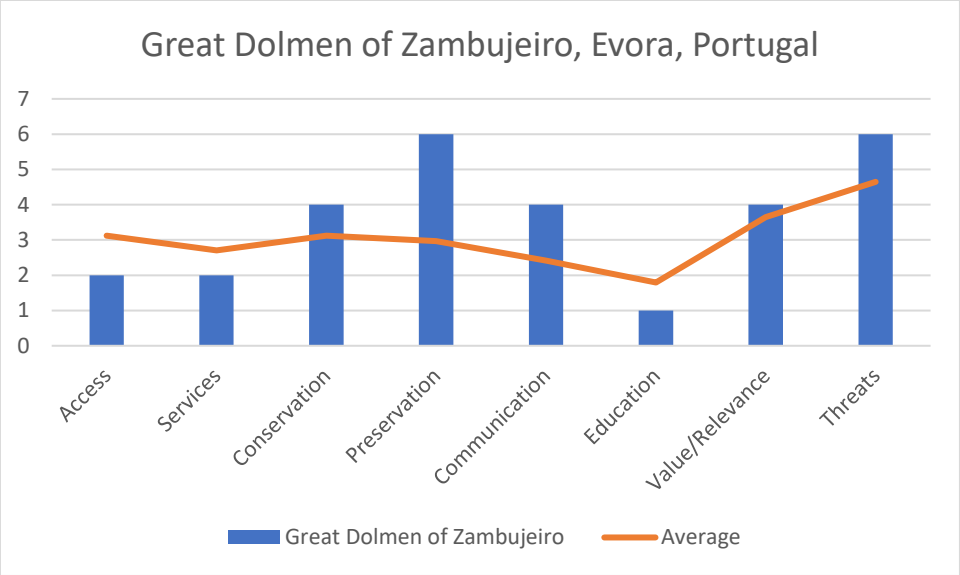


Figure 53- Summary of ratings for Zambujeiro with comparison to Average for the sample.

The great Dolman of Zambujeiro is in the Evora district of Portugal. Signage leading to the site from the main roads is adequate. The site has a small parking lot and a poorly maintain path to the monument. Wheelchair access would be difficult if not impossible due to the poor condition of the pathway and bridge. The bridge over a small depression is missing slats and is a tripping hazard. This is an example of the poor maintenance of the site, an investment in Musealizing in the site was made, likely several decades ago, in the roofing, paths, bridge and signs and has not been maintained. There are no services at the site, no toilets, limited parking and no benches. Access to site is somewhat controlled the area is fenced and gated.

The monument appears to retain most if not all of the original elements in it. Unusually that includes the mound, much of the lower part of the mound is intact. The restoration activities that had been undertaken, are easily recognizable and they appear to be consistent with the original form and function. The capstone is missing and the passageway is blocked with support beams installed in restoration activities. Due to the conservation of most of the original elements the monument offers

the visitor, a holistic experience by retaining most of the original Orthostats with minimal damage from weathering. Due to its size and the impressive state of preservation of the original architectural elements the site allows the visitor to imagine and experience the monument much like the Neolithic people who built it. The size of the monument is impressive. It is one of the largest dolmens in the Iberian peninsula and still inspires awe from the viewer. The monument has an aging roof installed to protect what remains from the elements. The roof and supports and the pathways and other infrastructure that was installed is aging and needs replaced. The site is locally, nationally and internationally recognized and therefore is a protected property.

Figure 54- Zambujeiro signage, damaged pathway and bridge, and fallen entry Menhir. Photos by Dan O'Brien 2022.

Figure 55- Zambujeiro Dolmen Passage and Chamber with protective roofing. Photos by Dan O'Brien 2022.

16) Dolmen Barrocal, Evora, Portugal, Coordinates 38.508, -8.006, Date of analysis 25/2/2022, Dating – ca. 3900.

Dolmen Barrocol is dated ca. 3,900 BCE in the Evora district in Portugal. The site is accessed by a side road with good directional, signage. There are no visitor services at the site. The dolmen is in the middle of a pasture. Parking is along the secondary road. There is no parking lot. Signage

for the site is informative, it gives brief information about the age and background signage in Portuguese in an English. The dolmen is a typical seven orthostat design with the capstone intact. The design is very common in Portugal with orthostats that lean on their neighbor. The design is straightforward and appears to be a labor-saving device, where the first two orthostats lean on the backstone and the each additional set of two orthostats leans on their neighbor. The passageway and mound are largely missing. The main chamber itself appears to retain all of its original elements, except for the protective mound. The dolmen is impressive in its size and good state of preservation. Access is not controlled. The surrounding farming activities are a challenge to both the visitor and conservators, and present a potential long-term threat from anthropic activities.

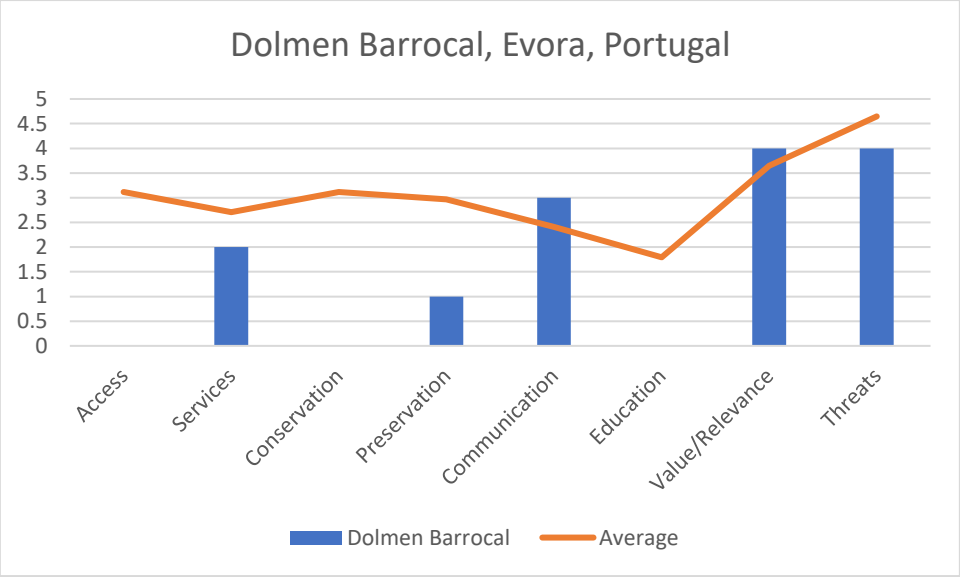


Figure 56- Summary of ratings for Barrocal with comparison to Average for the sample.

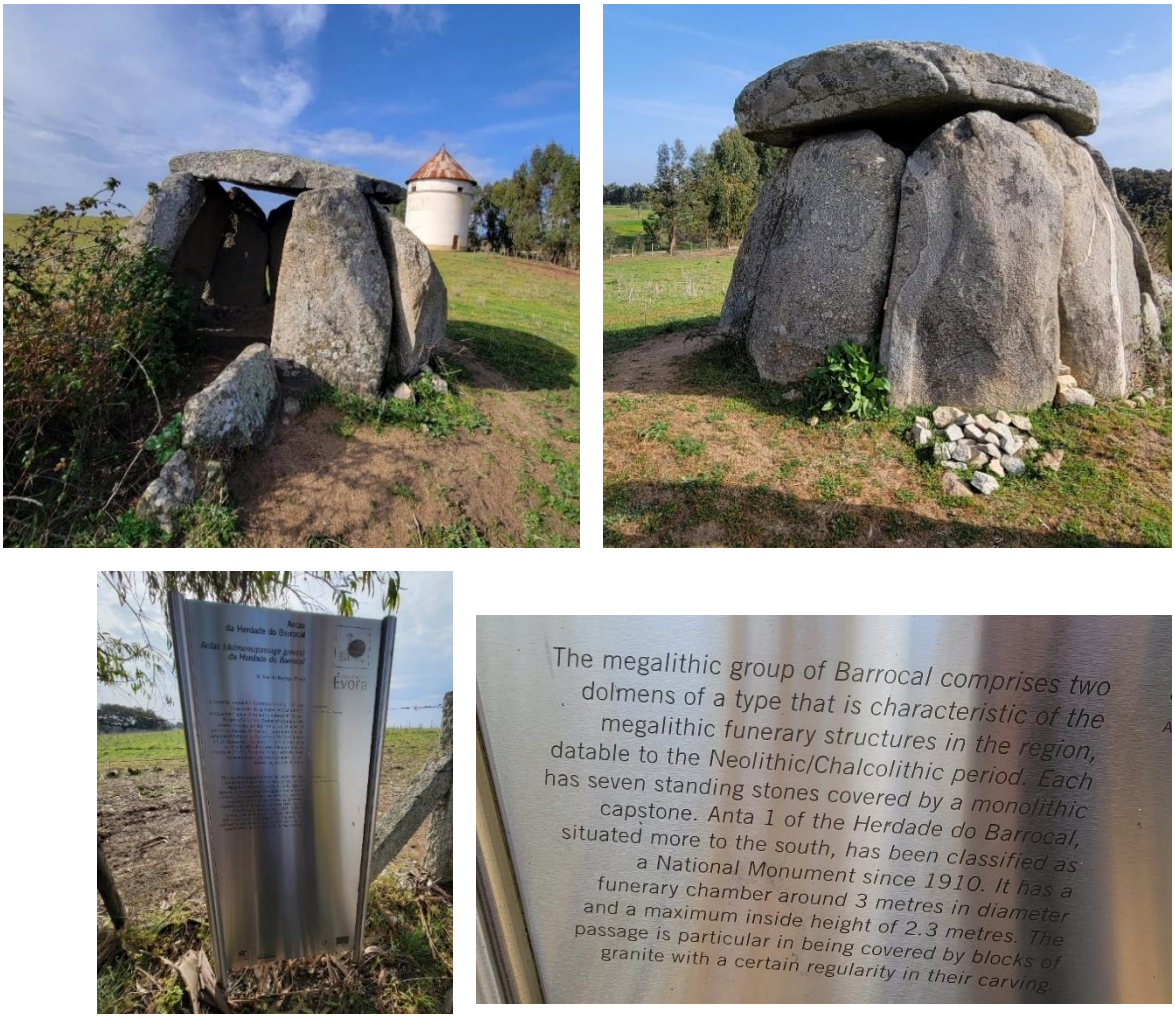


Figure 57- Dolmen Barrocal - Signage and Front and Back (above) of Chamber. Photos by Dan O'Brien 2022.

17) Dolmen (Anta) Cerqueira, Viseu, Portugal Coordinates 40.716, -8.225, Date of analysis 23/2/2022, Dating – ca. 3000 BCE.

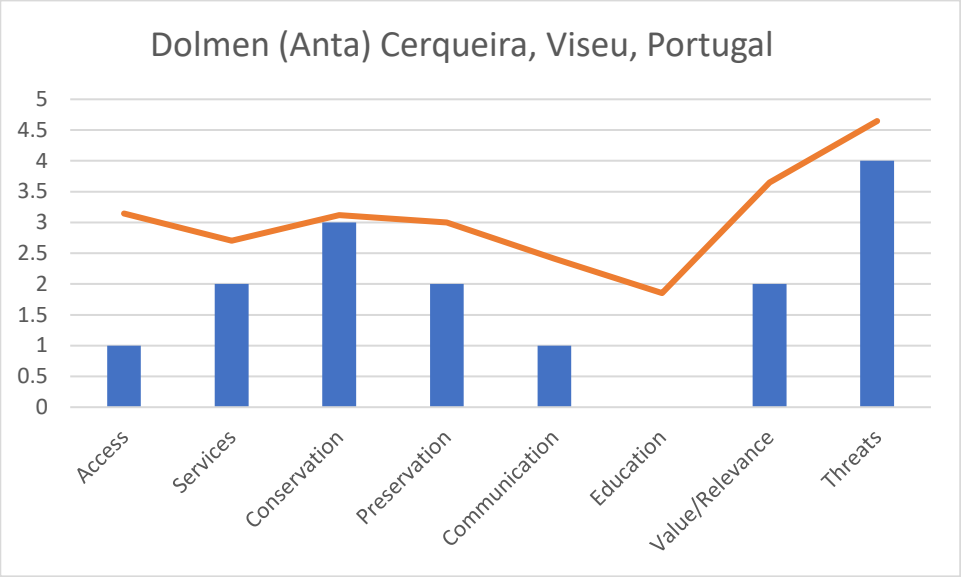


Figure 58- Summary of Ratings for Cerqueira with comparison to Average (brown line) for the sample.

Dolmen (Anta) Cerqueira is dated ca. 3000 BCE in the Municipality of Viseu in the Central region of Portugal. The dolmen is a typical 7 Orthostat design with each stone leaning on its neighbor. The chamber is orthogonal and retains all of its original elements including the capstone. Orthostats are largely intact but weathered and are in place, the protective mound is largely in place. Directional signage to the site is very clear from the main roads and easy access is from an adjacent logging road. The site is easily accessible by bike, car and walking. Wheelchair access might be somewhat difficult, but it seems possible to view the site from the paved road. The site is well tended, grass is mowed, and litter removed, signage is clear. Educational signage has good detail on background for the site but is only in Portuguese. No onsite educational activities were evident. The site is recognized locally and nationally. Commercial activity, logging, as well as encroachment of the surrounding forest may threaten the site.

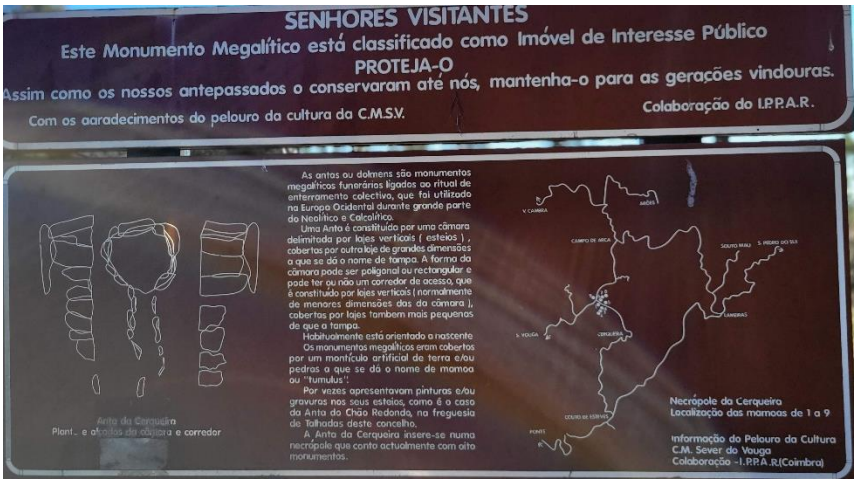


Figure 59- Cerqueira - Passageway and chamber. Photos by Dan O'Brien 2022.

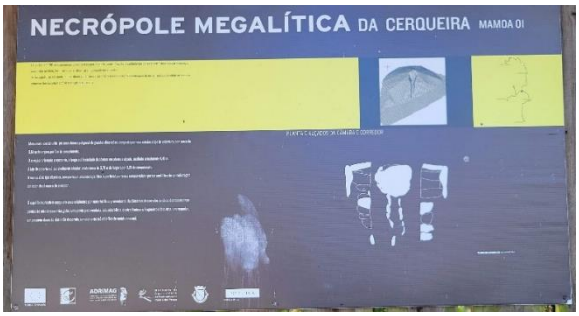


Figure 60- Cerqueira - Capstone, mound, and signage. Photos by Dan O'Brien 2022.

Sites 18 through 25 - Los Dolmenes del Pozuelo Necropolis - Huelva Province, Andalucia, Spain

The Pozuelo Necropolis includes 11 Dolmens constructed in the same epoch, 3000-2500 BCE. For this study 8 of the 11 were visited and rated. There are several intentional groupings, #1 and #2 are within a few meters of each other and Dolmens #3 and #4 and #6 and #7 are also paired closely together. Signage to the main parking at the Dolmens 6 and 7 site is good from the main roads. Access to Dolmens 1 through 4 is over rough dirt and gravel roads. Access to Dolmens 1 through 4 by any process other than a car or mountain bike would be difficult. Wheelchair access once at those four sites would be nearly impossible. There are no visitors' services, no toilets and benches and parking only at Dolmens 6 and 7, other sites have parking along the road. Some signage is worn and sun damaged to the extent that it was impossible to read. This led the observer to assume the sites other that 6 and 7 are not being actively managed and maintained. There are no educational activities at the site. However, the DeSoto visitor center, 50 kms away presents some information on the Pozuelo sites as well as a video presentation about the Neolithic builders of the Huelva sites.

Specific discussions of the groupings and individual sites follow.

18 & 19) Dolmenes del Pozuelo #1 and #2, Huelva, Andalucia, Spain, Coordinates 37.603, -6.635, Date of analysis 5/3/2022, Dating – ca. 3000-2500 BCE.

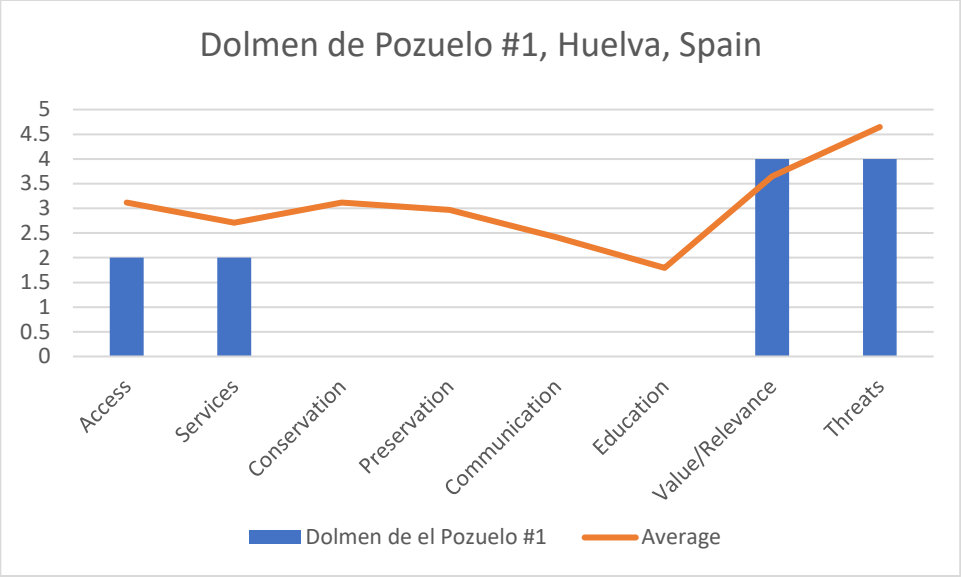


Figure 61Figure 62 - Summary of ratings for Pozuelo #1 with comparison to Average for the sample.

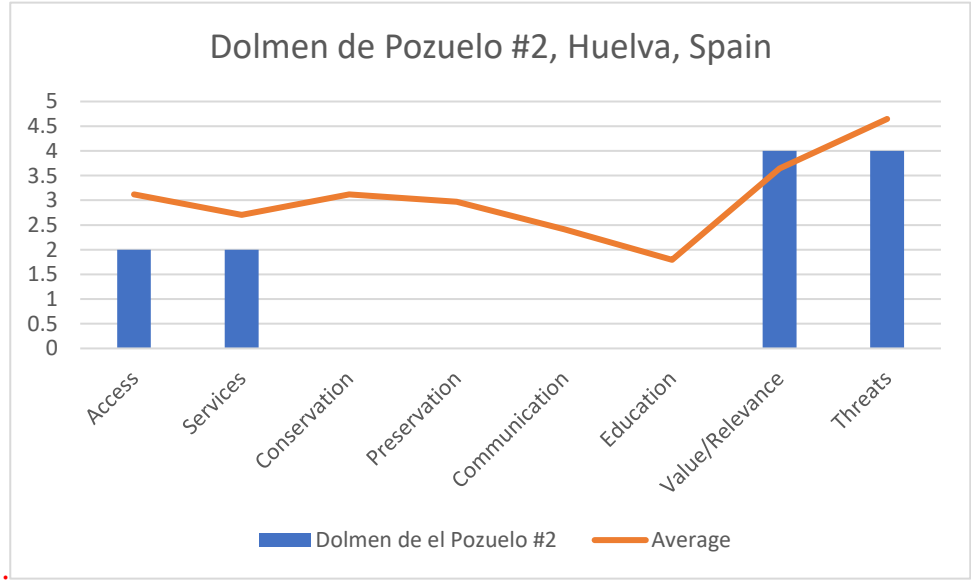


Figure 62- Summary of ratings for Pozuelo #2 with comparison to Average for the sample.

Dolmens de Pozuelo #1 and #2 are a paired set of monuments that are dated ca. 3000-2500 BCE in the Huelva Province of the Autonomous Community of Andalucia. Signage to the site is good from the main roads. Access to the site is over dirt and gravel roads. Access by any process other than a car or mountain bike would be difficult. Wheelchair access once at the site would be nearly impossible. There are no visitors' services, no toilets or benches and parking is along the

road. Signage is worn and sun damaged to the extent that it was impossible to read. This led the observer to assume the site is not being actively managed and maintained. There are no educational activities at the site. However, the DeSoto visitor center, 50 kms away presents some information on the Pozuelo sites as well as a video presentation about the Neolithic builders of the Huelva sites. The two monuments retain some of the lower part of the protective mound. Most of the capstones are missing from the two dolmens. Both dolmen one and two have the basic architectural elements in place. The orthostats are very worn and exposed but are largely in their original locations, making the "Y" shaped floorplan clear to the visitor. Site is locally and nationally recognized as part of the family of nine Pozuelo dolmens. There are potential threats from weather, commercial and anthropic activity such as climbing on the isolated monuments by tourists.

Figure 63- Dolmens Pozuelo #1 and #2 - Photos by Dan O'Brien 2022.

20) Dolmen de el Pozuelo #3 - Huelva, Andalucia, Spain, Coordinates 37.605, -6.636, Date of analysis 5/3/2022, Dating – ca. 3000-2500 BCE.

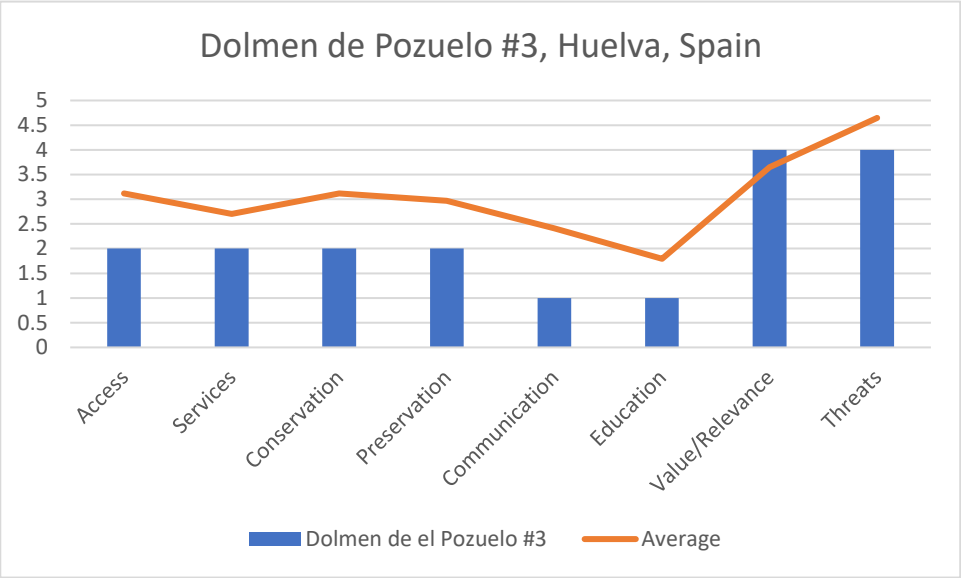


Figure 64- Summary of Ratings for Pozuelo #3 with comparison to Average for the sample.

Dolmen de Pozuelo #3 is dated ca. 3000-2500 BCE in the Huelva Province of the Autonomous Community of Andalucia. As with all the Pozuelo sites, some information is provided at the De Soto visitors center 50 kms away. Signage is worn and sun damaged to the extent that it was impossible to read, see figure 53.

El Pozuelo #3 monument retains most of the original orthostats and much of the mound, but not the capstones. This presents a wholistic experience for the visitor similar to what would have been experienced by the Neolithic people who built the monument. The monument passageway is a "Y" shaped passage with two passageways splitting off the entrance passage. The orthostats are very worn and exposed but are largely in their original locations, making the floorplan clear to the visitor. This gives the visitor an experience of visiting a small ancient "home" for the dead.

As with all the Pozuelo sites there is the threat from anthropic activities from tourist as well as commercial interests. There appeared to be logging or other commercial activity that may threaten the site.

Figure 65- Dolmen Pozuelo #3- Photos by Dan O'Brien 2022.

Figure 66- Sun damaged signage typical at Pozuelo Dolmens. Photos by Dan O'Brien 2022.

21) Dolmen de el Pozuelo #4, Huelva, Andalucia, Spain, Coordinates 37.605, -6.636, Date of analysis 5/3/2022, Dating – ca. 3000-2500 BCE.

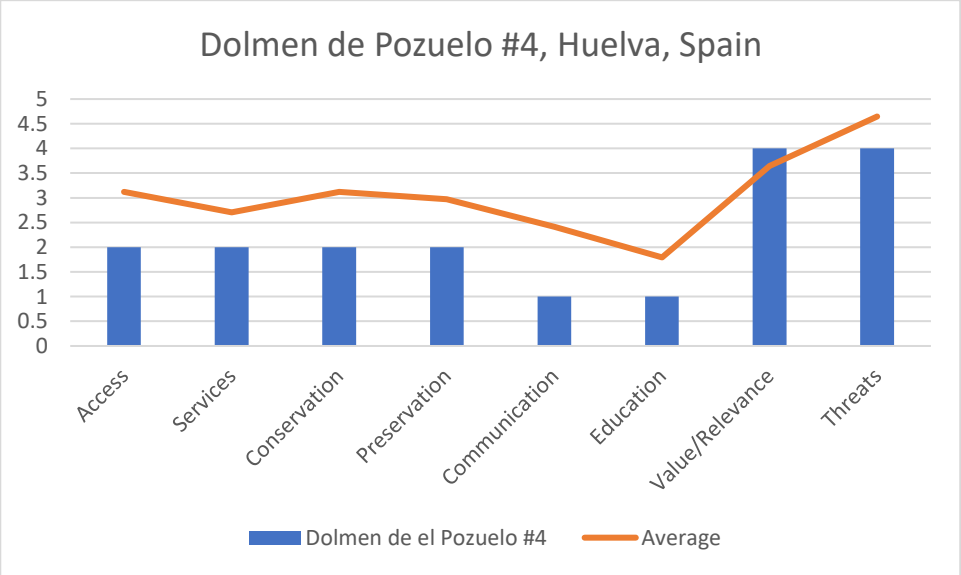


Figure 67- Summary of Ratings for Pozuelo #4 with comparison to Average for the sample.

The reader is referred to the general discussion of the Pozuelo sites at the head of this section. Except for the unique features addressed below the same details apply to Dolmen #4.

The mound of Dolmen #4 is not as well preserved as others of the El Pozuelo group and as a result it is not as well protected from erosion at the base of the orthostats. The chamber in Dolmen #4 is orthogonal with a unique feature of what could be referred to as an antechamber which shields the direct view of the chamber from the entrance passagway.

Figure 68- Passageway with a single orthostat forming the antechamber at the entrance to the chamber. Photos by Dan O'Brien 2022.

22) Dolmen de el Pozuelo #6, Huelva, Andalucia, Spain, Coordinates 37.605, -6.660, Date of analysis 5/3/2022, Dating – ca. 3000-2500 BCE.

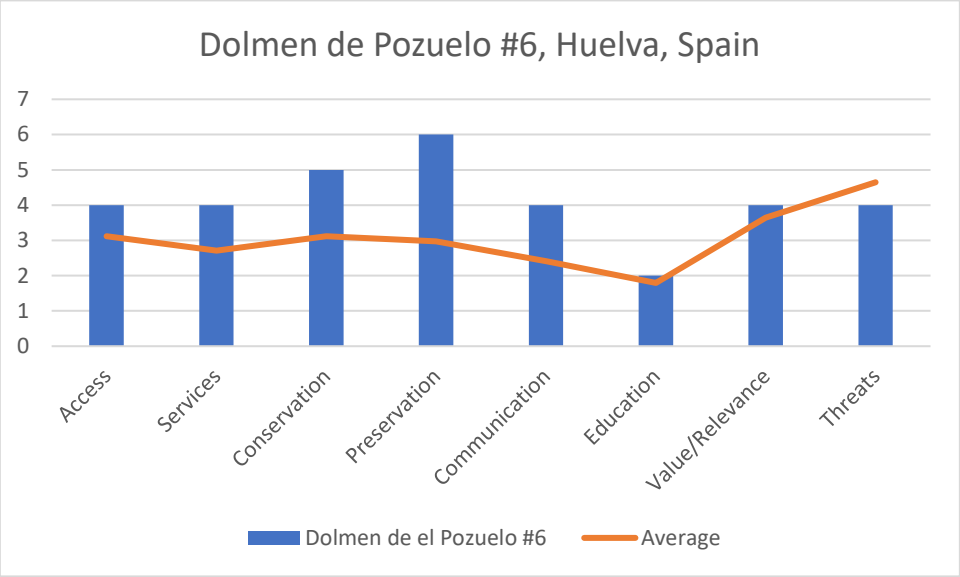


Figure 69- Summary of Ratings for Pozuelo #6 with comparison to Average for the sample.

The reader is referred to the general discussion of the Pozuelo sites at the head of this section. Except for the unique features addressed below the same details apply to Dolmen #6.

Pozuelo #6 is the most developed and tourist friendly of the 8 sites reviewed at the Pozuelo Necropolis. There is a small parking lot and good signage that gives some basic information about the site but only in Spanish. Wheelchair access might be somewhat difficult, but it seems possible to view the site from the pathway. The site is well tended, grass is mowed, and litter removed. Restoration on the monument is recognizable, the mound has been restored to give visitors a sense of the original dimensions. The monument is unusually complex with four orthogonal chambers off the main passageway. Orthostats that remain are weathered and some are partial but in place, The mound serves as a protective structure for the four chambers. Signage has sparse details on temporal, cultural and symbolic background for the site. No onsite educational activities were evident. The primary threats are anthropic, chief among them are over tourism and the observed penchant for visiting children to climb on the mound. Due to its size and the impressive state of preservation of the original architectural elements the site allows the visitor to imagine and

experience the monument much like the Neolithic people who built it. The complex floorplan allows the visitor to get a sense of a ”house” for the ancestors.

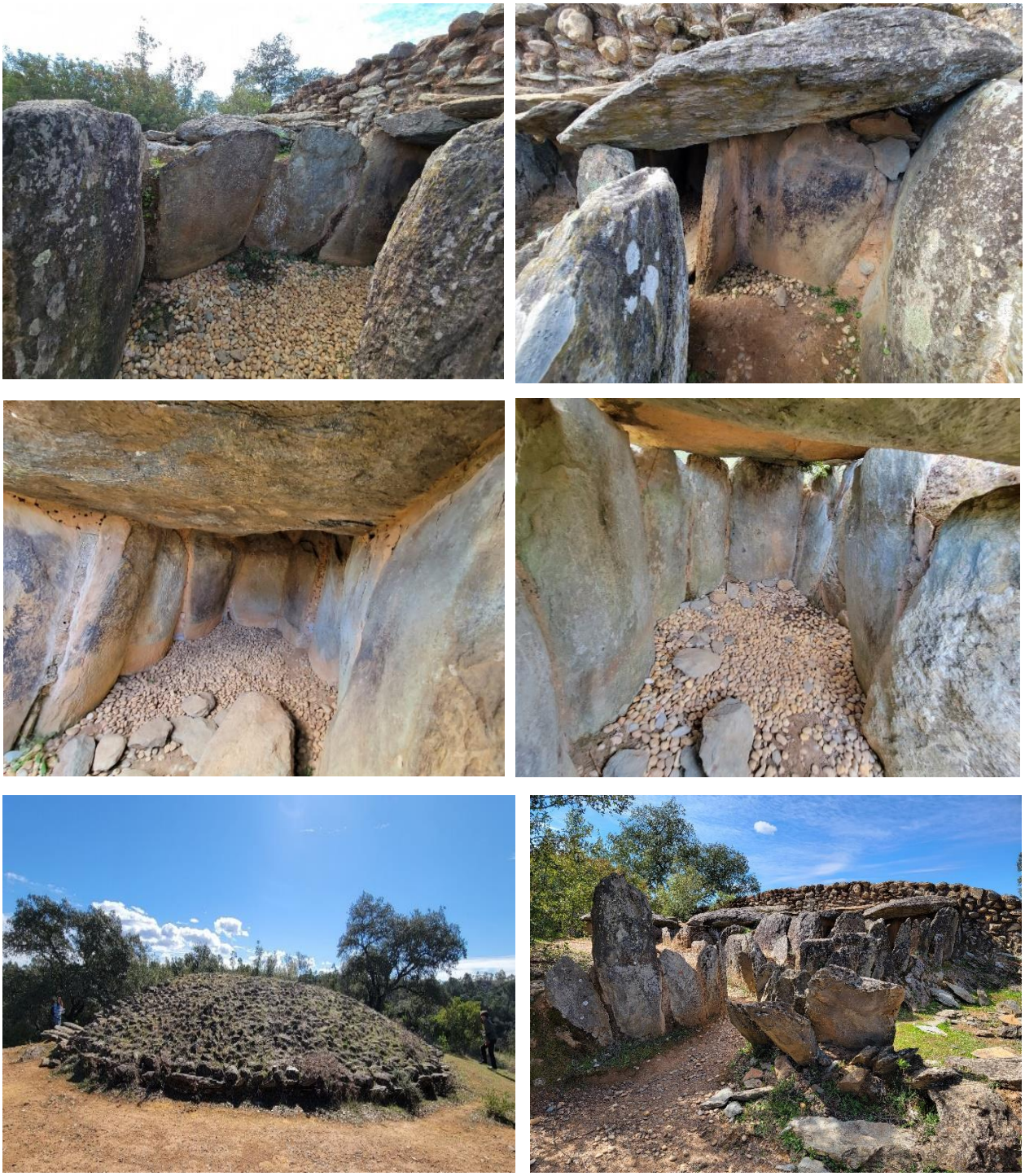


Figure 70 - Passageways, mound, and chambers Pozuelo #6. Photos by Dan O'Brien 2022.

23) Dolmen de el Pozuelo #7, Huelva, Andalucia, Spain, Coordinates 37.604, -6.663, Date of analysis 5/3/2022, Dating – ca. 3000-2500 BCE.

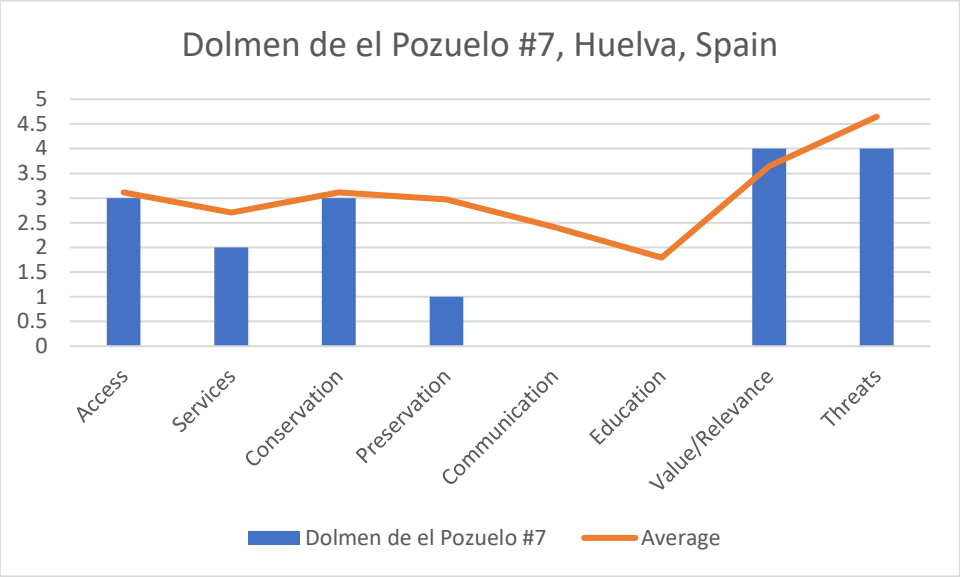
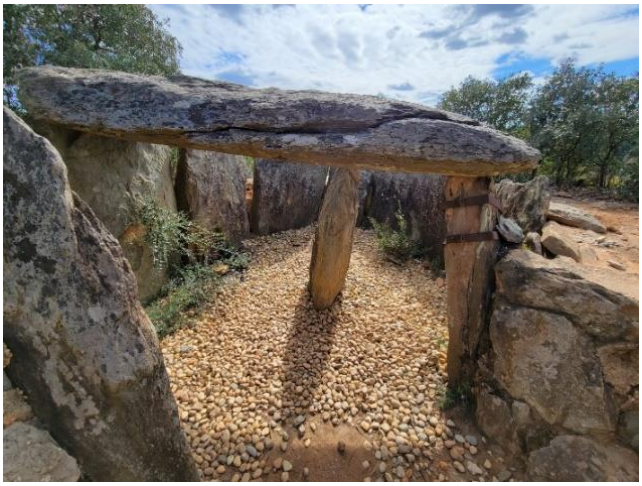


Figure 71- Summary of Ratings for Pozuelo #7 with comparison to Average for the sample.

The reader is referred to the general discussion of the Pozuelo sites at the head of this section. Except for the unique features addressed below the same details apply to Dolmen #6.

Pozuelo #7 is the partner of #6 as the Pozuelo builders repeatedly built Dolmens in pairs. #7 is approximately 100-200 meters from #7. The reader is referred to the #6 discussion for the site services discussion, which are identical. Wheelchair access for #7 is nearly impossible as there is a steep slop to climb to get its hilltop location. The site is well tended, grass is mowed and litter removed. Very little restoration has been done on the monument. Orthostats that remain are weathered and some are partial but in place, The mound is not in evidence.

Signage has some details on the background for the site and is only in Spanish. The primary threats are anthropic, chief among them are “over tourism” and erosion as this megalith’s hilltop site makes it more vulnerable.



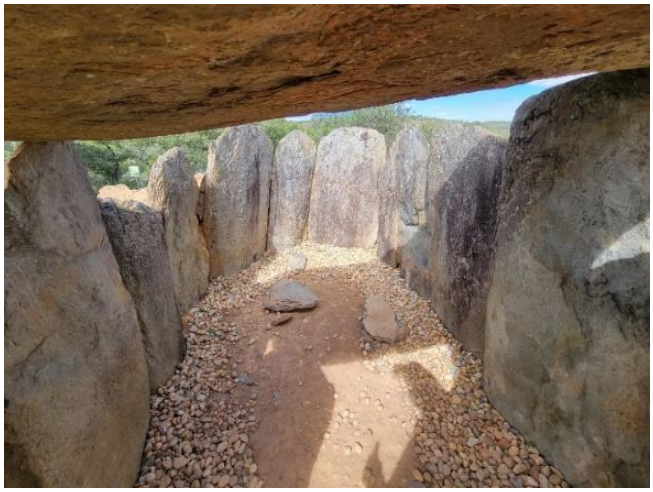


Figure 72- El Pozuelo #7 - Informational signage. Photos by Dan O'Brien 2022.

24) Dolmen de el Pozuelo #8, Huelva, Andalucia, Spain, Coordinates 37.605, -6.658, Date of analysis 5/3/2022, Dating – ca. 3000-2500 BCE.

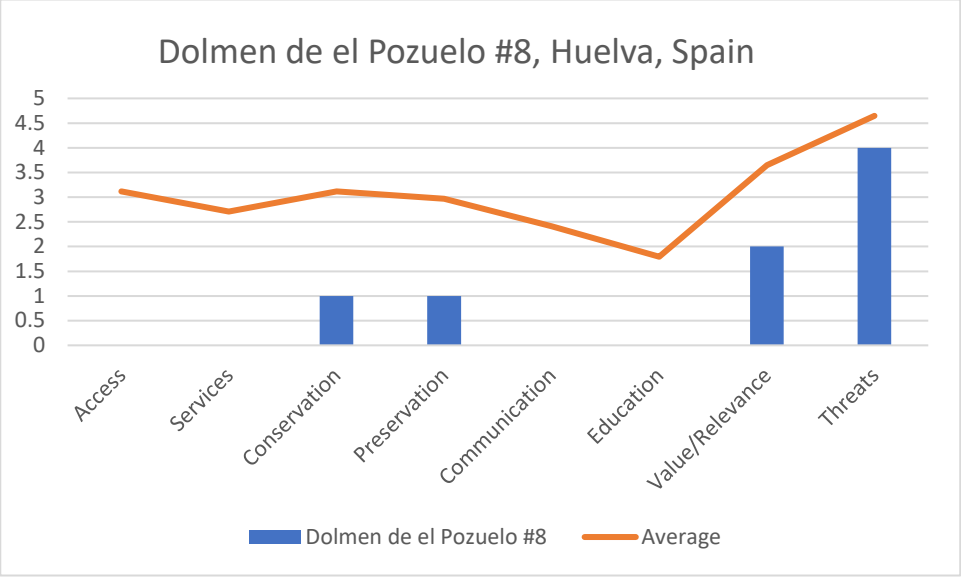


Figure 73Summary of Ratings for Pozuelo #8 with comparison to Average for the sample.

The reader is referred to the summary information on the Pozuelo Necropolis for most of the information on this site.

Dolmen Pozuelo #8 is in a poor state of repair. Directional signage to the site from Dolmen #6 is difficult to follow. The site is accessible only on foot along rough paths through hilly fields. Wheelchair access would be impossible.

The grass is mowed and litter removed. Orthostats that remain are so weathered that it is difficult for the viewer to appreciate the form and function. Signage has very little detail for the Dolmen and is only in Spanish.

Figure 74- Pozuelo #8 - signage and remains. Photos by Dan O'Brien 2022.

25) Dolmen de el Pozuelo #9, Huelva, Andalucia, Spain, Coordinates 37.605, -6.663, Date of analysis 5/3/2022, Dating – ca. 3000-2500 BCE.

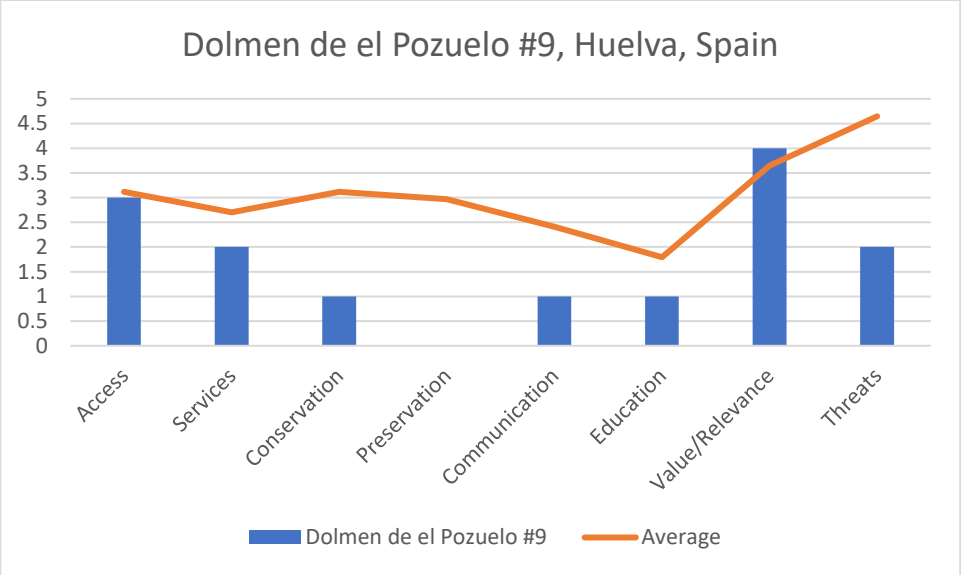


Figure 75- Summary of Ratings for Pozuelo #9 with comparison to Average for the sample.

The reader is referred to the summary information on the Pozuelo Necropolis at the head of this section for most of the information on this site.

Dolmen Pozuelo #9 is in a poor state of repair. Directional signage from the main road is very clear. The site is accessible directly from the entrance road to the main parking area for Dolmens 6 & 7, parking is along the road.

The grass is mowed, and litter removed. Most of the orthostats are missing and those that remain are so weathered that it is difficult for the viewer to appreciate the form and function. Signage has sparse detail for the Dolmen and is only in Spanish.

Figure 76- Pozuelo #9 - Passageway and sign. Photos by Dan O'Brien 2022.

26) Dolmen (Tholos) de Alcalar #7, Portimao, Portugal, Coordinates 37.198, -8.589, Date of analysis 8/3/2022, Dating – ca. 2500 BCE.

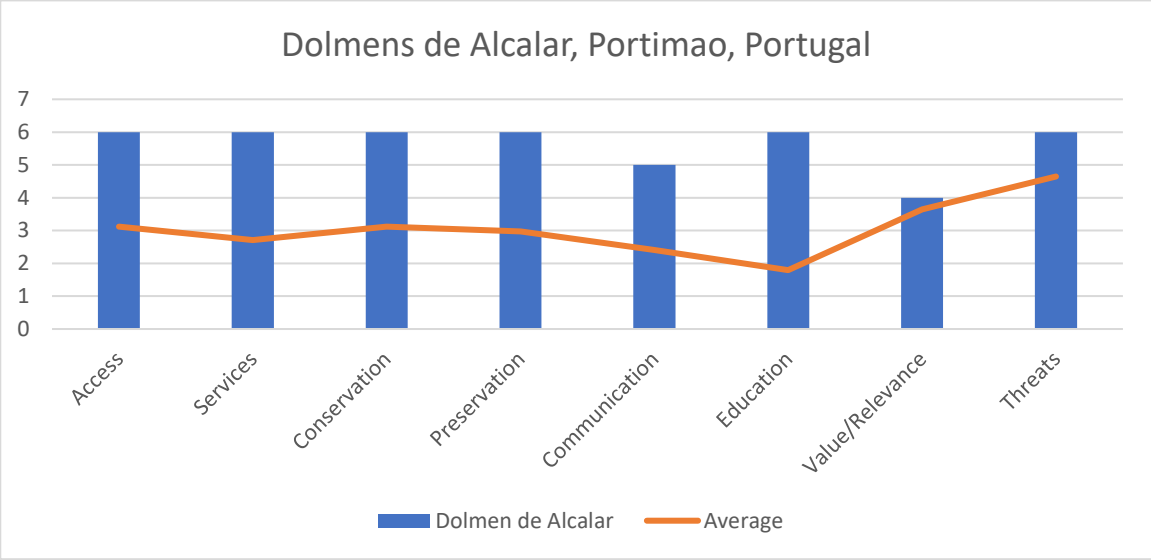
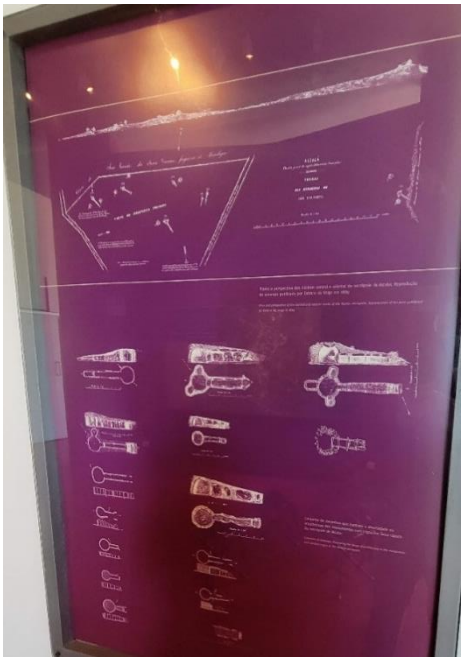


Figure 77- Summary of Ratings for Pozuelo de Alcalar with comparison to Average for the sample.

Dolmen #7 Alcalar is dated to the Chalcolithic period ca. 2500 BCE in the Municipality of Portimao in the Algarve region of Portugal. The Dolmen/Tholos has been carefully reconstructed to give the tourist an image of the original construction. Signage to the site is excellent from the main roads and access is by a main road. The site is easily accessible by bike, car and walking. Wheelchair access might be somewhat difficult because of the long cobblestone pathways from the parking to the monument. The restored monument appears to retain all of the original elements. The restoration included the mound, and narrow passageway. The restoration activities that had been undertaken, are easily recognizable and they appear to be consistent with the original form and function. The beehive shaped burial chamber is viewable by the tourist from a viewing port on the top of the structure. Due to its size and the careful restoration of the original architectural elements the site allows the visitor to imagine and experience the monument much like the Chalcolithic people who built it. The size of the monument is impressive. The site includes a museum with excellent detail on the history of the site and the people who built it. Informational signage provides good detail in both Portuguese and English. There are full tourist facilities available at the museum. The grounds have facilities for living history activities and demonstrations during the tourist season. The site is locally and nationally recognized and therefore is a protected property.

Signage has good detail on temporal, cultural and symbolic background for the site as well as connections to websites for additional information. There do not appear to be any major direct threats to the site other than possibly anthropic damage from over tourism.



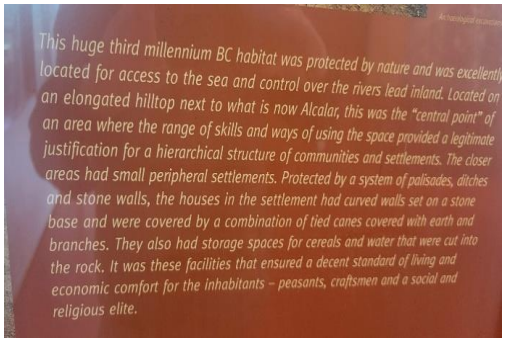


Figure 78- Alcalar visitors center, entrance, and educational signage.

Figure 79 - Interactive living history staging areas. Photo by Dan O'Brien 2022.

27)

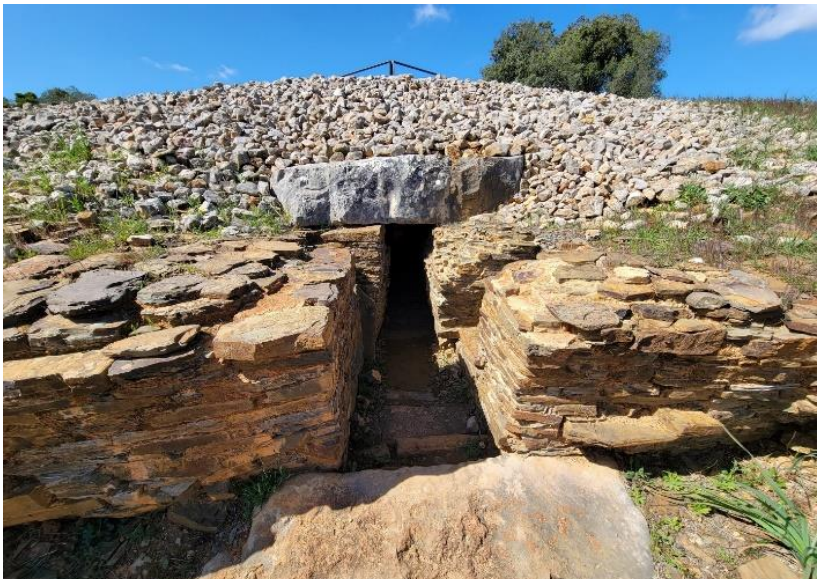


Figure 80- Tholos. Photos by Dan O'Brien.

Cova d'en Daina, Girona, Catalonia, Spain, Coordinates 41.857, 2.992, Date of analysis 17/3/2022, Dating – ca. 2700-1700 BCE.

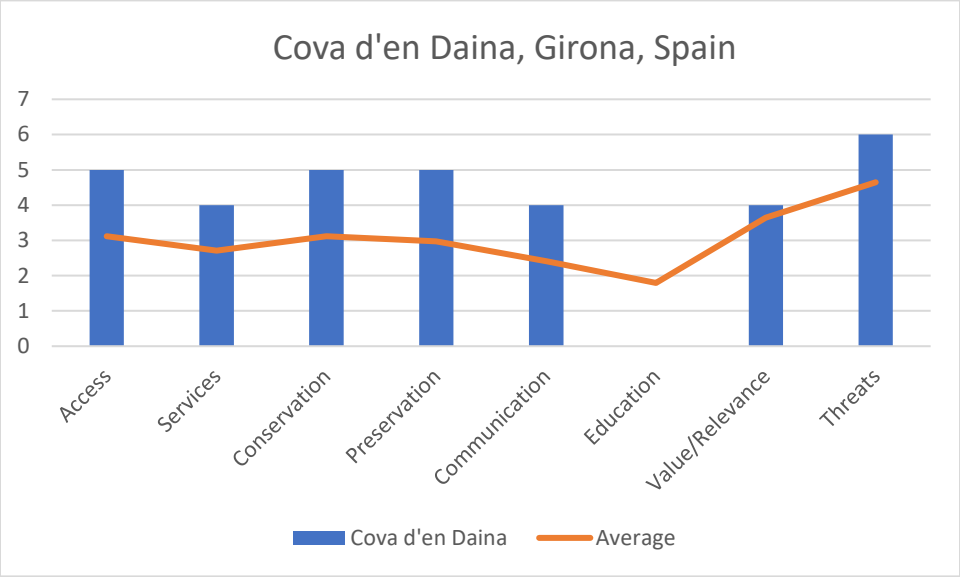


Figure 81- Summary of Ratings for d'en Daina with comparison to Average for the sample.

Cova d'en Daina is dated ca. 2700-1300 BCE in the Girona Province of the Catalonia Region, Spain. Directional signage to the site is excellent from the main roads and access to the ample parking lot is directly off the paved road. The site is easily accessible by bike, car and walking. Wheelchair access is feasible but not easy. There were limited visitor services at the site, there was parking but no toilets. The site is well tended, grass is mowed, and litter removed. Access to site is not controlled. Orthostats that remain are weathered and partial but in place, no protective structure is in place including the original mound. Enough of the original structure is in place to give the tourist a sense of the form and function of the original monument. Informational signage is excellent with important details in multiple European languages.

Facilities for onsite educational activities were not evident. The site is well promoted in the Catalonia region and is part of existing historical hiking and biking trails. Site is locally, regionally and nationally recognized. There were no major direct threats observed other than anthropic damage from tourists.

Figure 82- Cova d'en Daina informational signage. Photo by Dan O'Brien.

Figure 83- Cova d'en Diana and Chamber. Photos by Dan O'Brien 2022.

28) Dolmen de Can Gol II, Barcelona, Catalonia, Spain, Coordinates 41.565, 2.318, Date of analysis 17/3/2022, Dating – ca. 2200-1800 BCE.

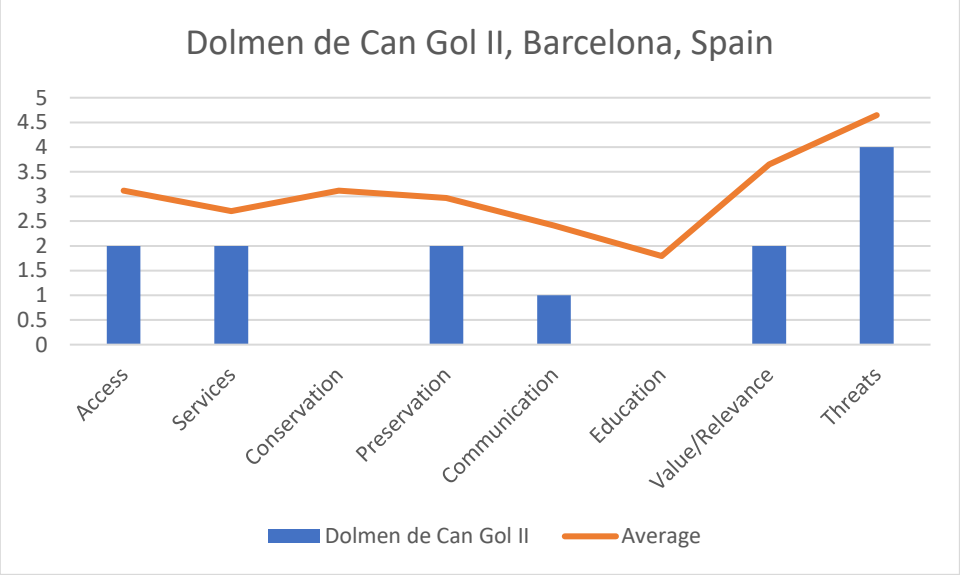


Figure 84- Summary of Ratings for Can Gol II with comparison to Average for the sample.

Dolmen de Can Gol II is dated ca. 2200-1800 BCE in the Province of Barcelona, Catalonia, Spain. The site part of a regional heritage hiking trail with Pedra de les Orenetes and Roca Fordada. Directional signage to the site from the main road which has a small parking space in a residential neighborhood. All three megalithic sites are accessed by a forest footpath. Wheelchair access would be very difficult. There were no visitor services near the site except in the adjacent town.

The site is well tended, vegetation has been cleared from the ground surrounding the dolmen. Access to site is not controlled, there is no fencing for protecting of the monument. Orthostats that remain are weathered and partial but in place, no vestige of the mound is evident. Informational signage has some information but only in Catalan. Site is locally and regionally recognized and is part of a well-used heritage trail. The only direct threats other than the surrounding vegetation growing over the site would be anthropic damage from visitors or hikers.

Figure 85- Dolmen de Can Gol II and informational signage. Photo by Dan O'Brien 2022.

29) Cista Carretera de Calonge, Girona, Catalonia, Spain, Coordinates 41.565, 2.993, Date of analysis 17/3/2022, Dating – ca. 3000 BCE.

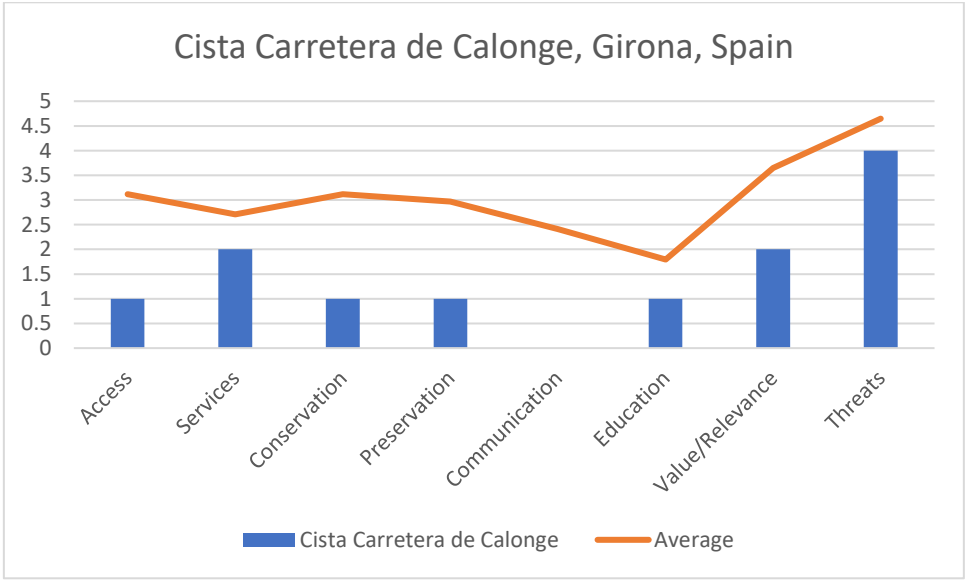


Figure 86- Summary of Ratings for de Calonge with comparison to Average for the sample.

Cista Carretera de Calonge is dated ca. 3000 BCE in the Province of Girona, Catalonia, Spain. The site is a secondary site that has been included with other more prominent sites in a regional heritage hiking trail that includes several other sites anchored by the Dolmen d'en Daina. Directional signage to the site from the main road and access is by a forest footpath from the parking lot at Dolmen d'en Daina. Wheelchair access might be somewhat difficult, but the path is relatively flat and it seems possible to access the site. There were no visitor services near the site the parking is at the road with a short walk to the dolmen.

The site is well tended vegetation has been cleared from the ground surrounding the dolmen. Access to site is not controlled, there is no fencing for protecting of the monument. Orthostats that remain are weathered and partial but in place, no vestige of the mound is evident. Informational signage has some information but only in Catalan. Site is locally and regionally recognized as it is maintained. The only direct threats other than the surrounding vegetation growing over the site would be anthropic damage from visitors or hikers.

Figure 87- Cista Carretera de Calonge. Photos by Dan O'Brien 2022.

Figure 88- de Calonge remnants of chamber and Orthostats. Photos by Dan O'Brien 2022.

30) Roca foradada de Can Gol, Barcelona, Catalonia, Spain, Coordinates 41.564, 2.318, Date of analysis 17/3/2022, Dating – ca. 2700 BCE.

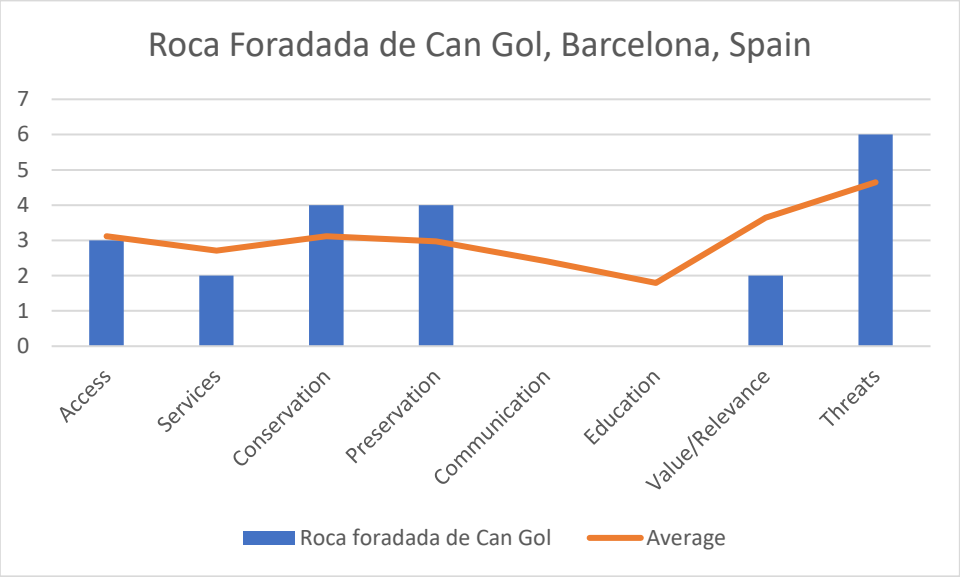


Figure 89- Summary of Ratings for Roca Foradada with comparison to Average for the sample.

Roca Foradada de Can Gol is dated ca. 2700 BCE in the Province of Barcelona, Catalonia, Spain. The site part of a regional heritage hiking trail with Pedra de les Orenetes and Dolmen de Can Gol II. Directional signage to the site is from the main road which has a small parking space in a residential neighborhood. All three megalithic sites are accessed by the same forest footpath. Wheelchair access would be very difficult. There were no visitor services near the site except in the adjacent town.

The site is a large boulder which according to the informational signage was chipped out to make a chamber or artificial cave for burial purposes. The chamber has a significant number of paintings which appear to be hunting scenes. Access to site is not controlled, there is no fencing for protecting of the monument. Two large stones are nearby that could have been used to close the entrance. The signage only has limited information and only in Catalan. The site is locally and regionally recognized and is part of a well-used heritage trail. The only direct threats would be anthropic damage from visitors or hikers.

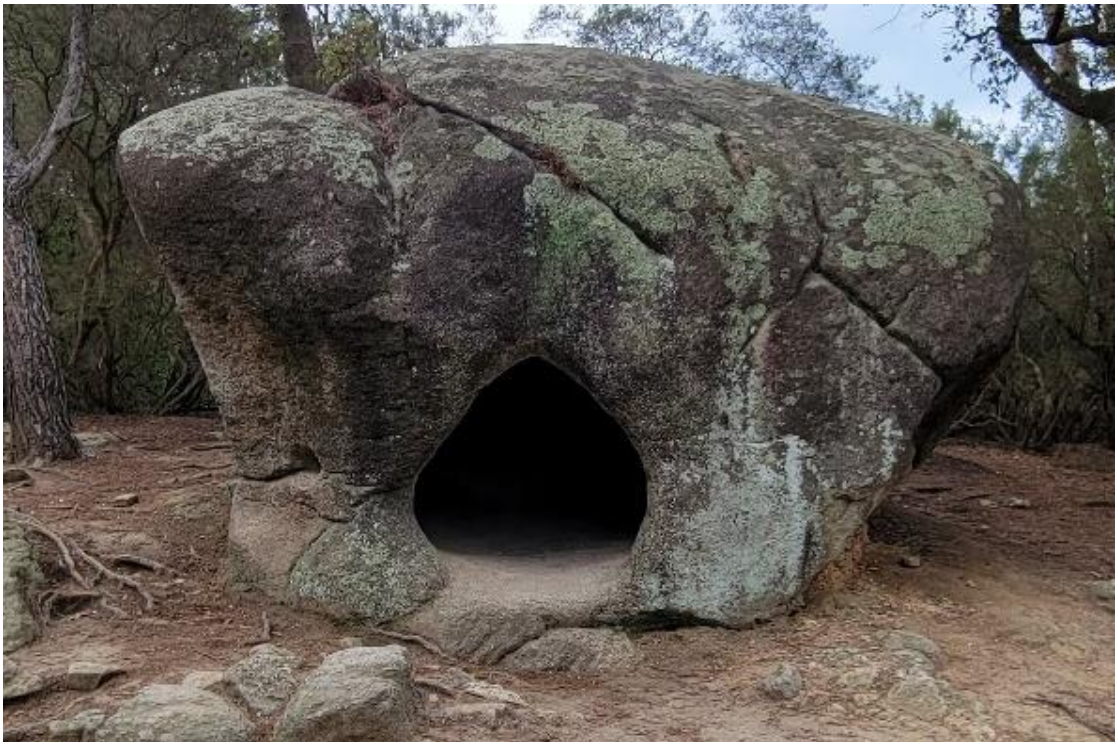


Figure 90- Roca Foradada - artificial cave grave. Photo by Dan O'Brien.

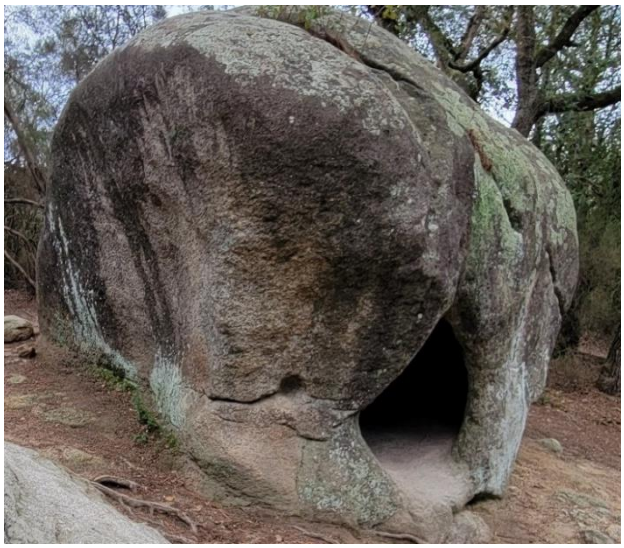


Figure 91- Roca Foradada - interior art. Photos by Dan O'Brien.

31) Pedra de les Orenetes, Barcelona, Catalonia, Spain, Coordinates 41.567, 2.324, Date of analysis 17/3/2022, Dating – Neolithic to Bronze age.

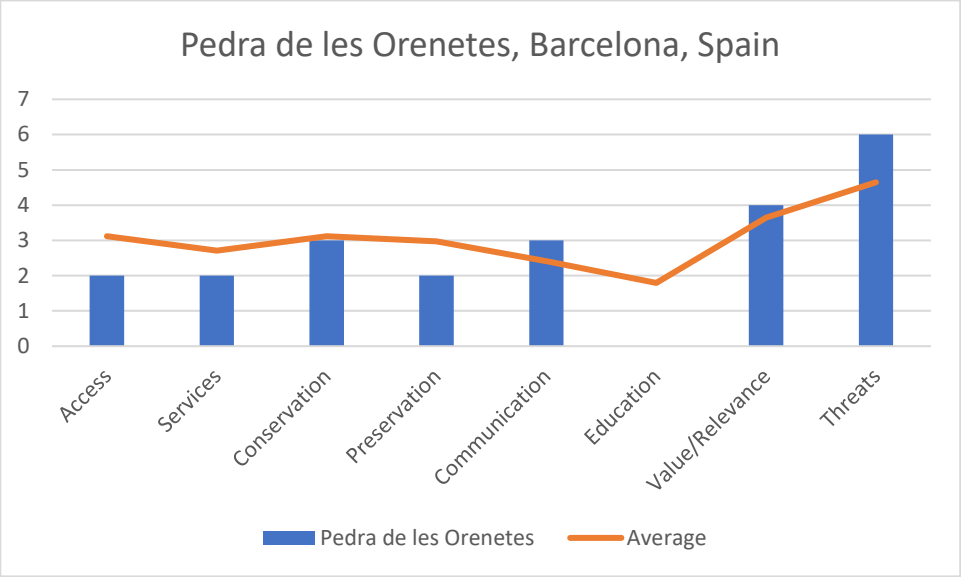


Figure 92- Summary of Ratings for de les Orentes with comparison to Average for the sample.

Pedra de les Orenetes is a rock art site dated to the Neolithic to the Bronze age in the Province of Barcelona, Catalonia, Spain. The is site part of a regional heritage hiking trail with previously discussed Roca foradada and Dolmen de Can Gol II. Directional signage to the site is from the main road which has a small parking space in a residential neighborhood. All three megalithic sites are accessed by the same forest footpath. Wheelchair access would be very difficult. There were no visitor services near the site except in the adjacent town.

The site is a group of large boulders which, according to the informational signage have 32 rock art paintings. The subjects are sometimes humans, quadrupeds or snakes but also shapes such as lines and cruciform shapes. Access to site is not controlled, there is no fencing for protecting of the monument. The signage only has limited information and only in Catalan. The site is locally and regionally recognized and is part of a well-used heritage trail. The only direct threats would be anthropic damage from visitors or hikers.

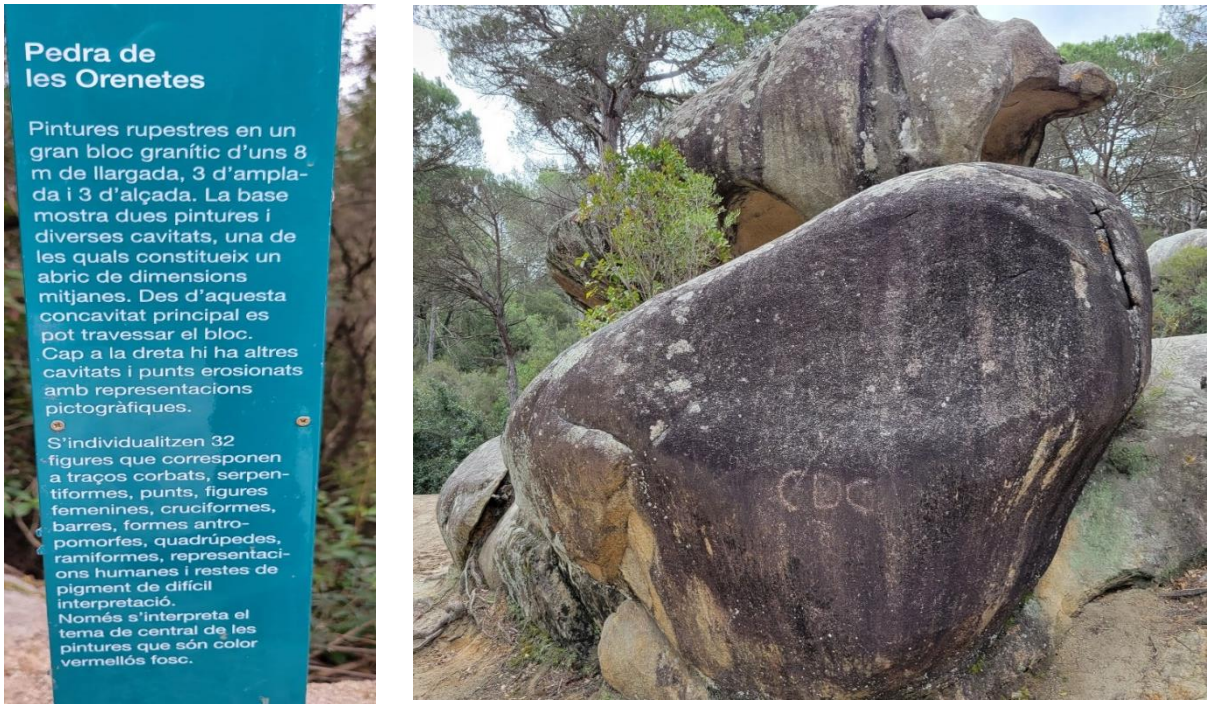


Figure 93- Pedra de Orenetes - Large Granite Boulders with Rock Art. Photos by Dan O'Brien 2020.

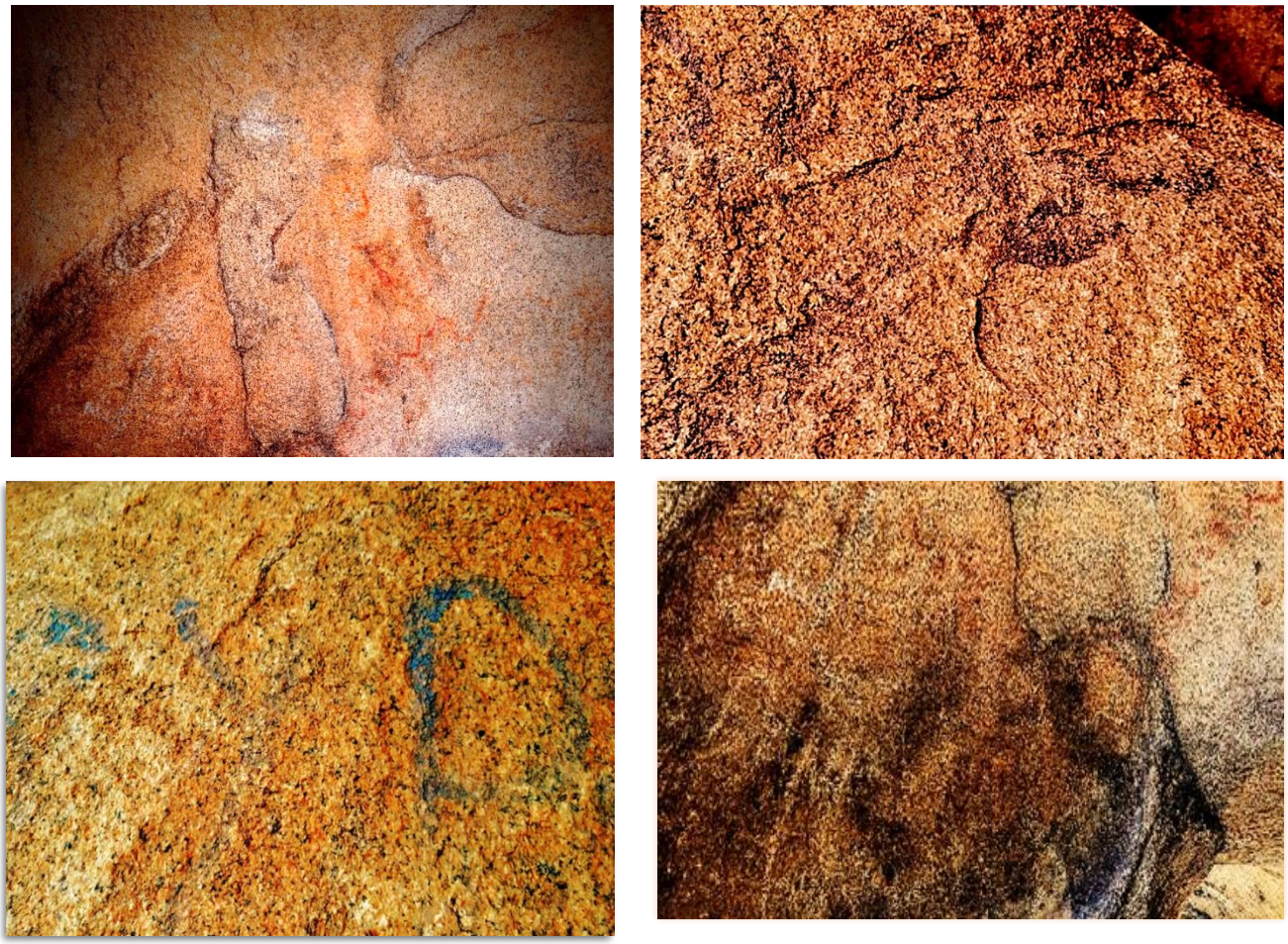


Figure 94- Pedra de Orenetes - Rock Art. Photos by Dan O'Brien 2020.

32) Menhir de la Murtra, Girona, Catalonia, Spain, Coordinates 41.857, 2.986, Date of analysis 17/3/2022, Dating – ca. 3000-2500 BCE.

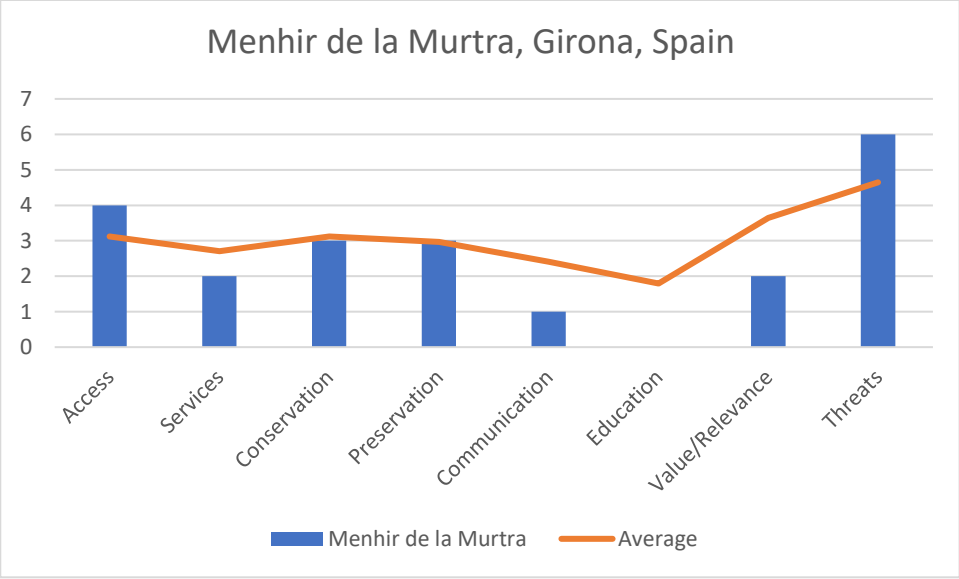


Figure 95- Summary of Ratings for de la Murtra with comparison to Average for the sample.

Menhir de la Murtra is dated ca. 3000-2500 BCE and is in the Province of Girona, Catalonia, Spain. The site is a secondary site that has been included with other more prominent sites in a regional heritage hiking trail that includes several other sites anchored by the Dolmen d'en Daina. Directional signage to the site from the main road is easy to follow and the site can be accessed directly from the road or by a forest footpath from the parking lot at Dolmen d'en Daina. Wheelchair access would be very difficult as the path is rough. There were no visitor services at or near the site. The parking is at the road or at Cova d'en Diana with a short walk to the Menhir.

The site is in a forest clearing, vegetation has been cleared from the ground surrounding the Menhir. Access to site is not controlled, there is no fencing for protecting of the monument. Informational signage has some information but only in Catalan. The Menhir is 2.5 meters tall and the signage indicates it is a phallic shape/symbol. Site is locally and regionally recognized. The only direct threats other than the surrounding vegetation intruding on the base or tree branches damaging the Menhir, would be anthropic damage from visitors or hikers.

Figure 97- Menhir de la Murtra and informational sign. Photos by Dan O'Brien.

33) Dolmen de Sant Jordi de Puigseslloses Barcelona, Catalonia, Spain, Coordinates 41.948, 2.297, Date of analysis 20/3/2022, Dating – ca. 2100-1500 BCE.

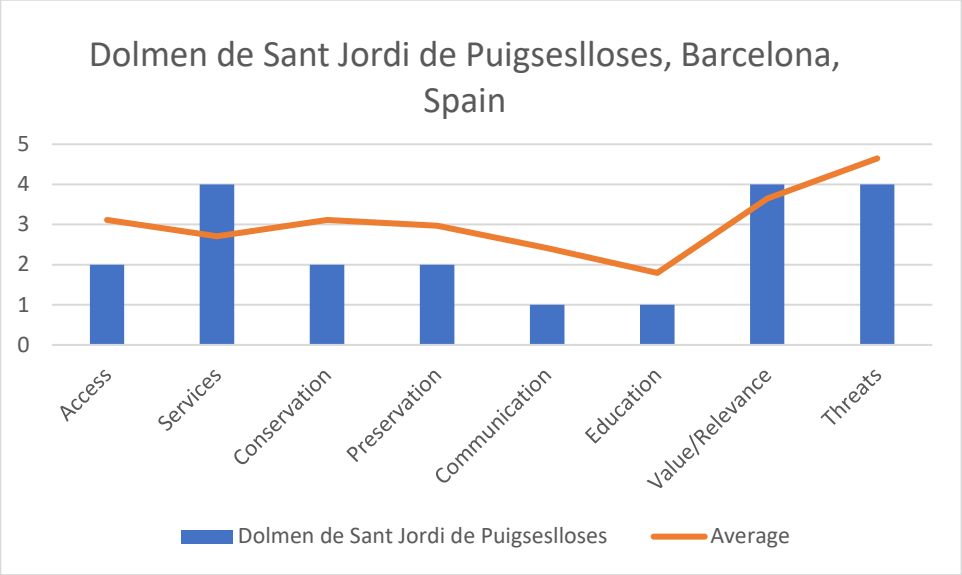


Figure 98- Summary of Ratings for de Puigseslloses with comparison to Average for the sample.

Dolmen de Sant Jordi de Puigseslloses, is dated ca. 2100-1500 BCE in the Province of Barcelona, Catalonia, Spain. Signage to the site is adequate from the main roads and access is by a narrow country road. There is a small parking lot near the adjacent church that also serves the Dolmen. Wheelchair access is likely impossible as there is a steep uneven path from the parking lot to the Dolmen. There were no visitor services, no toilets but there are places to sit in front of the church. This is one of the few sites to make use of QR codes on signage to allow visitors to reach a website for more information. The website and the signage in Catalan indicates that the church was built in 1477 next to the Dolmen. The signage speaks of the desire to unite the pagan and Christian traditions. The church intrudes on the space around the Dolmen that would once have contained the protective mound. The site is well tended, grass is mowed and litter removed, it is likely maintained as part of the church yard.

Orthostats that remain are severely weathered and but are still impressively large and appear to be in place. No protective structure is in place and the original mound is completely missing. Signage has little detail about the history or construction of the Dolmen. However, this is one of only a few of the 33 sites to take

advantage of the QR functionality to link the tourist with a website for more information see Figure 100 at the lower right.. While the linked website has informational background for the site, it has little information about the form and function of the Dolmen. The QR technology could be utilized at all Megalithic sites to convey detailed background information without the need for extensive signage and should be more widely used as a simple low-cost Musealization tool. Signage is only in Catalan.

Figure 99 - Sant Jordi de Puigdeslloses – Signage with QR code lower right, Orthostats. Photos by Dan O'Brien 2022.

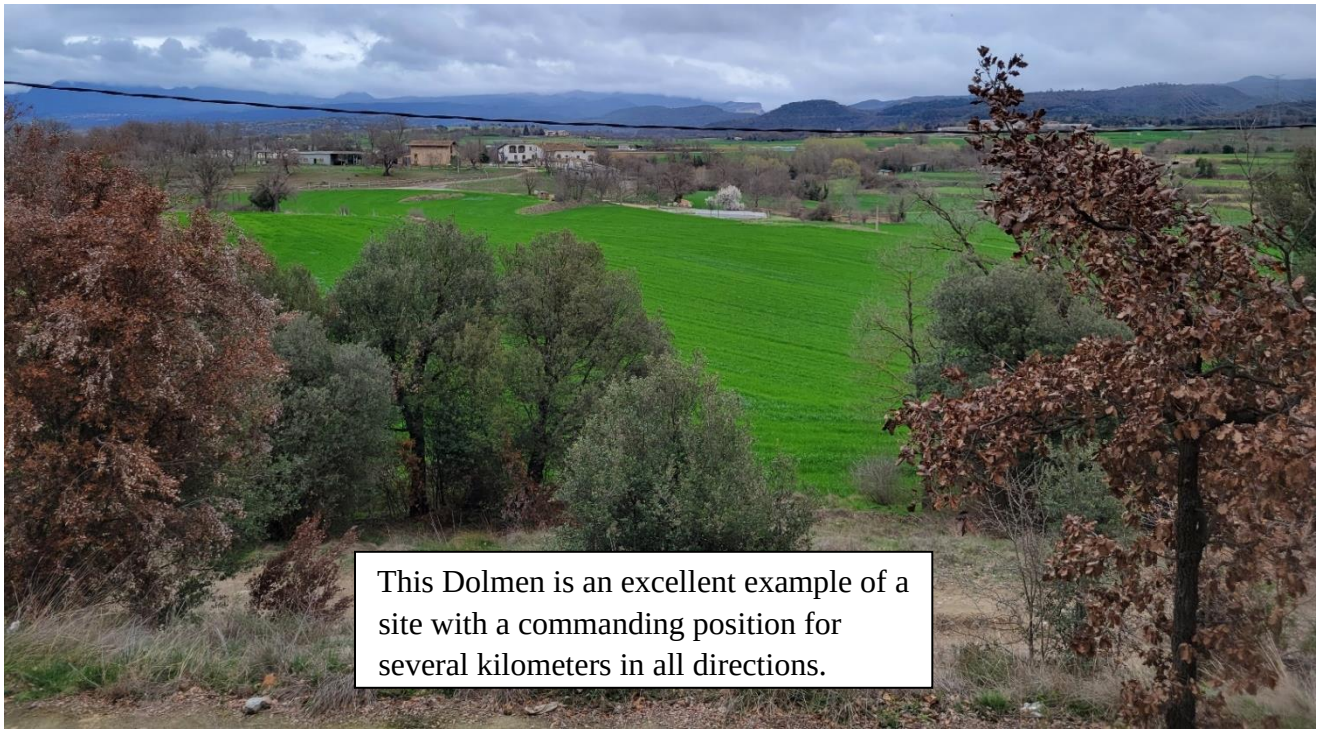


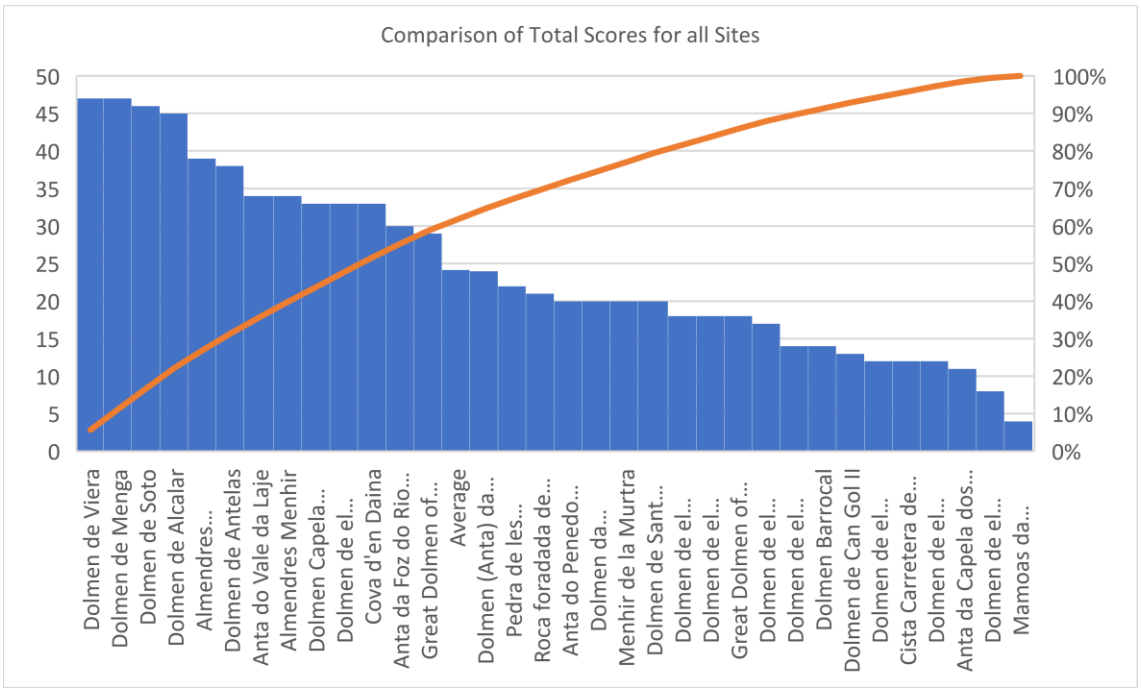
Figure 100- View over Vic plain from the commanding Hilltop Dolmen. Photo by Dan O'Brien 2022.

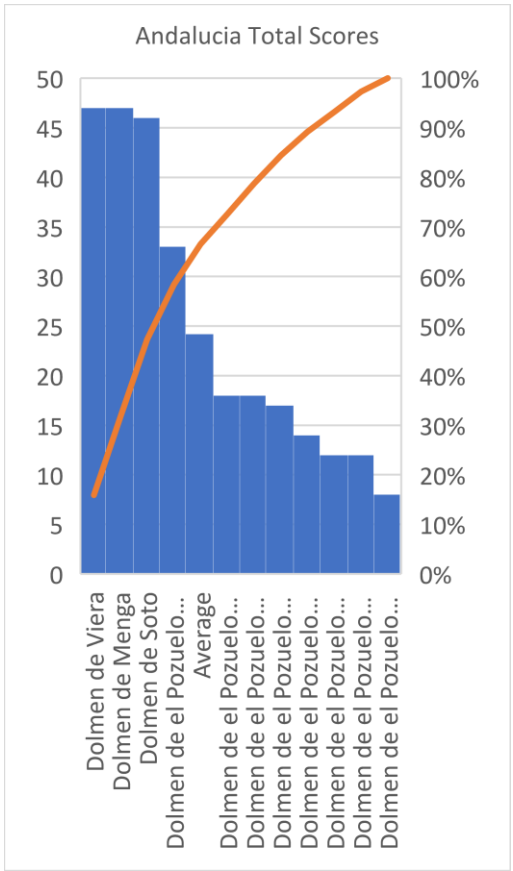
4. Discussion

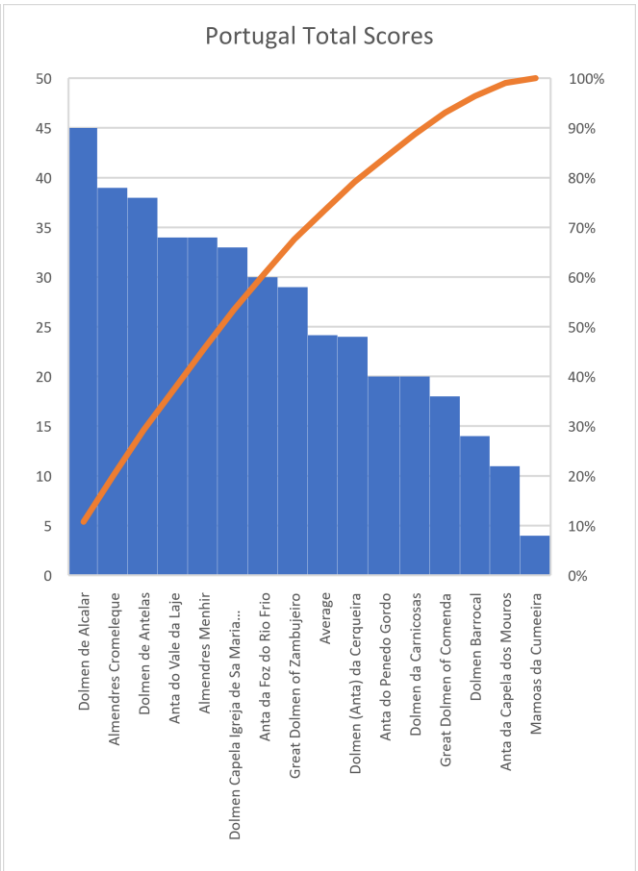
This work has reviewed thirty-three megalithic sites using a 24-item rating scale with 8 Musealization categories and three items per category. The major focus of this work has been to establish the current state of preservation, conservation and musealization of a sample of Iberian Megalithic monuments. The ultimate purpose is to establish a potential methodology to identify both best practices in musealization and outliers where musealization investments can return the greatest benefits. The Megalithic rating form developed served the purpose of collecting relevant data that could be summarized and cross refenced to identify low-cost high impact musealization interventions. The data collected and summarized in Pareto charts in this section helped identify the disparities in musealization efforts among the 33 monuments and differences between the major regions by musealization category. This methodology also identified the outliers and key monuments where the heritage value is high and the status of Musealization is low. Using this methodology can help allocate scarce public resources for musealization efforts. Targeting funding

to monuments where heritage value and musealization are most incongruent will allow Tourism authorities to maximize the return on public investments. For example, the ratings highlight a very common deficit in terms of musealization in the area of informational signage. This section will discuss each Pareto chart and its implications for the musealization of Megalithic Monuments in Iberia and two of the three regions, Portugal and Andalucia. The sample size for Catalonia was small and not sufficiently representative to allow conclusions to be drawn.

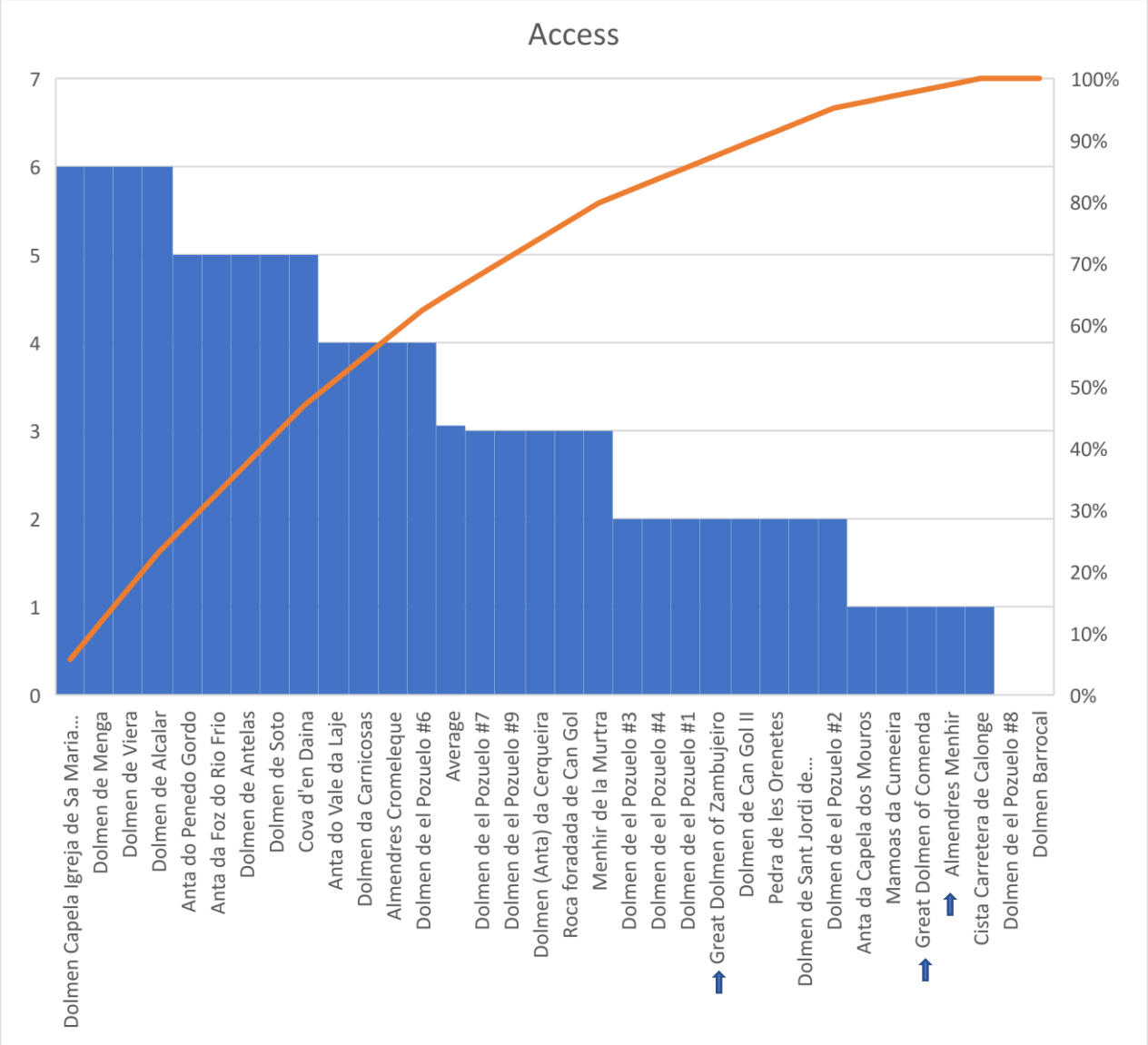
This section summarizes the results of this musealization focused research on the 33 selected Megalithic monuments in the Iberian Peninsula. The 32 Pareto charts allow easy comparison of the ratings and rapid identification of outliers both high and low within each of the 8 rating categories. This section will discuss comparisons between two regions, Andalucia and Portugal, after the overall discussion of comparisons across all sites. And finally, patterns will be discussed that appear in the data when looking across all three regions and what insights that may offer into effective Megalithic Musealization strategies.





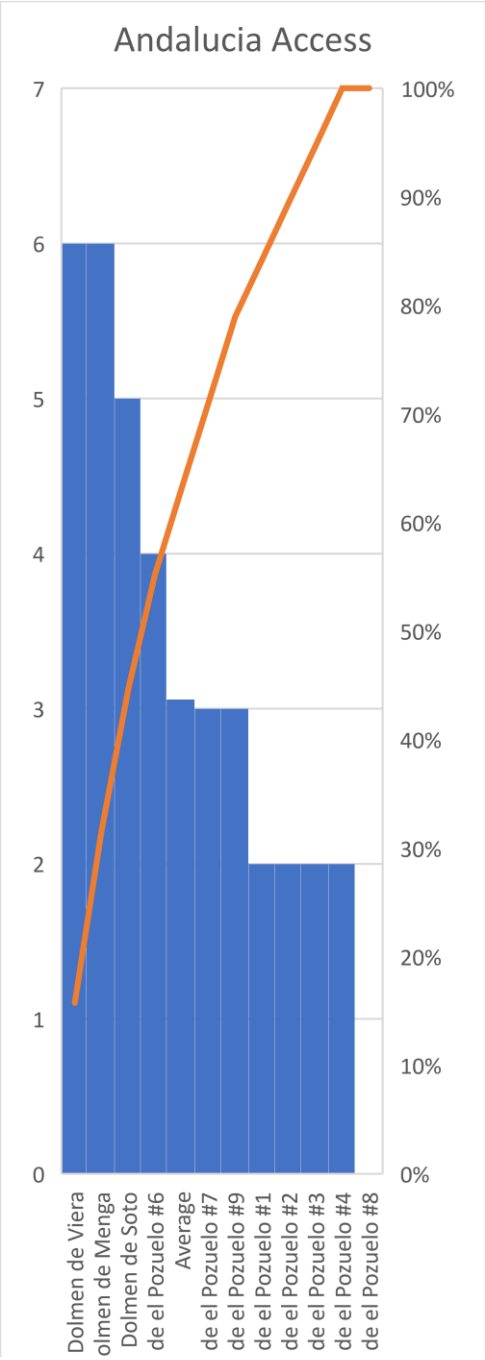


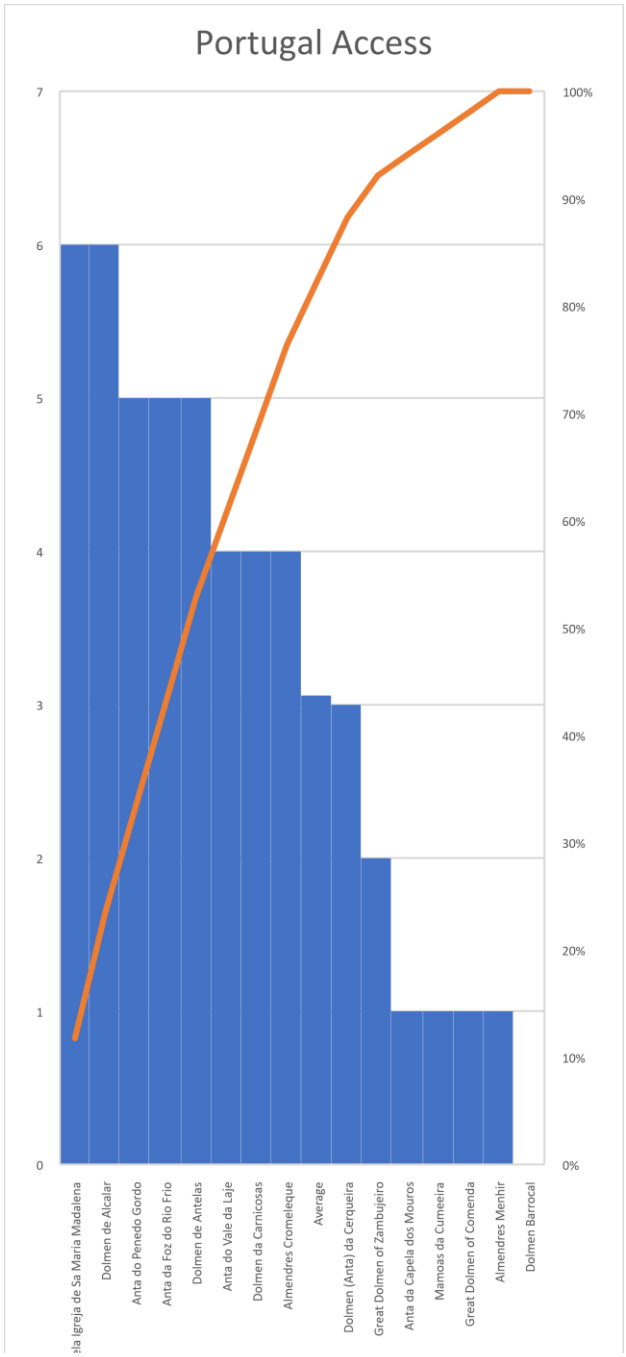
Of the 33 sites, 13 sites rated above average in the total score chart at the top, 11 were in Portugal, 4 in Andalucia and 1 in Catalonia. Setting aside the unrepresentatively small sample from Catalonia and comparing the remaining two regions presents an interesting contrast. In the two regional comparison charts 53% of the sites in Portugal rated above the overall average and 36% rated above average in Andalucia. The following charts will look at this contrast in finer detail.



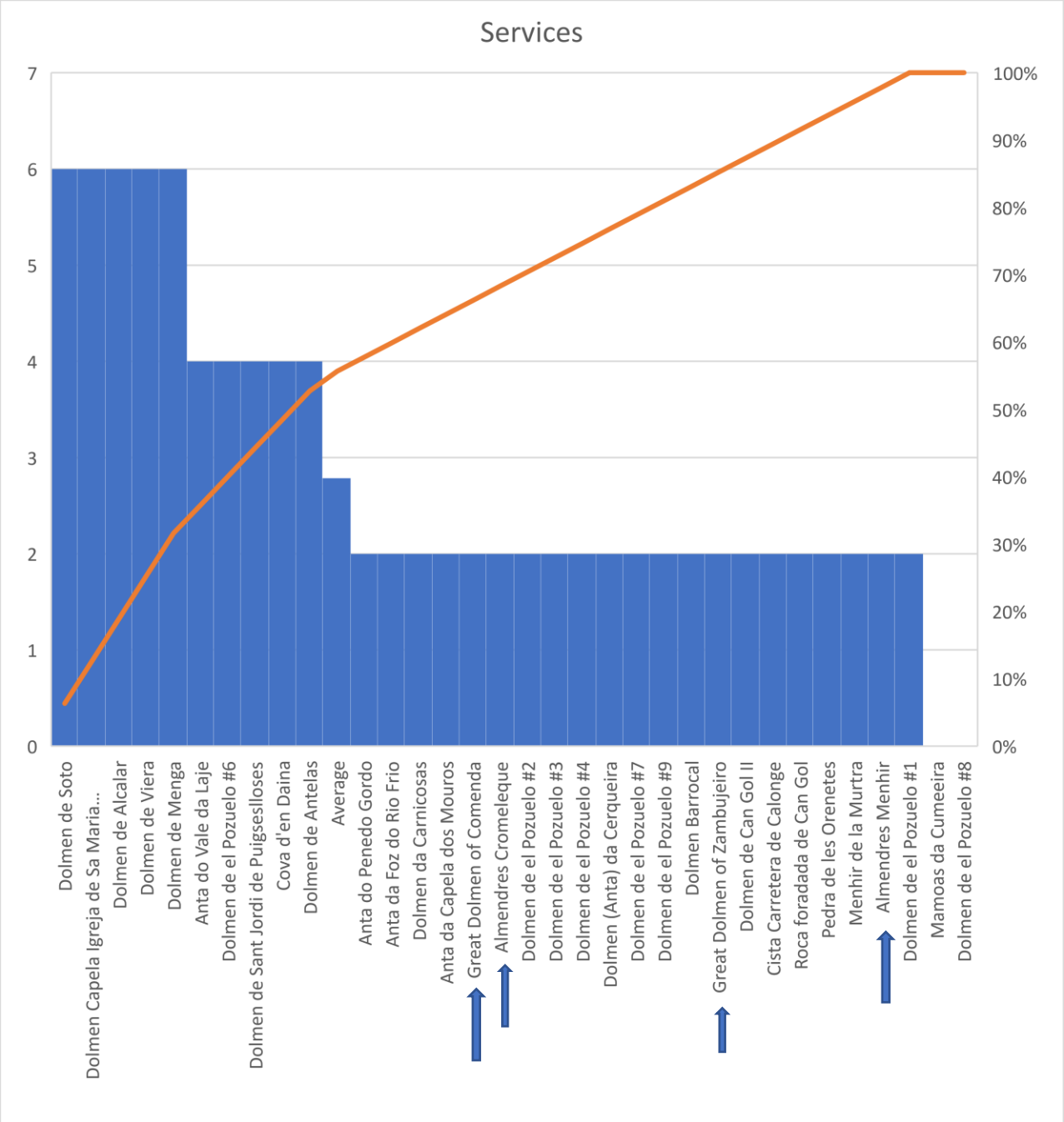
Access – covers accessibility by car, bike and walking. It also reflects signage from the main roads to the site and wheelchair accessibility at the site. On the above summary chart, it is possible to easily see that the sites on the right-hand side have some issues with accessibility that need to be addressed as part of a musealization initiative. Several examples stand out with a large gap between their Heritage value and recognition and their accessibility scores. The largest gap is for the Almendres Menhir which rates a 6 on recognition and is part of one of the most important Megalithic complexes in Europe. The Access rating of 1 reflects poor signage, parking and an extremely damaged pathway from the road to the site. The pathway was barely passable on foot having been deeply eroded by heavy rains and appeared not to have been maintained for a lengthy period. Two other gap between value and recognition and the sites accessibility were two other Portuguese sites, Great Dolmen's of Comenda and Zambujeiro. The Comenda site was very poorly marked with no parking and no clear pathway or effective signage. The access to the Great Dolmen of Zambujeiro was poorly maintained with rough pathway and dangerous gaps in the pedestrian bridge from the parking to the site Both Great Dolmens are extraordinary heritage assets that need to be invested in to realize its Musealization potential. A modest investment by local, regional or national Tourism authorities would undoubtedly yield economic development returns many times the cost of repairs.

Comparison of Access Scores of the two larger Regional Samples



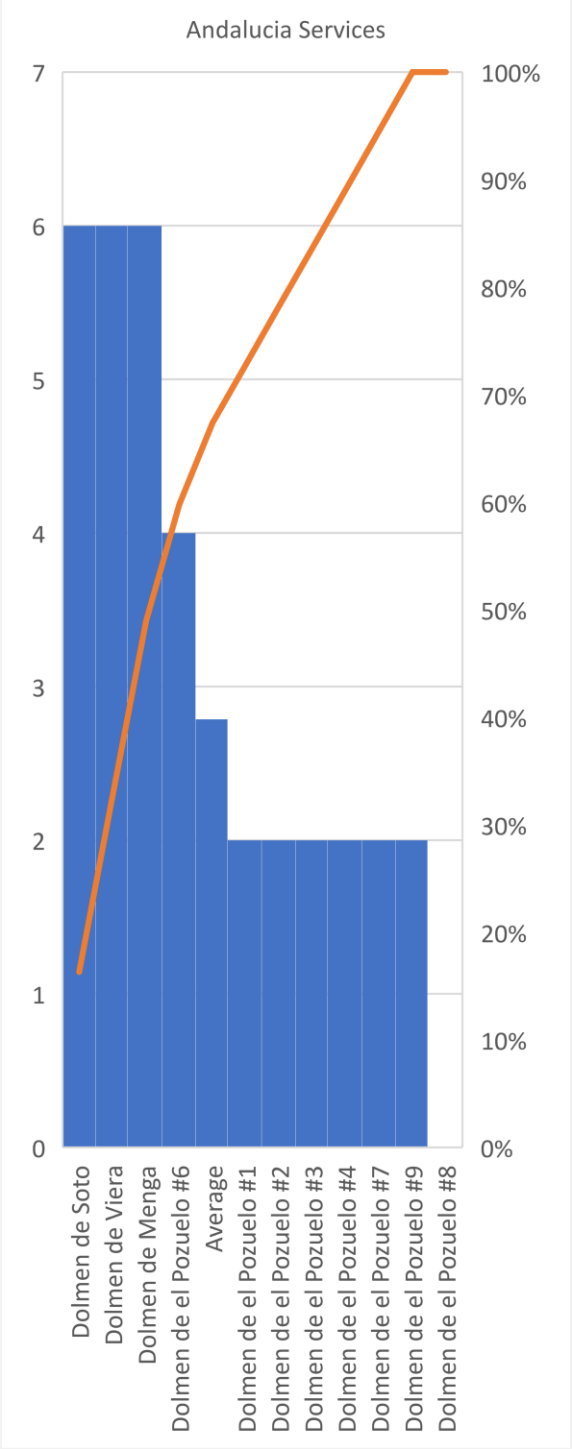


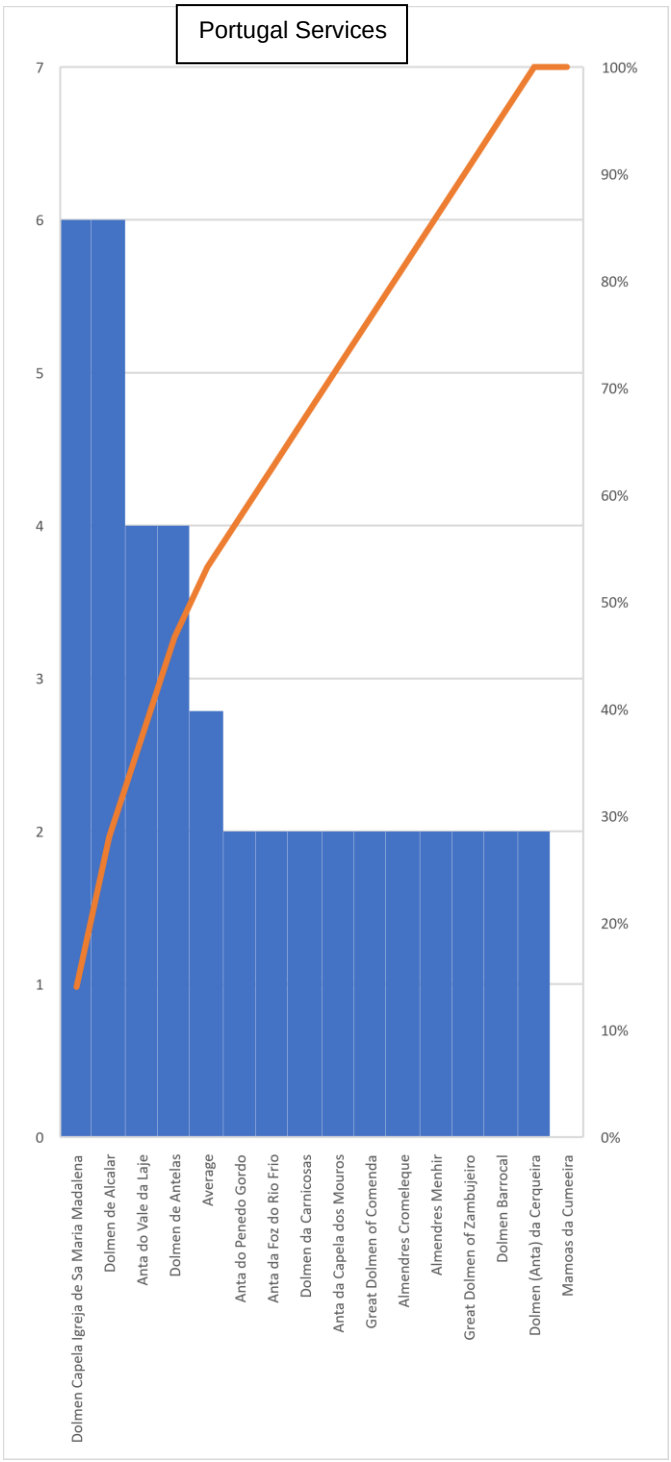
Comparing the samples indicates that 47% of the Portugal sample scored below average on this item whereas 64% of the Andalucia sample fell below average. The highest ratings show more differentiation with the Portuguese sample having 53% in the highest three scores (4,5,6) and the Andalucia group having 37% with the highest three scores. These two trends may reflect an apparent preference at Pozuelo Necropolis in Huelva to focus resources on Dolmen #6 (the only one above average in this rating), rather than address basic accessibility issues at the lesser visited sites.



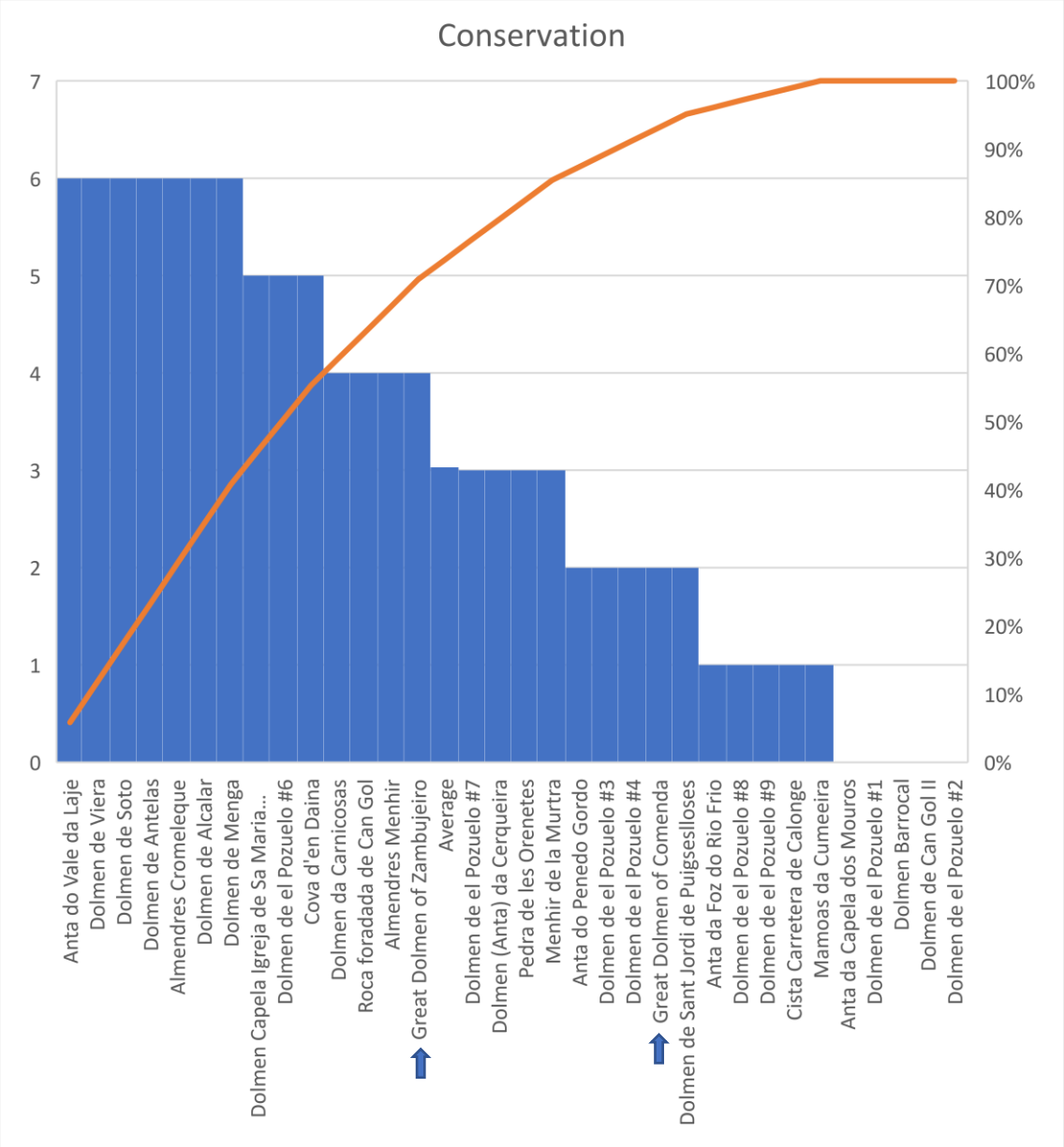
Services – This chart makes it very clear that 23 of 33 sites analyzed lack basic tourist services like toilets, benches and parking. Parking is only available along the side of the road at most sites. Four outstanding sites fall below the average and should be considered for access investments that would provide visitors basic services. Focus should be on these four higher value sites. First among the site's needing attention is the Almendres Cromeleque, a world class monument that has inadequate parking, benches, and no toilet facilities (except at the visitor center 4 km. away). The nearby Almendres Menhir lacks the same services. The Great Dolmen of Zambujeiro is another world class monument lacks basic services and has tourism potential as great as the Almendres complex. There appears to have been some effort to Musealize the site in the distant past, but the paths and signage have fallen into disrepair. Also, in this category the Great Dolmen of Comenda stands out as needing investment to Musealize an outstanding Megalithic monument.

Comparison of Scores on Services by Region



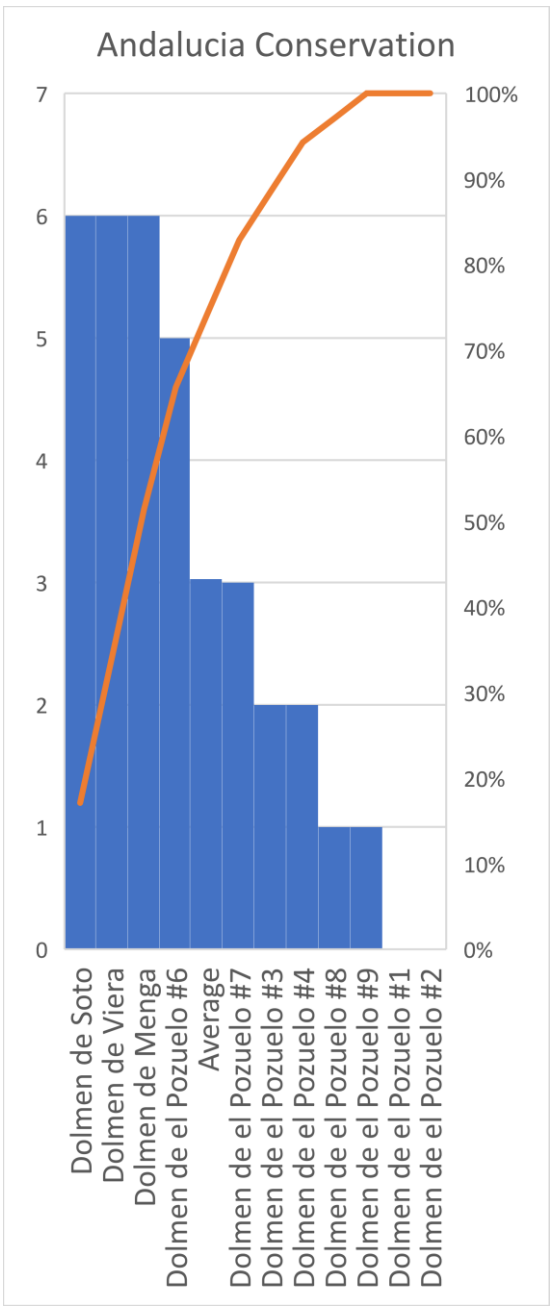


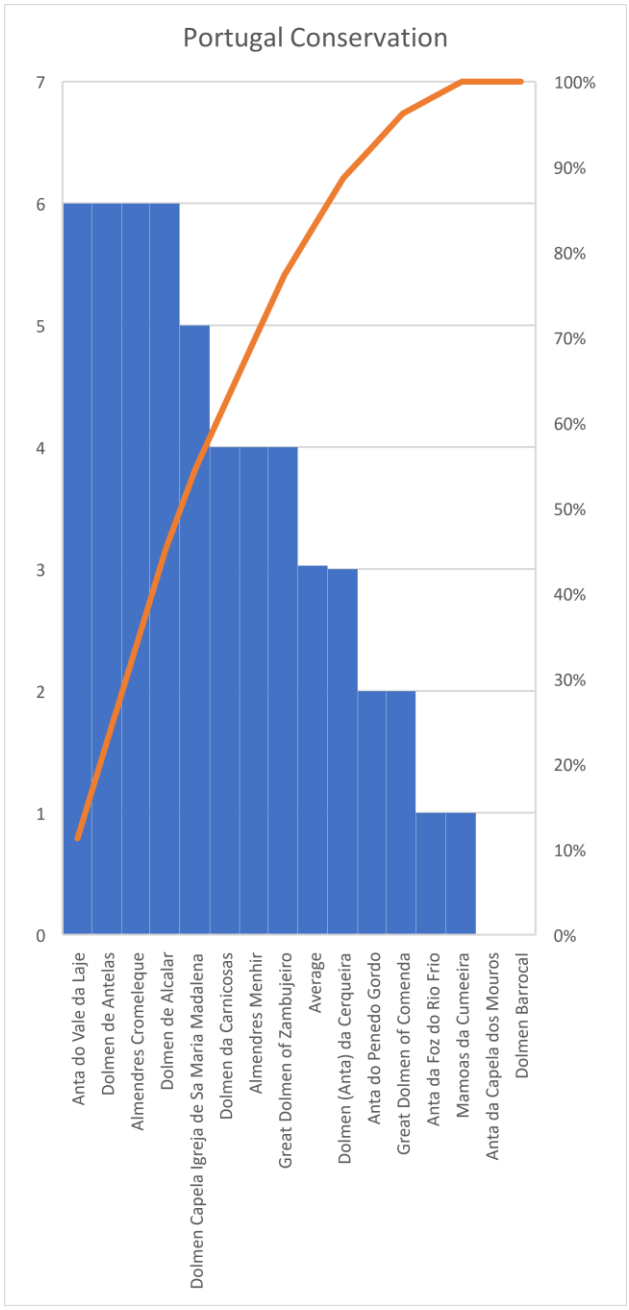
Sixty-four percent of Andalucian sites fell below average while in Portugal 73% were below average. As stated in the previous discussion this indicates a general inattention to basic tourist services in both regions and indicates an area needing major attention if touristic focused musealization initiatives are undertaken.



Conservation – This category uses the Cambridge definition of Conservation – "the act of keeping something the same or preventing it from being damaged." The questions focus on the condition of the Orthostats, any protective structures including a mound and roofing as well as any environmental threats to the integrity of the Orthostats. In this category there are two outstanding monuments that fell below the average, or just barely above, for this rating category indicated with an arrow above. The Great Dolmens of Comenda and Zambujeiro are both unique monuments with high heritage value that is not being musealized. Comenda is in the center of a farm field and the surrounding landscape and monument are poorly maintained. Its heritage value is very significant and it should be prioritized for funding and protection. Zambujeiro was musealized sometime in the last century but has been neglected for decades. Small investments in conservation at both sites with improved fencing and possibly restoring the protective mounds would ensure the conservation of the monuments for future generations.

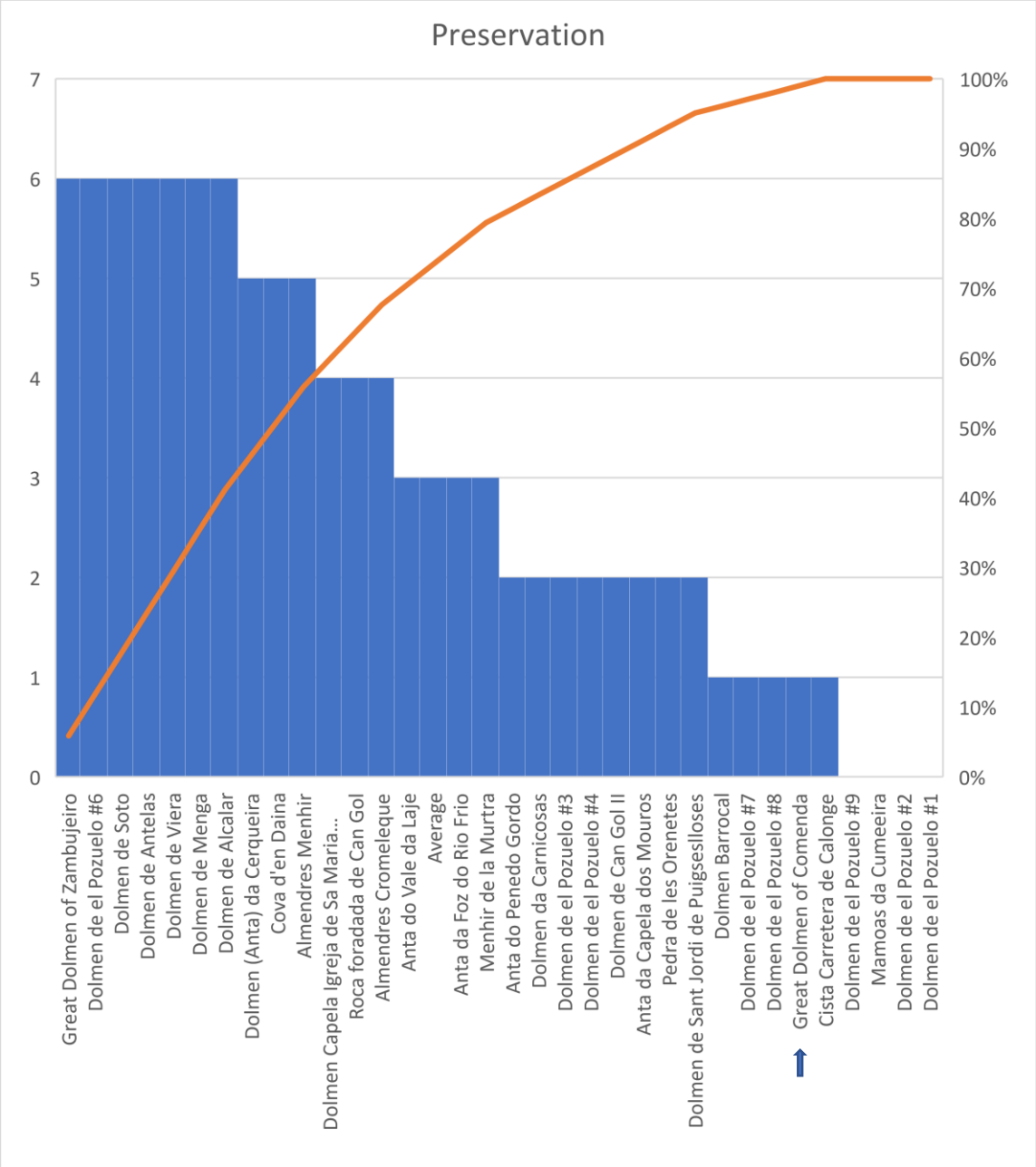
Comparison of Scores on Conservation by Region





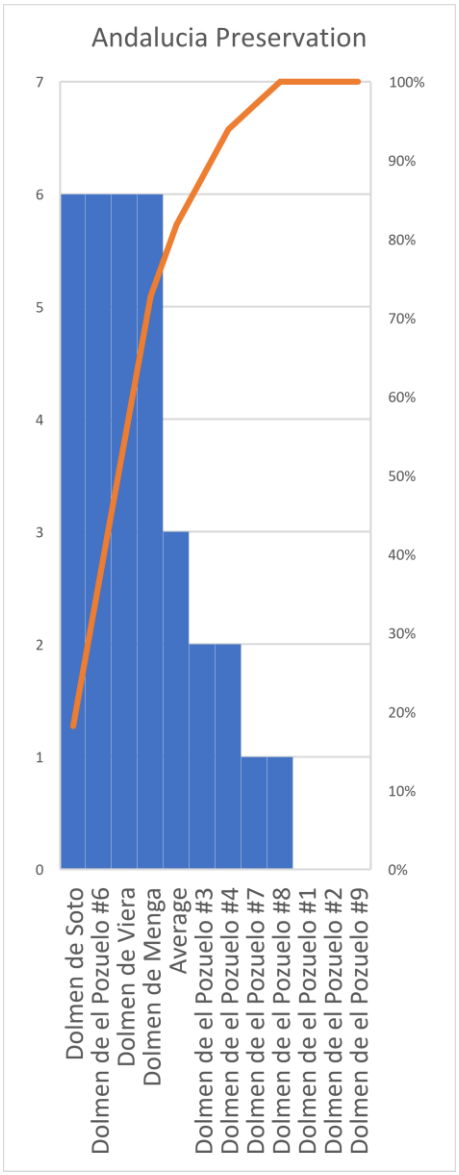
Forty-seven percent of the sites in Portugal were below average on and 64% if the Andalucia sites were. Fifty-three percent of the Portuguese sites were rated with the highest scores (4,5,6) whereas in Andalucia 37% were in that rank. These appreciably higher scores in the highest ranks in Portugal belies an apparent commitment to protecting and conserving Portugal's significant Megalithic heritage. Anta do Vale da Laje is particularly notable as an example of a modest but very well conserved site.

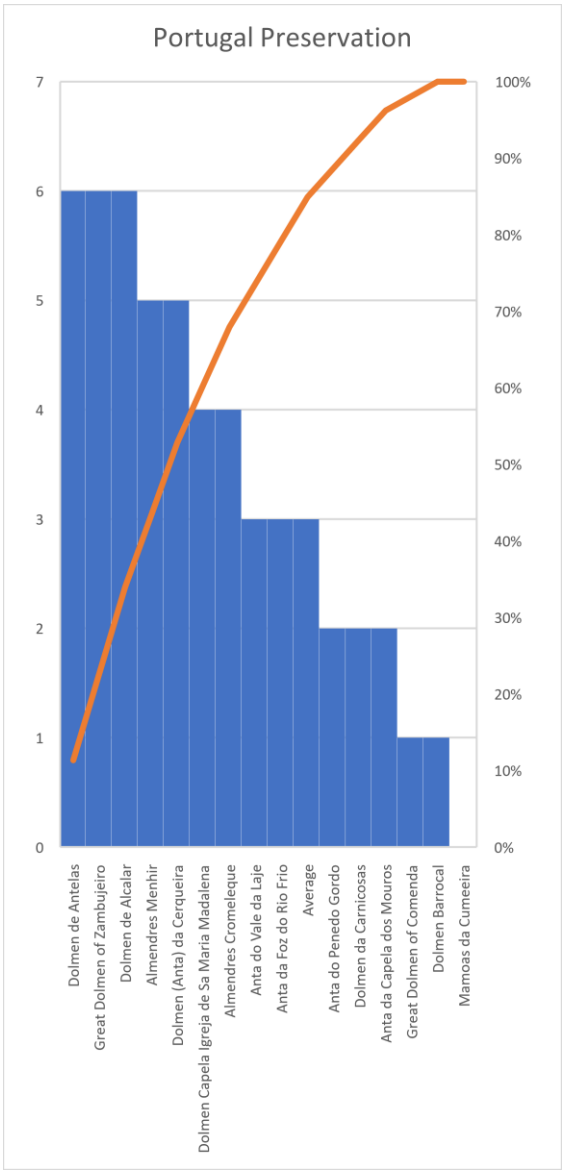
Preservation Ratings



Preservation – the Cambridge definition of Preservation is used "the act of keeping something the same or preventing if from being damaged". The Great Dolmen of Comenda is an outlier with below average ratings that are not in line with its cultural value. Environmental threats are the primary concern for Comenda as it is not well protected from threats and farming appears to be encroaching on the monument's periphery. In this category there are 19 monuments rated below average that need investments in preservation to improve Musealization. Recommended focus of resources would be on the higher tourism potential sites such as Comenda. That would be sites where the disparity between the potential and the current condition is the greatest.

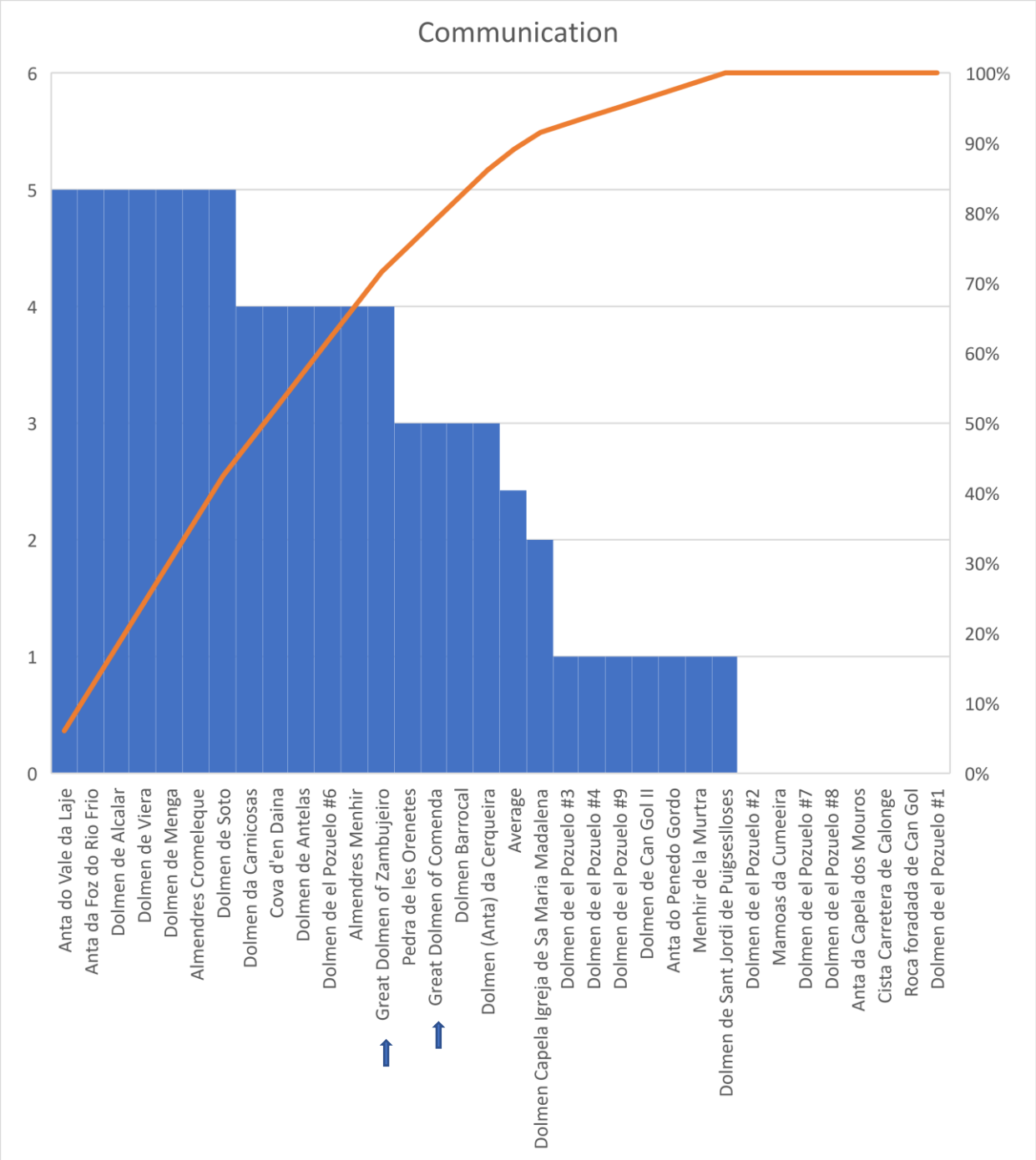
Comparison of Scores on Preservation by Region





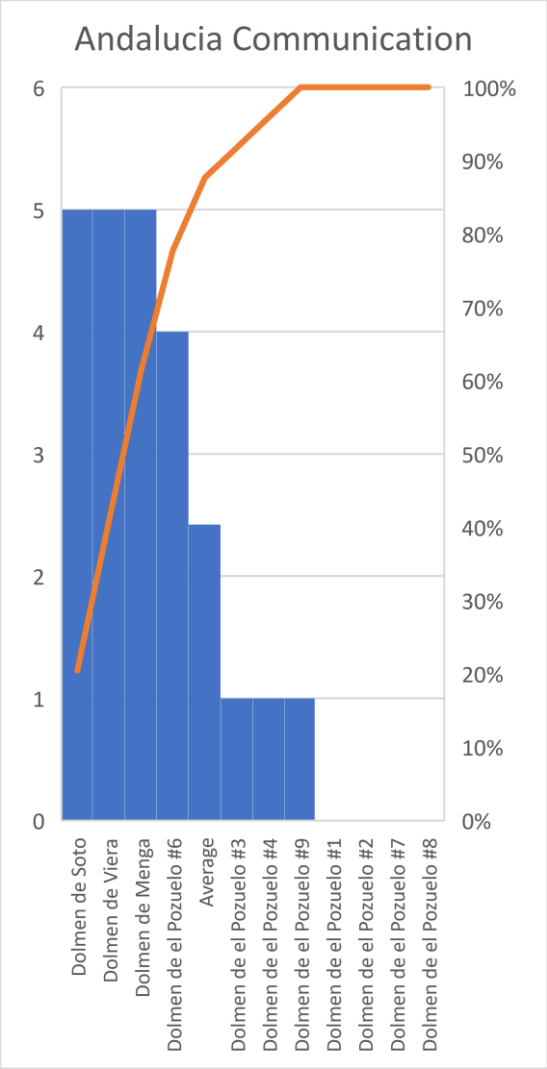
Sixty-four percent of the Andalusian monuments are below average on this score while only 40% of the Portuguese monuments were below average. This reflects heightened environmental threats in the Pozuelo Necropolis due to its isolation and poor maintenance.

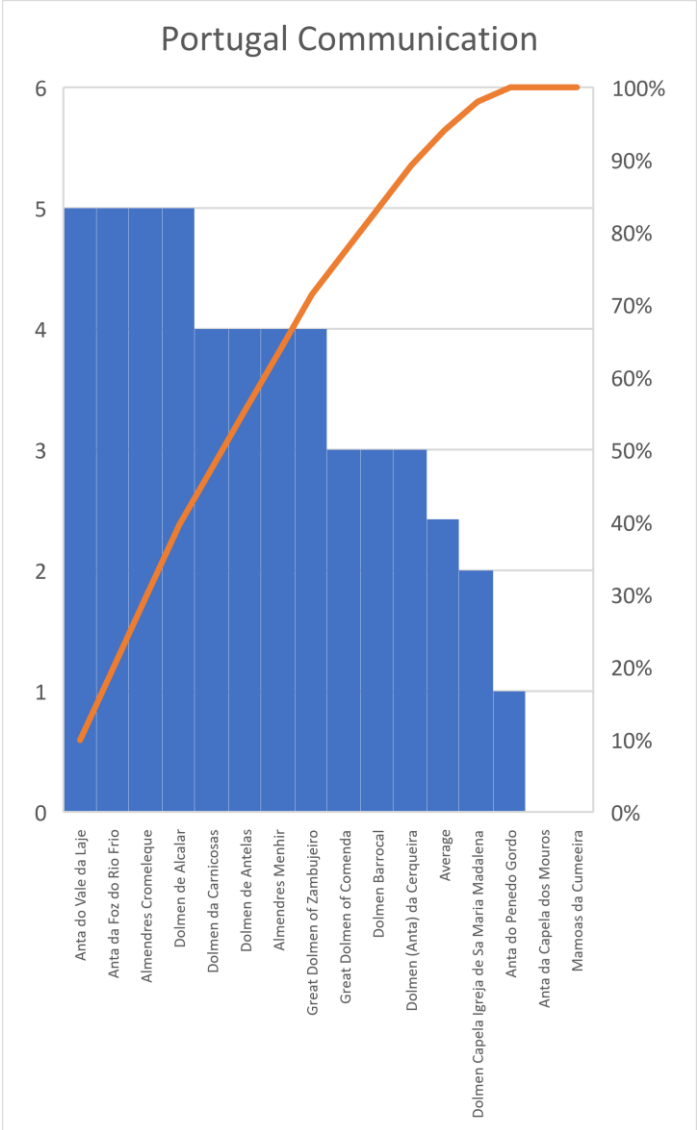
Communication Ratings



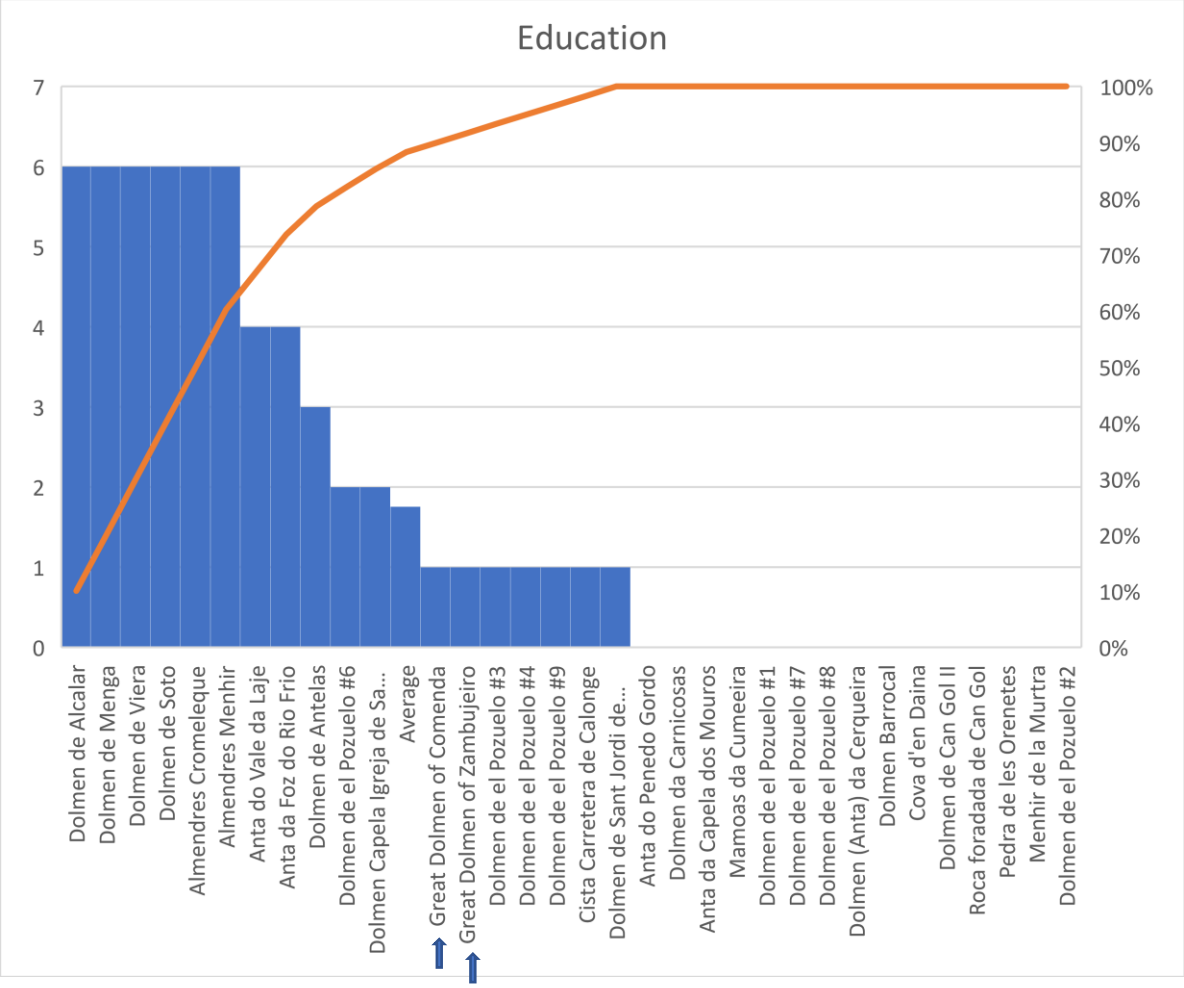
Communication – Communication includes ratings for information provided to visitors primarily through effective signage, on the cultural setting and background for the site. This includes information on excavations and the type and location of artefacts found. Signage is rated on its information value including usage of the three EU working languages as well as the presence of QR codes for more information. The Great Dolmens of Comenda and Zambujeiro stand out as needing improvement in signage in line with their strong musealization potential. Informational signage is one of the most problematic categories in this analysis. Sixteen monuments fell below the average on this an score and should be lack the very basics of Musealization focused signage. Informational signage involves a modest investment with a high return in visitor knowledge about the cultural heritage represented by the Megaliths.

Comparison of Scores on Communication by Region



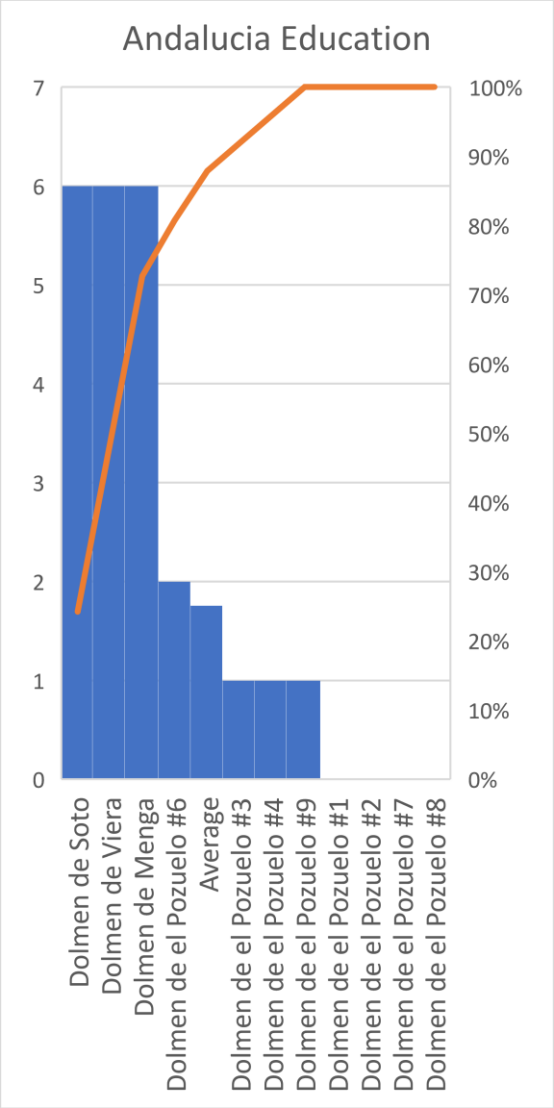


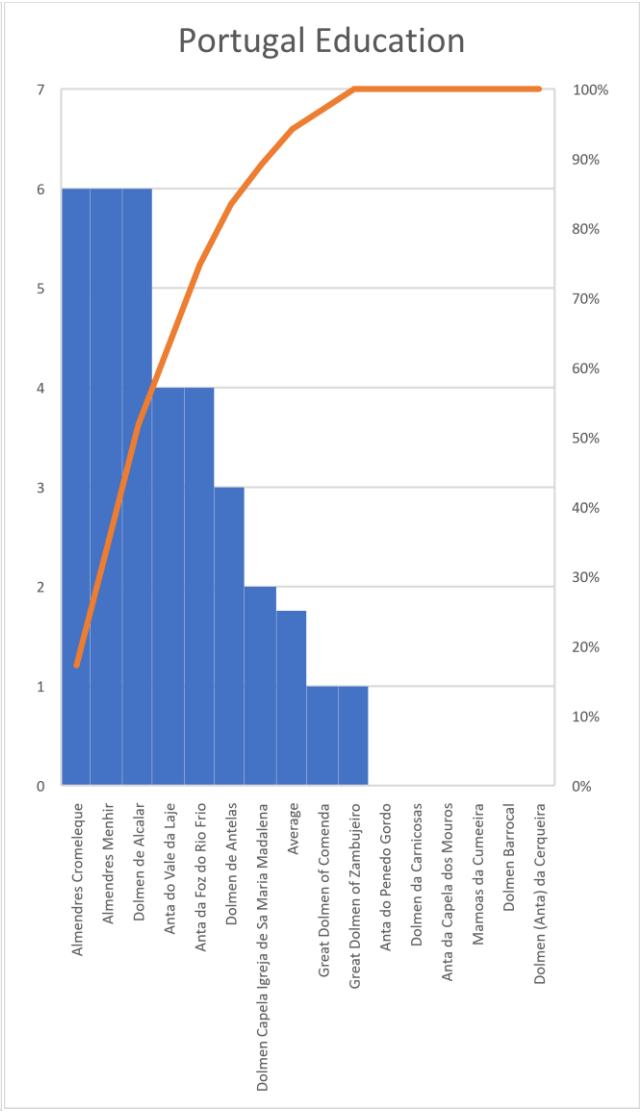
In this comparison it is notable that only 26% of the Portuguese sites fell below the overall average while in Andalucia 64% fell below the average on this item. This reflects several trends in Portugal that are not as common in Andalucia. It was more common to see details in the signage about the construction of the Megaliths. In addition, Portuguese signage very frequently presented information in English as well as Portuguese. Both of those were not the case at most of the Pozuelo monuments in Andalucia. The poor state of repair of the Pozuelo Necropolis signage was a significant factor, the choice of materials for the signs may have been a factor, see Annex III for a discussion of signage materials.



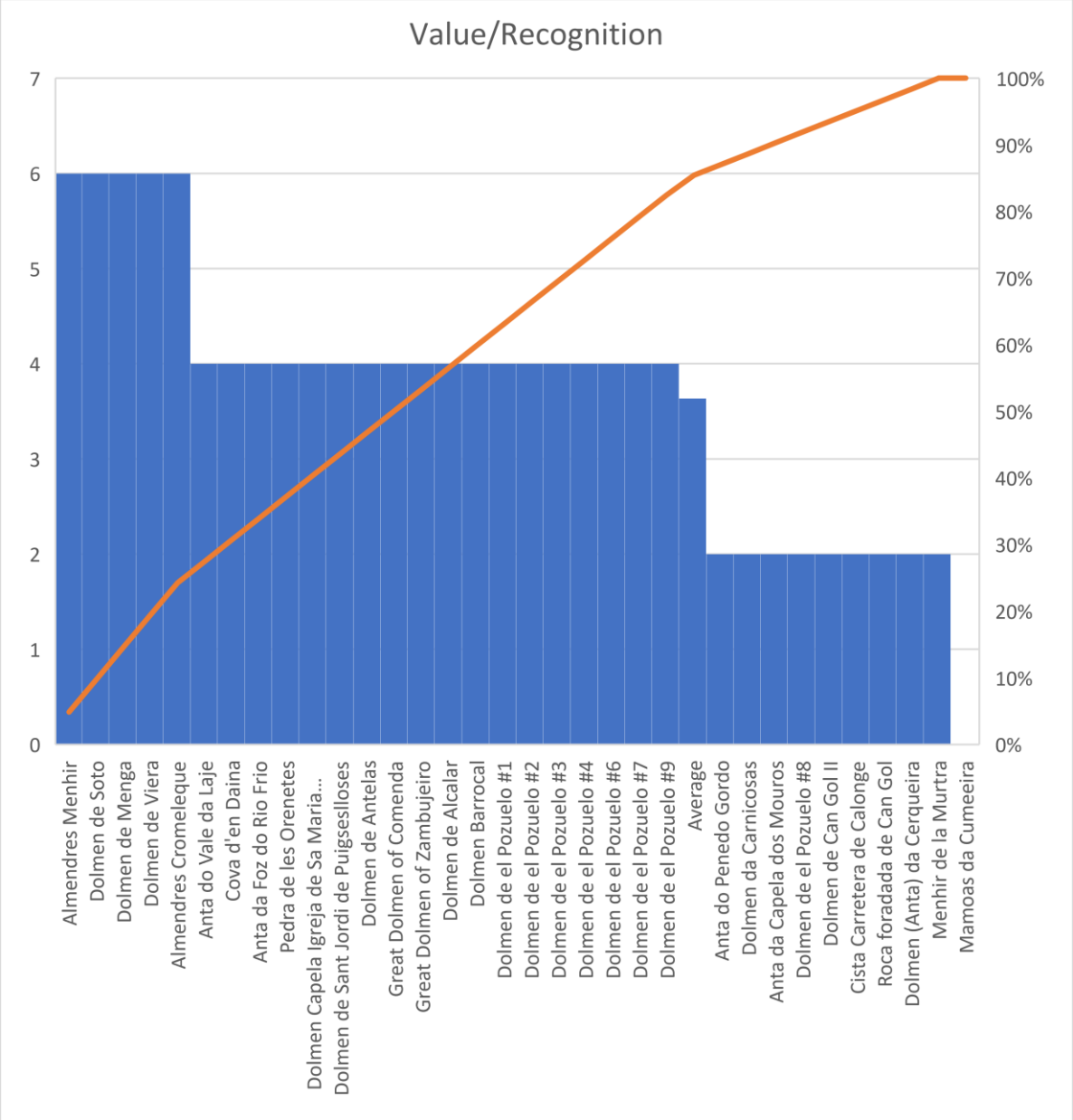
Education – Education includes detailed information provided on the signage or websites that are linked with QR codes to the site. Details about excavations and artefacts as well as the construction and history of the cultures that constructed the monument. Also rated are facilities for hands on educational activities at the site during tourist season. The greatest discrepancy noted in this chart is with the two Great Dolmens, Comenda and Zambujeiro. Both are tremendous assets that have had little recent investment by government to fully realize their tourism and educational potential. As can be seen in the chart above most monuments analyzed are below the average rating. A widespread issue is the lack of utilization of QR codes on existing signage to make detailed information available with links to websites. Also, only two sites were observed to have created facilities for experiential learning for visitors. The lack of educational signage and online educational information is widespread and could be remedied with relatively modest expenditures. This could be remedied by recruiting local schools or Universities to sponsor a megalith through an "Adopt-a-Megalith" program and raise funds for signage.

Comparison of Scores on Education by Region



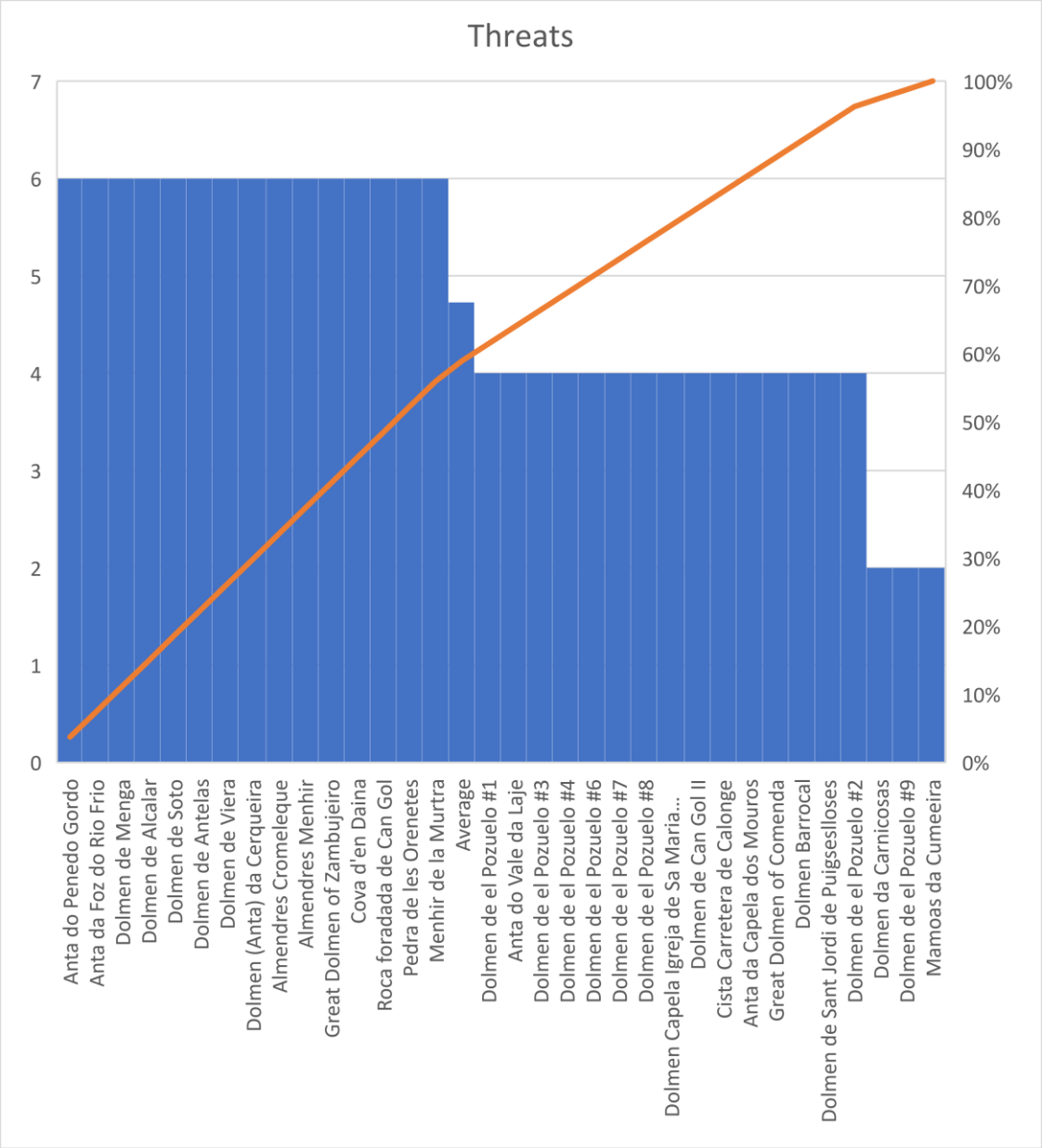


On this scale 53% of the Portuguese sites were below the overall average while in Andalucia 64% were, this primarily reflects the poor state of the signage and lack of maintenance thereof of most of the Megaliths in the Pozuelo Necropolis. Notably several smaller Portuguese monuments, Anta do Vale da Laje and Foz do Rio Frio, had outstanding signage, largely due to their collaboration with local Universities such as IPT Tomar.

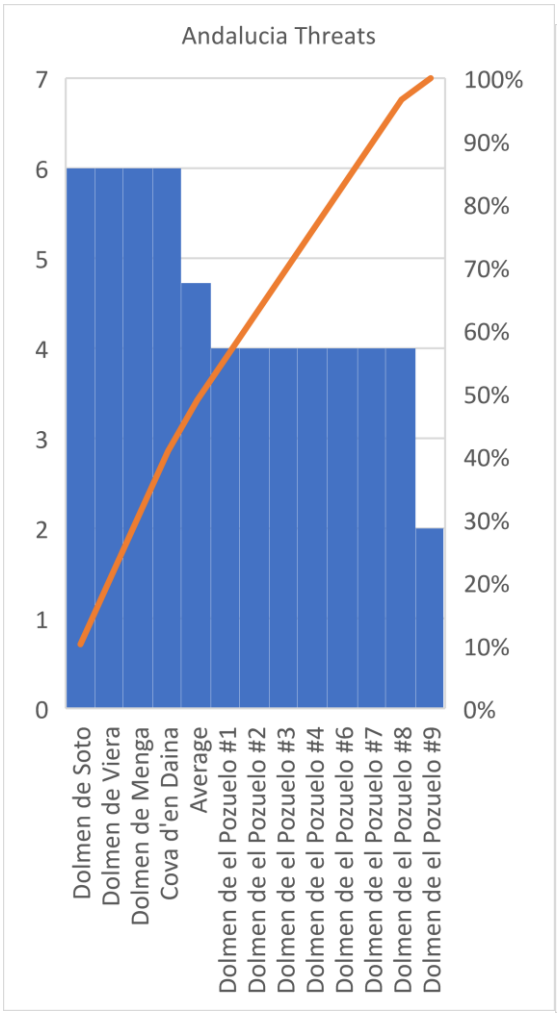


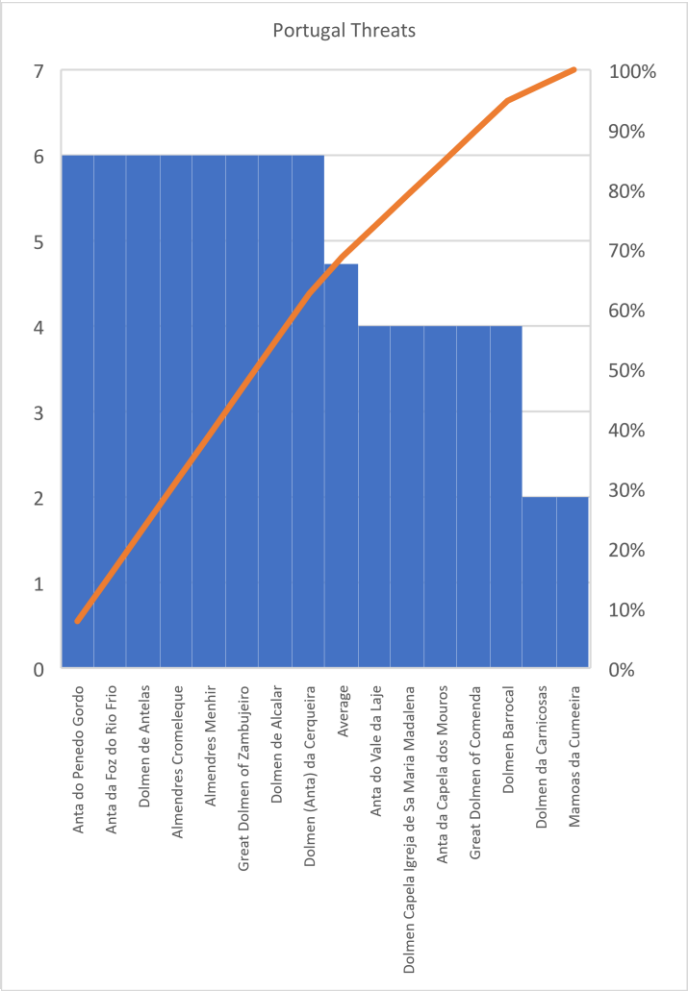
Value/Recognition – The role of formal recognition and protection by government authorities is essential for the preservation and conservation of Megalithic monuments. Recognition by some local or regional authority was almost universal. The only exception was a newly discovered site, Mamoas da Cumeeira and that likely has been resolved by this writing. As this was not one of the major issues identified the regional comparison for this item was not conducted.

Threat Analysis



Threats – major threats overall fell into two major categories, commercial and anthropic. Many of the monuments had potential threats from commercial interests, primarily farming, forestry, and construction. Better enforcement of protected setbacks from recognized monuments would be the primary countermeasure for commercial threats. Anthropic threats were generally down to poor monitoring and maintenance, lack of signage stating the rules of behavior for visitors, and vandalism. The civic engagement proposed in this work has the potential to shine a light on lax enforcement and signage, and reduce the danger from both commercial and anthropic threats.





For this rating a high level of threat was represented by a low score of 2 and no observed threats was rated as 6. The charts demonstrate a higher threat level overall in Andalucia, but this is due to the fact that most of the Pozuelo sites are in a remote area with commercial activity. Once discounting for this factor the two areas have comparable threat assessments.

5. Conclusion

The major focus of this work has been to establish the current state of preservation, conservation and musealization of a sample of 33 Iberian Megalithic monuments with the ultimate purpose of creating a data driven methodology for establishing best practices in musealization. The Megalithic rating form developed served the purpose of collecting relevant data that could be summarized and cross refenced to identify low-cost, high impact musealization interventions. The data collected and summarized in Pareto charts helped identify exemplary musealization efforts as well as outliers among the 33 monuments by musealization category. Using this methodology, scarce public resources for musealization efforts can be targeted to areas where investments by Tourism or government entities will do the greatest good. For example, the ratings highlight the very common deficit in terms of musealization in informational signage. Small investments in detailed informational signage are critical investments in the musealization of Megalithic monuments. An outstanding example of what can be accomplished in musealization with a modest investment by regional authorities is the Portuguese Megalith, Anta do Vale da Laje. This site speaks to the value of university participation with Government in preservation and musealization, as previously discussed..

Based on this research and a review of the work of Carrera et al. (2003 and 2014) the following conclusions and recommendations can be made. Economic Resources for preservation and conservation of Megaliths are limited. Competing economic forces (productivity and profitability) are limiting factors, development will continue, and the best outcome may be to minimize the damage. Human activity is the most significant risk factor and the most complex to address. Based on this review the following findings are proposed.

1. Access issues include the findings that:
    a. Most sites were not wheelchair accessible, in the more developed sites this could be easily remedied with paved pathways.
    b. Three sites with high heritage value, the Grand Dolmens Comenda and Zambujeiro and the Almendres Menhir, have serious pedestrian access issues that can be addressed with small expenditures.

c. Good directional signage was lacking at most sites, GPS directions could not be relied on at some remote locations, particularly for the last few kilometers.

2. Services issues include the following findings:
    a. Basic tourist comfort services, parking, benches and bathrooms, were lacking at most sites.
    b. Due to the expense involved, a full set of tourist services would only be justified for the higher volume and higher heritage value sites, such as the Almendres Cromeleque and Menhir and the Great Dolmens Comenda and Zambujeiro, in the Evora district of Portugal.
3. Conservation issues include the following findings:
    a. Two sites with high heritage value and below average scores on conservation, that should have a good return on a small investment to correct the problems identified are the Great Dolmens Comenda and Zambujeiro in the Evora district of Portugal.
    b. In the comparison with Andalucia on this issue it seemed that a greater commitment to conservation of Megalithic heritage was apparent in the Portuguese sites. One possible operative factor may have been the partnering of Portuguese Universities with local government to conserve Megalithic heritage.
4. Preservation issues include the following findings:
    a. The Portuguese sites showed higher overall rankings on this rating than those in Andalucia, this appears to be partially a result of a decision to invest limited resources in one site at the Pozuelo Necropolis to the detriment of the others.
    b. Portuguese University partnership in excavating, preserving and musealizing Megalithic sites appears to be an operative fact that was not in evidence at the sites visited in Andalucia.
    c. Nineteen of the 33 monuments surveyed rated below average on this criteria. The greatest disparity on this criteria was observed at the Great Dolmen of Comenda in the Evora district of Portugal. Farming activity is preventing it from being appreciated and may threaten its preservation.
5. Communication issues include the following findings:

a. Lack of or poor Informational signage was a major problem at many of the sites reviewed. Communicating the background for the site is key to Musealization.
b. A large disparity was apparent between the Portuguese and Andalucían samples on this criterion. Sixty-four percent of the Andalucian sample fell below the overall average for the 33 sites while on 26% of the Portuguese sample did. This was largely due to the poor maintenance of signage at the large Pozuelo Necropolis, and two related positive trends in Portugal, the partnering with Universities and the more common use of one of the European Union working languages, English in signage.

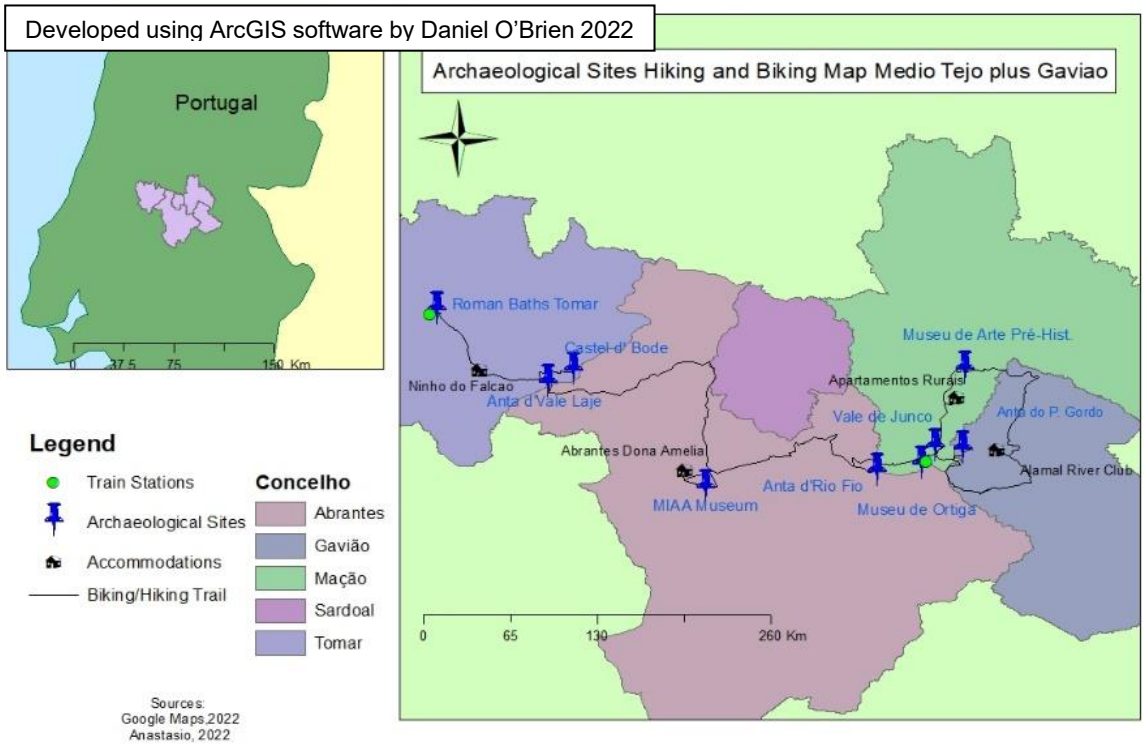
6. Education issues include the following findings:
    a. Web-based information on individual sites is underutilized to provide museum quality educational experiences to the visitor at most of the sites reviewed.
    b. The use of QR codes on site signage to connect visitors to museum quality information was almost non-existent. A significant improvement in musealization of the monuments could be inexpensively made with retrofitting existing signage with QR codes that link with information available on existing websites.
    c. The opportunity for visitors to have hands-on experiences that allow them to relate to our Neolithic ancestor were only in evidence at two of the 33 sites reviewed. Expanding experiential learning at the more visited sited and the high heritage value sites should be considered.
7. Value/Relevance in terms of recognition and protection from local, regional or national authorities did not appear to be a problem.
8. Direct threats were seen frequently from agriculture or forestry and at least in one case construction of housing. The key recommendation here would be better reporting and enforcement of existing protections.

The focus of conservation efforts should be on public education and raising awareness among elected officials and local and community organizations. Adequate methods exist for knowledge preservation and conservation through documentation using digital photographic tools. These digital documents can be the basis for public education programs on websites and in local schools and regional and local governing organizations. Public participation should be solicited in

monitoring and preservation which could take the form of "Adopt a Megalith" programs modeled after similar programs in some countries for maintaining public properties where public funds are not adequate. Schools, Universities, businesses and local organizations should be engaged collectively through education to adopt and maintain specific monuments. This University partnership model was seen at several sites in Portugal. Megalith and heritage hiking routes, as proposed below and seen in "Rotas de Macao" could be established to combine preservation and economic development goals to build local council support for groups of sites. An example of this type of heritage focused low-carbon-footprint hiking/biking trail is presented on the following page and an outstanding existing example is the "Rotas de Macao" from the Macao Municipality in the Santarem region of Portugal, see Walking Trails - Mation Routes (rotasdemacao.pt). This work explored these issues to develop and test a template for combining the existing best practices into a replicable template for improved museumization of the western European megalithic heritage.

The 35,000+/- megalithic monuments in Europe have deteriorated over time and many appear to the public to be a simple "pile of rocks". Some monuments are individually well marked and include detailed educational material but are not linked to the larger regional history. By improving Musealization and linking groups of monuments to tell the larger regional story, with QR links to websites and information about exhibits at local museums, we can better educate the public and put each site in a larger context. Concerted efforts need to be made to preserve and promote the important place Megalithism and Megalithic monuments had in the Neolithic revolution in Europe. Areas for further research include further testing and refinement of the Megalithic Rating scale. Also, testing this method as a "crowd-sourced" methodology for simultaneously enhancing public engagement and gathering data to advocate for public funding. Promoting low-carbon-footprint regional hiking and biking trails to simultaneously promote tourism, public appreciation and preservation of the rich European Megalithic heritage is win-win strategy, see the example that follows.

Example of a Low Carbon Footprint - Touristic Hiking and Biking Map



Hiking Biking Trail Stops

1) Arrival Train Station and Visit Roman Baths, Tomar
2) B&B – first night bike/hike to Ninho do Falcao
3) Second day – bike/hike to Castel do Bode and Anta do Vale Laje then visit MIAA Museum Abrantes
4) B&B – second night Dona Amelia Abrantes
5) Third day – bike/hike to Anta do Rio Frio, Estacao arqueologica Vale de Junco and Anta do Penedo Gordo
6) B&B – third night Alamal River Club, Ortiga
7) Fourth day – bike/hike to Museu de Arte Prehistoria and Vale de Junco
8) B&B – fourth night Apartamentos Rurais, Macao
9) Bike/Hike to Ortiga Train Station for return to Lisbon

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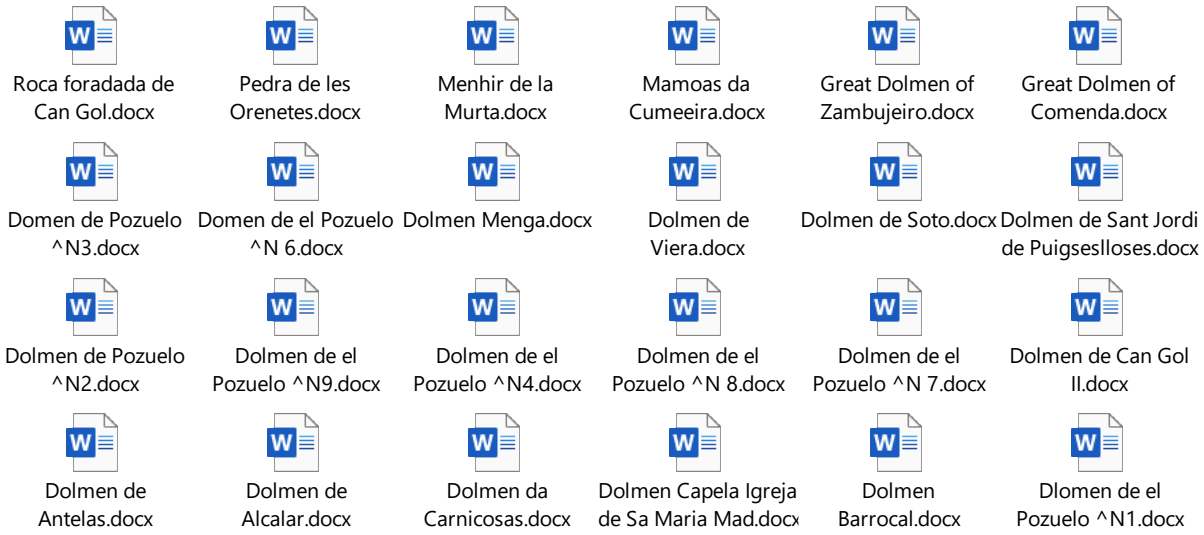
Figures and tables

Annex 1. - Megalithic Rating Forms Chart with Summary of data and Original Forms with the same Data

Name	Access			Services			Conservation			Preservation			Communication			Education			Value/Relevance			Direct Threats		
Anta do Vale da Laje	2	2	1	2	0	2	2	2	2	1	1	1	2	2	1	2	1	2	2	2	0	0	2	2
Anta do Penedo Gordo	2	2	1	2	0	0	0	2	0	1	0	1	1	0	0	0	0	0	2	0	0	2	2	2
Anta da Foz do Rio Frio	2	2	1	2	0	0	0	1	0	1	0	2	2	2	1	2	2	0	2	2	0	2	2	2
Dolmen da Carnicosas	1	2	1	2	0	0	1	2	1	1	0	1	2	1	1	0	0	0	2	0	0	2	2	2
Dolmen Capela Igreja de Sa Maria Madalena	2	2	2	2	2	2	1	2	2	1	1	2	1	1	0	1	1	0	2	2	0	0	2	2
Anta da Capela dos Mouros	0	1	0	2	0	0	0	0	0	1	1	0	0	0	0	0	0	0	2	0	0	2	2	0
Dolmen de Antelas	1	2	2	2	1	2	2	2	2	2	2	2	2	1	1	1	1	1	2	2	0	2	2	2
Mamoas da Cumeeira	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
Dolmen de Viera	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2
Dolmen de Menga	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2
Great Dolmen of Comenda	1	0	0	2	0	0	1	0	1	1	0	0	1	1	1	1	0	0	2	2	0	2	0	2
Almendres Cromeleque	1	2	0	2	0	0	2	2	2	2	1	1	2	2	1	2	2	2	2	2	2	2	2	2
Almendres Menhir	0	1	0	2	0	0	2	1	1	2	1	2	2	1	1	2	2	2	2	2	2	2	2	2
Great Dolmen of Zambujeiro	1	1	0	2	0	0	1	1	2	2	2	2	2	1	1	1	0	0	2	2	0	2	2	2
Dolmen Barrocal	0	0	0	2	0	0	0	0	0	1	0	0	1	1	1	0	0	0	2	2	0	2	0	2
Dolmen (Anta) da Cerqueira	1	1	1	2	0	0	1	1	1	2	1	2	2	1	0	0	0	0	2	0	0	2	2	2
Dolmen de Soto	1	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2
Dolmen de el Pozuelo #1	0	2	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2	2	0	2	2	0
Dolmen de el Pozuelo #2	0	2	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2	2	0	2	2	0
Dolmen de el Pozuelo #3	1	1	0	2	0	0	1	1	0	1	0	1	1	0	0	1	0	0	2	2	0	2	2	0
Dolmen de el Pozuelo #4	1	1	0	2	0	0	1	1	0	1	0	1	1	0	0	1	0	0	2	2	0	2	2	0
Dolmen de el Pozuelo #6	1	2	1	2	0	2	2	2	1	2	2	2	2	1	1	1	0	1	2	2	0	2	0	2
Dolmen de el Pozuelo #7	1	2	0	2	0	0	1	1	1	1	0	0	0	0	0	0	0	0	2	2	0	2	2	0
Dolmen de el Pozuelo #8	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	2	0	0	2	0	2
Dolmen de el Pozuelo #9	1	2	0	2	0	0	0	1	0	0	0	0	1	0	0	1	0	0	2	2	0	0	2	2
Dolmen de Alcalar	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	0	2	2	2
Cova d'en Daina	2	2	1	2	0	2	1	2	2	2	1	2	2	1	2	0	0	0	2	2	0	2	2	2
Dolmen de Can Gol II	1	1	0	2	0	0	0	0	0	1	0	1	0	1	0	0	0	0	2	0	0	2	2	0
Cista Carretera de Calonge	1	0	0	2	0	0	0	1	0	1	0	0	0	0	0	1	0	0	2	0	0	2	2	0
Roca foradada de Can Gol	1	2	0	2	0	0	2	2	0	2	1	1	0	0	0	0	0	0	2	0	0	2	2	2
Pedra de les Orenetes	1	1	0	2	0	0	1	1	1	1	0	1	2	1	0	0	0	0	2	2	0	2	2	2
Menhir de la Murtra	1	2	0	2	0	0	1	1	1	2	0	1	0	1	0	0	0	0	2	0	0	2	2	2
Dolmen de Sant Jordi de Puigseslloses	1	1	0	2	0	2	0	2	0	1	0	1	0	1	0	1	0	0	2	2	0	0	2	2

Figure 101 - Ratings for All Sites on all Questions - Summary above, original documents embedded below.

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