



EVALUATING VISITOR MANAGEMENT AT THE ARCHAEOLOGICAL SITE OF PETRA

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ABSTRACT

This paper aims at shedding the light on the problems caused by negative tourists' behaviors at the site of Petra, also giving a general assessment of implemented visitor management tools. This was achieved by conducting field visits where different impacts and management efforts were documented; a form was designed for this purpose, also interviewing members working at the site. The site is facing damage despite the economic benefits gained by tourism; such damage is caused by littering, wear and tear as well as random movement of tourists. Suggestions are given to improve visitor management at the site of Petra.

KEYWORDS: Tourism impact, Tourist behavior, Visitor Management, Interpretation, Petra Archaeological Park

INTRODUCTION

After its rediscovery on August 22nd 1812 by the Swiss traveler J. Burckhardt (Burckhardt, 1822), the city of Petra became a well-known destination for travelers and explorers. The locals who were living within and around Petra could recognize economic benefits of tourism since the early decades of the 20th century. The numbers of tourists kept increasing, also tourism associated development, particularly in the late 1980's. Despite the great economic benefits of tourism, the pressure and destruction caused by the increasing influxes of tourists, besides natural threats as weathering, all made UNESCO consider it as an endangered site, Petra was listed as a World Heritage Site in 1985 (UNESCO, 1993).

The numbers of tourists visiting Petra was 120,338 in 1989 to reach 975,285 tourists

Table 1. Numbers of Visitors to the site of Petra (1989- 2010)(MOTA 2010)

| Year | Number of Visitors |
|------|--------------------|
| 1989 | 120,338 |
| 1990 | 102,151 |
| 1991 | 40,889 |
| 1992 | 117,347 |
| 1993 | 138,559 |
| 1994 | 200,505 |
| 1995 | 337,221 |
| 1996 | 414,448 |
| 1997 | 380,527 |
| 1998 | 347,109 |
| 1999 | 429,644 |
| 2000 | 481,198 |
| 2001 | 231,203 |
| 2002 | 158,837 |
| 2003 | 160,658 |
| 2004 | 310,271 |
| 2005 | 393,186 |
| 2006 | 359,366 |
| 2007 | 581,145 |
| 2008 | 813,267 |
| 2009 | 766,938 |
| 2010 | 975,285 |

in 2010 (see Table 1) (Ministry of Tourism and Antiquities [MOTA], 2012). In 2010, 17,821,663 JD (1 JD = 1.4 US \$) were the entrance fees for the site of Petra, which contributed with 81% of total tourism sites' entrance fees in Jordan (Jordan Press Foundation, 4/3/2011).

With such increasing numbers of tourists, there are damages threatening the integrity of the site. Such damages are caused by negative behaviors as random climbing and stepping, graffiti and littering. Unfortunately, there is a lack in implementing visitor management procedures to mitigate the influence of such behaviors. This paper aims at presenting different forms of damage caused by tourists' behavior, also to give a general evaluation of the actions already taken by the site management to protect the site. This was achieved through field visits observation, in which both different problems and existing visitor management tools were documented, also, a short interview was made with the management of the site to get more information on this issue. Early awareness to prevent further irreversible phenomena is vital, and this paper contributes to this issue, which applies to other archaeological sites beyond Petra, too.

ABOUT THE SITE AND ITS PROBLEMS

The World heritage Site of Petra (located in Petra Archaeological Park [PAP]) is 255 km far from Amman (the capital of Jordan). The different features of the site are carved in the red sandstone; these are dated from Hellenistic Period (2nd century B.C.) to Late Byzantine Period (6th century A.D.)(Fig. 1). The following is a brief description of the main features of the site (from Causle, 2003; Browning, 1982), also of different problems caused by tourists' behavior.

The site of Petra is entered through the outer Siq (path) in which some tombs' facades as Obelisk tombs are located, also

Djen Rock Blocks, these are representations of the gods protecting the water channel system in this area. This part of the site is suffering from random climbing and stepping by tourists, causing then an erosion of the sandstone cliffs flanking the path. The outer Siq ends into a natural gorge known as Siq with a length of 1200 m, it is flanked with two water channels, as well as carved niches, two statues of

Dushara and al-Uzza gods are located in the middle of this gorge. Horse and chariots rides (used by tourists) are raising the dust which becomes encrusted on the sides of the Siq; some graffiti can be also noticed. One of the niches in the Siq is known as a "niche of luck", guides and tourists keep throwing stones as trying to place them in the niche, which is causing a quick and drastic erosion of the stone (Fig. 2).

Figure 1: A map showing the locations of different archaeological features of Petra (Petra National Trust 2011)

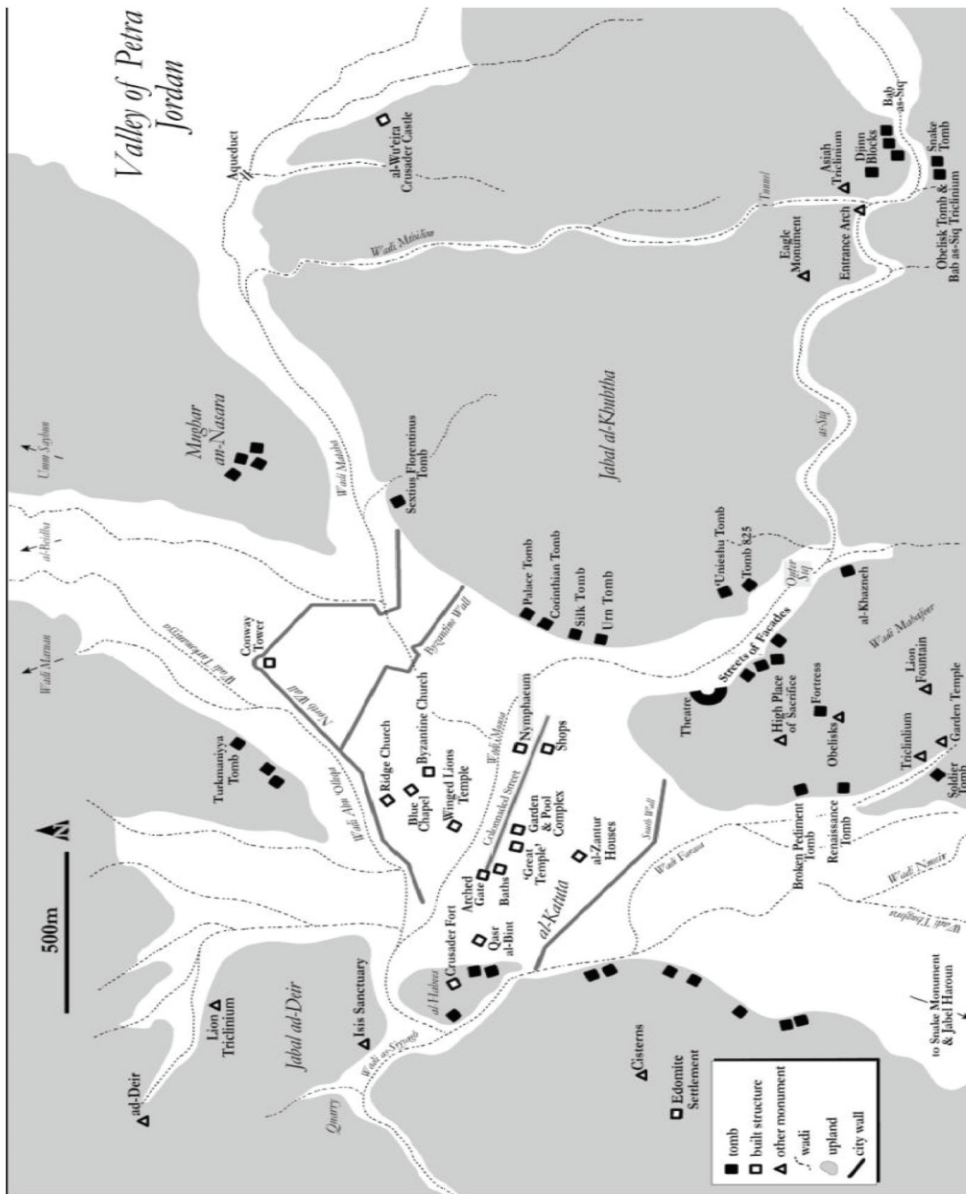




Figure 2. The "Luck Niche" in Siq area, tour guides and tourists keep throwing stones, which caused more erosion of the sandstone

The Siq then widens upon the most magnificent of all Petra's monuments al-Khazneh (meaning Treasury in Arabic), there is an uncertainty about the function of this monument, and it is believed to be a temple or a royal tomb. According to Tom Paradise, a geomorphologist from the University of Arkansas at Fayetteville, tourists are wearing shoes with soles that grab on everything instead of the rubber-soled working boots or soft sneakers, a quick disappearance rock carved features is taking place, parts of the façade of the Treasury had lost sand, tour guides and tourists usually sit on its lower parts, which caused the loss of half a cubic meter of sandstone over few years (Fig.3). Another form of deterioration is the existence of white deposits on the walls of carved tombs, mainly the Treasury; such deposits are of stearic acid. This acid is formed when people rest by leaning against the wall with sweating hands, where they leave a scum of fat behind (Lubick 2004).

The Siq continues through the site where different features are located; these include the Street of Facades, the Amphitheater which can accommodate more than 6000 spectators, the Royal tombs (Urn Tomb, silk tomb, Corinthian Tomb and Palace Tomb),

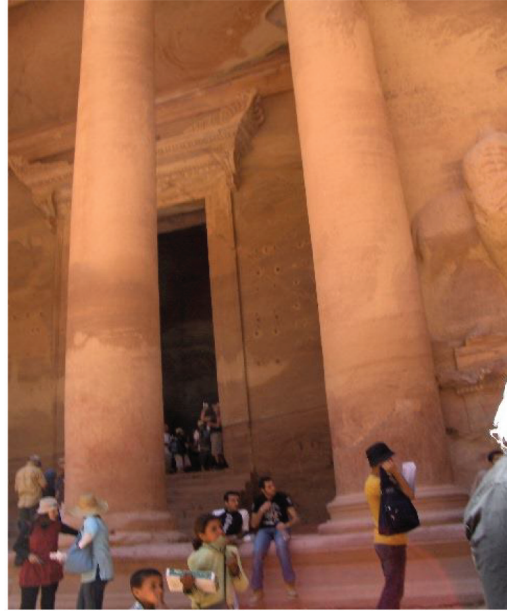


Figure 3 Tourists setting on the lower parts of the Treasury

also the Mausoleum of Sextus Florentinius. Another feature is the colonnaded street leading to triple-arched Temenos Gateway, which marked the entrance into the courtyard or "temenos" of Qasr al-Bint, one of the main Nabataean temples in Petra. Other remains include Nymphaeum, the Great Temple Complex, Temple of the Winged Lions, Petra Byzantine Church, Blue Church, high places (with their platforms for the purpose of giving animal sacrifices), al-Deir (the Monastery) with its huge façade, a big number of tombs as the Lion tomb, Garden Tomb, Tomb of the Roman Soldier, Triclinium (Feast Hall), as well as many other features (Map 1). Some problems are obvious in the area where these features are located, these include: littering, random climbing erosion of stone caused by donkeys' hooves, graffiti, and picking flora, fauna as well as artifacts (e.g. pottery sherds and coins) by tourists. (Figures 4-7)



Figure 4 Graffiti on a stone in the Street of Facades Area (Incised with sharp tools).



Figure 5 Graffiti in the Siq area (a name of a tourist written with a marker)



Fig.6: Graffiti in the Siq area (a name of a tourist incised with a sharp tool)

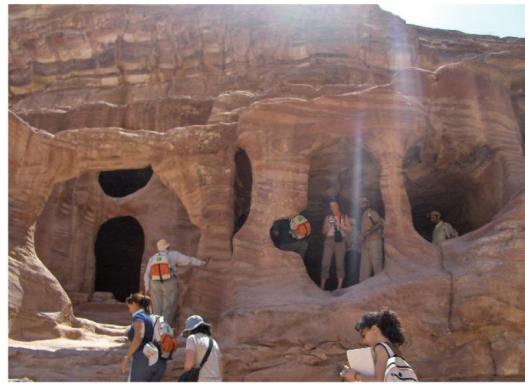


Fig.7 Random climbing and touching by tourists causing sandstone erosion (the area in front of the Theater)

Such problems are reflecting inefficiency in applying visitor management at the site; the next section gives a general evaluation of implemented procedures to reduce such negative impacts.

VISITOR MANAGEMENT AT PETRA SITE

Regarding the visitor management procedures implemented at the site of Petra, the author conducted several field visits to monitor them, special forms were designed to record visitor management tools in each part of the site (Appendix 1), photographs were also taken for documentation. The following summarizes the results of this fieldwork:

Signage and Displays: different types of

interpretational signs are distributed at the site, for about two decades and till 2011, the signs at the site were giving a brief description for each feature (in Arabic and English), these were metallic and of a black color, with being highly exposed to dust, the clarity of text becomes less. Very few behavioral signs are found at the outer Siq and Treasury areas; these are for prohibiting visitors from climbing cliffs. Unfortunately, these signs are not to be easily seen by tourists since they are small in size, of a pale yellow color, and written in a very small size font. There are also displays at the visitor center; these include only general information about the site, maps of trails, and entrance fees. Just recently, new signage system was installed along the way



Figure 8. One of the old interpretation signs at the site



Figure 9. One of the warning signs at the Outer Siq area, it prohibits climbing the cliffs behind

from the Siq to Qasr al-Bint; the signage gives more information on the cultural significance of the site. Though, the site still lacks behavioral interpretation (Figs. 8, 9).

Personnel: The personnel of the site are mainly found in visitors' center and entrance of the site. They supervise ticketing and entering of tourists to the site, there is no monitoring for visitors behavior, only the Treasury makes an exception, where tourist police make sure that tourists do not pass the fence on the entrance of this monument.

Trails: Only the outer Siq area has two trails, one of them serves as a pedestrian trail while the other is for horses' rides.

Fencing: Few areas were protected by

fencing; these include the Treasury, a small section of the water system at the Siq area, and some tombs at the Street of Facades (Figs. 10 & 11).

A short interview was made on May 2011 with the one of the site's engineers (Ms. Hanadi as-Salih, Cultural Resources Unit in PAP) regarding actions taken to control visitors' movement and behavior. The manager emphasized that visitation reaches 800-1200 daily during the low season, and 2500-3500 during the high season, which creates a real pressure on the site; moreover, the site is open to visitor n.yu9s from 7:00 am-5:00 pm. This initiated the need to implement the following: restricting the accesses to the top of the Monastery and the

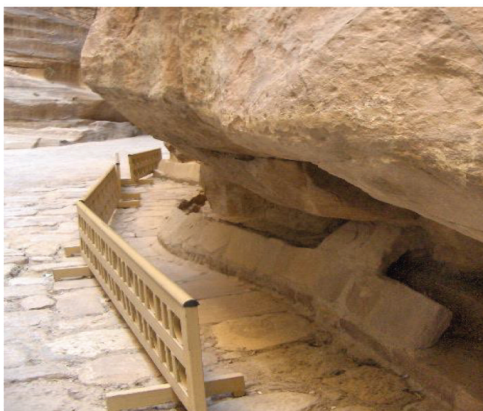


Figure 10. A fence in the Siq area that was put to protect a portion of the water system (pottery pipe)

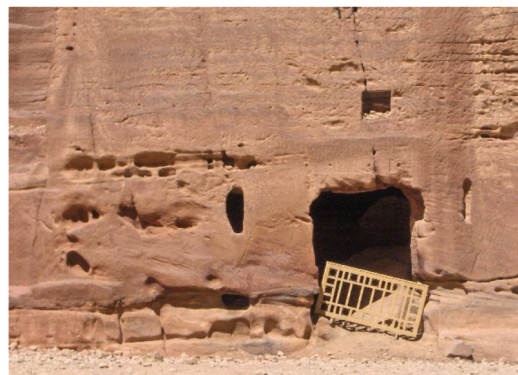


Figure 11. A fence in the Street of facades area that was put to prevent tourists from entering the tomb

theater, training some of the PAP employees to become park rangers, continuous maintenance of interpretive and directional signs, putting fences to protect some particular features at the site, designating few locations for photographing and as viewpoints, limiting vehicles movements in the Central Area, and conservation works, these are taking place at the areas of Zantour, Great Temple, Painted Cave in al-Beidha, the Blue Chapel, the Byzantine Church, paths leading to the High Place, paths reaching up to Khubtha peaks, and Monastery. Unfortunately the local community involvement in implementing these procedures is still limited, moreover, procedures as zoning and awareness programs are still not applied.

IMPROVING VISITOR MANAGEMENT AT THE SITE

With the rapid growth of tourism in Petra, and the increasing damage that took place, the Jordanian government invited some international institutions to prepare management plans for the site. Unfortunately, such plans are still not implemented nor endorsed by authorities (Akrawi 2000). These plans are listed as follows:

The "Master Plan for the Protection & Use of the Petra National Park" by US National Parks Service (NPS) in 1968. The plan focused the establishment of a National Park with an independent park division and zoning, as well as tourism development, archaeological protection and preservation, social issues and administrative issues.

The UNESCO "Petra National Park Management Plan" issued in 1994. It focused on the different kinds of threats in the site, and suggested recommendations and proposals to remedy these threats. These included zoning, archaeological conservation, and conservation of biodiversity, Park infrastructure and

personnel, physical planning, sustainable rural development, mitigation measures, training and communication, research and monitoring, and the implementation of the Management Plan.

The US/ICOMOS "Management Analysis & Recommendations for the Petra World Heritage Site" in 1998. The plan addressed the maintenance of the management values related to infrastructure in Petra.

The US National Parks Service "Operating Plan" of 2000. The plan included comprehensive management policies, detailed operating procedures and standards, a training plan, and the recommended position of the Petra Archaeological Park (PAP) within the organization of the Ministry of Tourism and Antiquities (MOTA).

Recently, a three year plan was developed for *Petra Development and Tourism Region Authority (PDTRA)*, it focuses on park conservation, visitor experience, services, management and marketing (USAID, 2012).

With having these plans not applied, it becomes clear that site's management strategies should be more focused to control the level and nature of site consumption, also different impacts on its physical and socio-economic environment. Variables to control include the number of visitors, the types of activity, visitors' behavior and the environment's physical and social resistance and resilience (Pedersen, 2002). Visitor flow management is significant in heritage protection policies, different areas are varying in their needs for protection. Some issues are to be considered here: fragility of materials, means of visit (size of group) and carrying capacity, these factors determines the preventive actions to be taken (Pedregal & Diekmann, 2004). Magablih & al-Shorman (2008) calculated the monthly physical carrying capacity of the site of Petra to be 16,200 visitors, which has been always highly exceeded (see Table 2).

Table 2. Numbers of Visitors to Petra Site by Month (2005-2012)

| Month | Year | | | | | | | |
|--------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
| January | 16,258 | 24,843 | 25,804 | 49,383 | 40,322 | 57,368 | 66,419 | 41,277 |
| February | 19,024 | 22,568 | 28,809 | 52,786 | 36,057 | 59,258 | 44,326 | 39,745 |
| March | 44,600 | 42,617 | 46,051 | 87,652 | 70,390 | 102,918 | 69,660 | 59,460 |
| April | 57,528 | 68,613 | 80,794 | 100,703 | 102,489 | 126,970 | 90,376 | 87,714 |
| May | 35,368 | 35,705 | 41,626 | 86,745 | 68,977 | 98,201 | 47,498 | 56,858 |
| June | 23,898 | 21,027 | 29,131 | 46,503 | 41,346 | 48,664 | 32,366 | 40,197 |
| July | 26,645 | 21,374 | 36,779 | 48,056 | 45,680 | 56,355 | 39,525 | |
| August | 31,881 | 22,713 | 64,647 | 60,047 | 49,988 | 51,497 | 24,972 | |
| September | 32,107 | 15,845 | 35,869 | 59,330 | 60,622 | 74,551 | 44,487 | |
| October | 35,924 | 26,594 | 70,844 | 108,112 | 105,866 | 124,466 | 57,229 | |
| November | 42,229 | 32,142 | 69,914 | 89,474 | 86,933 | 106,943 | 70,505 | |
| December | 27,724 | 25,325 | 50,877 | 61,527 | 58,268 | 68,094 | 42,501 | |
| Total | 393,186 | 359,366 | 581,145 | 850,318 | 766,938 | 975,285 | 629,864 | 325,251 |

In order to reduce congestion and crowding at the site, some procedures should be taken; these include limiting group sizes, and limiting the permissible length of stay at the site (Pedersen, 2002). There are no restrictions on the numbers of tourists entering the site daily; moreover, the site is open for continuous ten hours, this is in addition to "Petra by Night" show, which lasts for two hours every Monday, where hundreds of tourists walk through the candle-lit Siq to the Treasury area to enjoy Bedouin Music. Reducing the daily visit hours or visitation days of the week could be good solutions to the problem of crowding at the site.

For the problems of random climbing and stepping, littering, graffiti, and touching; the following actions can be taken: informing potential visitors about the disadvantages of their behaviors, conducting awareness programs about appropriate behaviors and respect for site's resources, discouraging or prohibiting use when impact potential is high, involving guides in making tourists aware of

ecotourism ethics, and strengthening the site by having trails and viewing platforms all through the site (Pedersen, 2002; Nature Conservancy, 2004). The signage and other interpretational material should include statements for consequences of negative behaviors on the site; especially that many tourists are not aware of the accumulative slow effects caused by touching, stepping and random climbing. A good example comes from Dinosaur National Monument in Utah (as Petra, it has features carved in sandstone), where a series of interpretive signs were developed for individual sites. One of these signs says:

"..... Archeological sites are irreplaceable and once destroyed cannot be reconstructed. Most damage is not immediately apparent and often occurs because visitors do not realize the effect they have. When you visit a site like this, behave as if you were in a museum of rare and fragile items. Walk carefully, watch where you sit and what you touch, watch your children, and don't take or leave anything but shadows. Touching destroys these outdoor museum pieces. Inquisitive observer or thief of time, which are

you? If this site had been vandalized prior to excavation, we would have lost valuable material in reconstructing the area's prehistory. Help preserve these sites: Don't touch rock art. The oils on your hands and abrasion of the sandstone hasten their erosion. If you see others touching, or in any way damaging petroglyphs or pictographs - ask them to stop. Most visitors are inquisitive observers and would never consider damaging or stealing from these sites. If you find a site, arrowhead, or other artifact, leave it in place. Artifacts and sites are protected by law, but we want you to fear your impact on these resources more than the law. People who damage these sites are thieves of time. If you observe someone damaging a site, report it immediately". (Ryan, 1993, 25)

This applies as well to awareness programs and interpretive material given by tour guides, both can create an effective method in directing the behavior of tourists toward appreciating and protecting the different features of Petra archaeological site.

CONCLUSIONS

It becomes clear that managing visitors' flows at Petra should become a priority by its management. Signage should be improved concerning design and content, signs should be more visible and in better locations, besides the information about history and description of the feature, more information should be given on actions to be prevented. This applies as well to other interpretational methods as brochures, tour guides and awareness programs. A pedestrian trail should be laid over the area starting from the street of facades to museum; this trail should be accompanied with displays of information on activities and points interest, also conservation and management efforts done to protect the site. Another important implication is to inform guides on appropriate ways of leading groups through the site, and how to be an effective tool in spreading the environmental awareness. Restricting duration and group size through signage and trained personnel is not less important than all previously suggested implications.

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Appendix 1:
Visitor Management Sheet

1. Name of the Observer:
 2. Area name:
 3. Date of Observation: (----/----/----)
 4. Time of Observation: (From -----To-----) (am/pm)
 5. Number of Visitors Observed (Total):
 6. Types of facilities within the area of investigation:
-
7. Notes about the availability and the condition of visitor management tools at the site:
Restriction on access and certain activities
.....
-
- Security site personnel/rangers/police
.....
-
- Behavior and instructions signs for certain activities
.....
-
- Discriminated entrance
.....
-
- Zoning (sanctuary zones, wildlife zones, tourism zones, developmental or facilities zones)
.....
-

Resource hardening as construction of boardwalks, reconstruction and conservation of archaeological buildings and monuments

Provision of visitor information and environmental interpretation

Interpreting specific information to some targeted visitor groups

Landscaping and planting

Viewing and photographing platforms

Fencing

Limiting vehicles movements

Ensuring visitor safety in the site

Reducing visitor congestion

Fines for negative actions (littering, vandalism, etc)

Introducing timed ticketing or visitation

On site transport systems

Restricted movement to sensitive areas

Sign posts, information points and marked routes (give location, detailed description and condition, as well as type of information written on it)

Types of interpretation methods provided in the site

Other notes

Notes about the behavior of groups in the site:
