IUCN Conservation Outlook Assessment 2017 **(archived)**
Finalised on 09 November 2017

Please note: this is an archived Conservation Outlook Assessment for Hierapolis-Pamukkale. To access the most up-to-date Conservation Outlook Assessment for this site, please visit https://www.worldheritageoutlook.iucn.org.

Hierapolis-Pamukkale

SITE INFORMATION

Country:
Turkey
Inscribed in: 1988
Criteria:
(iii) (iv) (vii)

Site description:
Deriving from springs in a cliff almost 200 m high overlooking the plain, calcite-laden waters have created at Pamukkale (Cotton Palace) an unreal landscape, made up of mineral forests, petrified waterfalls and a series of terraced basins. At the end of the 2nd century B.C. the dynasty of the Attalids, the kings of Pergamon, established the thermal spa of Hierapolis. The ruins of the baths, temples and other Greek monuments can be seen at the site. © UNESCO

SUMMARY

2017 Conservation Outlook

Good with some concerns

The natural values of Hieropolis-Pamukkale, as well as its cultural attributes, caused a flood of tourists to visit the site which in turn stimulated the rapid growth of a tourist infrastructure. The diversion of spring water to feed hotel pools, pollution by sewage, mechanical damage to the stone and constant tourist bathing and littering in the pools diminished them and began to turn the travertine grey. Moreover, the thermal water flow that feed travertine has decreased compared to previous times. The encroaching hotel development was therefore pushed back and the commercial use of water came under control. As a consequence the quality of the travertine deposit is returning. However, high tourist numbers are still an issue which requires careful management for which the current level of staffing is insufficient. There are some concerns about the clarity regarding the responsibilities of different authorities and lack of cooperation between them. There is an urgent need to establish a management unit with representatives from all relevant agencies. There is also a need of revision of the current management plan with integration of social, cultural, economic and natural values at larger landscape level.

Current state and trend of VALUES

Low Concern
Trend: Data Deficient

The natural values of Hieropolis-Pamukkale are confined to the beauty of the calcite-laden waters which over millennia have created a snow-white landscape of petrified waterfalls. The problem of over-use of this site by tourists was noted already at the time of inscription of the site. The diversion of spring water to feed hotel pools, pollution by sewage, mechanical damage to the stone and constant tourist bathing and littering in the pools diminished them and began to turn the travertine grey. Moreover, the thermal water flow that feed travertine has decreased as compared to previous times. If flow rate of water decreases further

due to natural or human factors (illegal drilling, etc.) the future of travertine would be in danger just as in past years. The encroaching hotel development was therefore pushed back from the edges of the natural formations and the commercial use of water came under control. Bathing in the pools was prohibited and access limited to certain paths by unshod visitors only. As a consequence the quality of the travertine deposit is returning.

Overall THREATS

Low Threat

The main current threat to the site’s integrity is from tourism infrastructure development and high tourist numbers, as well as diversion of spring water, and domestic sewage. Tourist numbers have been declining in the recent years and threats from tourism infrastructure to spring water and natural assets have been reduced thanks to measures undertaken in line with the management plan. However, there is a need for better planning with regards to tourism management.

Overall PROTECTION and MANAGEMENT

Some Concern

Since the inscription of the site in 1988 the main results are the management plan for protection of the landscape and environment and the demolition of hotels built near the archaeological area. The site is under the supervision of a steering group since 2000 but there is no site manager/coordinator. Overall protection and management of the site are effective. However, there are some concerns with regard to management structure, levels of staffing, staff training and development, education and interpretation programs and particularly tourism management. Both the archaeological and cascade areas have many thousand visitors each year but there are too few guards and enforcement of regulations is weak. There are two authorities responsible for the management of site and there are some concerns and uncertainties regarding their responsibilities. The Ministry of Culture and Tourism is responsible for activities to control tourism movement, income, archaeological excavations and daily management of the heritage site. There is Museum Directorate in the park which is responsible for the archaeological site including travertine terraces and there is a very experienced Director. However, management of natural assets are not their responsibility. General Directorate of Protection of Natural Assets are

responsible for environmental planning, and management and monitoring of natural assets. However, there is neither a representative body nor a management unit at the park.

FULL ASSESSMENT

Description of values

Values

World Heritage values

- **Visually stunning landscape of calcite deposits forming white travertine terraces**
  Criterion:(vii)

  Calcite-laden waters from hot springs, emerging from a cliff almost 200 metres high overlooking the plain, have created a visually stunning landscape at Pamukkale. These mineralized waters have generated a series of petrified waterfalls, stalactites and pools with step-like terraces, some of which are less than a meter in height while others are as high as six meters. Fresh deposits of calcium carbonate give these formations a dazzling white coating. The Turkish name Pamukkale, meaning “cotton castle”, is derived from this striking landscape (SoOUV, 2013)

Other important biodiversity values

- **Plant endemism**

  According to Pamukkale Special Environmental Protection Area biodiversity report (2010), there are 29 endemic plants (3 LR(nt), 2 VU, 20 LR (Lc), 1 DD, 2 EN and 1 LR (cd)).

Assessment information

Threats

Current Threats

Low Threat

The main current threat to the site’s integrity is from tourism infrastructure development and high tourist numbers, as well as diversion of spring water, and domestic sewage.

Pamukkale is one of the top ten visited tourisim destination among the archaeological sites in Turkey (2015 DÖSİMM tourism statistics). According to the archaeological site statistics in 2014 there were 1,874,657 visitors and in 2015 there were 1,731,271 visitors in Hierapolis. However in 2016 this numberdecreased to 974,508. This shows and overall a decline in tourist numbers in the recent years. Threats from tourism infrastructure to spring water and natural assets have been reduces thanks to measures taken in line with the management plan.

► Tourism/ Recreation Areas

Low Threat
Outside site

Tourism infrastructure has been built by both the municipality of Denizli and by private enterprise and includes hotels, motels and swimming pools. (UNEP-WCMC Fact Sheet, 2011). Threats from infrastructure werehave been reduced thanks to several measures, incuding demolition of hotels inside the park in line with the management plan. that Currently there are no threats to the travertine terraces caused by tourism infrastructure (Consultation with park staff, 2017).

► Dams/ Water Management or Use

Low Threat

Inside site, extent of threat not known

It was stated in the project report for "Determination of biodiversity of Pamukkale Special Environmental Protection Area" in 2010 that water regulation and flow was negatively affected by use of water at tourism locations and agriculture. Agricultural lands within the upper basin may affect and pollute the water (Consultation with park staff, 2017). Since there is no research and landscape level planning, the impacts at upper basins are not known. The main pollution is at the archaeological pool due to high tourist numbers.

► Water Pollution

Low Threat
Inside site, extent of threat not known
Outside site

Pollution from sewage and constant tourist bathing in natural pools was reported as a threat at the time of inscription. (IUCN , 1988). Organic pollution at travertine ponds due to tourism and agriculture has also been reported more recently (Cinar Muhendislik 2010).

► Dams/ Water Management or Use

Low Threat
Outside site

Water regulation in the site has improved in recent years due to strict measures to control tourism infrastructure (hotels etc.). Calcite deposits have been recovering and there is enough water discharge for travertine terraces (Consultation with park staff, 2017)

► Tourism/ visitors/ recreation

Low Threat
Inside site, extent of threat not known
Outside site

High tourist numbers (more than one million tourists in some years) constitute a serious threat to the property (UNESCO 2006). However, number of tourists has been declining in recent years. Pamukkale is the one of the top-ten visited tourism destination among the archaeological sites in Turkey (2015 DÖSİMM tourism statistics). According to archaeological site statistics

in 2014 there were 1,874,657 visitors and in 2015 there were 1,731,271 visitors in Hierapolis. However in 2016 this number decreased to 974,508. This shows and overall a decline in tourist numbers in the recent years. There is still some impact due to unplanned and /uncontrolled tourism. The management plan needs revision and an integrated plan should be prepared which include would considers tourism, nature conservation, socio-economic and rural development as a whole (Consultation with park staff, 2017).
At travertine terraces there is controlled movement through pedestrian roads. There is only a small part where tourists can enter with bare foot which is controlled by site rangers (private guards).

Potential Threats

Low Threat

Earthquakes have been identified as a potential threat the travertine terraces; however, it is considered as a low threat.

► Earthquakes/ Tsunamis

Low Threat
Inside site, extent of threat not known

Earthquakes are the only identified potentials threat to travertine terraces (IUCN Advisory Body Evaluation, 1988).

In 2017, earthquakes in southern part of Aegean Sea have increased but no impacts have been recorded in Denizli Province. The quantity of water within the property is mostly affected by earth movements. The earth movements may change the flow of water within the limestone system. At the moment, there is adequate water for travertine terraces (Consultation with park staff, 2017).

Protection and management

Assessing Protection and Management

► Relationships with local people

Some Concern

The Turkey Community Development and Heritage Project (2000) encompassed a socio-economic assessment, the resettlement of squatters on the site, and an association of local stakeholders all to be coordinated by the University of Pamukkale (IUCN, 2002; IUCN/WCMC, May 2011). For an increased brand image in Pamukkale there is a need of increased collaboration among stakeholders. There should be social, economic and cultural research to define the integration of local culture in management. Local people should receive more benefits from the tourism by increasing the quality of their services and defining quality standards. The benefits from tourism are mostly received by large companies and there is less income generation for local people.

► Legal framework

Some Concern

The site was declared a “First Degree Archaeological Site”. In 1990 the site and the related protected zone were approved as a “Special Environment Protection Area.” according to the Environment Law. The Pamukkale Conservation Plan was approved and is carried out since 1992. Protection arrangements are considered highly effective. (SOC 2006 Periodic Report Cycle 1).
Recent changes in the legislation (Nature and Biodiversity Conservation Draft Law, change in the directive concerning the identification and registration of protected sites, changes in Coastal Law bylaws, EIA Bylaw change, etc,.) all are regulations that would weaken the protected sites and open them up for usage. (Confidential consultation, 2013).
In May 2017 the Draft Law was submitted to the chairman of the Parliament to be discussed in commission. A number of stakeholders continue to express concerns regarding the proposed Law.
For the management of the site, there are several legislations in force for archaeological site, and protection and management of the environment; however, there is little harmonization between the two (IUCN Consultation, 2017).

► Enforcement

Data Deficient

Data deficient

► Integration into regional and national planning systems

Some Concern

There is an environmental plan which was approved in 2011 for three provinces including Denizli Province. There is also a 1/25000 scale environmental plan but it doesn’t include the heritage site. There is a need to revise the management plan at the landscape level.

► Management system

Some Concern

Hierapolis-Pamukkale is legally protected through national conservation legislation, but there is no specific planning legislation to protect World Heritage properties. The responsibility for managing and conserving the property is shared by the national Government (the Ministry of Culture and Tourism and the Ministry of Environment and Urbanization), local administration (Denizli Provincial Special Administration) and several State institutions. The approval of the Regional Conservation Council and Provincial Directorate for Environment and Urbanism has to be obtained for physical interventions and functional changes in the site (SoOUV, 2013). There is an environmental plan which was approved in 2011 for three provinces including Denizli Province. There is also a 1/25000 scale environmental plan but it doesn’t include the heritage site. There is a need to revise the management plan at the landscape level. The main concern is the lack of a single management unit at the site with representation from all relevant stakeholders. At the moment , the local museum directorate is responsible for the management of the site. In the past during management planning, an integrated management unit was defined, but has never been established. Other two bodies involved in the management of the site are the Protection Committee of the Ministry of Culture and Tourism and the Regional Commission of Ministry of Environment and Urbanism. Both work together and include representatives from each Ministry’s local authorities. Decisions taken by the Protection Committee are presented at the Regional Committee for a final decision.

► Management effectiveness

Some Concern

A number of issues impede effective management of the site, including lack of clarity among different authorities with regards to the responsibility for the site and absence of a single management unit for the entire site with an adequate number of staff.

► Implementation of Committee decisions and recommendations

Mostly Effective

IUCN has drawn the attention of the Bureau, at its fourteenth session, to the problem of over-use of this site by tourists. Subsequently the Ministry of Culture of Turkey organized an international workshop from 1-3 July 1991 to discuss the “Preservation and Management Plan” for the site. (SOC 1991). Measures have been taken, in line with the management plan, to ensure better control of tourism activities (IUCN Consultation, 2017).

► Boundaries

Mostly Effective

Status of boundaries of the site considered adequate. No buffer zone has been defined. (Periodic Reporting Cycle 1).

► Sustainable finance

Mostly Effective

Major funding comes from entrance fees, Authority of Protected Special Areas, Italian Archaeological Mission for excavation, UNDP, and WB. Funding for management is insufficient, whereas funding for protection and conservation is adequate (Periodic Reporting Cycle 1).
There is annual funding from the Government but there should be a share from tourism income to ensure a better management (to ensure a better management (

► Staff training and development

Some Concern

The 1992 Pamukkale Management plan proposed a staff consisting of a

superintendent, administrative officer, chief of visitor services and chief of maintenance (Periodic Reporting Cycle 1). Current staff numbers are considered insufficient (IUCN Consultation, 2017).

▶ Sustainable use

Data Deficient

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▶ Education and interpretation programs

Some Concern

Interpretation of the site is not adequate as are guiding, information panels, and orientation. Communications and health facilities are totally lacking. (Periodic Reporting Cycle 1).

▶ Tourism and visitation management

Some Concern

Threats from infrastructure have been reduced thanks to several measures, including demolition of hotels inside the park in line with the management plan. Currently there are no threats to the travertine terraces caused by tourism infrastructure (Consultation with park staff, 2017). However, there is a need for a revision of the management plan and planned tourism at regional level.

▶ Monitoring

Some Concern

No formal monitoring programme.
(SOC 2006 Periodic Reporting Cycle 1). A project-funded monitoring of algal flora at travertine terraces and thermal spings was undertaken between 2010-2011 (Çınar Mühendislik 2010). General Directorate of Protection of Natural Assets, through private sector engagement, had monitored water quality and treatment facilities between 2012-2015 (www.csb.gov.tr).

▶ Research

Mostly Effective

Recent Turkish investigations have proved the role of cynobacteria in the

precipitation of the travertine (Zedef et al., 2003; IUCN/WCMC Data Sheets April, May 2011). No research was conducted in recent years.

Overall assessment of protection and management

Some Concern

Since the inscription of the site in 1988 the main results are the management plan for protection of the landscape and environment and the demolition of hotels built near the archaeological area. The site is under the supervision of a steering group since 2000 but there is no site manager/coordinator. Overall protection and management of the site are effective. However, there are some concerns with regard to management structure, levels of staffing, staff training and development, education and interpretation programs and particularly tourism management. Both the archaeological and cascade areas have many thousand visitors each year but there are too few guards and enforcement of regulations is weak. There are two authorities responsible for the management of site and there are some concerns and uncertainties regarding their responsibilities. The Ministry of Culture and Tourism is responsible for activities to control tourism movement, income, archaeological excavations and daily management of the heritage site. There is Museum Directorate in the park which is responsible for the archaeological site including travertine terraces and there is a very experienced Director. However, management of natural assets are not their responsibility. General Directorate of Protection of Natural Assets are responsible for environmental planning, and management and monitoring of natural assets. However, there is neither a representative body nor a management unit at the park.

▶ Assessment of the effectiveness of protection and management in addressing threats outside the site

Data Deficient

According to Gavra (2012), there are several managerial problems at heritage sites of Turkey. There are listed as 1) lack of adequate and effective planning, 2) lack of buffer zone outside, 3) lack of awareness among local people, 4) inadequate administrative structure and appropriate staff, 5) communication of and cooperation with stakeholders and 6) inadequate financial problems (Gavra 2012).

State and trend of values

Assessing the current state and trend of values

World Heritage values

▶ **Visually stunning landscape of calcite deposits forming white travertine terraces**

Low Concern
Trend:Stable

Both the archaeological and cascade areas have many thousand visitors each year but there have been too few guards and too little enforcement of regulations. In 1990 the degradation was obvious during the evaluation mission. The diversion of spring water to feed hotel pools, pollution by sewage, mechanical damage to the stone and constant tourist bathing and littering in the pools diminished them and began to turn the travertine grey (Dilsiz, 2002).
Moreover, the thermal water flow that feed travertine has decreased compared to previous times. If flow rate of water decreases further due to natural or human factors (illegal drilling, etc.) the future of travertine would be in danger just as in past years. (Somuncu, Yiğit and Yoldaş, 2008).
The encroaching hotel development was therefore pushed back from the edges of the natural formations and the commercial use of water came under control. Bathing in the pools was prohibited and access limited to certain paths by unshod visitors only. As a consequence the quality of the travertine deposit is returning.
(IUCN/WCMC, May 2011)

Summary of the Values

▶ **Assessment of the current state and trend of World Heritage values**

Low Concern

Trend: Data Deficient

The natural values of Hieropolis-Pamukkale are confined to the beauty of the

calcite-laden waters which over millennia have created a snow-white landscape of petrified waterfalls. The problem of over-use of this site by tourists was noted already at the time of inscription of the site. The diversion of spring water to feed hotel pools, pollution by sewage, mechanical damage to the stone and constant tourist bathing and littering in the pools diminished them and began to turn the travertine grey. Moreover, the thermal water flow that feed travertine has decreased as compared to previous times. If flow rate of water decreases further due to natural or human factors (illegal drilling, etc.) the future of travertine would be in danger just as in past years. The encroaching hotel development was therefore pushed back from the edges of the natural formations and the commercial use of water came under control. Bathing in the pools was prohibited and access limited to certain paths by unshod visitors only. As a consequence the quality of the travertine deposit is returning.

► **Assessment of the current state and trend of other important biodiversity values**

Low Concern

Trend: Stable

Under Pamukkale Special Environmental Protection Area Biological Diversity Determination Project, an assessment was conducted in 2010. According to the project report there are 29 endemic plants (3 LR(nt), 2 VU, 20 LR (Lc), 1 DD, 2 EN and 1 LR (cd)) (Cinar Muhendislik 2010).

Additional information

Benefits

Understanding Benefits

► **Wilderness and iconic features**

This site is exceptional because of its calcite-laden waters that have created a snow-white landscape of petrified waterfalls, step-terraced pools and stalactites on a hillside cliff almost 200 m high above a plain. (IUCN/WCMC

Data Sheets, May 2011).

▶ **Outdoor recreation and tourism**

More than one million tourists visit Hierapolis-Pamukkale every year and provide an important source of income for communities in and around the site as well as the global tourism industry. In response to the inflow of visitors, tourist infrastructure has been built by both the municipality of Denizli and by private enterprise and includes hotels, motels and swimming pools.

▶ **Water provision (importance for water quantity and quality)**

There are 17 thermal water sources with temperatures ranging from 35-100 oC. The geothermal source has been irresponsibly used by houses, motels and hotels without considering re-injection for years. In order to get benefit in accordance to its natural balance, General Directorate of Protection of Natural Assets, Denizli Governorship and General Directorate of Mineral Research and Exploration have been working in coordination. The main utilization of geothermal energy in SEPAs is for domestic heating, greenhouses, spas and thermal resorts (Taşeli 2016). The geothermal quality of water inside the area is not enough for producing energy.

Summary of benefits

By conserving the superlative natural landscape of Hierapolis-Pamukkale the communities in and around the site as well as the global tourism industry benefit from the income provided by over one million tourists a year. Landscape level analysis and planning is required to define benefits and their beneficiaries in order to manage the flow and prevent unsustainable use.

Projects

Compilation of active conservation projects

№	Organization/ individuals	Project duration	Brief description of Active Projects

1	Ministry of Environment and Urbanization General Directorate for Protection of Natural Assets	Management of Special Environment Protection Area
2	Pamukkale landscaping project in 2016	Denizli Municipality
3	Pamukkale University	They have been involved in a joint project with the Government of Japan about earthquakes. There are also other projects of the University about the travertines.

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