IUCN Conservation Outlook Assessment 2017 **(archived)**
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Please note: this is an archived Conservation Outlook Assessment for Jeju Volcanic Island and Lava Tubes. To access the most up-to-date Conservation Outlook Assessment for this site, please visit https://www.worldheritageoutlook.iucn.org.

Jeju Volcanic Island and Lava Tubes

SITE INFORMATION

Country:
Republic of Korea (South Korea)
Inscribed in: 2007
Criteria:
(vii) (viii)

Site description:
Jeju Volcanic Island and Lava Tubes together comprise three sites that make up 18,846 ha. It includes Geomunoreum, regarded as the finest lava tube system of caves anywhere, with its multicoloured carbonate roofs and floors, and dark-coloured lava walls; the fortress-like Seongsan Ilchulbong tuff cone, rising out of the ocean, a dramatic landscape; and Mount Halla, the highest in Korea, with its waterfalls, multi-shaped rock formations, and lake-filled crater. The site, of outstanding aesthetic beauty, also bears testimony to the history of the planet, its features and processes. © UNESCO

SUMMARY

2017 Conservation Outlook

Good

The Outstanding Universal Value of the property is well recognized, is under no immediate threat and generally effectively managed and protected. Inscription of the property has had a very positive outcome in raising awareness of conservation and the World Heritage Convention among the general public and key stakeholders. The property has brought considerable benefits to the local community through employment and through promotion of tourism, which is a major generator of revenue in the Province. Key threats include further increases in visitor numbers and in development of tourist infrastructure which will require vigilance and continual monitoring to avoid any undesirable impacts. Recent studies on groundwater are showing this to be a potentially concerning threat given the geoheritage values of the property and sensitivity to geohydrological changes which may be exacerbated by climate change and sea level rise. The property is pioneering better integrated approaches with other internationally designated areas, four of which overlap on Jeju, and a commendable holistic approach to island management is evident from the authorities. There is still considerable potential for strengthening the protection of the property through further purchases of private lands, and there is scope for extending the property to include more volcanic features and to protect the significant biodiversity values.

Current state and trend of VALUES

Good
Trend: Stable

There remain no immediate concerns with the current state and trend of the natural values and attributes of the property, which are generally well protected under the current management regime. Developments in the buffer zone need monitoring to avoid any possible negative effects on the property. Priority attention will be needed to carefully monitor the impacts of high visitation and

any adverse impacts from changes to groundwater.

Overall THREATS

Low Threat

Overall, the level of both actual and potential threats to the property remains low. Management authorities are well aware of the threats, which are being effectively prevented or mitigated. High tourism interest remains a potentially significant problem for property and some of its delicate lava tube systems and will need effective management. Declining levels and quality of groundwater could potentially impact on the property’s geohydrology.

Overall PROTECTION and MANAGEMENT

Mostly Effective

Overall protection and management of the property are satisfactory and at present the values of the property do not appear to be threatened. Commendable efforts are being made to manage Jeju Island in a holistic manner to balance development, use and conservation. Matters giving some concern are the challenges of managing increasing tourism demand in small very popular sites and finding a feasible funding model to support the property in the long term.

FULL ASSESSMENT

Description of values

Values

World Heritage values

- **An outstanding shield volcano with an extensive lava tube system**
  Criterion:(vii)

  The Geomunoreum lava tube system is regarded as the finest such cave system in the world, displaying a unique spectacle of multi-coloured carbonate decorations adorning the roofs and floors, and dark-coloured lava walls partially covered by a mural of carbonate deposits. The fortress-like Seongsan Ilchulbong tuff cone, with its near-vertical walls rising from the ocean, is a dramatic landscape feature. Mount Halla, with its array of textures and colours through the changing seasons, waterfalls, multi-shaped rock formations and columnar-jointed cliffs, and the towering summit with its lake-filled crater, further adds to the scenic and aesthetic appeal. (SoOUV, 2007 and Periodic Reporting Form, 2010)

- **One of few shield volcanoes in the world on a stationary continental crust plate, with the world’s best developed system of lava tubes**
  Criterion:(viii)

  The Jeju property, centred on the Mount Halla volcanic complex, is of outstanding importance in protecting one of the few large shield volcanoes in the world built by fissure eruption on a stationary continental crust plate. The volcano is distinguished by the most impressive and significant series of protected lava tube caves in the world – the Geomunoreum system - which includes a spectacular array of secondary carbonate speleothems (stalactites, stalagmites and other decorations) with an abundance and

diversity unknown elsewhere within lava caves. The Seongsan Ilchulbong tuff cone has exceptional exposures of its structural and sedimentological characteristics, making it a world-class location for understanding Surtseyan-type volcanic eruptions. (SoOUV, 2007 and Periodic Reporting Form, 2010)

Other important biodiversity values

▶ **Regionally significant biodiversity including endemic and rare species.**

The Jeju Island UNESCO/MAB Biosphere Reserve, which is included in the property, recognizes regionally significant biodiversity values, including species endemic to Jeju Island and Korea, and species at their northern and southern distributional limits. Four of 20 mammal spp. and 24 of 1,600 insect spp. are Jeju endemics. Rare cave spiders occur.(IUCN Evaluation, 2007)

Assessment information

Threats

Current Threats

Low Threat

Most of the identified threats are well recognized by the authorities, are documented in the management plan and are being managed effectively at present. Thus, the overall current threat for the property remains low.

▶ **Utility / Service Lines**

Low Threat
Outside site

Towers have been removed in the property but remain in the buffer zone (IUCN Evaluation, 2007). Some visual impacts from communication

infrastructure.

► Tourism/ Recreation Areas

Low Threat
Outside site

Hotels have been removed from the property but development is occurring in the buffer zone (IUCN Evaluation, 2007). Jeju Island is a popular tourism destination and there is generally high development pressure on the island due to increased visitors and mainland immigrants (many mainland Koreans retire to the warmer climate of Jeju). Demand is increasing for land, urban areas, and transport infrastructure (Lee at al., 2014).

► Roads/ Railroads

Low Threat
Inside site, localised(<5%)
Outside site

Many roads have been removed from core zones, or closed and/or converted into trails. Some roads have been upgraded and new improved roading is planned and budgeted, especially to minimize any vibration from traffic that might affect the lava tubes (IUCN, 2007).

► Invasive Non-Native/ Alien Species

Very Low Threat
Inside site, localised(<5%)

Some exotics are present in the Hallasan National Park within the property.

► Agricultural effluents

Very Low Threat
Inside site, localised(<5%)
Outside site

Some instances of fertilizers being applied to agricultural land inside and outside the property. There are no known impacts at present and only about 15% of the land above the caves is in private ownership and not all this is being used for gardening and farming purposes. At the time of inscription the private lands were planned to be progressively purchased up to 2013, retired from such uses and restored to natural vegetation cover (IUCN Evaluation,

2007). Most of private land have now been purchased and restored to original natural conditions (IUCN Consultation, 2017).

► Tourism/ visitors/ recreation

High Threat
Inside site, scattered(5-15%)
Outside site

Overall tourism numbers are increasing on Jeju from negligible numbers in 1996 to nearly 11 million visitors in 2013. User density levels of 16.2 persons/km2/day have been estimated (Lee et al., 2014). Some volcanic features and caves are vulnerable to trampling damage, and cave speleothems are very delicate and readily damaged unless carefully protected. The caves with delicate carbonate speleothems are not open to public, thus they are well protected. At the time of inscription the property already received significant visitation (2.3m people in 2005) (IUCN Evaluation, 2007) and tourist numbers have since increased. Especially, the maximum number of visitors as well as visitor pressure on the Manjang Cave and the Seongsan Ilchulbong Tuff Cone needs to be monitored. Overcrowding and impacts such as excessive trampling and erosion of soils and damage to sensitive ground and geological features (especially speleothems in caves) could occur. Careful monitoring and management are required.

► War, Civil Unrest/ Military Exercises

Data Deficient
Outside site

A locally controversial naval base was finally opened in Dec 2015. To deliver economic benefit to the island it was developed as a joint military-civilian facility that also caters for cruise boats (The National Interest - Euan Graham, 2016). The construction has no direct impact on the WH property (IUCN Consultation, 2017). The changed operation to accommodate cruise boats may bring additional visitor pressure to bear on the island and the property.

Potential Threats

Low Threat

All the potential threats are recognized and are being addressed in so far as possible. Some such as a volcanic eruption are only a very remote chance of

occurring. However, research into the groundwater dynamics shows declining groundwater levels and condition which may threaten the geohydrology of the property. High tourism interest remains a potentially significant threat to the property and some of its delicate lava tube systems. The new naval and potential cruise boat facility at Gangjeong Village on the south Jeju coast could also contribute to additional visitor pressure. The effective management of tourism will continue to be a priority.

► Volcanoes

Very Low Threat
Inside site, throughout(>50%)
Outside site

Jeju volcano is not extinct but probability of re-eruption is exceptionally low.

► Dams/ Water Management or Use

Low Threat
Inside site, throughout(>50%)
Outside site

Research in 2012 reveals increasing demand for groundwater extraction thereby reducing quantities. There is also deterioration in quality due to seawater intrusion and other contaminants (Choi and Lee, 2012; Lee at al., 2014). There is no evidence to date to show that changes in groundwater have adversely impacted values but these changes could have potentially serious impacts on the geohydrology of the property.

Protection and management

Assessing Protection and Management

► Relationships with local people

Highly Effective

At the time of inscription, there was a high degree of public awareness and support for World Heritage. Local communities directly contribute to some decisions relating to management and indigenous peoples have some input into discussions relating to management but no direct role. (IUCN Evaluation,

2007; Periodic Reporting Form, 2010). The globally unique overlap of four international designations on Jeju Island (UNESCO World Heritage, Biosphere Reserve and Global Geopark; and a Ramsar site) has significantly raised conservation awareness and bolstered a more holistic approach to balancing conservation and development on the island.

▶ Legal framework

Highly Effective

A strong statutory and regulatory basis exists at both national and provincial level for strict legal protection of all sites in the property (Nomination, 2006; IUCN Evaluation 2007). Manjanggul lava tube, Seongsan Ilchulbong tuff cone and Hallasan National Park became Global Geopark sites in 2010 (Periodic Reporting Form, 2010).

▶ Enforcement

Some Concern

The property has several smaller and sensitive components which receive substantial visitation and this is the most significant challenge in managing the property. It will be essential that sufficient capacity and funding is maintained in the long term (IUCN Evaluation, 2007).

▶ Integration into regional and national planning systems

Highly Effective

The management plan for the property has government approval and is legally binding on national and provincial governments and all administering authorities. The widely consulted plan also reflects the consensus view of national and local institutions and communities. (IUCN Evaluation, 2007; Periodic Reporting Form, 2010). Commendable efforts are being made to manage Jeju Island in a holistic manner. At this time, the island is the only place in the world subject to four overlapping international designations. Efforts are ongoing to better harmonize policy, planning and management practice to achieve more comprehensive and integrated management strategies. (Schaaf and Clamote Rodrigues, 2016).

▶ Management system

Mostly Effective

Management policies, provisions and plans are exemplary. A General Plan for Jeju World Natural Heritage Conservation and Utilization was set up by the Province in 2008.The property management plan is due for revision (IUCN Evaluation, 2017).

► Management effectiveness

Mostly Effective

In two Protected Area Management Effectiveness Evaluations for Korea the Hallasan National Park was deemed to be well managed, in fact at a higher standard than many mainland parks in Korea due to the higher attention given by Jeju Province who administer the park (KNPS/MoE, 2009; Hockings and Shadie 2016 unpub). IUCN’s evaluation of the nomination also found management to be mostly effective (IUCN Evaluation, 2007). Apart from the show cave section of Manjang, there are strict access controls on all caves in the Geomun system and entry to Yongcheon Cave is very tightly controlled (Brush, 2010)

► Implementation of Committee decisions and recommendations

Data Deficient

Management of visitors and tourism infrastructure is generally satisfactory. Improvements in management of some agricultural activities in the buffer zone have been achieved through new regulations. No obvious consideration has been given to management of significant volcanic features outside the property, but there has been research to improve knowledge of biodiversity values. The potential for extension of the property to include other significant volcanic features and lava tubes does not appear to have been given serious consideration.

► Boundaries

Mostly Effective

Boundaries of the existing property and buffer zone are adequate (IUCN, 2007), but there remains potential for adding further areas to the property to include more tuff cones and lava tubes.

► Sustainable finance

Mostly Effective

Substantial investment was made in the property at the time of nomination and following inscription (IUCN Evaluation, 2017). Korea's input to Periodic Reporting conceded that the available annual budget was acceptable but could be further increased to fully meet the current management needs. (Periodic Reporting Form, 2010). Efforts are being made to develop a better financial model to sustain the property in the context of other internationally designated areas on Jeju. (Lee et al., 2014).

► Staff training and development

Mostly Effective

Week-long educational and training programs to foster management skills were reported as part of the periodic reporting of 2010. At that time, some 230 managers had been trained and the number of managers was expected to increase year by year because of the educational/training programs. (Periodic Reporting Form, 2010).

► Sustainable use

Some Concern

Groundwater extraction, whilst not directly a use of the property, has the potential to indirectly threaten underground systems. Korea's "Groundwater Law" (1994) regulates all kinds of groundwater development activities on the Korean mainland. There is a "Special Law of the Jeju Special Self-Governing Province" established in 2006 which controls more strictly all groundwater development activities on the island. The Jeju Government is also harvesting rainwater and artificially recharging groundwater through a system of wells. Studies have also modeled the groundwater dynamics of the island (Park et al., 2013). Despite the law and these measures, groundwater use has continuously increased due to increasing freshwater demand. Groundwater quality has also deteriorated due to seawater intrusion and other contaminants (Lee and Choi, 2012).

► Education and interpretation programs

Highly Effective

The World Heritage logo is displayed in many localities and is readily visible to visitors. The World Heritage status has been an important influence on public education, information and awareness building activities. The Jeju World Natural Heritage Centre constructed in 2012 has greatly improved education and interpretation programs. (Periodic Reporting Form, 2010) and is a world class centre. As noted above the multiple international designations for Jeju have increased public environmental awareness.

► Tourism and visitation management

Some Concern

Tourism numbers immediately following inscription were not reported to increase dramatically (Periodic Reporting Form, 2010) however, visitor numbers were already high for often small areas (IUCN Evaluation, 2007) and numbers have increased more recently. Overall visitation to Jeju has risen dramatically since 1996 (Lee et al., 2014). There is only limited co-operation with the tourism industry. The number of visitors is monitored daily. Carrying capacity surveys have been conducted to determine improved methods for managing the large numbers of visitors on Hallasan. (Periodic Reporting Form, 2010). There is significant overcrowding in some areas of the property.

► Monitoring

Mostly Effective

Since the inscription a comprehensive monitoring program has been conducted and regular monitoring reports produced. Values and key indicators have been defined but monitoring the status of indicators could be intensified. (Periodic Reporting Form, 2010). Remote sensing [DEM (Digital Elevation Mapping) by LiDAR (Light Detection and Ranging) is being used to monitor changes to natural systems (Lee et al., 2014).

► Research

Mostly Effective

Knowledge of the values and attributes of the property are mostly sufficient but there are gaps. There is a comprehensive, integrated program of research, covering all sites in the property, and results have been published

in scientific journals and on the web. (Periodic Reporting Form, 2010).

Overall assessment of protection and management

Mostly Effective

Overall protection and management of the property are satisfactory and at present the values of the property do not appear to be threatened. Commendable efforts are being made to manage Jeju Island in a holistic manner to balance development, use and conservation. Matters giving some concern are the challenges of managing increasing tourism demand in small very popular sites and finding a feasible funding model to support the property in the long term.

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

Some Concern

High levels of public awareness were noted in the IUCN evaluation of the nominated property in 2007. There is evidence that this continues to be the case and the central importance of the World Heritage designation to Jeju Island as a whole is strongly emphasized in planning, development investment. A holistic approach is clearly evident from the Jeju Provincial Government which has embraced the multiple international designations that overlap on the island. There are nonetheless concerns about external threats such as groundwater dynamics, increasing tourism demand and infrastructure and resultant pressure on the smaller and more delicate areas of the property (Geomunoreum lava tube system, Seongsan Ilchulbong tuff cone and scenic values of the Hallasan National Park).

▶ Best practice examples

At the time of the nomination, the State Party instigated a hugely successful and influential national World Heritage awareness-raising and promotional campaign led by politicians, and involving government officials, the business community and the media, which is an excellent model for involving civil society in the World Heritage Convention.
The Stare Party has negotiated a twinning arrangement with the Tongariro NP World Heritage property in New Zealand and the Hawaii Volcanoes

National Park in the USA (Jeju WH Management Bureau and Hawaii Volcanoes National Park, 2008).
Jeju Island is currently the only site in the world where all four international, area-based conservation designations overlap in the same location. One of the biggest benefits of Jeju Island being a multi-internationally designated area with four overlapping international designations is the level of the local communities' awareness of conservation and sustainability. (Schaaf and Clamote Rodrigues, 2016). This has translated into high levels of active volunteer engagement in conservation, a heightened awareness of any environmentally threatening developments and better tourism co-branding of the property.

State and trend of values

Assessing the current state and trend of values

World Heritage values

▶ **An outstanding shield volcano with an extensive lava tube system**
Good
Trend:Stable

Since inscription in 2007 the high scenic and aesthetic values remain generally very well protected. Obtrusive impacts of hotels, roads, communication towers and transmission lines were removed from the property, though they do remain in the buffer zone.

▶ **One of few shield volcanoes in the world on a stationary continental crust plate, with the world's best developed system of lava tubes**
Good
Trend:Stable

Geological values and attributes are generally resilient and resistant to impacts and changes. Protection of the lava tubes and their delicate carbonate speleothems is a major task requiring constant monitoring and effective management intervention if necessary. The management regime is well designed and resourced to undertake this task and no problems have been reported to date. Potential impacts from growing tourist numbers and

changes to groundwater require vigilance.

Summary of the Values

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

Good

Trend: Stable

There remain no immediate concerns with the current state and trend of the natural values and attributes of the property, which are generally well protected under the current management regime. Developments in the buffer zone need monitoring to avoid any possible negative effects on the property. Priority attention will be needed to carefully monitor the impacts of high visitation and any adverse impacts from changes to groundwater.

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

Good

Trend: Stable

Regionally significant biodiversity, mainly located within Hallasan National Park, continues to be in good condition. The property’s World Heritage values are managed in an integrated way, mindful of the broader array of values in the protected areas.

Additional information

Benefits

Understanding Benefits

▶ **Importance for research**

Inscription of the Jeju World Heritage property has resulted in very positive outcomes for raising conservation awareness in the general public and

among key stakeholders. Interpretation and promotion of the property also contribute significantly to promotion of the World Heritage Convention. A comprehensive research program is conducted. The property is used extensively in education programs within the Jeju community.

► Outdoor recreation and tourism

Tourism is a major industry on Jeju Island and the property plays a central role in promoting tourist operations. Tourism provides extensive employment opportunities and is a very significant generator of revenue.

Summary of benefits

The site clearly has intrinsic biodiversity, geoheritage and ecosystem service benefits. The key benefit of the property, as far as Jeju residents and stakeholders are concerned, rests in its tourism and the flow-on economic value from this to the tourism sector. The property provides a natural and scenically attractive foundation for Jeju and contributes to the residential amenity of the entire island.

Projects

Compilation of active conservation projects

№	Organization/ individuals	Project duration	Brief description of Active Projects
1	SP, Jeju Province and property management authorities.		Construction of World Natural Heritage Centre in the property, nearing completion.
2	Property management authorities.		On-going research and monitoring programs and projects, including scientific publications.
3	Hallasan Preservation Centre, Hallasan Research Institute.		Five-year program for exotic species research and control/elimination.

Compilation of potential site needs

№	Site need title	Brief description of potential site needs	Support needed for following years

1	Study on geohydrology and groundwater links	Study to better understand the geohydrology of the property and groundwater dynamics required to sustain its values

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