

EUROPE / NORTH AMERICA

TEIDE NATIONAL PARK

SPAIN



---

## WORLD HERITAGE NOMINATION – IUCN TECHNICAL EVALUATION

### TEIDE NATIONAL PARK (SPAIN) – ID No. 1258

---

#### 1. DOCUMENTATION

- i) **Date nomination received by IUCN:** April 2006
- ii) **Additional information officially requested from and provided by the State Party:** IUCN requested supplementary information on 19 September 2006 before the IUCN Evaluation Mission. The State Party response was submitted on 21 November 2006, including responses to all the issues raised by IUCN.
- iii) **UNEP-WCMC Data Sheet:** 1 reference (nomination)
- iv) **Additional literature consulted:** Arana, V. and Carracedo, J.C. (1978). **Los Volcanes de las Islas Canarias**. Editorial Rueda, Madrid. Carracedo, J.C. et al. (2002). **Cenozoic volcanism II: the Canary Islands**. In: W. Gibbons and T. Moreno (eds.). *The Geology of Spain*. Geological Society Special Publication, London: 439-472. Day, S. and Carracedo, J.C. (2002). **Canary Islands (Classic Geology in Europe 4)**. Terra, Harpenden. Decker, R. and Decker, B.C. (1997). **Volcanoes**. W.H. Freeman, New York. Editors of Chambers (2005). **Chambers Book of Facts**. Chambers Harrup. Gill, R. and Thirlwall, M. (2003). **Tenerife (Geologists' Association Guide 49)**. Geological Society, London. IUCN (2005). **Geological World Heritage: A Global Framework**. IUCN. Ollier, C. (1988). **Volcanoes**. Blackwell, Oxford. Smithsonian National Museum of Natural History (2007). **Global Volcanism Program**. Accessed online: [www.volcano.si.edu/index.cfm](http://www.volcano.si.edu/index.cfm).
- v) **Consultations:** 14 external reviewers. Extensive consultations were undertaken during the field visit with: representatives of the Ministry of Culture and Directorate of Teide National Park, Joint Management Commission of the Canaries National Parks (Ministry of Environment and Canaries Government), Teide National Park Patronato, and Mayors and Residents' Associations of the areas covered by the park; tourism stakeholders including SPET Assoc. Guías de Turismo, TUI and ASHOTEL; geology and landscape experts; representatives of scientific institutions such as Universidad de La Laguna, Consejo Superior de Investigaciones Científicas, Instituto de Astrofísica de Canarias, and Observatorio Atmosférico de Izaña; representatives of NGOs including Amigos de la Tierra, Amigos de la UNESCO, ATAN, CICOP, Greenpeace, Seo Birdlife and WWF; and the School Council of Canaries.
- vi) **Field visit:** Bernard Smith, September – October 2006
- vii) **Date of IUCN approval of this report:** April 2007

#### 2. SUMMARY OF NATURAL VALUES

The nominated property comprises Teide National Park (TNP), which is situated on the island of Tenerife in the Autonomous Community of the Canary Islands, Spain. It covers 18,990 ha and spans an altitudinal range from 1,650 to 3,718 m above sea level. A buffer zone (Corona Forestal Natural Park) of 54,128 ha surrounds the nominated property.

The dominant feature of TNP is the Teide-Pico Viejo stratovolcano that, at 3,718 m, is the highest peak in Spain. The volcano stands at some 7,500 m above the ocean floor and is thus regarded as the world's third tallest volcanic structure. Seen from the sea, Teide has been renowned throughout the centuries as a navigational marker for its distinctive silhouette that seems to float above the 'Alizé' clouds.

Tenerife is composed of a complex of overlapping Miocene-Quaternary stratovolcanoes that have remained active into historical times. Examples of relatively recent volcanism include the Fasnía Volcano (1705) and the eruption of the parasitic 'Narices del Teide' (Teide's Nostrils, 1798). The older and more complex crater of Pico Viejo dates from the Pleistocene. The stratovolcano is located in the centre of a large depression known as Las Cañadas Caldera, which is delimited to the east, south and part of the west by abrupt escarpments of up to 650 m that display the geological history of the area along their 25 km length.

In the east the Las Cañadas escarpment comprises alternating layers of lava and explosion debris, followed by an arc of pumice deposits and, finally, outflow deposits. The landscape continues to develop through active erosion and deposition as exemplified by features such as the Corbata del Teide torrent and the talus slopes of the Las Cañadas wall. To the north and north-west of the

stratovolcano the wall of the caldera is absent apart from a limited escarpment at La Forteleza. This is considered by many to reflect the lateral collapse of a proto-volcano via massive and complex avalanche-like collapses in the direction of Icod and Oratava.

Between the base of the stratovolcano and the foot of the wall is an extensive field of lavas (including obsidian – volcanic glass) and recent pyroclastic material. This area also contains numerous medium and small forms including ridges, cones, craters, volcano fields, domes, fissures, blocks, needles, tubes, channels, badlands and lahars. The geology of TNP represents the entire range of the magmatic series, with a large amount and variety of fully differentiated acid (felsic / phonolitic) volcanic materials as well as basic (basaltic) materials.

The nominated property thus presents a complex assemblage of geological features and is noted for the variety of structures present and the processes they represent within a limited and accessible space. As such it is an important scientific resource that has provided and continues to provide excellent opportunities for researchers to study and understand the evolution of volcanic terrains in detail and earth history in general.

The physical isolation of an oceanic island and the high mountain environment combine to produce a complex biological environment with a high degree of adaptive radiation and endemism. High altitude means that Tenerife is one of the few volcanic islands to have a zonal ecosystem above the tree-line. These are the unique summit *retamar* (white broom scrub) and peak ecosystems. Together with the lower slopes of the mountain these provide, as in Hawaii, an archetypal ecological succession that was first recognized by Alexander von Humboldt and was instrumental in his development of the concept of 'geobiology'. The vascular flora of TNP comprises 220 taxa, of which 73 are endemic to the Canaries and 33 to Tenerife, including 16 taxa that are exclusive to TNP. The most characteristic endemics are the Codeso, Rosalillo de Cumber, Teide Flixweed, Teide Violet and Teide White Broom. TNP also contains three endemic species of reptiles: a lizard (*Gallotia galloti galloti*), a salamander (*Tarentola delalandii*) and a skink (*Chalcides viridanus viridanus*), and twenty bird and five bat species. TNP also displays high levels of endemism within invertebrate populations with 70 species that are exclusive to TNP.

### 3. COMPARISONS WITH OTHER AREAS

The Global Volcanism Program at the Smithsonian Institution notes the existence of some 1,546 volcanoes active since the start of the Holocene. Depending on counting method there are currently at least 454 and possibly 1,343 active volcanoes on earth with the majority found within the 'Pacific Rim of Fire'.

The geological processes that shaped (and continue to shape) TNP are the result of a combination of factors associated with intra-plate ocean island volcanism and the prolonged volcanic history of the island. Because of these conditions, the Canary Islands have a high diversity and variety of volcanic products, features, structures and eruptive processes. Geological expert reviewers have

emphasised the long history of evolution of TNP, the concentration of volcanic deposits and morphological features and structures, the unusual example of caldera formation processes involving massive landslides, and the unusual and diverse geochemical and magmatic evolution in an ocean-island setting as amongst the features of the nominated property that are both significant and distinctive in relation to other comparable sites. Although other islands in the Canary Islands archipelago contain significant features which rival those of TNP in value, it is in Tenerife, currently at the peak of its geological development, that these features are best represented. One other natural World Heritage property is inscribed in the Canary Islands: Garajonay National Park on La Gomera. The property is distinctly different to TNP and is listed on the basis of its unique Laurel forest community.

Volcanic systems are already well represented on the World Heritage List. Around 13 properties have been inscribed primarily for their volcanic values, making volcanic systems the best represented of the themes identified in IUCN's global theme study on Geological World Heritage, completed in 2005. The range of properties is diverse including Virunga National Park (Democratic Republic of the Congo), Sangay National Park (Ecuador), Tongariro National Park (New Zealand), Giant's Causeway and Causeway Coast (UK) and Yellowstone National Park (USA). It should also be noted that some volcanic properties have been inscribed solely for their aesthetic values (criterion vii) rather than geological values – most notably Kilimanjaro National Park (United Republic of Tanzania). There are a number of volcanic properties on the World Heritage List which are of greater scale compared to TNP, most notably the Volcanoes of Kamchatka property (Russian Federation) which far exceeds all other volcanic properties in the number and diversity of volcanoes included, but it, and a number of the other World Heritage properties, are located in an entirely different tectonic and landscape setting.

Direct comparisons may be made with the eight existing World Heritage properties that include volcanic features on island systems. These include the Hawaii Islands, Galapagos Islands, Aeolian Islands, Gough and Inaccessible Islands, Heard and McDonald Islands, Morne Trois Pitons and Pitons. Some of these contain stratovolcanoes, but none of these rivals the Mt Teide stratovolcano in its combination of size, complexity, age, depth of study and ongoing relevance to science. There are other intra-plate oceanic stratovolcanoes (e.g., Pico do Pico, Azores; Fogo, Cape Verde Islands) not included on the World Heritage List, but few are located on slow-moving or stationary lithosphere and TNP exceeds them in scale. The closest direct comparison in terms of intra-plate oceanic volcanoes is that between TNP and the Hawaii Volcanoes National Park. The latter contains shield volcanoes which exhibit volcanic eruptions involving the least evolved magmas of the intra-plate oceanic island magmatic series. On purely geological grounds, a strong case is made that, whilst both represent intra-plate volcanic complexes, Hawaii and Teide define the two ends of a spectrum in terms of development. From the relatively young, fast-moving, geologically simple islands of Hawaii, to the older, slower-moving, geologically complex and mature stratovolcano of Mt Teide.

The nominated property compares favourably to other World Heritage properties in relation to the scale and diversity of its geological and geomorphological features and its additional distinctive landscape values. Teide remains a scenically striking and remarkable landscape in some respects attributable to its barren slopes and spectacular volcanic features. Most striking of these is the Las Cañadas Caldera itself, but features such as the isolated pillar of Roque Cinchado when viewed against the profile of Mt Teide are equally iconic for most Spaniards, and many visitors. The park's high levels of visitation also provide supporting evidence of the draw of this visually spectacular landscape. In addition, local atmospheric conditions frequently create a unique visual dynamic, the 'sea of clouds' phenomenon that forms below the caldera. This creates a visual backdrop to the mountain, and also acts as a 'gateway' through which visitors must pass to arrive at the park, a natural phenomenon of exceptional beauty. The case for inscription is further supported by the long history of scientific investigation at the site and especially its importance in the development of modern geology and volcanology. TNP has attracted the interest of naturalists and geoscientists from all over the world, including pioneer work at the beginning of the 19th century by researchers such as Alexander von Humboldt, Leopold von Buch and Charles Lyell, who established basic concepts of geology and volcanology while studying this island.

In summary, although there are sites with comparable features, the diversity of volcanic features found in the nominated property and their impressive scale certainly place it in the category of other volcanic World Heritage properties. IUCN notes, however, the increasingly limited potential for further inscriptions of volcanic sites on the World Heritage List and has made recommendations on this issue in its evaluation of Jeju Volcanic Island and Lava Tubes (Republic of Korea) which is also currently under consideration by the World Heritage Committee.

## 4. INTEGRITY

### 4.1 Legal status

The nominated property is the area contained within TNP. As such it will be afforded the same legal status and protection that currently applies to the park. The primary national legislation governing TNP is Law 5/1981 which assigns TNP a special legal regime designed to protect it and limit the rights to use its natural resources. It also delimits a protective buffer zone.

In addition, Decree 153/2002 contains the legal basis for the protection of the natural resources of the park, establishing general management criteria and zoning of the park into Reserved, Restricted Use, Moderate Use and Special Use Zones to govern use. As well as the above general legislation, a range of supporting environmental legislation provides protection to the park and its resources.

Proposals are in development to transfer management responsibility of TNP to the Autonomous Community of the Canary Islands, through the Joint Management Commission of the Canaries National Parks. Measures

are in place to ensure coordination and integration between the different levels of government.

The day-to-day management of the park is the responsibility of the National Park Technical Team who report to the Joint Management Commission. Participatory mechanisms such as the 'Patronage Committee' ('Patronato') ensure wide consultation with stakeholders.

The national and regional legislative framework currently in place to protect the integrity of TNP appears to be adequate and it is effectively administered through the various tiers of park management.

### 4.2 Boundaries

The boundary of the nominated property coincides with the existing boundary of TNP which generally follows the upper limit of the tree-line and is thus also defined by an appropriate ecological boundary.

Completely surrounding TNP is the buffer zone defined by the Corona Forestal Natural Park. Construction in the buffer zone is effectively prohibited and measures are in place to support natural resource protection and control introduced species.

### 4.3 Management

The management of TNP is carried out in accordance with a 'Management and Usage Administration Plan' which runs for six years and is due for renewal in 2008. The management plan specifies objectives and measures to protect the park's values and natural resources, raise public awareness through education, and control use and development.

TNP is adequately staffed and resourced with 23 staff directly employed and a further 114 working in the park for other agencies. At present, core funding for the park comes from the State via the budget of the Ministry of the Environment. This is then allocated to the Autonomous Organisation of National Parks that assigns and distributes funds to TNP. The park also receives budget contributions from the Star Programmes of the Autonomous Organisation of National Parks that finance specific park projects. Annual budgets range from 3.7 to 4.8 million euros and are considered adequate.

Impressive scientific research and monitoring programmes are in place on a range of issues such as visitor carrying capacity. In 1989, TNP was awarded the European Diploma for Protected Areas by the Council of Europe. This award is reviewed every 5 years and the park authorities have to submit an annual report. This award signifies a high standard of management.

### 4.4 Threats and human use

High mountain environments are particularly sensitive indicators of climate change. For this reason, TNP, together with other Spanish national parks, are to be included in a global change monitoring network. The Picos del Europa, Sierra Nevada and TNP have also been selected as sites to monitor wider ecological change. Through the Izaña Atmospheric Observatory, the high-altitude area above the temperature inversion is one of

five similar international sites monitoring global atmospheric change and is also part of the international Network for the Detection of Stratospheric Change. In this context, TNP is seen as a valuable early-warning system for environmental change based on long and detailed records of environmental conditions.

Biological threats are monitored through regular 'phytosanitary inspections' that survey indicator species for foliage loss, discolouration and evidence of damage from biological agents. There is some localised evidence of damage by beetles, but generally damage is slight.

Natural disasters including fire and seismic / volcanic activity are covered by contingency planning required by national legislation. This includes coordination of emergency plans with other administrative agencies and the presence in the park of emergency stations at El Portillo and the Cable Car Station, including a fire station. The scrub vegetation of the park is less susceptible to fire than the forest of the buffer zone. Fire prevention and control in this zone is the responsibility of the Insular Government of Tenerife (the Cabildo).

Visitor pressure is generally recognized as a significant potential threat to TNP. With more than 3.5 million visitors per annum, it is inevitable that key sites come under considerable strain at different times of the day and year. Site management based on usage zones is seen as the most appropriate type of management tool for dealing with the large numbers of visitors to TNP. Effective visitor education and use programmes assist in limiting visitor impact in sensitive areas.

Overall visitation to Tenerife is controlled through the imposition of strict numbers of bed spaces on the island. The emphasis within the next management plan will therefore be on the development of an integrated access strategy including the possible establishment of a series of 'service centres' on access routes just beyond the park boundary. These could contain a range of visitor facilities and it is envisaged by the park authorities that they should provide the opportunity for visitors to park their car and use a shuttle bus service to tour the park.

Devolution of management responsibility and the transfer of responsibility for TNP from national to regional government is possibly the greatest area of uncertainty regarding the future management of the park. Concerns relate to the potential erosion of long-term conservation goals and strategies in the face of development and economic pressures. It is important that participatory processes are maintained so that transparent decisions are made which are consistent with management objectives for the protection of the park's values and natural resources.

In summary, the national park status of the nominated property has ensured that sufficient management capacity is in place, as well as experience in managing the site effectively and in close collaboration with the local population. Its status has also resulted in effectively enforced legislative controls and a management strategy that is supported by central government funding.

Overall, IUCN considers that the nominated property meets the conditions of integrity as required under the Operational Guidelines.

## 5. ADDITIONAL COMMENTS

Although the property has not been nominated under criteria (ix) and (x), special mention should be made of the important role played by the biodiversity of TNP. Tenerife is one of the few islands in the world that can support zonal ecosystems above the tree-line, giving rise to two unique ecosystems and one of the best natural environments in the world for primary ecological successions linked to the variety of volcanic deposits and the adversity of the climate. There is an impressive faunal and floral biodiversity with close to 50 species of vascular plants that are exclusive to TNP.

## 6. APPLICATION OF CRITERIA / STATEMENT OF OUTSTANDING UNIVERSAL VALUE

The property has been nominated under criteria (vii) and (viii). IUCN considers that the nominated property meets these criteria and proposes the following Statement of Outstanding Universal Value:

Teide National Park, dominated by the 3,781 m Teide-Pico Viejo stratovolcano, represents a rich and diverse assemblage of volcanic features and landscapes concentrated in a spectacular setting.

### **Criterion (vii): Superlative natural phenomena or natural beauty and aesthetic importance**

Mount Teide is a striking volcanic landscape dominated by the jagged Las Cañadas escarpment and a central volcano that makes Tenerife the third tallest volcanic structure in the world. Within this landscape is a superlative suite of landforms that reveal different phases of construction and remodeling of the volcanic complex and highlight its unique geodiversity. The visual impact is emphasized by atmospheric conditions that create constantly changing textures and tones in the landscape and a 'sea of clouds' that forms a visually impressive backdrop to the mountain.

### **Criterion (viii): Earth's history, geological and geomorphic features and processes**

Teide National Park is an exceptional example of a relatively old, slow moving, geologically complex and mature volcanic system. It is of global importance in providing diverse evidence of the geological processes that underpin the evolution of oceanic islands, and these values complement those of existing volcanic properties on the World Heritage List, such as the Hawaii Volcanoes National Park. It offers a diverse and accessible assemblage of volcanic features and landscapes in a relatively limited area. The area is a major centre for international research with a long history of influence on geology and geomorphology especially through the work of von Humboldt, von Buch and Lyell which has made Mount Teide a significant site in the history of volcanology.

### Conditions of Integrity, Protection and Management

The property is well managed and resourced, with a six-year management plan in place which is due for renewal in 2008. The property is afforded the same legal protection as other national parks in Spain and is surrounded by a buffer zone. Key management issues include the management of tourism, the potential impact of climate change, and effective coordination of management responsibility between national and regional levels of government.

## 7. RECOMMENDATIONS

IUCN recommends that the World Heritage Committee **inscribes** the Teide National Park, Spain, on the World Heritage List on the basis of criteria (vii) and (viii).

IUCN recommends that the World Heritage Committee commends the State Party for its continued efforts to conserve this protected area and for establishing impressive educational and awareness raising programmes in the park.

IUCN also recommends that the State Party be requested, as part of the process to review and update the management plan for Teide National Park, to:

- a) Strengthen harmonization between strategic tourism planning and development in the Canary Islands and the use of Teide National Park to ensure that use does not adversely impact the outstanding universal value of the property;

- b) Strengthen mechanisms to monitor visitor use and develop management approaches that balance the protection of park values with enhanced visitor experience;
- c) Encourage improved research and monitoring of the potential impact of global climate change and the need for adaptive management strategies;
- d) Strengthen coordination and cooperation between the Spanish State and Autonomous Community of the Canary Islands to share responsibility and to guarantee central funding; and
- e) Encourage exchange of management experience and joint promotion between the Teide National Park and other World Heritage properties in the Canary Islands (Garajonay National Park and San Cristóbal de La Laguna).

Finally, and in the interests of maintaining the credibility of the World Heritage List, IUCN recommends that the World Heritage Committee notes that volcanic systems are relatively well represented on the World Heritage List and that there is increasingly limited potential for further inscriptions of volcanic sites on the World Heritage List. The Committee may therefore recommend States Parties considering further nominations of volcanic sites to consider the principles suggested in section 5.2 of the IUCN evaluation of Jeju Volcanic Island and Lava Tubes.

**Map 1: Location of nominated property**



**Map 2: Boundaries of nominated property**

