The Dolomites

2020 Conservation Outlook Assessment

SITE INFORMATION

Country: Italy
Inscribed in: 2009
Criteria: (vii) (viii)

The site of the Dolomites comprises a mountain range in the northern Italian Alps, numbering 18 peaks which rise to above 3,000 metres and cover 141,903 ha. It features some of the most beautiful mountain landscapes anywhere, with vertical walls, sheer cliffs and a high density of narrow, deep and long valleys. A serial property of nine areas that present a diversity of spectacular landscapes of international significance for geomorphology marked by steeples, pinnacles and rock walls, the site also contains glacial landforms and karst systems. It is characterized by dynamic processes with frequent landslides, floods and avalanches. The property also features one of the best examples of the preservation of Mesozoic carbonate platform systems, with fossil records. © UNESCO

SUMMARY

2020 Conservation Outlook
GOOD WITH SOME CONCERNS

Finalised on 04 Dec 2020

The necessary measures to establish an overall management system for the entire serial World Heritage sites were achieved in 2015 with the formal acceptance, by the Foundation Dolomites UNESCO and local administrations, of the Overall Management Strategy. The adoption of this overarching strategy, which includes Tourism Strategy, was a result of a participatory process involving local administrations, communities and a large group of stakeholders. This represents an important step; however, adequate resources will need to be secured for the implementation of the Strategy. The building of touristic infrastructures continue to represent a threat to the site’s values, which is now being exacerbated by the impact of climate change (extreme weather events, increasing hydrogeological instability) on landscape. The threat from tourism is still highly concentrated in certain areas and carefully monitored, but projects exist to expand skiing infrastructure, including in the vicinity of some components of the site. The deterioration of the landscape associated with tourism infrastructure development is still contained, but is on the rise. Potential threats are currently low, with the exception of climate change will result in significant reduction and eventual loss of glaciers with the site in the future.
FULL ASSESSMENT

Description of values

Values

World Heritage values

► Spectacular mountain landscape  
Criterion: (vii)

The Dolomites are widely regarded as being among the most attractive mountain landscapes in the world. Their intrinsic beauty derives from a variety of spectacular vertical forms such as pinnacles, spires and towers, with contrasting horizontal surfaces including ledges, crags and plateaux, all of which rise abruptly above extensive talus deposits and more gentle foothills. A great diversity of colours is provided by the contrasts between the bare pale-coloured rock surfaces and the forests and meadows below. The mountains rise as peaks with intervening ravines, in some places standing isolated but in others forming sweeping panoramas. Some of the rock cliffs here rise more than 1,500 m and are among the highest limestone walls found anywhere in the world. The distinctive scenery of the Dolomites has become the archetype of a “dolomitic landscape” (World Heritage Committee, 2009). This serial World Heritage site comprises a diversity of landscapes that are spectacular not only because of their physical characteristics, but which also responds to natural changes in light to create views of great natural beauty (IUCN, 2009).

► Extremely varied limestone formations  
Criterion: (viii)

The Dolomites are the classic site for the development of mountains in dolomitic limestone. The area presents a wide range of landforms related to erosion, tectonism and glaciation. The quantity and concentration of extremely varied limestone formations is extraordinary in a global context, including peaks, towers, pinnacles and some of the highest vertical rock walls in the world (World Heritage Committee, 2009). The World Heritage site also contains interesting glacial landforms, as well as karst systems. A further key feature is the dynamic nature of the landscape creating frequent landslides, floods, and avalanches (IUCN, 2009).

► Geological and fossil values of international significance  
Criterion: (viii)

The geological values are of international significance notably the representation of a large part of the Mesozoic Era in a continuous manner, as well as some sequences of earlier and later stratigraphy. The property contains important reference areas for the Triassic period and one of the best examples of the preservation of Mesozoic carbonate platform systems, including accompanying fossil records of reef-building organisms (notably the evidence of Mesozoic carbonate platforms, or “fossilized atolls”). As a whole, the Dolomites permit the accurate reconstruction of the evolution of a passive continental margin and successive phases of continental collision and evolution over more than 250 million years (World Heritage Committee, 2009; IUCN, 2009).

► Long history of geological studies  
Criterion: (viii)

The scientific values of the site are also supported by the evidence of a long history of study and recognition at the international level. Pioneering studies on stratigraphy, mineralogy, sedimentology and paleontology have been undertaken in the Dolomites by leading geologists since the 18th century (World Heritage Committee, 2009; IUCN, 2009).

Other important biodiversity values
IUCN World Heritage Outlook: https://worldheritageoutlook.iucn.org/
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▸ Faunal diversity

The World Heritage site includes areas of national and regional importance for faunal biodiversity. The fauna is very diverse due to the great number of different habitats, altitudinal levels and the region’s pivotal biogeographic location. A gradual recolonisation of remote areas by large carnivores is occurring, and has been facilitated by a diminishing human use and disturbance of both valley lands and alpine pastures. This has encouraged the return of animals such as bear (partially reintroduced) and lynx, previously killed to protect livestock (IUCN, 2009).

▸ Plant diversity

The site includes areas of national and regional importance for plant biodiversity. The flora of the Dolomite region includes c. 2,400 plants. Not all the species are represented in the property, however some component protected areas included in the site host a very high plant biodiversity: the national Park of the Dolomiti Bellunesi alone has 1,350 species, a quarter of Italy's flora, and 55 forest types (IUCN, 2009).

Assessment information

Threats

Current Threats

Activities and infrastructures linked to tourism represent a high threat to the site’s Outstanding Universal Value in some areas. Many other human activities represent a low threat but if added together they could be of some concern. It is very important to evaluate the cumulative effects of all the human activities on the components of this serial site. Pressures for further winter tourism infrastructure has increased as the 2026 Winter Olympic Games will be hosted in Milan-Cortina d'Ampezzo, and the building of new ski tracks and lifts is already ongoing. Climate change, with the occurrence of severe weather events, has become a tangible threat.

▸ Hunting and trapping

(Hunting in some areas (Bolzano province))

Hunting is permitted in the area, but is well managed (IUCN, 2009; State Party of Italy, 2009). Hunting represents a traditional activity, is subject to strict planning and is reserved for local residents only (State Party of Italy, 2017).

▸ Logging/ Wood Harvesting

(Limited forest exploitation (sanitary cuttings))

The intensity of these forestry activities is low and commonly limited to individual trees. However, no legal prohibition of clear cuttings exists. This is a low threat for the landscape value of the site and its biodiversity (IUCN, 2009). In October 2018, many forest stands across North-Eastern Italy were significantly damaged by the Vaia storm (Chirici et al., 2019).

▸ Roads/ Railroads

(Roads (not open to the public))

There are few public roads crossing small parts the property, but many other roads and tracks are present. These are used for the limited forestry and hunting (only in Bolzano province) activities and to supply the mountain refuges (IUCN, 2009). These roads represent a low threat to the site’s biodiversity.
The Dolomites are a very important touristic destination within the Alps. Current visitor numbers in the Dolomites region are estimated at 10 million annually (State Party of Italy, 2017). Important touristic infrastructure surrounds the components of the site. Tourism facilities and activities are at the limits of tolerance for a natural World Heritage site in some of the component parts of the site (e.g., Marmolada, component 2 and Tre Cime, part of component 5). Tourism infrastructure also has significant impacts within the buffer zone. Further infrastructure development can have a high potential to affect the landscape and the superlative beauty of the site, as well as its biodiversity (IUCN, 2009; State Party of Italy, 2009). The recently adopted Overall Management Strategy (2016) includes “management and containment of existing tourism facilities within the WHS” as one of its strategic goals (State Party of Italy, 2017). Further infrastructures are being built, related to the FIS Alpine World Ski Championship that will be held in Cortina d’Ampezzo from 7th to 21st February 2021 (https://www.cortina2021.com/en/) and the 2026 Winter Olympic Games in Milan and Cortina d’Ampezzo (https://www.dolomiti.it/en/cortina/news/2026-winter-olympics-cortina-and-the-dolomites-win/), which are so far confined outside of the buffer zones, but already affect the landscape significantly. The Italian association for mountaineering assessed very negatively the building of these new ski tracks and ski lifts (https://www.cai.it/wp-content/uploads/2020/07/50_Cs_Cantieri_Cortina_MondialiOlimpiadi.pdf). Projects for further ski lifts are being considered that may bring to the building of the largest network for ski mass tourism in Europe (e.g., https://www.repubblica.it/cronaca/2020/01/10/news/le_dolomiti_in_seggiovia_o_sugli_sci_parte_il_progetto_del_grande_carosello-_245352320/). The exact map of the forthcoming new ski lifts is not known yet, but it has been anticipated that they would pass close to some of the areas of the site (e.g., between Settsass and Col di Lana: https://www.skiforum.it/skinews/838-progetto-carosello-cortina-arabba-civetta.html).

In recent years there is a significant increase in extreme weather events, such as windstorms, heavy and localized rain and thunderstorms. Abnormal temperatures have also been documented in the Dolomiti area. One of the effects is the increase in landslides and rockfalls (Paranunzio et al., 2016). A catastrophic wind storm hit the whole Dolomites region between the 26th and 30th of October, 2018, which has been called “Storm Vaia”. It was an exceptional weather event which has no analogues in the historical record of this region, and compromised severely the landscape by tearing down millions of trees (Chirici et al., 2019). Forests in several components of the site were affected; floodings, landslides and rock falls also occurred as a consequence of the storm Storm Vaia, but did not seriously affect the environments above the treeline, nevertheless, the landscape of vast parts of the Dolomites is changed dramatically. Extreme weather events, such as Vaia, are now demonstrated to be a tangible threat for the Dolomites area. Wind storms may only affect the landscape, but floodings and landslides, triggered by extreme weather and/or rising temperatures, have the potential to modify also the geological value if they would hit localized geosites.

Currently, there are only very low potential threats, with the exception of climate change will result in significant reduction and eventual loss of glaciers with the site in the future.

The Dolomites in Friuli and the Sinistra Piave (left Piave bank) are known to be particularly active. This area is part of the western edge of the Friuli seismogenic system and is subject to widespread, frequent
earthquakes with a magnitude of < 3. Occasionally, stronger earthquakes have been recorded at the edges of this system (8th October 1986, M = 3.1) (CPTI11). Seismic activities could lead to large scale landslide phenomena, which could potentially affect the landscape and geomorphology linked attributes (State Party of Italy, 2009).

- **Temperature extremes**
  
  *Glacier and permafrost melting due to global warming*
  
  The glaciers and permafrost melting could become a potential threat for the values related to the superlative beauty of the site.
  
  Climate change has been recognized as a significant and increasing factor (State Party of Italy, 2014). Some recent studies have confirmed that significant reduction has already occurred in some glaciers, e.g. the Marmolada glacier, which has seen a reduction of 30% in its volume between 2004-2014. The same study concludes that the Marmolada glacier is predicted to disappear by 2050 (Santin et al., 2019).

### Overall assessment of threats

Activities and infrastructures linked to tourism represent a high threat to the site's Outstanding Universal Value in some areas. Many other human activities represent a low threat but if added together they could be of some concern. It is very important to evaluate the cumulative effects of all the human activities on the components of this serial site. Further winter tourism infrastructure is already being built in view of the hosting of the 2026 Winter Olympic Games by Milan-Cortina d'Ampezzo. Extreme weather events are a tangible threat for the landscape. Potential threats are currently low, with the exception of climate change which will result in significant reduction and eventual loss of glaciers with the site in the future.

### Protection and management

#### Assessing Protection and Management

- **Management system**
  
  The Foundation Dolomiti-Dolmen-Dolomitis-Dolomites UNESCO was established on the 13th May 2010 as the institutional mechanism for co-ordinated management of the nine separate component sites of the serial World Heritage Property. The nine component sites are found within five provinces and three separate Regions (Friuli Venezia Giulia, Trentino Alto Adige and Veneto) (IUCN, 2011). This management structure integrates most stakeholders and coordinate all different regions/provinces and local governance structures.

- **Effectiveness of management system**
  
  The Overall Management Strategy was finalized in 2016 (OMS, 2016) and is expected to have positive effects on the overall management effectiveness. So far, the Foundation Dolomites UNESCO was able to promote the geological values of the World Heritage site, as proved by the long list of promotional and educational activities (https://www.dolomitiunesco.info/activities/?lang=en). There is, however, a concern about the way scientific advice is provided to the Foundation. The board of directors of the Foundation is made of representatives of the provinces in which the components of the site are located. The board of directors then nominates the scientific committee, which is supposed to “provide consultancies on the matters of competence of the Foundation” (translated from https://www.dolomitiunesco.info/la-fondazione-dolomiti-unesco/lo-statuto/). However, nominated by the board of directors, the Committee might lack independence. At present, none of the members of the scientific committee have a scientific background in geology.
IUCN World Heritage Outlook: https://worldheritageoutlook.iucn.org/
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(https://www.dolomitiunesco.info/consulenti-e-collaboratori-2/), which is also of some concern.

**Boundaries**
Highly Effective

The World Heritage site includes all areas that are essential for maintaining its Outstanding Universal Value.

**Integration into regional and national planning systems**
Mostly Effective

The regional management system is integrated into the overall management strategy (OMS, 2016).

**Relationships with local people**
Highly Effective

In the recently adopted Overall Management Strategy (OMS, 2016) the role of local communities, local authorities and other stakeholders is planned and a list of actions and strategic lines is considered. Up to now, 59 municipality and 19 other common ownerships (Mountain communities, “Regole” or “Magnifiche Comunità” and Natural Park Authority) are involved as members in the Board of Supporters, a formal structure of the Foundation Dolomites UNESCO (OMS, 2016). Local authorities and stakeholders are actively involved in the development of the guidelines for the sustainable tourism strategy and other functional networks (Management Progress report 2013, 2015; Guideline for Tourism, 2014; #Dolomites2040, 2015).

**Legal framework**
Mostly Effective

The existing legal framework is considered effective (IUCN, 2011). However, in regards to some threats (especially tourism development), some concerns remain.

**Law enforcement**
Mostly Effective

Law enforcement is considered effective overall and the UNESCO Dolomites Foundation constantly monitors regulatory changes promoted by the regions and provinces (IUCN Consultation, 2020).

**Implementation of Committee decisions and recommendations**
Mostly Effective

The adopted overall management strategy (OMS, 2016) seems to respond positively to the requests and recommendations made at the time of the inscription (World Heritage Committee, 2009).

**Sustainable use**
Mostly Effective

The sustainable tourism strategy was completed in 2015 and formally adopted in 2016 as part of the Overall Management Strategy (OMS, 2016). However, concerns are now being expressed over increasing pressure for additional infrastructure development related to the winning of the 2026 Winter Olympic Games by Cortina d'Ampezzo.

**Sustainable finance**
Highly Effective

The Foundation currently has an annual turnover of around 1,2 million Euro. Activities are implemented on the basis of a plan approved by the Administration Board. One third of the total budget (400.000 Euro) is guaranteed by the contributions of the founding members (Provinces and Regions in which the World Heritage site is located). Two thirds are covered by project-related funding both public and private (European Union, Ministries, Local authorities, private sponsors) and by the contribution of the Supporters of the Foundation (48.500 Euros in 2019) (IUCN Consultation, 2020).

**Staff capacity, training, and development**
Highly Effective

In 2019, 6 staff members (a manager and 5 employees) worked for the management body (Foundation Dolomites UNESCO). Staff members have an opportunity to attend different relevant courses (State Party of Italy, 2017; IUCN Consultation, 2020).

**Education and interpretation programs**
Highly Effective

A number of educational and awareness raising materials and activities were prepared following the
inscription of the site on the World Heritage List (IUCN, 2011). A training program on management of
world natural heritage is being implemented and research programs in collaboration with universities
and institutes are ongoing (Management progress report, 2015). Numerous educational activities
involving local communities are regularly organized by the Fondazione Dolomiti and are presented on

Tourism and visitation management
Mostly Effective

The sustainable tourism strategy was completed in 2015 and formally adopted in 2016 as part of the
Overall Management Strategy (OMS, 2016). However, at this stage it is impossible to evaluate its
effectiveness. A study (EURAC, University of Ca’ Foscari) is being finalised to monitor tourism flows with
the aim of verifying the effects of the sustainable tourism plan adopted. A number of activities, such as
traffic management on scenic roads around the most touristic areas, were implemented since the
adoption of the OMS.

On the other hand, current development of new ski lifts and ski tracks, and additional forthcoming
projects, mostly in the area of Cortina d’Ampezzo and related to the 2026 Winter Olympic Games is of
potential concern.

Monitoring
Highly Effective

A monitoring system is included in the Overall Management Strategy (OMS, 2016) and is being
implemented. Recently a common platform for monitoring of the site has been developed, starting with
biodiversity data (http://biostreamportal.net).

Research
Highly Effective

There are some research institutes involved (EURAC; University of Udine, University of Trento, IUAV of
Venice, Ca’ Foscari; University of Ferrara) in different researches and projects related to the World
Heritage site (Management progress report, 2015).

Overall assessment of protection and management
Mostly Effective

The necessary measures to establish an overall management system for the entire serial World
Heritage site have been implemented and resulted in the adoption of the Overall Management
Strategy (OMS, 2016). While the adoption of this important framework document was an important
step, it will be crucial to effectively implement it and to ensure that the necessary resources are also
available for the implementation of the sustainable tourism strategy and of the monitoring system
foreseen by the OMS.

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

The Overall Management Strategy (OMS 2016) includes an interpretative model addressing not only
core and buffer areas but also transitional areas connecting the different component sites of the
site and is mostly effective.

Best practice examples

Tourism is a particularly important and complex factor in the Dolomites, and the UNESCO Dolomites
Foundation is supported by a team of researchers using a range of innovative and complementary
methods. The goal is to understand the behaviour, expectations and opinions of visitors to the
Dolomites, but also to see the potential and critical issues in relation to tourism; to provide the right
tools that help plan and manage our heritage in a way that is both sustainable and consistent with
the guidelines of the Overall Management Strategy. The process of collecting data from various
sources and creating a network of specialists from the institutes concerned has once more
underlined the status of the Dolomites as a global laboratory.
https://www.dolomitiunesco.info/understanding-current-tourism-to-plan-for-the-future/?lang=en
The #Dolomitesvives initiative was undertaken to reduce traffic pressure and was presented as a best practice in several academic contributions (Scuttari et al., 2019).

There are other numerous examples of best practices, such as for example: https://www.dolomitiunesco.info/unesco-dolomites-study-for-managing-access-to-the-most-crowded-places/?lang=en

State and trend of values

Assessing the current state and trend of values

World Heritage values

▶ Spectacular mountain landscape

The state of the site’s mountain landscape remains in good condition, however existing threats from tourism overuse and development are of concern in some areas (IUCN, 2008; IUCN, 2011). The conservation of the site’s landscape and its outstanding natural beauty have been somewhat affected. Climate change, and the impact of extreme weather events on the landscape, as evidenced by a recent storm Vaia (Chirici et al., 2019), add to human activity as a threat.

▶ Extremely varied limestone formations

Geological values of the site remain well preserved and are less impacted by tourism activities and infrastructure (IUCN, 2008).

▶ Geological and fossil values of international significance

Geological values of the site remain well preserved and are less impacted by tourism activities and infrastructure (IUCN, 2008).

▶ Long history of geological studies

Geological values of the site remain well preserved and are less impacted by tourism activities and infrastructure (IUCN, 2008).

Summary of the Values

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

The conservation of the site’s landscape and its outstanding natural beauty have been somewhat affected by tourism activities and infrastructure, particularly in the vicinity of certain components of the site. Climate change, and the impact of extreme weather events on the landscape, add to human activity as a threat. The landscape of the site has been modified in the last few years because of these factors. The geological values of the site are instead currently well preserved and will most likely be maintained in the foreseeable future.
Assessment of the current state and trend of other important biodiversity values

Low Concern

Trend: Stable

Different activities linked to tourism as well as other activities (sanitary cuttings, hunting) affect the site’s fauna and flora (Mission report, 2011). The impact of these activities, within the property, seems to be minimal (State of the Conservation of the Property, 2017); however, it is still too early to evaluate the trend for these values. The wind storm Vaia caused serious damage to the forests of the Dolomites, but the outlook for the mountain ecosystems after the storm was assessed to be positive by a panel of experts (Zanella et al., 2019).

Additional information

Benefits

Understanding Benefits

Outdoor recreation and tourism

The Dolomites are one of Italy’s main tourist attractions and an iconic international tourism destination.

Importance for research

The Dolomites have along history of being important research areas for geological processes. Given the importance of the area for tourism, it also represents a laboratory for social sciences in the field of tourism management, stakeholder engagement and regional development (see e.g. Della Lucia, 2017).

Summary of benefits

The Dolomites are one of Italy’s main tourist attractions and an iconic international destination. The site also is an important area with a long history of geological research.
## REFERENCES

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