Swiss Alps Jungfrau-Aletsch

2020 Conservation Outlook Assessment

SITE INFORMATION
Country: Switzerland
Inscribed in: 2001
Criteria: (vii) (viii) (ix)

The extension of the natural World Heritage property of Jungfrau - Aletsch - Bietschhorn (first inscribed in 2001), expands the site to the east and west, bringing its surface area up to 82,400 ha., up from 53,900. The site provides an outstanding example of the formation of the High Alps, including the most glaciated part of the mountain range and the largest glacier in Eurasia. It features a wide diversity of ecosystems, including successional stages due particularly to the retreat of glaciers resulting from climate change. The site is of outstanding universal value both for its beauty and for the wealth of information it contains about the formation of mountains and glaciers, as well as ongoing climate change. It is also invaluable in terms of the ecological and biological processes it illustrates, notably through plan succession. Its impressive landscape has played an important role in European art, literature, mountaineering and alpine tourism. © UNESCO

SUMMARY

2020 Conservation Outlook
Finalised on 02 Dec 2020
GOOD WITH SOME CONCERNS

The overall values of the site are in a good state and it continues to be exceptional in terms of landscape, geological values and ecological processes, with few negative trends. The main threat is climate change leading to the continued retreat of glaciers, which will ultimately significantly impact the site's values in the long term. Other more immediate threats include increasing tourism pressures on the site, however the overall management capacity is effective and management measures are being implemented to respond to and address these pressures. Potential future threats may result from the proposed development of hydroelectric infrastructure within the site and associated termination of a landscape protection contract, as well as potential tourism developments in the immediate surrounding of the site.
FULL ASSESSMENT

Description of values

Values

World Heritage values

- **Superlative scenic features**  
  Criterion:(vii)
  The impressive north wall of the High Alps, centred on the Eiger, Mönch and Jungfrau peaks, is a superlative scenic feature, complemented on the southern side of the Alpine divide by spectacular peaks and a valley system which supports the two longest glaciers in western Eurasia. The area is globally recognised as one of the most spectacular mountain regions with its impressive mountain landscape reflected by its important role in European art, literature, mountaineering and alpine tourism (OFEFP, 2000; IUCN, 2001).

- **Geological processes**  
  Criterion:(viii)
  An outstanding example of the formation of the High Alps resulting from uplift and compression of 400 million-year-old crystalline rocks thrust over younger carbonate rocks which began 20-40 million years ago. Also a historical study site for glaciation theory developed during the 19th century (OFEFP, 2000; IUCN, 2001).

- **Abundance and diversity of geomorphological features**  
  Criterion:(viii)
  Great abundance and diversity of geomorphic and glaciological features such as U-shaped glacial valleys, cirques, horn peaks, valley glaciers and moraines (OFEFP, 2000; IUCN, 2001).

- **The largest and the longest glacier in Europe**  
  Criterion:(viii)
  Aletsch glacier, the largest (78.4 km² in 2010 according to Fischer et al., 2014) and longest (22km) in Europe, is of significant scientific interest in the context of glacial history and ongoing processes, particularly related to climate change. The same is true of the Fiesch glacier, the third largest and second longest in Europe (OFEFP, 2000).

- **Habitat variety**  
  Criterion:(ix)
  Within its altitudinal range and its dry southern/wet northern exposures, the property provides a wide range of alpine and sub-alpine habitats (OFEFP, 2000; IUCN, 2001).

- **Variety of undisturbed ecosystems**  
  Criterion:(ix)
  On the two main substrates of crystalline and carbonate rocks, a variety of ecosystems have evolved in the absence of significant human intervention (OFEFP, 2000; IUCN, 2001).

- **Ecological processes (plant succession and colonization)**  
  Criterion:(ix)
  Superb examples of plant succession including the distinctive upper and lower tree-line of the Aletsch forest, as well as examples of plant colonization on emerging new substrates due to varying rates of glacial retreat, processes driven by climate change (OFEFP, 2000; IUCN, 2001).

Other important biodiversity values

- **Characteristic Alpine fauna**
  The fauna of the site is predominantly of species adapted to subalpine and alpine conditions, with good inventories and monitoring. In 2005, 42 mammals were recorded including ibex, lynx, and red deer (all
reintroduced) as well as chamois and marmot and 99 bird species including rock partridge, white-winged snow finch and citril finch (for which Switzerland has a special responsibility) as well as ptarmigan, black grouse, golden eagle, chough, wallcreeper and bearded vulture (the latter also being reintroduced). In addition 8 reptiles, 4 amphibians, 7 fish, 97 molluscs and 979 insects have been recorded, including the unique glacier flea Isotoma saltans, a species of springtail whose optimum temperature is barely above freezing (OFEFP, 2000; OFEFP, 2007).

**Characteristic Alpine vegetation**

The rich diversity of vegetation and its distribution is strongly influenced by altitude, aspect, climate and geology. A mixture of calcicole and calcifuge species occur within the property, with more than 1,800 species of vascular plants and 700 mosses recorded. While diversity decreases with altitude, more than 529 species of flowering plants and ferns have been recorded above the tree line (OFEFP, 2000; OFEFP, 2007).

### Assessment information

#### Threats

**Current Threats**

The main current threat is climate change leading to the continued retreat of the glaciers in the site, with some concerns regarding impacts of tourism. While measures are being implemented to manage tourism, little can be done by the government of Switzerland alone to address the retreat of the glaciers which will ultimately significantly impact the values of the site.

**Tourism/ visitors/ recreation**

*(Disturbance to wildlife and scenic beauty)*

There have been issues with a high number of aircraft flying over the site, particularly with heli-skiing within and outside the property (JABWHA, 2005; OFEFP, 2007; Wallner et al., 2008). Increasing tourism also increases the potential disturbance to wildlife. As the high mountains become increasingly accessible to people (heli-skiing, suspension bridges, cable cars, etc.), the sensitive natural environment is under increasing pressure from tourism (Gasser & Wiesmann, 2011). The upper part of the site is highly frequented by tourists and mountaineers, where there is a well-developed network of footpaths on the margins of the site, however most of the property remains inaccessible to walkers. The site is popular with experienced mountaineers which can use a series of 37 shelters and five mountain refuges, noting that many of the huts can only be visited in small groups and under the expensive supervision of professionals, which limits visitation and potential impact (IUCN Consultation, 2020b). Management measures are being undertaken to effectively address tourism pressures, for example in relation to heli-skiing and mountaineer access, and visitor management and monitoring is an important management focus in the 2020-2024 period (IUCN Consultation, 2020b).

**Temperature extremes**

*(Climate Change)*

Global climate change and warming are significant threats, resulting in marked glacial retreat and increased slope instability (Grämiger et al., 2018; Bosson et al., 2019). In 2019, the Cryospheric Commission of the Swiss Academy of Sciences considered that Switzerland’s glaciers have shrunk by 10 percent over the past five years (SCNAT, 2019). Climate change is certainly affecting the World Heritage site, as shown by the continuing retreat of its glaciers (Fischer et al., 2015): in 2008, studies undertaken and oscillations observed between 1850 and 1973 indicated that only three quarters of the 1973 glacier area remained (Wallner et al., 2008), and in 2019 future climate model predictions for 2100 ranged from a loss of 60% of today’s ice volume to an almost complete loss of ice, depending on global carbon dioxide emission scenarios (Jouvet and Huss, 2019).
Potential Threats

Potential threats include the possible expansion of hydropower, although the only project currently under consideration within the site appears to be carefully evaluated and managed. However, increased water use for hydropower or for making artificial snow, needed due to climate change, has the potential to negatively impact the site. The recent amendment of the Federal Nature Protection Act (01.04.2020) facilitates the realization of renewable energy installations in protected areas, which could pose a potential increased pressure for hydroelectric developments in or near the site in future. Development and renewal of infrastructure linked to tourism in the immediate surrounding of the site, which does not take into account the aesthetic values of the site, is also a potential threat.

► Renewable Energy

(Hydropower)

In 2017, Switzerland voted on a new energy policy aimed at relinquishing nuclear power and increasing alternative power sources such as hydropower and wind (Reuters, 2017). A potential Oberaletsch hydroelectric project has been proposed, which would be located inside the site. In order for this development to proceed, the project proponent would need to apply for a construction permit, thereby cancelling the existing OCFH (l’Ordonnance sur compensation des pertes subies dans l’utilisation de la force hydraulique) if accepted. The cancellation of this OCFH contract would cause a void in the protection of a large part of the World Heritage site. The Communes have engaged themselves to fill this void through the communal regulation (IUCN Consultation, 2017). Ultimately, the project would need to be subject to a detailed Environmental Impact Assessment in the context of the World Heritage values, prior to any decision being made to proceed, and to date no decision on the project has been taken (IUCN Consultation, 2020b).

The recent amendment of the Federal Nature Protection Act (01.04.2020) facilitates the realization of renewable energy installations in protected areas (IUCN Consultation, 2020a). This could theoretically increase the pressure for hydroelectric developments in or near the site, which could pose a threat to the site in future.

► Roads/ Railroads

(Fragmentation)

While the World Heritage site itself is intact, fragmentation is on the increase in the areas surrounding the property due to increased urbanisation and changes in agricultural practices (Gasser & Wiesmann, 2011). Construction and renewal of touristic infrastructure in the immediate surrounding of the site is also a threat to the OUV (IUCN Consultation, 2017). Planned to be opened in late 2020, a new cable car “Eigerexpress" of the Jungfraubahn just outside the boundaries of the site has the potential to negatively affect the view on the magnificent north slope of the Eiger and the aesthetic values of the site (V-bahn, 2020). It is reported that, in response to concerns raised, and to give the highest possible consideration to the aesthetic value of the north face of the Eiger, the height of the masts have been reduced to the absolute minimum (IUCN Consultation, 2020b).

► Other Ecosystem Modifications

(Extension of wooded areas)

Forested areas are tending to increase, due to on one hand climate change (rise in the upper limit of forests) and on the other hand to changes in animal husbandry practices, leading locally to the disappearance of species-rich high-altitude grasslands (Ebneter et al., 2018).

Overall assessment of threats

The main current threat is climate change leading to the continued retreat of glaciers in the site, with some concerns regarding tourism, however the values of the site still remain preserved at this point in time. In the long-term the retreat of the glaciers will ultimately significantly impact the site. Tourism
and potential projects such as hydropower within and around the site, and cable cars pose a certain threat. The recent amendment of the Federal Nature Protection Act (01.04.2020) facilitates the realization of renewable energy installations in protected areas, which could pose a potential increased pressure for hydroelectric developments in or near the site in future. Development and renewal of infrastructure linked to tourism in the immediate surrounding of the site, with potential visual impacts on the aesthetic values of the site, is also a potential threat.

**Protection and management**

**Assessing Protection and Management**

**Management system**

The World Heritage site is well managed, with a management strategy and plan in place, which have been developed through an exemplary participatory process (JABWHA, 2005; Wiesmann et al., 2005). The Management plan 2021-2030 was finalized in March 2020 (MZ SAJA, 2020) and the 2020-2024 Programme (MZ SAJA, 2019) is in preparation, both also developed with a large participatory process.

**Effectiveness of management system**

The World Heritage site has an effective management plan (MZ SAJA, 2020), and activities are implemented through 4-year Action Plans and Programmes (MZ SAJA, 2019).

**Boundaries**

IUCN (2001) noted that “while encompassing the main features of this portion of the high Alps, several adjoining areas of high associated natural values were not included”. This was addressed in the 2007 extension of the World Heritage property which “significantly increased the values for which the property has been inscribed”, although it was noted that there was still potential for further extensions, which could further enhance the values and integrity of the site (IUCN, 2007). Taking into account the threats on the Outstanding Universal Value of the site originating from the surrounding of the site, it would be useful to evaluate the necessity of a buffer zone (IUCN Consultation, 2017). In 2020, the boundaries currently remain unchanged (MZ SAJA, 2020), however a review of the potential expansion is taking place under the framework of the programme agreement between the Confederation and the Cantons in the period 2020-2024. This also includes the consideration of potential buffer zone establishment through a broad environmental assessment process which assesses potential impacts on the OUV of the property (IUCN Consultation, 2020b).

**Integration into regional and national planning systems**

There is an ongoing commitment to ensure effective coordination of management responsibility between federal, cantonal and communal levels of government (MZ SAJA, 2020).

**Relationships with local people**

The management plans are developed in an extensive participatory process with 23 local communes, the Cantons of Bern and Wallis, The Federal Office for the Environment, regional organizations, public and private companies and NGOs (MZ SAJA, 2020). This resulted in the development of a highly democratic institutional structure The Stiftung UNESCO-Welterbe Swiss Alps Jungfrau-Aletsch (SAJA).

**Legal framework**

94.4% of the World Heritage Site is protected by the Federal Inventory of Landscapes and Natural Monuments of National Importance (BLN), and 41% of this area has additional protection status, which includes five biotopes of national importance, six federal hunting reserves, four landscapes protected under the Ordinance Concerning Compensation for Losses in Hydropower Generation, plus there are 29 cantonal nature protection areas. Of the 5.6% of the surface not under BLN protection, a further 2% is
protected by other measures (JABWHA, 2005). However, these various designations are complex and the site could benefit from a more coordinated approach. Nonetheless, the existing legal basis is adequate to ensure that the site will not be affected by any activity inconsistent with its World Heritage status (OFEFP, 2007). Considering the importance of the Oberaletsch for the values linked to criteria (viii) and (ix), the possible termination of the OFCH contract for the Oberaletsch region protecting a surface of 7465.9 ha within the site to permit hydroelectric infrastructure raises concerns, however to date no decision has been taken to proceed with the project (IUCN Consultation, 2020b).

**Law enforcement**

Highly Effective

Enforcement and examination of laws and existing planning regulations are undertaken by the MZ SAJA (Managementzentrum Stiftung UNESCO-Welterbe Swiss Alps Jungfrau-Aletsch), in association with the state, the cantons, the communes, and the regional planning departments (MZ SAJA, 2020).

**Implementation of Committee decisions and recommendations**

Highly Effective

There have been no recommendations made for this World Heritage site apart from one in 2007 to consider changing the name of the site to better reflect its extended area (World Heritage Committee, 2007), which was immediately implemented (World Heritage Committee, 2008).

**Sustainable use**

Mostly Effective

Sustainable development is firmly embedded in the Management Plan with six main objectives that provide the main content and elementary building blocks for the design and implementation of sustainable development measures (MZ SAJA, 2020). Since increasing tourism activities and accessibility also increases disturbance to wildlife and pressure on the sensitive ecosystem (Gasser & Wiesmann, 2011), these factors need to be considered in sustainable development plans. In 2021, SAJA will complete a new monitoring report that will address key issues such as visitor management, with plans to ensure that the Aletsch Forest, the Eiger Glacier and other places such as the Grimsel or Lake Oeschinen have the sustainable use of the natural landscape as their primary objective. This will also include awareness-raising measures (IUCN Consultation, 2020b).

**Sustainable finance**

Mostly Effective

The site receives federal, cantonal and local/municipal funding as well as sponsorship and partner funding. Budget figures are available for the 2020-2024 Programme and the total amount (CHF 11’417’500.-) is not fully secured yet (MZ SAJA 2019).

**Staff capacity, training, and development**

Mostly Effective

Employees responsible for the protection of nature and landscape in cantonal offices have academic and vocational training and university degrees, usually in biology or geography (OFEFP, 2005). The site currently benefits from a highly qualified team of twelve SAJA staff members with tertiary qualifications including geography, biology, engineering, hospitality management, economics and environmental sciences (IUCN Consultation, 2020b).

**Education and interpretation programs**

Highly Effective

Numerous educational and interpretations programs exist and will be developed in the future, notably through the World Nature Forum, awarded by the European Museum Prize for Sustainable Development (MZ SAJA 2019, 2010).

**Tourism and visitation management**

Mostly Effective

The site has been historically and is currently a major tourist attraction in Switzerland, especially in summer but also in winter. The Jungfrau can be reached by the highest train in Europe, bringing tourists to the Jungfraujoch (3,454m) where there are two restaurants and visitors can admire the mountains and Aletsch glacier. There is a well-developed network of footpaths on the margins of the site, but most
of the property is inaccessible to walkers. The site is popular with experienced mountaineers which can use a series of 37 shelters and five mountain refuges with a total of 1,582 beds. Tourists are managed at the Jungfraujoch and there are the World Nature Forum in Naters (a visitor center) managed by SAJA and nature centre at Riederalp run by Pro Natura - both organize exhibitions, walks, and training on environmental issues. Total visitor numbers are not available, but the Aletsch Forest receives 50,000 to 70,000 visitors a year. A 2019 census recorded just over 30,000 visitors to the Forest, which also takes into account a temporary closure of the Pro-Natura-Centre Villa Cassel (IUCN Consultation, 2020b). There are also seven helicopter landing pads and 3-4,000 overflights a year (JABWHA, 2005). The helicopter sites within the World Heritage area receive less visitation than others in the region, such as in the western Bernese Oberland or southern Wallis, due to the local tourist structure and related purchasing power in these areas (Gstaad, Verbier, Zermatt). In 2019, the mountain landing site in the north-east of the perimeter (“Rosenhorn”) will be closed, so from 2020 the potential for helicopters to disturb wildlife and the beauty of the landscape will be further reduced (IUCN Consultation, 2020b). In cooperation with the tourist network of Swiss UNESCO World Heritage Sites and UNESCO Biospheres (World Heritage Experience Switzerland, ”WHES”), the Swiss World Heritage sites are networked and promoted as attractive excursion destinations (MZ SAJA, 2020). However, there has been research showing that making the high mountains increasingly accessible to people also puts pressure on the sensitive natural environment (Gasser & Wiesmann, 2011). In the 2020-2024 period, visitor management and monitoring will be an important management focus (IUCN Consultation, 2020b).

Monitoring

The monitoring of the World Heritage site is based on an extensive system of indicators. This is based on the OUV and the criteria for inclusion in the World Heritage site as well as the objective of sustainable development in the World Heritage region (MZ SAJA, 2020).

Research

Research has a long tradition in the World Heritage site. Many research institutions have been active in the area for centuries and have contributed a lot to the understanding of the Alps, the development and the processes taking place. It is supported by a wide variety of educational and research institutions, from Switzerland and from other countries, and is characterized by specific objectives in relation to the World Heritage site. Research areas that are particularly strong include geology, glaciology, geomorphology, botany, zoology and tourism (MZ SAJA, 2020). Since mid 2016 research with the University of Bern was boosted by an intense cooperation with the UNESCO Chair on Natural and Cultural Heritage for Sustainable Mountain Development. SAJA is the core partner of the broad national and international network in which the UNESCO Chair is embedded. More concretely, the UNESCO Chair contributed with research in the SAJA area in the form of one Master and four BSc theses (IUCN Consultation, 2020a).

Overall assessment of protection and management

The protection and management of the site, given its very high visitation, is effective and based on a complex system with local, regional and national stakeholders being involved. Management decisions are carefully and thoroughly planned and implemented democratically.

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

The Swiss Alps Jungfrau-Aletsch (SAJA) UNESCO World Heritage Foundation, through its participatory structure with all of the neighbouring communes, is well placed to address threats from outside the site and finding solutions.

Best practice examples

The participatory management system bringing together the communes, the cantons, the State and many stakeholders is well structured and democratic.
State and trend of values

Assessing the current state and trend of values

World Heritage values

▸ Superlative scenic features

Low Concern
Trend: Deteriorating

Global climate change and warming are significant threats, resulting in marked glacial retreat and increased slope instability (Grämiger et al., 2018; Bosson et al., 2019). In 2019, the Cryospheric Commission of the Swiss Academy of Sciences considered that Switzerland’s glaciers have shrunk by 10 percent over the past five years (SCNAT, 2019). The glaciers in the site continue to retreat (Fischer et al., 2015): in 2008, studies undertaken and oscillations observed between 1850 and 1973 indicated that only three quarters of the 1973 glacier area remained (Wallner et al., 2008). Although 2019 climate model predictions for 2100 predict a loss of the glacier ranging from 60% of today’s ice volume to an almost complete loss of ice by 2100, depending on global carbon dioxide emission scenarios (Jouvet and Huss, 2019), the high snow-capped Alps and glaciers continue to maintain their superlative scenic features at this point in time.

▸ Geological processes

Good
Trend: Stable

The site’s geological processes are unlikely to be altered, or if they are, it will be on a geological time scale. At shorter time scale, climate changes induce the intensification of landscape modification, especially due to slope instability related to the changing cryosphere (Grämiger et al., 2018).

▸ Abundance and diversity of geomorphological features

Good
Trend: Stable

The site’s geomorphological features are well preserved. However, recent glacial landforms, as well as periglacial and nival landforms can be degraded or even disappear in the warming context. At the same time, para(peri)glacial landforms (e.g. proglacial lakes, fans, rockfall scarp and deposits) due to glacier retreat and/or permafrost degradation will develop (IUCN Consultation, 2017).

▸ The largest and the longest glacier in Europe

Low Concern
Trend: Deteriorating

Climate change is affecting the length and size of the glaciers (SwissInfo, 2019), although this is occurring in just about all the glaciers in Europe so the glaciers in the World Heritage site are likely to continue to be the largest and the longest in Europe, despite their retreat.

▸ Habitat variety

Low Concern
Trend: Deteriorating

The variety of habitats within the World Heritage site has not notably changed since inscription, however rising forest upper limits and changes in agricultural practices are altering some high altitude habitats (Ebneter et al., 2018). Continuous upgrading work by SAJA has strengthened biodiversity. For example, endangered species have been specifically promoted including the Provençal Fritillary butterfly (Leinkraut-Scheckenfalter (Mellicta deione berisalii)), Southern Alpine Tulip (Südalpine Tulpe (Tulipa australis – Fam. Liliaceae)), sycamore trumpet moss (Bergahorn Trompetenmoos (Acer pseudoplatanus)) and the Swiss Ephedra (Schweizer Meerträubchen (Ephedra helvetica)). Ongoing management measures include the targeted renovation of dry stone walls, dry meadows and pastures, the control of forest ingrowth and promotion of amphibian migration. Details of these measures will be
reported in the new 2020 monitoring report (IUCN Consultation, 2020b).

▶ Variety of undisturbed ecosystems

The site includes vast, barely fragmented, undisturbed habitats. The total area comprising unproductive vegetation and no vegetation (ice, rock) inside the perimeter is greater than 88.4% (JABWHA, 2005). Increasing pressure from tourism, especially heli-skiing, could contribute to the disturbance of some alpine ecosystems and the species that live there.

▶ Ecological processes (plant succession and colonization)

Ecological succession and habitats are changing as a result of climate change and shifts in agriculture in the Alps (Gehrig-Fasel et al., 2007) and studies are continuing to document changes in vegetation due to climate change and other factors. Therefore, it is likely that some habitats have changed since inscription of the site.

Summary of the Values

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

Although it is clear that global warming is affecting the glaciers in the site and will significantly impact the values in the long term, in general the values for which the site was inscribed on the World Heritage List remain stable and the site continues to be exceptional in terms of landscape, geological values and ecological processes.

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

Although the status of the alpine flora and fauna in the site is closely monitored, this data is complex and was not available for this evaluation. However, there have been no significant reports of biodiversity loss in the site with reports of specific improvements, thus the situation appears to be stable.

Additional information

Benefits

Understanding Benefits

▶ Outdoor recreation and tourism, Natural beauty and scenery

The World Heritage site is a top tourist destination and tourism is undertaken in close cooperation with local, regional and national tourism organisations which have a joint market programme together with other Swiss World Heritage sites (OFEFP, 2007).

Factors negatively affecting provision of this benefit:
- Climate change: Impact level - High, Trend - Increasing

▶ Importance for research, Contribution to education

Important climate change research (OFEFP 2001; OFEFP 2007), the World Nature Forum was built in Naters as a research, education and communication center. The Pro Natura Centre also contributes to
environmental education. Historically, glaciations theory was developed here in the 19th century.

► History and tradition,
Sacred natural sites or landscapes,
Cultural identity and sense of belonging

The impressive North Wall of the Jungfrau, Mönch and Eiger are celebrated in European mountaineering, literature and art (OFEFP, 2001). At the same time, the adjacent cultural landscape is a result of a vast variety of cultural practices, among others with regard to sustainable use of common resources (e.g. common irrigation, pasture or forest use systems).

Factors negatively affecting provision of this benefit:
- Habitat change: Impact level - Moderate, Trend - Increasing

► History and tradition

Research on the evolution of vegetation reveals that human intervention in the landscape began approximately 3,400 years ago. There is archeological evidence that the area was once inhabited by Celts, Romans and Alemans. There are remains of an elaborate canal irrigation system dating from the Middle Ages or possibly from Roman times, the canals obtaining their water from glacial rivers (OFEFP, 2001).

► Water provision (importance for water quantity and quality)

Glaciers are an essential source of water, flushing out the rivers with the spring thaw.

Factors negatively affecting provision of this benefit:
- Climate change: Impact level - High, Trend - Decreasing

Summary of benefits

The site is providing various benefits going far beyond the long-standing natural values/iconic mountain wilderness values (for which the site was valued already before inscription). Tourism, education and awareness building, cooperation with regional and national business/enterprises and between tourism and traditional agriculture have been enhanced through the World Heritage project. In addition, the site provides inestimable ecosystem services through the capture and provision of clean water.

Projects

Compilation of active conservation projects

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<th>Organization</th>
<th>Brief description of Active Projects</th>
<th>Website</th>
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<td>1</td>
<td>Swiss Alps Jungfrau-Aletsch Managementzentrum</td>
<td>Ongoing monitoring to detect any social and environmental changes in the World Heritage Region</td>
<td><a href="https://www.jungfrauitalsch.ch/en/monitoring-2/">https://www.jungfrauitalsch.ch/en/monitoring-2/</a></td>
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<td>4</td>
<td>Swiss Alps Jungfrau-Aletsch Management Centre</td>
<td>Collective work (volunteering) for cultural landscapes</td>
<td><a href="https://www.jungfrauitalsch.ch/de/welterbe-gmeiwaerch/">https://www.jungfrauitalsch.ch/de/welterbe-gmeiwaerch/</a></td>
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<td>SCNAT (2019). Glacier volume reduced by 10 per cent in only five years. Press release, 15.10.2019. [online] Available at: <a href="https://naturalsciences.ch/topics/water/climate_change_and">https://naturalsciences.ch/topics/water/climate_change_and</a>__... May 2020].</td>
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