IUCN Conservation Outlook Assessment 2017 **(archived)**
Finalised on 10 November 2017

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

Swiss Alps Jungfrau-Aletsch

SITE INFORMATION

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

Site description:
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

2017 Conservation Outlook

Good with some concerns

The WH values of the site are in good state with few negative trends. The main threat is climate change which will have a major impact on the property, plus increasing tourism, and in particular recreational practices such as heli-skiing, requiring strict management. The planning of hydroelectric infrastructure within the site causing the termination of a landscape protection contract is of some concern as well as the plans to develop a cable car in the immediate surrounding of the property potentially affecting the OUV.

Current state and trend of VALUES

Good
Trend: Stable

Even though it is clear that global warming is affecting the glaciers in the property, in general the values for which the property was inscribed remain stable and the property continues to be exceptional in terms of landscape, geological values and ecological processes.

Overall THREATS

Low Threat

While climate change and glacial retreat is continuing, it poses a low threat to the property at this point in time. Tourism and potential projects such as hydropower within and around the property, and cable cars pose a certain threat and should be evaluated through EIA processed taking into account the OUV of the property. While the threats to the property in the long-term remain high, they can still be considered as relatively low provided that no infrastructure development which could result in negative impacts on the OUV is approved.

Overall PROTECTION and MANAGEMENT

Mostly Effective

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. The protection framework is currently under discussion and the planned termination of one of the OFCH contract that protect the property is of some concern.

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

High Threat

Current threats are mainly due to climate change and tourism. While the latter is being managed, little can be done by the State Party of Switzerland alone, about the retreat of the glaciers which will ultimately significantly impact the property.

► **Tourism/ visitors/ recreation**

Low Threat

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

There have been issues with a high number of aircraft flying over the property, particularly with heli-skiing within and outside the property (JABWHA, 2005; OFEFP, 2007; Wallner et al., 2008). Increasing tourism also increases disturbance to wildlife. The upper part of the property is highly frequented by tourists and mountaineers, where there is a dense network of large mountain huts. 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, 2008).

▶ Temperature extremes

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

Global climate change and warming are significant threats, resulting in marked glacial retreat and increased slope instability. Studies undertaken and oscillations observed between 1850 and 1973 indicate that only three-quarters of the 1973 glacier area currently remain (Wallner et al., 2008). Climate change is certainly affecting the property, as shown by the continuing retreat of the glaciers (Fischer et al., 2015).

Potential Threats

Low Threat

Potential threats include expansion of hydropower, although the only project currently under consideration within the property 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 property. Depending on the future status of the Federal Inventory of Landscapes and Natural Monuments of National Importance, protection status may be weakened, above all when it comes to renewable energy production. Development and renewal of infrastructure linked to tourism in the immediate surrounding of the property which is not taking into account the OUV of the property is also a potential threat.

► Renewable Energy, Dams/ Water Management or Use

Low Threat
Inside site, localised(<5%)

Switzerland recently voted a new energy policy aimed at relinquishing nuclear power and increasing sustainable power sources such as hydropower and wind (Reuters, 2017). Oberaletsch hydroelectric project has been proposed, which would be located inside the property. In order for this development to proceed, the project proponent must apply for a construction permit, thereby cancelling the existing OCFH I'Ordonnance sur compensation des pertes subies dans l'utilisation de la force hydraulique) if accepted. The cancellation of the existing OCFH contract will cause a void in the protection of a big part of the property. The Communes have engaged themselves to fill this void through the communal regulation, but this is not yet done (IUCN Consultaiton, 2017). The project will nevertheless, need to be subject to a detailed EIA considering its location, prior to considering if the project could proceed. Note that a considerable part of the commune of Gutannen was not included in the extension of the property in 2007 because of extensive hydropower infrastructure (OFEFP, 2007). Increasing infrastructure for generating hydropower could be a threat to the property in the future.

► Roads/ Railroads

Low Threat
Outside site

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 (Geisser & Wiesmann, 2008). Construction and renewal of touristic infrastructure in the immediate surrounding of the property is also a threat to the OUV (IUCN Consultation, 2017). A project to build a new cablecar "Eigerexpress" of the Jungfraubahn just outside of the site's boundaries but in front of and negatively affecting the magnificent north slope of the Eiger could impact the aesthetic values of the property (https://www.jungfrau.ch/en-gb/corporate/v-cableway/project/).

Protection and management

Assessing Protection and Management

► Relationships with local people

Highly Effective

The management plan/strategy was developed in an extensive participatory process with 26 local communes and a few private landowners, including the conservation NGO Pro Natura and the electricity company Kraftwerken Oberhasli (JABWHA, 2005; Weismann et al., 2005). This resulted in the development of a highly democratic institutional structure has been implemented through the Jungfrau-Aletsch-Bietschhorn World Heritage Association (JABWHA), registered in May 2002 under Swiss law (OFEFP, 2007).

► Legal framework

Some Concern

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). The planned termination of the OFCH contract for the Oberaletsch region protecting a surface of 7465.9 ha within the property to permit a hydroelectric infrastructure is problematic. However, the Communes have engaged themselves to protect the same surface through the communal planning. This situation is at the moment of some concern considering the importance of the Oberaletsch are for the values linked to the criteria (viii) and (ix) (IUCN Consultation, 2017).

► Enforcement

Mostly Effective

Enforcement and examination of laws and existing planning regulations are undertaken by the JAB World Heritage, in association with the cantons, communes, regional planning departments, Inforama Hondrich, Upper Valais Chamber of Agriculture, regional associations, and environmental organisations (NGOs) (JABWHA, 2005).

► Integration into regional and national planning systems

Mostly Effective

There is a continuing need to ensure effective coordination of management responsibility between federal, cantonal and communal levels of government (JABWHA, 2005).

► Management system

Highly Effective

The property is well managed, with a management strategy and plan in place, which have been developed through an exemplary participatory process (JABWHA, 2005; Weismann et al., 2005). The Management plan is under revision (2017).

► Management effectiveness

Highly Effective

The property has an effective management plan (JABWHA, 2005) which is in the process of being updated, and activities are implemented through 3-4 year Action Plans and Programmes (State Party of Switzerland, 2013).

► Implementation of Committee decisions and recommendations

Highly Effective

There have been no recommendations made for this property apart from one in 2007 to consider changing the name of the property to better reflect its extended area (Decision 31 COM 8B.18) which was immediately implemented (Decision 32.COM.8B.4).

► Boundaries

Mostly Effective

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 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 OUV occurring in the surrounding of the site, it would be useful to evaluate the necessity of a buffer zone (IUCN Consultation, 2017).

► Sustainable finance

Mostly Effective

The property receives federal (32%), cantonal (33%) and local/municipal funding (10%) as well as private funding from the conservation NGO Pro Natura (25%), which manages the protected areas of Hinteres Lauterbrunnental and monitors the Aletsch Forest (State Party of Switzerland, 2013). Budget figures are only available from the 2005 management plan, but amount to a secure and substantial budget which covers communication, site management, promotion of sustainable development, regulation of perimeter use, knowledge management, education and excursions, monitoring and control (JABWHA, 2005). The State Party notes that funding is assured and sufficient (State Party of Switzerland, 2013).

► Staff training and development

Mostly Effective

Information of staffing levels are not available, but the State Party notes as excellent its staff engaged in research and monitoring, promotion, community extension, interpretation, education, visitor management, conservation, administration, disaster preparedness, tourism and control. (State Party of Switzerland, 2013). 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).

▶ Sustainable use

Highly Effective

Sustainable Development is firmly embedded in the Management Plan (JABWHA, 2005) which notes that 21 fields of action provide the main content and elementary building blocks for the design and implementation of sustainable development measures, under the Sustainable Development Strategy issued by the Swiss Federal Council in 2002.

▶ Education and interpretation programs

Mostly Effective

A number of education and interpretation programs exist (OFEFP, 2005; State Party of Switzerland, 2013), managed in partnership with the conservation NGO Pro Natura.

▶ Tourism and visitation management

Mostly Effective

The property has been historically and is currently a major tourist attraction in Switzerland (see http://www.jungfraualetsch.ch), both in summer as well as 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 foot-paths 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 is a nature centre at Riederalp run by Pro Natura, which organizes exhibitions, walks, and training on environmental issues. Visitor numbers are not available, but the Aletsch Forest receives 50,000 to 70,000 visitors a year. There are also seven helicopter landing pads and 3-4,000 overflights a year (JABWHA, 2005).

▶ Monitoring

Highly Effective

Monitoring is undertaken (Gasser & Wiesmann, 2011; State Party of Switzerland, 2013). Monitoring of biodiversity and geological aspects is shared between a number of specialised institutions, consulting companies and universities and is highly effective.

▶ Research

Highly Effective

Research is conducted in cooperation with various Swiss universities and schools of applied sciences. The Management association has established a monitoring/research program covering ten themes (Gasser & Wiesmann, 2011). Nearly all the glaciers of the area have been measured, some continuously since the late 19th century. The high altitude research centre at Jungfraujoch stands at 3,500m, a height for a research station unique in Europe. It is permanently accessible by the Jungfrau railway, and well placed for the study of the physical environment, the atmosphere and astronomy. Research areas that are particularly strong include geology, glaciology, geomorphology, botany, zoology and tourism. The site is inventoried and monitored as a global benchmark case study area as part of the National Centre of Competence in Research (NCCR) North-South (JABWHA, 2005).

Overall assessment of protection and management

Mostly Effective

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. The protection framework is currently under discussion and the planned termination of one of the OFCH contract that protect the property is of some concern.

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

Mostly Effective

The JAB World Heritage Association, through its participatory structure with all of the neighbouring communes, is well placed at addressing threats from

outside the site and finding solutions.

▶ **Best practice examples**

The participatory management system bringing together all the communes and other stakeholders (nature conservation NGOs, hydroelectric companies) 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 to the glaciers, resulting in marked glacial retreat and increased slope instability. Studies undertaken and oscillations observed between 1850 and 1973 indicate that only three-quarters of the 1973 glacier area currently remains (JABWHA, 2005). However, 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 sediment transfer related to the changing cryosphere.

▶ **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 been 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 certainly affecting the length and size of the glaciers (JABWHA, 2005), although this is occurring in just about all the glaciers in Europe so the glaciers in the property are likely to continue to be the largest and the longest in Europe, despite their retreat.

► Habitat variety

Data Deficient
Trend:Data Deficient

It is unlikely that the variety of habitats within the property has changed since inscription, although more information is required to make an assessment.

► Variety of undisturbed ecosystems

Good
Trend:Stable

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).

► Ecological processes (plant succession and colonization)

Low Concern
Trend:Stable

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 property.

Summary of the Values

► **Assessment of the current state and trend of World Heritage values**
Good
Trend: Stable

Even though it is clear that global warming is affecting the glaciers in the property, in general the values for which the property was inscribed remain stable and the property 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**
Low Concern
Trend: Stable

Although the status of the alpine flora and fauna in the property 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 property, and there may even be some improvements, thus the situation appears to be stable.

Additional information

Benefits

Understanding Benefits

► **Outdoor recreation and tourism, Natural beauty and scenery**

Superb natural beauty and scenery. The property 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 WH properties (OFEFP, 2007). Tourism is a major element connecting all the WH communes (IUCN, 2007).

► Importance for research, Contribution to education

Important climate change research (OFEFP 2001; OFEFP 2007), the Aletsch Campus is being built in Naters as a research, education and communication center (JABWHA, 2005). The Pro Natura Centre also contributes to environmental education. Historically, glaciations theory was developed here in the 19th century.

► Sacred natural sites or landscapes

The impressive North Wall of the Jungfrau, Mönch and Eiger are celebrated in European mountaineering, literature and art (OFEFP, 2001).

► 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.

Summary of benefits

The property has triggered 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 WH project. In addition, the property provides inestimable ecosystem benefits

through the capture and provision of clean water.

Projects

Compilation of active conservation projects

№	Organization/ individuals	Project duration	Brief description of Active Projects
1	Swiss Alps Jungfrau-Aletsch Managementzentrum		Ongoing monitoring to detect any social and environmental changes in the World Heritage Region
2	Swiss Alps Jungfrau-Aletsch Managementzentrum		Restoration and projection of priority species and habitat
3	Swiss Alps Jungfrau-Aletsch Managamentzentrum		Education for sustainable development

REFERENCES

№	References
1	Fischer, M., Huss, M. and Hoezle, M. (2015). Surface elevation and mass changes of all Swiss glaciers 1980-I2010. The Cryosphere, 9: 525-540
2	Fischer, M., Huss, M., Barboux, C. and Hoezle, M. (2014). The New Swiss Glacier Inventory SGI2010: Relevance of Using High-Resolution Source Data in Areas Dominated by Very Small Glaciers. Arctic, Antarctic and Alpine Research, 46 (4): 933-945
3	Gasser, J. & Wiesmann, U. (2011). The state of this World Heritage region as a starting point for regional monitoring. Eco.mont 3 (2): 31-41.
4	Gehrig-Fasel, J., Guisan, A. & Zimmermann, N.E. (2007). Tree line shifts in the Swiss Alps: Climate change or land abandonment? Journal of Vegetation Science 18: 571-582.
5	IUCN (2001). World Heritage Nomination – IUCN Technical Evaluation Jungfrau-Aletsch-Bietschhorn (Switzerland).
6	IUCN (2007). World Heritage Nomination – IUCN Technical Evaluation Jungfrau-Aletsch-Bietschhorn (Switzerland).
7	JABWHA (2005). Management Plan for the Jungfrau-Aletsch-Bietschorn UNESCO World Heritage Site. Jungfrau-Aletsch-Bietschhorn World Heritage Association, Naters and Interlaken, Switzerland.
8	OFEFP (2000). Proposition d'inscription du bien « Jungfrau - Aletsch - Bietschhorn » sur la Liste du Patrimoine mondial, préparé par l'Office fédéral de l'environnement, des forêts et du paysage. Berne, Switzerland.
9	OFEFP (2007). Nomination for the extension of the "Jungfrau-Aletsch-Bietschorn World Heritage Site", prepared by the Swiss Agency for the Environment, Forests and Landscape (Office fédéral de l'environnement, des forêts et du paysage), Berne, Switzerland.
10	Reuters (2017). Swiss voters embrace shift to renewable energy. http://www.reuters.com/article/us-swiss-energy-idUSKBN18H0HM
11	State Party of Switzerland (2013). Periodic Report Second Cycle Section II: Alpes suisses Jungfrau-Aletsch. Paris, France: UNESCO World Heritage Centre.

№	References
12	Wallner, A, Rist, S., Liechti, K. & Wiesmann, U. (2008). Protection: A means for sustainable development? The case of the Jungfrau- Aletsch-Bietschhorn World Heritage Site in Switzerland. In: Galvin M, Haller T (eds). People, Protected Areas and Global Change: Participatory Conservation in Latin America, Africa, Asia and Europe. Perspectives of the Swiss National Centre of Competence in Research (NCCR) North-South, University of Bern, Vol. 3. Bern: Geographica Bernensia, pp. 471-504.
13	Wiesmann, U., Liechti, K. & Rist, S. (2005). Between Conservation and Development: Concretizing the First World Natural Heritage Site in the Alps Through Participatory Processes. Mountain Research and Development 25(2):128-138.