



World Heritage Sites

Protected
Areas and
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WEST NORWEGIAN FJORDS - GEIRANGERFJORD AND NÆRØYFJORD NORWAY

The starkly dramatic Geirangerfjord and Nærøyfjord are classic examples of the upper sections of two of the world's longest and deepest fjords. They are pristine well-developed examples of an active glacial landscape. Their sheer rock walls, hung with waterfalls and old transhumant farms rise 1,400m directly from sea level to a quite different landscape of glaciated mountains.

COUNTRY

Norway

NAME

West Norwegian Fjords - Geirangerfjord and Nærøyfjord

NATURAL WORLD HERITAGE SERIAL SITE

2005: Inscribed on the World Heritage List under Natural Criteria vii and viii.

STATEMENT OF OUTSTANDING UNIVERSAL VALUE [pending]

The UNESCO World Heritage Committee issued the following statement at the time of inscription:

Justification for Inscription

Criterion (viii): The West Norwegian Fjords are classic, superbly developed fjords, considered as the type locality for fjord landscapes in the world. They are comparable in scale and quality to other existing fjords on the World Heritage List and are distinguished by the climate and geological setting. The property displays a full range of the inner segments of two of the world's longest and deepest fjords.

Criterion (vii): The Nærøyfjord and Geirangerfjord areas are considered to be among the most scenically outstanding fjord areas on the planet. Their outstanding natural beauty is derived from their narrow and steep-sided crystalline rock walls that rise up to 1400m direct from the Norwegian Sea and extend 500m low sea level. Along the sheer walls of the fjords are numerous waterfalls while free-flowing rivers rise up through deciduous and coniferous forest to glacial lakes, glaciers and rugged mountains. There is a great range of supporting natural phenomena, both terrestrial and marine such as submarine moraines and marine mammals. Remnants of old and now mostly abandoned transhumant farms add a cultural aspect to the dramatic natural landscape that complements and adds human interest to the area.

IUCN MANAGEMENT CATEGORY

Geirangerfjord area:

Hyskjett Nature Reserve	I Nature Reserve	52 ha
Kallskaret Nature Reserve	I Nature Reserve	90 ha
Geiranger-Herdalen	V Protected Landscape Area	49,745 ha
Protected Landscape Area (proposed)		

Total: 49,887 ha

Nærøyfjord area:

Hatle-Styve Natural Monument	III Natural Monument	0 ha
Grånosmyrane Nature Reserve	I Nature Reserve	357 ha
Nordheimsdalen Nature Reserve	I Nature Reserve	1,330 ha
Bleia Nature Reserve (proposed)	I Nature Reserve	2,180 ha
Bleia-Storebotnen	V Protected Landscape Area	6,595 ha
Protected Landscape Area (proposed)		
Nærøyfjorden Protected Landscape Area	V Protected Landscape Area	57,884 ha

Total: 68,346 ha

BIOGEOGRAPHICAL PROVINCE

West Eurasian Taiga (2.3.3) / Boreonemoral (2.10.5) - valleys

GEOGRAPHICAL LOCATION

The West Norwegian Fjords are located in southwestern Norway 240km and 120km northeast of Bergen. The Geirangerfjord area lies 60 km inland between 62°00' to 62°17' N and 06°55' to 07°24' E in Møre & Romsdal county. The Nærøyfjord area, 120 km to its south, lies 100 km inland between 60°45' to 61°09' N and 6°41' to 7°16' E in Sogn & Fjordane and Hordaland counties.

DATES AND HISTORY OF ESTABLISHMENT

- 1933: Hatle-Styve Natural Monument designated, for a distinctive tree;
- 1970: The Nature Conservation Act decreed the protection of all significant natural features, Protected Landscapes, Nature Reserves and Natural Monuments; it succeeded a similar act passed in 1905;
- 1978: The Cultural Heritage Act was passed to protect all pre-Reformation (1537) monuments and sites, establishing a 5 km buffer zone around each; later extended to cover all pre-1650 monuments;
- 1984: Kallskaret Nature Reserve designated, for geology and scenery;
- 1985: Planning and Building Act: Environmental Impact Assessments were required nation-wide for all major new developments affecting natural or cultural assets.
- 1995: Grånosmyrane Nature Reserve designated, for its wetland and bird life.
- 1999: Nordheimsdalen Nature Reserve designated, for virgin pine woodland;
- 2002: Nærøyfjorden Protected Landscape Area designated, for a natural and cultural landscape;
- 2003: Hyskjett Nature Reserve designated, for its woodland;
- 2004: Geiranger-Herdalen and Bleia-Storebotnen Protected Landscape Areas and Bleia Nature Reserve; proposed for scenery, geology, wildlife and cultural landscapes: approval expected.

LAND TENURE

The State owns 14.5% of the areas (17,771ha);
Privately owned lands comprise 81.6% of the areas (100,103ha);
The nature conservation areas cover 96.1% of total area.

Geirangerfjord: Total area excluding settlements:	49,887ha
Private land:	45,302ha owned by 330 owners;
State owned area of fjord:	4,585ha

Protected areas are under the management of the Governors of Møre and Romsdal county.

Nærøyfjord: Total area: excluding settlements:	68,346ha
Private land:	55,160ha owned by 262 owners;

State owned land:	9,800ha
State owned area of fjord:	3,386ha

Protected areas are under the management of the Governors of Sogn & Fjordane and Hordaland counties. The Borough Councils in each sector are responsible for the management of inhabited areas.

AREA

Total area:	122,712 ha	Land: 111,966 ha (including settlements)	Fjord: 10,746ha
Geirangerfjord:	51,802 ha	Land: 46,151 ha	Fjord: 5,651ha
Nærøyfjord:	70,910 ha	Land: 65,815 ha	Fjord: 5,095ha

ALTITUDE

Sea level to 1,850m (Torvløysa mountain above Geirangerfjord) and 1,761m (Stiganosi mountain above Nærøyfjord).

PHYSICAL FEATURES

These dramatic fjords are the grandest landscapes in a country of spectacular fjords, and the rivers which enter them have not been developed for hydroelectric power. Each landscape is at the upper end of a major fjord system that developed along faults and fracture zones at right angles, giving them a characteristic zigzag form. Both fjords are submarine hanging valleys, which have floors between 300-500m deep in ice-scoured basins, the floor of Nærøyfjord ending 1,000m above the floor of Sognefjord. Though their differences are not dramatic, the two areas comprising the nominated property complement each other.

The Geirangerfjord site is 60km inland at the end of Storfjord where it branches into two: Sunnlyvsfjord of which Geirangerfjord is a branch, and Norddalsfjord of which Tafjord is a branch. These fjords are 1-2km wide and their sides reach a height of 1,300m in places with old transhumance farms in the hanging valleys. They are surrounded by mountains 1,600-1,700m high, carrying glacial lakes. The highest peak, Torvløysa, 1,850m, rises north of Geiranger. The Geirangerfjord mountains are more alpine in character than those of the more southerly Nærøyfjord; block fields are more prevalent there and permafrost and glaciers persist on the highest summits. Nærøyfjord is located 100km inland near the end of Sognefjord, and Aurlandsfjord branches off it. Its fjords are 250m-2.5km wide with sides in places 900-1,400m high. The surrounding mountains are smooth-topped with high glacial lakes, a plateau glacier in Fresvikbreen and reach to 1,761m in Stiganosi, above the Syrdal glacier. The uplands of Nærøyfjord preserve much of the rounded landforms of the pre-glacial fluvial-dominated landscape.

The Management Plan describes five main landscape types in the area. The fjord system with shore areas and undisturbed hillsides where the physical relief is more prominent than any other feature. Farms of three distinct types with their surrounding cultural landscapes: fjord-side, valley and mountain-ledge. Valleys of which a large number extend into the mountains, have been used for centuries for transhumant summer grazing and are marked by pastures and sheilings. Woods which are deciduous in the valleys and on mountainsides, coniferous at higher elevations. On mountains the tree line is at 900m and 1,100m, up to 1,300 - 1,400m the vegetation is alpine. Above this the landscape becomes one of scree, block fields, snow fields and, above 1,700m, glaciers.

Geologically, the areas are well-developed examples of fjord landscape and excellent examples of young active glaciation. Relatively recently, in geologic terms, the products of glacial weathering were removed, leaving ice- and wave-polished surfaces on the steep fjord sides which provide superbly exposed and continuous three-dimensional sections through the bedrock. In Geirangerfjord these are Precambrian gneisses of the West Gneiss Region, a world-class example of deeply subducted continental crust and of well preserved high-pressure rocks. In Geirangerfjord there are outcrops of peridotite and serpentinite in the predominant gneiss bedrock. In Nærøyfjord, the underlying rocks are anorthosite and gabbro, with softer phyllite in Aurlandsfjord. The high mountain surface is a slightly undulating peneplain dissected by rivers, the courses of which were deepened, widened and scoured 20,000 years ago by the glaciers of the

last Ice Age. Later melting of the heavy ice cap allowed the land to rebound by some 110m, deepening the fjords, and by 5000 years ago most of the glaciers had disappeared leaving thick till in places and many moraines. Where fractured, the crystalline rocks are unstable and in weathering have created a wide variety of rock-slide scars and slumps, active screes and snow avalanche paths. Unpredictable rockfalls are still frequent hazards and, in extreme cases, have created local tsunamis in the enclosed waters of some fjords (62m high in Tafjord in 1934). Most of the soils derived from gneiss and anorthosite are nutrient-poor, but there are pockets of richer soil on the other minerals and from newly eroded slides.

CLIMATE

This is transitional between oceanic and continental, but varies markedly with aspect and altitude. Approximate measurements can be given based on nearby readings: the average annual temperature for the Geirangerfjord area is 6.6°C, ranging from 0.5°C in January to 13.8°C in July with an average rainfall of 1180mm, decreasing towards the east. Nærøyfjord being further inland is some 1.5°-3°C colder and 120mm drier. Snow persists from October to late May on the mountains and from late November to March in the valleys of the northern site, but only 2-3 weeks at Nærøyfjord. Winter ice periodically ices over the fjord heads for 1-3 weeks, though in Nærøyfjord it lasts longer. Large avalanches, of both powdery snow and wet slabs regularly occur. The narrow valleys can generate strong down-valley winds, and avalanche air blasts can be very dangerous

VEGETATION

The vegetation ranges with altitude between boreonemoral in the valleys to taiga on the plateaus. It is typical of this part of West Norway, and is moderately diverse despite the nutrient-poor soils because of the range of gradients from coast to inland, from north to south, from sea level to 1600m and the consequent variety of terrains and microclimates. Pockets of peridotite and serpentinite rocks in the Geirangerfjord area give nutrient-rich soil. Its main vegetation types are temperate woodland, rock and scree, alpine grassland and man-made meadows. The woodland includes old deciduous woods, pinewoods on peridotite, wooded pasture and small patches of very diverse deciduous woods on warm south-facing slopes. Around Nærøyfjord woodlands are similar but vary with the soil, moisture, exposure, altitude above sea level and use. There are large natural woods of Scots pine *Pinus sylvestris*, but birch *Betula* spp. woodland communities are the most common. A somewhat richer grey alder *Alnus incana* community dominates on avalanche fans beside the fjords. The best virgin pine woodland in western Norway is found in Nordheimisdalen and below Bleia. In a belt of phyllites around Flamsdalen 500 species have been recorded, including unusual species.

The Alpine flora of the Geirangerfjord area is dependent on snow cover and ranges from dwarf birch *Betula* spp. and polar willow *Salix polaris* to herb-rich grassland. The grasses of the grazed meadows host many rare fungi. Above the tree-line between 800m and 900m are scree, blockfields, snow fields and glaciers. The tree-line above Nærøyfjord is between 900 and 1100m. Half the alpine flora of Norway is found on its mountains, on carbonate rocks and lenses of phyllite. In the ungrazed highland of Bleia there is natural grassland and on its screes, a rare sub-species of arctic poppy *Papaver radicum* ssp. *relictum*.

FAUNA

These districts are one of few areas in Norway where all four native deer occur together: reindeer *Rangifer tarandus*, three separate strains of which are found here, the rarer elk *Alces alces* in the east, red deer *Cervus elaphus* and European roe deer *Capreolus capreolus*. Arctic foxes *Alopex lagopus*, brown bears *Ursus arctos*, lynx *Lynx lynx*, wolverine *Gulo gulo* and Eurasian otter *Lutra lutra* are occasionally seen. Marine species have been well surveyed only in Nærøyfjord where the water is unpolluted: 76 species, including Atlantic salmon *Salmo salar*, are recorded. Species common in deep sea water are found here in much shallower water, including Norway lobsters and sea pens, one from a depth of more than 300m down *Kophobelemnon stelliferum*, occurring here at a depth of 35m. A harbour seal *Phoca vitulina* colony of 15-30 individuals has a pupping site in Nærøyfjord, and the harbour porpoise *Phocoena phocoena* is common in both areas. White-beaked dolphins *Lagenorhynchus albirostris*, sperm whales *Physeter macrocephalus* (VU), minke whales *Balaenoptera acutorostrata* and killer whales *Orcinus orca* occur. Some 100 bird species typical of western Norway breed in the area, ranging from

coastal birds to high mountain species. The rivers have Norway's densest population of the national bird, the dipper *Cinclus cinclus*. The alpine and subalpine mires attract many waders and the cliffs host several raptors. The invertebrate fauna is not well known, but most of the habitats may have quite a rich range of species.

CONSERVATION VALUE

The starkly dramatic landscapes of Geirangerfjord and Nærøyfjord are exceptional in scale and grandeur in a country of spectacular fjords. They are extremely well-developed and pristine examples of a classic fjord and glaciated landscape which is still actively evolving. The West Gneiss Region is among the most important reference landscapes of its type in Europe. The fjords lie within a WWF Global 200 Eco-region and the sites are recorded on a National Register of Valuable Cultural Landscapes.

CULTURAL HERITAGE

Many carefully recorded relics are present in the area such as Neolithic tools, burial mounds, hunting hides and reindeer pitfall traps in the mountains, some of which were still in use 400 years ago. Viking houses a thousand years old are present and over 350 registered old buildings. These include stave churches (Undredal church dates from 1147), abandoned farms, some perched high on fjord sides, and transhumance farm sheilings. Farming was the main source of income until the mid 19th century when emigration accelerated and tourism began to become important.

LOCAL HUMAN POPULATION

A population of 473 people exists within the nominated area. This is relatively dense for a mountainous region of Norway but it only inhabits 1.4% of the total area. In Geirangerfjord there are 230 people in two settlements of which Geiranger is much the larger. In Nærøyfjord there are 243 people in four small settlements. The main local villages of Flam and Aurlandsvangen border the site. These valley settlements are at river mouths and fjord heads at points at least risk from avalanches. There are 56 farms within the Nærøyfjord area of which 12 main farms and 24 smaller holdings are still worked. In the Geirangerfjord nominated area there are 12 working farms and 24 with grazing. The average area is ten hectares, with orchards, small arable infields and much grazing mainly for goats and sheep using the marginal upland valleys. Hunting is undertaken to cull the deer but local fishing is now mostly recreational.

VISITORS AND VISITOR FACILITIES

These fjords are one of the cradles of scenic tourism in Europe, visited for more than 150 years by scientists, artists and tourists. Their values having been preserved by their steepness and inaccessibility, the two fjords remain among the least affected by development and have attained iconic status. Local people have learned to cope successfully with great numbers of tourists without degrading the landscape. More than a million people are believed to visit the areas annually. Most touring is done from cruise ships (151 in Geirangerfjord in 2003, 157 in Nærøyfjord in 2002) but the fjords can be reached by car, train, boat and by foot along a number of good trails and roads: Nærøyfjord is on the main Bergen to Oslo highway. The Tourist Board figures for visitors arriving by cruise ships in 2002 are 378,000 for Geirangerfjord and 296,800 for Nærøyfjord, totalling about three-fifths of the total visitor numbers to each area.

Geiranger has four large modern hotels, the Norwegian Fjord Centre, a national Geological Park and a tourist information centre. In 2004 the world's largest cruise liner visited the fjord. There are many hotels, guesthouses, holiday flats, cabins and campgrounds in both areas, most in Nærøyfjord being outside the nominated site. A tourist information office exists there and a Fjord Heritage Foundation is to be established there. Both areas have traditional working farms on display: Herdalssaetra in the upland above Geirangerfjord, Styvi farm and museum on Nærøyfjord. There are guided walking and boat tours. Maps, guides, documentation and films for the area, are excellent.

SCIENTIFIC RESEARCH AND FACILITIES

There has been continuous investigation of aspects of the terrestrial biology since the mid 18th century, now recorded on the National Database. A report on the entire biological diversity of the Geirangerfjord area was published in 2001 and the birds of rivers in the Nærøyfjord area were also recorded. Marine

investigations have been fewer, but the waters of the Nærøyfjord area and the seals of Sognefjord have been studied. Both areas are important for geomorphological research, having some features seldom seen elsewhere or revealed so clearly. Historic rockslides and the related tsunamis such as the Tafford disaster became internationally known through early studies; and the continuing active mass movements on the steep slopes create opportunities for useful research into geohazards. The recently established International Centre for Geohazards financed by the Norwegian Research Council, will focus on this region in future. The avalanches and landslides can be used as indicators of climatic change, using the records of past events: several sites around Geirangerfjord have been studied for the frequency of avalanches, and connections have been made with changes in meteorological conditions.

MANAGEMENT

The areas have a tradition of conservation. Maintenance of their natural condition is essential to tourism in the area. The Protected Landscape status safeguards their natural beauty, cultural interest and geology. The Nature Reserve designation safeguards smaller more specific aspects, geological, floral and faunal. They are regulated by many national acts, covering buildings near the sea, open-air recreation, forest protection, traffic on uncultivated land and waters, land, wildlife, pollution, salmonid and freshwater fish and protection of watercourses from development. Seven local rivers are legally protected from any hydro-electric schemes. There is also a wide range of up-to-date county, municipal and local development plans and sub-plans. The Storfjord Project report (Geirangerfjord) describes a management strategy for maintaining active farming and spreading awareness locally of the cultural values of the landscape. An action plan for nature and landscape management in Aurland, Nærøyfjord, was drawn up in 1998. In 2004 a Declaration of Intent to cooperate in the World Heritage Areas was agreed on between the main councils and government agencies involved in them: the Directorates for Nature Management and the Norwegian Nature Inspectorate, the Directorate for Cultural Heritage, the Regional Divisions for Environmental Conservation and Agriculture and Departments of Cultural Affairs and Planning. Two consultative committees will be established if the site is inscribed.

A management plan was drawn up for the Nærøyfjord area in 2003 and a similar plan is to be drawn up for Geirangerfjord in 2004. This divides the area into protected wilderness, traditionally utilised land, land for multiple/recreational facility use, and settlement zones. The full plan will provide guidelines for natural values and biological diversity, wild areas, archaeological and historical monuments, cultural landscapes, farming, woodland and forestry, wild reindeer, outdoor recreation, tourism, transport and traffic, the armed forces, rivers and hydroelectric power, research, education, the media and information. There are regulations for each of the Reserves and Protected Landscape Areas. Regulations for settled areas also cover buildings, shoreline development and quarrying. Hunting and fishing are licensed. Monitors for the following areas have already been assigned: geological activity, flora and fauna, monuments, buildings and landscapes, farmland, tourism and land use.

MANAGEMENT CONSTRAINTS

Almost the whole area is covered by detailed protective regulations. However, there are several issues of concern. There is potential for viable mining and quarrying. Peridotite mining occurs very near Geirangerfjord and anorthosite rock is mined underground within the nominated area in the Nærøy river valley. However, any future developments will be subject to thorough environmental impact assessment. In Geirangerfjord avalanches remain a threat to open roads in places and avalanche blast can affect settlements across the valley (as at Gudvangen), but local expertise in siting buildings and the use of tunnels in the Nærøyfjord area have generally forestalled losses. Abandonment of the traditional but not very profitable farms would lead to loss of biodiversity, though niche farming could be encouraged. Threats from military training maneuvers, hydroelectric plants and aquaculture have now been eliminated. A vast bluff of the mountain above Akernes is moving and threatening to slide into Sunnylvsfjord. It is being carefully monitored and evacuation routines are in place at the valley head. Damage from tourism is limited by the confined nature of the communications and is not much despite the high numbers of visitors.

COMPARISON WITH SIMILAR SITES

The west coasts of Canada, southern Alaska, southern Chile and Norway itself all have many comparable inlets and fjords but no other World Heritage fjord landscape exists within either of the two biogeographical provinces. In Norway the two sites are acknowledged to be the least disturbed of the dramatic interior fjordlands. Glacier Bay, in the St Elias parks complex in Alaska, is already a World Heritage site as are three other notable fjord landscapes: Ilulissat Icefjord, west Greenland, Gros Morne National Park, Newfoundland and Te Wahipounamu, South Island, New Zealand. These are all much shorter in length than the nominated sites. Glacier Bay is also shorter but is very deep and part of a very high mountain landscape with glaciers actively calving into the bay. Ilulissat is basically an ice sheet in a lower hinterland. Gros Morne is again in lower surroundings with no ice. Te Wahipounamu is geologically a young landscape of tectonic origin. None is closely comparable nor do they show the same degree of historically settled landscape and (except for Ilulissat) minuteness of past and present geological study.

STAFF

In Geirangerfjord a Warden is to be appointed for the Geiranger-Herdalen Protected Landscape Area. In Nærøfjord the Aurland Municipal Council for Marginal Land operates a wardening system for its lands. Three new wardens from the Norwegian Nature Inspectorate have been appointed for nature conservation duties within any future World Heritage site. Further surveillance duties are carried out by the Nordfjella Wild Reindeer Committee, the local police, local cultural maintenance contracts and private landowners.

BUDGET

The Directorate for Cultural Heritage allocates the funds necessary for cultural World Heritage sites and monuments and the Directorate for Nature Management will do the same for natural sites. The farms, forests and cultural landscapes may receive funding from other sources. No further details are currently available.

LOCAL ADDRESSES

County Governor of Møre & Romsdal, Fylkeshusa, NO-6404 Molde. Norway.

County Governor of Sogn & Fjordane:

- Department for Environmental Conservation Affairs, PB 37, NO-6861 Leikanger.
- Department for Agricultural Affairs, PB 14, NO-6801 Førde, Norway.

County Governor of Hordaland, PB 7310, NO-5020 Bergen, Norway.

Websites: www.geiranger.no www.fjordarv.no

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The principal source for the above information was the original nomination for World Heritage status.

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DATE

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