

Nature Index

Innholdsfortegnelse

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Norway uses the Nature Index to monitor the state of and trends for biodiversity in major ecosystems. Measured in this way, the pelagic ecosystems in both marine and coastal waters have shown an improvement since 1990. The situation has been stable in freshwater ecosystems. In terrestrial ecosystems, there has been a decline for wetlands and cultural landscapes (open lowland) and a slight improvement for forest, while the state of biodiversity in mountain ecosystems has fluctuated.



Looking towards the Rondane mountains. Wetlands like the area in the foreground support a variety of bird species. Photo: Bård Bredesen, Naturarkivet.no



Boreal rain forest, a type of spruce forest that grows in very humid conditions and is home to a number of rare and threatened lichen species. Such forests are under threat internationally and have a very restricted distribution in Norway. Photo: Sigve Reiso, Naturarkivet.no



Coastal heathlands are some of Norway's oldest cultural landscapes, formed 4000–5000 years ago. They are now under serious threat from modern agricultural techniques and afforestation. Photo: Kim Abel, Naturarkivet.no



Mountain scenery in Lomsdal-Visten national park, Nordland. Photo: Sigve Reiso, Naturarkivet.no

STATE

Positive trend for pelagic marine and coastal ecosystems; stable in freshwater

Nature Index values for marine and pelagic coastal ecosystems are relatively high. The overall trend for the period 1990–2014 has been positive, but there has been a small decline from 2010 to 2014. The situation has been fairly stable for both marine and coastal seabed ecosystems. The positive trend for biodiversity can probably be linked to improvements in fisheries management since 1990. For example, quotas are now based more on the precautionary principle, in order to ensure sustainable management of fish stocks. Nevertheless, Nature Index figures are lower for coastal seabed ecosystems than for other parts of the marine environment. This is related to the high level of human activity in coastal waters and nearby land areas.

Nature Index values for freshwater (rivers and lakes) are also high, and have been stable for the past 25 years. The values for Southern Norway and parts of Western Norway are somewhat lower than for other regions of the country. This is explained by the widespread and persistent acidification of river systems caused by long-range transport of pollutants.

Decline for wetland and mountain ecosystems

There has been a weak but steady decline in the state of biodiversity in wetlands in Norway since 1990. The same trend can be seen in all regions of the country, but the underlying causes vary from region to another. Physical alterations, more intensive agriculture, the abandonment of traditionally-farmed areas and climate change all have impacts on biodiversity in wetland areas.

Nature Index values for mountain ecosystems have fluctuated over the past 25 years, but the value for the whole country is now slightly lower than in 1990. Land-use change including road and railway construction and other infrastructure developments (hydropower, holiday cabins), tourism and climate change all have impacts on mountain biodiversity.

Low Nature Index value for forest, but positive trend

The Nature Index value for forest is low, indicating that biodiversity is lower than in forest ecosystems that are not influenced by human activities. The main explanation for this situation is that Norway's forests contain relatively little dead wood and a low proportion of old trees today. These are natural consequences of forestry operations. The weak positive trend since 1990 is mainly explained by an increase in the amount of dead wood, which has improved conditions for a wide range of insects and fungi that are dependent on dead wood habitats. In addition, there has been an increase in the numbers of forest-dwelling cervids.

Decline for cultural landscapes

Cultural landscapes (or open lowland in the Nature Index) in this context include all open areas below the treeline where the vegetation is natural or semi-natural. The state of biodiversity here is assessed using indicator species that are mainly associated with cultural landscapes formed through long periods of traditional management, including grazing, mowing and burning of the vegetation. The results show that there has been a negative trend for many years throughout the country. The overall Nature Index value for cultural landscape is now relatively low, mainly because traditional management techniques have been abandoned in most parts of the country.

PRESSURE

Land-use change, pollution and climate change

The state of biodiversity in ecosystems is influenced by different kinds of human activities, pollution and climate change.

Coastal areas under great pressure

The high level of human activity in coastal waters and nearby land areas makes ecosystems vulnerable. Nutrients, particulate matter and pollutants from waste water treatment, agriculture and forestry, industry and other land-based sectors are carried out to sea by rivers. Fisheries, kelp trawling, aquaculture and shipping put pressure on coastal waters in various ways. Many fjords are recipients for pollution from industry and mining. In addition, sediments still store large quantities of hazardous chemicals released in the past, which are slowly released to the environment.

Land-use change and climate change affecting wetlands and mountains

For many years, large areas of mires and bogs were lost in Norway as they were converted to farmland or forest by ditching and draining. Wetlands are also vulnerable to land-use change, for example infrastructure development including housing and forest roads, golf courses, and peat extraction for horticultural uses. In the mountains, land-use changes and construction activities connected with the tourist industry, holiday cabins, hydropower developments and roads and railways are important pressures.

Climate change is also having impacts on biodiversity. For example, palsa mires are under threat in a number of regions. These are peat bogs dotted with hummocks, each with a core of ice, and rising temperatures are causing them to thaw. In the mountains, climate change may have a variety of impacts. It has already been shown that the breeding success of some bird species is declining with climate change. This appears to be explained by a mismatch between the onset of spring and the timing of egg laying and hatching.

Both wetland and mountain ecosystems have also been affected by the abandonment of traditional farming techniques. Open landscapes are becoming overgrown as a result, making conditions less suitable for species that prefer open areas with plenty of light.

Modern forestry puts pressure on forest biodiversity

People have been using Norway's forests for many hundreds of years. Today, forestry is considered to be the most important human pressure on forest ecosystems. Felling and modern forest management bring about drastic changes in environmental conditions in forests. After hundreds of years of large timber harvests, there is considerably less dead wood and fewer old trees than in natural forest, and this reduces the diversity of insects and fungi associated with such habitats.

Cultural landscapes becoming overgrown when not actively managed

The areas included in the category 'open lowland' in the Nature Index consist mainly of traditional types of cultural landscape that need to be maintained by active management, for example grazing or regular mowing or burning of the vegetation. There has been a dramatic shift from traditional farming techniques to intensive agriculture, including tilling and crop production using mineral fertilisers. At the same time, many areas of traditional pasture and meadow have been abandoned, and open landscapes such as coastal heathlands and herb-rich hay meadows are becoming overgrown with trees and shrubs.

RESPONSE

The Nature Index provides an overview of ecosystems

Under international agreements, Norway has undertaken to obtain an overview of status and trends for biodiversity in major ecosystems. The Norwegian Nature Index is a tool for providing this information and for indicating whether Norway is making progress towards its goal of halting the loss of biodiversity.

Compilation of ecosystem data

The Nature Index is the most extensive compilation of information on Norway's biodiversity to date. It provides information on the state of biodiversity in seven major ecosystems: marine (pelagic and seabed), coastal (pelagic and seabed), freshwater, wetlands, forest, mountain and cultural landscape (or open lowland).

A set of indicators has been chosen to represent biodiversity in each of these ecosystems. The indicators include naturally occurring species, groups of species and other elements of ecosystems of importance for biodiversity (for example the presence of dead wood). In all, the Nature Index uses 301 indicators split between the different ecosystems.

The Nature Index uses a scale from 0 to 1, where 0 is very poor and 1 corresponds to the reference state, which in a natural ecosystem is defined to correspond to minimal disturbance from human activities. In other words, a Nature Index value tells us how the actual situation compares with the reference state which is based on the biodiversity expected in an undisturbed ecosystem. In semi-natural ecosystems, i.e. cultural landscapes, the reference state is defined to correspond to optimum biodiversity under a traditional management regime.

Nature Index



- The Nature Index provides information on the state of and trends in biodiversity in major ecosystems in Norway.
- Nature Index values indicate how the actual situation compares with the reference state, which is based on the biodiversity expected in an ecosystem where there is minimal human pressure.
- The Nature Index measures trends using more than 300 indicators.
- Indicators are chosen from a variety of species groups for each ecosystem, and measure deviation from a reference state, which is intended to represent ecological sustainability.
- All indicators and the overall Nature Index have values between 1 (reference state) and 0 (very poor state).