



Meld. St. 14 (2015–2016) Report to the Storting (white paper)

Nature for life

Norway's national biodiversity action plan



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(Government Solberg)*

Summary

Why do we need a white paper on biodiversity?

The natural world is the foundation for human life and livelihoods. A huge variety of species, habitats and ecosystems provides us with everything from food and medicines to building materials, opportunities for outdoor activities and aesthetic and spiritual benefits. Pollination, natural flood control and CO₂ uptake are just a few examples of the variety of ecosystem services that nature provides. Many Norwegian industries are dependent on the environment and natural resources. Norwegian outdoor traditions developed from people's close contact with the natural world, and have given rise to activities in other sectors, such as tourism.

Norway's previous white paper on biodiversity was published 14 years ago. A great deal has happened in the intervening years. The preparation of a new white paper has been a fresh opportunity to look at the challenges we face as regards biodiversity and the priorities, tools and instruments we should use to safeguard biodiversity.

Biodiversity is essential in the green shift

The Norwegian Government is actively promoting a transition to a greener Norwegian economy.

Safeguarding biodiversity for current and future generations is essential to the success of this 'green shift'. The green shift is intended to facilitate production and consumption patterns that have far less negative environmental and climate impact than is the case today. Through conservation and sustainable use, we will seek to maintain the supply of ecosystem goods and services for the future.

Biodiversity under pressure globally and in Norway

In recent decades, human activity has resulted in considerable losses of biodiversity and caused deterioration of ecological status in many ecosystems. Climate change is adding to the pressure on ecosystems. Some of the world's ecosystems are under such pressure that they are no longer able to provide the goods and services on which people depend.

In many ways, the biodiversity situation in Norway is more positive. But here too, there is work to be done. Land-use conversion and land-use change are vital for society, for example in connection with road construction, housing developments and industrial and commercial activities, but is also the most important driver of biodiversity loss in terrestrial ecosystems. Ocean acidifica-

tion, pollution and the spread of alien species are other drivers of biodiversity loss. Climate change is already affecting Norway's ecosystems, particularly polar ecosystems, and is expected to have increasingly negative impacts on other ecosystems as well in future.

Healthy ecosystems provide vital goods and services. Ecosystems consist of many different organisms that interact with each other and the physical environment. Species are the building blocks of ecosystems. Habitat loss or degradation may threaten species or populations with extinction, and the loss of species or populations may alter ecosystem functioning. Species that are considered to be at risk of extinction are classified as threatened. In Norway's latest assessment, 2355 species have been classified as threatened. This corresponds to 11.3 % of the approximately 21 000 species that were assessed.

National and international targets for biodiversity conservation

The Government's policy is designed to play a part in achieving national and international targets for biodiversity, particularly the Aichi targets under the Convention on Biological Diversity. The Aichi targets are reflected in Norway's three national biodiversity targets, which are concerned with:

- achieving good ecological status in ecosystems;
- safeguarding threatened species and habitats;
- maintaining a representative selection of Norwegian nature (the conservation of areas covering the whole range of habitats and ecosystems).

The Aichi targets are global in nature but require action at national level. Norway's contributions in this field will focus primarily on national action, but we are part of a globalised economy. We are responsible for the environmental pressure Norwegian activities cause outside the country's borders through trade and investment. Norway's efforts to reduce pressure from Norwegian activities in other countries are therefore an important part of its national policy for biodiversity at global level.

Norwegian policy

The Government takes a long-term approach to the management of Norwegian nature. We must ensure that future generations also have opportunities for wealth creation based on healthy ecosys-

tems. The Government will therefore take steps to ensure that Norwegian nature is used sustainably, prevent the loss of species and ecosystems, and continue efforts for the conservation of a representative selection of Norwegian nature.

The Government's policy for biodiversity management in Norway can be summarised under the following main headings:

1. More clearly targeted nature management
2. Climate-resilient nature management
3. Strengthening municipal expertise on biodiversity
4. Safeguarding threatened species and habitats
5. Long-term conservation of a representative selection of Norwegian nature
6. Knowledge-based management
7. Adaptation of tools and instruments to the different ecosystems

More clearly targeted nature management

Decisions are constantly being made that require a balance to be found between biodiversity considerations and other important public interests. Overall, the many different decisions that are made may cause the ecological status of ecosystems to deteriorate, which in the long run is unsustainable. At present, there is a lack of clear, agreed management objectives related to ecological status for several major ecosystems: forests, wetlands, cultural landscapes, mountains, polar ecosystems and to some extent marine waters. The Government will initiate the development of management objectives based on scientific definitions of good ecological status for different ecosystems. Once this has been done, it will be possible to target the use of policy instruments more clearly in order to achieve and maintain the desired ecological status. The Government's proposals in this area are discussed in Chapter 5.3. For rivers and lakes and coastal waters, a system of management objectives has already been established through the Water Management Regulations.

Climate-resilient nature management

Climate change will become an increasingly important pressure on biodiversity. This will have a number of implications for nature management. It will be possible to reduce the cumulative environmental effects by limiting other environmental pressures. For example, if climate change reduces the availability of food for certain species so that

they produce fewer young, it may be necessary to restrict harvesting of these species.

The Government will assess whether Norway's existing protected areas will be adequate if climate change results in shifts in the geographical distribution of species. Moreover, the Government will manage Norwegian nature in such a way that it can play a part in climate change adaptation. For example, wetlands can help to moderate flooding.

Strengthening municipal expertise on biodiversity

Land conversion and land-use change is the most important driver of biodiversity loss in Norway. Since the municipalities have extensive responsibilities for land-use management, it is vital that they organise this work in a way that ensures sound management of the natural environment.

The Government will provide a framework to enable the municipalities to build up their expertise on biodiversity. It proposes to achieve this through a sound knowledge base and the provision of better guidance, and by initiating a pilot project on municipal sub-plans for biodiversity as a tool for biodiversity management. The pilot project will focus on biodiversity of national, regional and local value.

Chapter 5.4 discusses the main principles of Norway's land-use policy. Chapter 9 deals with the responsibilities of local and regional authorities, which include responsibility for biodiversity in towns and built-up areas.

Safeguarding threatened species and habitats

One of Norway's national targets is to ensure that no species or habitats are lost as a result of the cumulative effects of human activity. Special safeguards will continue to apply to threatened species and habitats when decisions are made under sectoral legislation and in connection with land-use planning. Protection of areas under the Nature Diversity Act, priority species and selected habitat types are instruments the Government will use to safeguard threatened species and habitats.

The Government's first priority will be species that are critically endangered or endangered in Norway and also have a substantial proportion of their population in Norway. Some species are critically endangered or endangered not only in Norway but also in the rest of Europe or globally. There is even more urgent reason to take steps to safeguard such species. Chapter 6 deals with the

Government's policy for threatened species and habitats.

Long-term conservation of a representative selection of Norwegian nature

The long-term conservation of a selection of Norwegian nature has been part of Norway's policy for many years. Area-based measures to achieve this include the national park plan, county protection plans, the protection plan for watercourses, the designation of key forest biotopes that are not to be felled, and the protection of coral reefs against fisheries.

The Government will ensure that the value of conservation areas is maintained through sound management. The Government will also consider whether the areas concerned are sufficiently representative of the whole range of Norwegian nature. The Government will expand the scope of voluntary forest protection and continue work on marine protected areas. Some other habitat types, particularly in the lowlands, are also poorly represented. The Government will initiate county-level supplementary protection of areas under the Nature Diversity Act, and will test protection on a voluntary basis in ecosystems other than forest. Application of the Marine Resources Act will also be considered.

Chapter 7 deals with the Government's policy for conservation of a representative selection of Norwegian nature.

Knowledge-based management

One of the principles of Norway's environmental policy is that management must be knowledge-based. The Government will therefore continue initiatives to map Norwegian nature and establish maps of ecological information for Norway. The Government also proposes further development of the environmental monitoring system to ensure satisfactory monitoring of all ecosystems, and further development of good indicators for pressures and ecosystem services.

Other forms of knowledge generation, for example research, analyses and syntheses, will also be further developed and improved. New editions of the Norwegian Nature Index, red lists and ecological risk assessments for alien species will be presented regularly. To ensure that decision makers and the general public have adequate information about what knowledge is available, databases will be improved and coordinated. Envi-

ronmental data and statistics will be of good quality and will be available in public databases.

Adaptation of tools and instruments to the different ecosystems

Every ecosystem is different. The environmental pressures affecting them vary, and the tools and instruments used to safeguard them must be adapted accordingly. The Government's main principles for safeguarding biodiversity are the same for all ecosystems, but this white paper sets out proposals for adapting the use of tools and policy instruments to different major ecosystems: marine and coastal waters, rivers and lakes, wetlands, forest, cultural landscapes, mountains and polar ecosystems. These include proposals for achieving or maintaining good ecological status in different ecosystems (Chapter 5), safeguarding threatened species and habitats (Chapter 6) and conservation of a representative selection of Norwegian nature (Chapter 7).

The marine management plans and the river basin management plans are tools for ecosystem-based management of marine and coastal waters and rivers and lakes. Sectoral legislation and the Planning and Building Act are used to regulate activities that can put pressure on biodiversity. It is a principle of Norwegian environmental policy that each sector is responsible for dealing with pressures and impacts resulting from its own activities. Instruments such as priority species, selected habitat types and area-based protection are relevant in all ecosystems, but can only be used out to twelve nautical miles from the baseline in sea areas, since this is the limit for the geographical scope of the relevant provisions in the Nature Diversity Act.

Note to the reader: Chapter 1–3 describe the need for a national biodiversity action plan, the state of Norway's ecosystems and achievement of the Aichi-targets. These chapters have not been translated into English.

4 Indirect drivers of biodiversity loss and general framework

4.1 Introduction

The loss of biodiversity must be considered from both a global and a national perspective. Pressures on some of the world's ecosystems are having such serious negative impacts that they are no longer able to deliver the goods and services or maintain the natural processes on which people depend.

At the same time, living conditions for people across the world are improving. According to the UN,¹ the world population is projected to rise to 9.6 billion in 2050, while at the same time large population groups will need to be lifted out of poverty. Globally, the number of people in the middle class is projected to rise from about 1.8 billion in 2008 to 4.9 billion by 2030.² World energy demand is expected to rise by about 50 % up to 2050.³ In themselves, these trends will improve people's welfare, but they will also intensify pressure on the natural environment at both national and international level, through processes such as land-use change and climate change. The World Economic Forum report *Global Risks 2015* identifies climate-related risks and biodiversity loss and ecosystem collapse among the top risks that may have an impact on macroeconomic developments in the years ahead.

The European environment – state and outlook 2015, published by the European Environment Agency,⁴ lists three characteristics that are common to many of the environmental challenges facing Europe today. Firstly, they directly and indirectly affect human health and well-being, as well as prosperity and standards of living. Secondly, people are responsible for their existence, since

these environmental challenges are intrinsically linked to our consumption and resource use patterns. And thirdly, they are closely interwoven, so that the existence of one environmental problem may exacerbate the effects of others. Their evolution also depends on European and global trends, including those related to demographics, economic growth, trade patterns, technological progress and international cooperation. International cooperation is therefore vital if we are to resolve global and European environmental problems.

Implementation of the Strategic Plan for Biodiversity 2011–2020 adopted by the Convention on Biological Diversity is the world community's most important tool for safeguarding biodiversity. In 2014, a mid-term evaluation of progress so far was published in *Global Biodiversity Outlook 4*. This report describes some significant progress but finds that a great deal still remains to be done to achieve the plan's targets.

The complex nature of the environmental challenges facing us means that a wide range of policy instruments and processes of change will be needed to address them. In the short term, tackling biodiversity-related problems will require policy instruments and action that can give results rapidly where the threats are most serious, for example if species or habitats are at risk of extinction or destruction. In addition, it is vital to stimulate processes of social change that address the underlying causes of biodiversity loss and will have long-term effects.

The European environment – state and outlook 2015 and other reports⁵ indicate that neither environmental policies alone nor economic and technology-driven efficiency gains are likely to be sufficient to achieve the vision set out in the EU's 7th Environment Action Programme: 'In 2050, we live well, within the planet's ecological limits.' Achieving this will require fundamental changes in production and consumption systems, which are the main drivers of the growing pressure on the envi-

¹ Medium-variant projection as published in: United Nations, Department of Economic and Social Affairs, Population Division (2013). *World Population Prospects: The 2012 Revision, Highlights and Advance Tables*. Working Paper No. ESA/P/WP.228.

² Kharas, Homi. *The emerging middle class in developing countries*. Working paper 185. Paris: OECD, 2010.

³ There is uncertainty associated with all these prognoses.

⁴ EEA, 2015, *The European environment – state and outlook 2015: synthesis report*, European Environment Agency, Copenhagen

⁵ OECD (2012), *OECD Environmental Outlook to 2050*, OECD Publishing. <http://dx.doi.org/10.1787/9789264122246-en>

ronment. And this in turn will necessitate profound changes in dominant institutions, practices, technologies, policies, lifestyles and thinking.

Unless we devise more resource-efficient production and consumption systems, in other words systems that reduce greenhouse gas emissions, material use and environmental pressures, the cumulative environmental effects will become more and more serious, and will hinder growth and improvements in welfare. A transition to a greener society, often called the ‘green shift’, denotes a transformation process to create a society where production and consumption have far less negative environmental and climate impact than today. This is both part of sustainable development and an essential basis for it, and ecological sustainability is an essential concern here.

The Aichi targets are global in nature but require action at national level. Norway’s contributions in this field will focus primarily on national action, but we are part of a globalised economy and must take responsibility for the environmental pressure Norwegian activities cause outside the country’s borders through trade and investment. Aichi targets 1, 2, 3 and 4 (under strategic goal A) are important in this context. They include raising people’s awareness of the value of biodiversity, sustainable production and consumption, and developing and reporting on systems to ensure that the whole range of biodiversity values is incorporated into planning and national accounting systems. According to the targets, ‘by 2020, at the latest, governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.’ This means that authorities, the business sector and other stakeholders in Norway too must take steps to ensure that production and consumption are sustainable and within safe ecological limits – both within Norway and abroad.

It is an important principle that states have a responsibility for the environmental impacts their activities have in other countries. This follows from international law, and is specifically mentioned in the Convention on Biological Diversity. Article 3 establishes that states have ‘the sovereign right to exploit their own resources pursuant to their own environmental policies’, but also that they have the ‘responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdic-

tion.’ Moreover, the Convention states that, subject to the rights of other states, its provisions apply to processes and activities carried out under the jurisdiction or control of a party to the Convention, regardless of where their effects occur (Article 4(b)).

Businesses can help to reduce environmental pressure by improving their environmental performance and making efficient use of resources. Companies can develop processes and technologies to make more efficient use of scarce resources and reduce greenhouse gas emissions. Ensuring that suppliers and the entire value chain meet high environmental standards is an important element of corporate environmental responsibility. This applies to all companies, regardless of their ownership structure.⁶

4.2 The value of ecosystem goods and services

The value of nature, and thus the cost to society of environmental degradation, is often not readily apparent. Countries’ national accounts and calculations of the national wealth do not include environmental resources. The prices of goods and services will not reflect the environmental costs associated with their production and consumption unless policy instruments are used to change this. The true value of nature thus tends to be underestimated in private and public decision-making processes, particularly if it takes a long time before any damage becomes apparent or if the damage is caused in a distant part of the world.

International initiatives have therefore been taken to develop methods for demonstrating and raising awareness of the value of ecosystem services (both those with a market price and those without) in various types of decision-making processes and documents. The Government will continue Norway’s active participation in this work, for example in the UN system (UNEP and the UN Statistics Division), the World Bank, the OECD, the EU and the Nordic Council of Ministers.

Even though many people in Norway are knowledgeable about biodiversity and its value, knowledge about nature, the state of ecosystems and pressures on them nationally and internationally can still be improved among both decision

⁶ Meld. St. 27 (2013–2014) *Diverse and value-creating ownership*, Ministry of Trade, Industry and Fisheries, www.regjeringen.no

makers and the general public. Knowledge needs and related action are discussed in Chapter 8.

The Government will:

- *Promote the development of methods, indicators and models to demonstrate the values associated with biodiversity and ecosystem services from a macroeconomic perspective.*
- *Raise the awareness of the general public, decision makers and the business sector about the possible implications for society of changes in ecosystems at national and global level.*
- *Contribute to international efforts under the UN Statistics Division to continue to develop and test the system of environmental-economic accounting, and consider whether to incorporate this into Norway's reporting and accounting systems.*
- *Develop better methods for integrating the whole range of values associated with biodiversity and ecosystem services (both those with a market value and those without) into economic analyses and decision-making processes at different levels.*
- *Continue international cooperation to highlight and value ecosystem services; this includes continuing the development of qualitative, quantitative and monetary approaches to valuation.*

4.3 The EEA Agreement, trade and investment

4.3.1 The EEA Agreement and broader cooperation with the EU on biodiversity

The EU plays a leading role as regards environmental policy, and much of the EU's environmental legislation is incorporated into Norwegian law through the Agreement on the European Economic Area (EEA Agreement). Legislation on nature management, including the Birds and Habitats Directives, is not part of the EEA Agreement. However, some EU legislation with important implications for biodiversity has been incorporated into the Agreement, including the Water Framework Directive and the Directive on the deliberate release into the environment of genetically modified organisms. The EEA Agreement also includes a range of legal acts relating to the climate and environment, and these play a part in reducing pressure on the environment. They include legislation on waste, chemicals and air pollution. Norway's participation in EU processes, its cooperation with the EU and its influence on EU environmental policy through the EEA Agree-

ment are thus important as regards biodiversity too. A large body of harmonised food law (including food safety, animal health and intermediate inputs) has also been established through the EEA Agreement. Norway's animal health legislation is fully harmonised with EU law. It includes legislation on disease control and on trade in live animals and animal products within the EEA and with non-EEA countries.

Norway and the EU also cooperate closely in global and regional biodiversity initiatives, for example through the system of EEA and Norway Grants. This includes projects relating to implementation of the Convention on Biological Diversity and to mapping and assessing the economic value of ecosystem services.

Improving resource efficiency is one element of the EU's efforts to develop a circular economy. Greater resource efficiency is also vital to the success of efforts to reduce pressure on species and ecosystems to a sustainable level. The aim of a circular economy is to maintain the value of materials and energy along the value chain, thus minimising waste and resource use. By avoiding a loss of value along material flows, it is possible to create sustainable economic opportunities and competitive advantages.

The European Commission has announced that an EU action plan for the circular economy will be presented towards the end of 2015. The EU has indicated that specific, binding proposals for revision of the waste legislation will be put forward. These will include requirements for more recycling and re-use to improve resource efficiency and reduce environmental pressure and at the same time promote economic growth and employment. The proposals will also be designed to contribute to the achievement of the EU's climate targets and to reduce its dependence on imports of raw materials from outside the Union.

In summer 2015, Norway submitted its contribution to the consultation on the Commission's action plan for the circular economy, and among other things highlighted consumer and product policy, waste and chemicals policy and green public procurement.

Norway also pointed out that developing a non-toxic circular economy requires coherence between the legislation on chemicals, waste and products. We consider it important to ensure satisfactory consumer rights and legal guarantees, particularly as regards the durability of products. It is important to develop good indicators and methods that cover the entire life cycle of products in order to reduce their environmental and carbon

footprint. Effective national waste management is a key instrument for preventing marine litter. Norway also gives high priority to action to reduce food waste, including cooperation with the food industry.

Strategic use of public procurement to drive progress towards overall policy goals was an important reason for developing the new EU procurement legislation. With the new legislation, member states have a better instrument for achieving the goals of the Europe 2020 strategy for ‘smart, sustainable and inclusive growth’. The new legislation encourages wider use of green procurement than before. It is a new development that the EU is promoting strategic use of procurement and clearly defining procurement as an instrument for achieving overall social goals. Norway plans to implement the new legislation in Norwegian law during the first six months of 2016.

One of the goals of the EU’s 7th Environment Action Programme is to protect nature and strengthen ecological resilience. The programme is a common strategy that provides an overall framework for EU policy and priorities. It sets out common objectives that are to underpin the development of new policy and the implementation of existing legislation. The 7th Environment Action Programme was adopted by the EU in 2014 and is being incorporated into Protocol 31 of the EEA Agreement.

The first thematic priority of the programme deals with ‘natural capital’, which includes vital services such as pollination of plants, natural protection against flooding, and climate regulation.

Through the EEA and Norway Grants, Norway is contributing to the reduction of social and economic disparities in the EEA. Under these schemes, grants can be awarded to funds and programmes that have clear goals and use results-based management. In the period 2009–2014, Norway allocated a total of EUR 550 million to the programme areas environmental protection and management, climate change and renewable energy, and green industry innovation. Funding has for example been granted for projects to step up work on climate change mitigation and adaptation, improve the management of marine and inland waters, biodiversity and ecosystems, safeguard the cultural heritage, strengthen environmental monitoring and improve the management of chemicals and hazardous waste. About EUR 65 million was allocated to projects on biodiversity management and ecosystem services. Adaptation to climate change is also a key funding area. Climate, energy and environment will also be among

the top priorities in the next funding period, which runs from 2014 to 2021.

The European Environment Agency describes its mission as ‘to support sustainable development and to help achieve significant and measurable improvement in Europe’s environment through the provision of timely, targeted, relevant and reliable information to policymaking agents and the public.’ Norway and 32 other European countries are members of the Agency, which is an important information source for those involved in developing, adopting, implementing and evaluating environmental policy.

The Government will:

- *Through continued cooperation with the EU and the European Environment Agency, supply data and report on indicators in such a way that the information on status and trends for Norwegian biodiversity in relevant European compilations of environmental information is comparable to that available from other sources.*
- *Contribute to the EU’s work on development of the circular economy where relevant, particularly as regards waste, chemicals and product policy.*

4.3.2 Trade and environment

Introduction

In accordance with its political platform, the Norwegian Government is promoting freer trade and pursuing an active trade policy that emphasises Norway’s national interests. Trade agreements provide an opportunity to shape the course of globalisation through international cooperation. The Government’s objective is to maintain and develop a trade framework that maximises Norwegian value creation while at the same time contributing to global growth and sustainable development.

In recent decades, Norway’s ties to other countries have become even closer, through trade, labour migration and capital flows. Production and consumption are increasingly taking place in a global market with global supply chains. The international trade in goods and services makes it possible to specialise and thus contribute to better use of resources and greater productivity.

Norway has an open economy and a considerable volume of trade with other countries. About 30 % of domestic demand is met through imports. Norwegian production and consumption there-



Figure 4.1 Trade opens up access to a wider selection of products. The world's genetic resources are the origin of almost all the food we eat.

Photo: Svein Magne Fredriksen

fore have an influence on the exploitation of nature in other parts of the world.

The multilateral trading system includes various provisions allowing countries to take steps to implement a sound environmental and climate policy. For example, it is possible to introduce subsidies, prohibitions, restrictions and labelling systems, provided that such measures are in accordance with trade rules. Measures may be introduced at national, regional or international level.

Sustainable fisheries

Norway is one of the countries that has been advocating the development of effective rules under the World Trade Organization (WTO) to prohibit fisheries subsidies that contribute to overfishing, excess capacity and illegal, unreported and unregulated fishing (IUU fishing). Norway also played an active role in work under the Food and Agriculture Organization of the UN (FAO) resulting in the conclusion of the global

agreement on port state measures. The EU has adopted a Regulation to prevent, deter and eliminate illegal, unreported and unregulated fishing, and Norway has entered into a bilateral agreement with the EU to implement the same rules. Fisheries management is not part of the EEA Agreement, but Norway has close, broad cooperation with the EU on the management of pelagic fish stocks and shared stocks in the North Sea. Considerable progress has been made in this field in recent years.

Trade in threatened species

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is intended to ensure that trade in species to which it applies is sustainable. Trade in these species is organised through a licensing system, with licences issued by national authorities. CITES species are placed on one of three lists, depending on how seriously threatened they are by interna-

tional trade. In all, about 35 000 species are currently listed, about 1000 of them in Appendix I, which puts the strictest restrictions on trade.

The Convention was implemented in Norwegian law by the Regulations of 15 November 2002 No. 1276. New regulations are being drawn up which in some respects will go beyond the minimum requirements of the convention. The regulations will also implement decisions made by the Conference of the Parties after the adoption of the current regulations, and will widen their scope to include keeping or possession and trade within Norway.

Globalisation and trade

By trading with and investing in other countries, Norway is contributing to a global division of labour in the production of goods and services. Norwegian companies are increasingly turning towards and becoming established in new growth markets, which may be in countries where governance is weak and the environmental legislation is poorly developed. This trend is bringing about economic growth and improvements in welfare, but is also causing growth in production, consumption and transport. The latter may increase pressure on the environment, for example through heavier use of scarce natural resources, releases of greenhouse gases and pollutants and the spread of alien species. However, international trade and investment can also promote more climate friendly and environmentally sound development, for instance by deploying more effective and greener technology and encouraging the location of different forms of production in areas where they will put least pressure on the environment. In principle, there is thus no contradiction between an open world trading system and a sound climate and environmental policy.

Like EU treaties and law, the EEA Agreement includes a wide range of provisions designed to promote conservation and sustainable use of nature. Trade agreements are increasingly incorporating environmental provisions, for example in the form of separate chapters on trade and sustainable development. Norway and the European Free Trade Association (EFTA) have decided that a trade and sustainable development chapter should be part of the standard model for free trade agreements. Norway is also playing an active part in the negotiations on the Environmental Goods Agreement, which is intended to promote trade in environmental goods and if possible also related services.

A white paper on globalisation and trade published in 2015 (Meld. St. 29 (2014–2015)) discusses the interactions between trade policy and climate and environment. It is crucial that both the international trade regime and Norway's free trade agreements promote green growth and take climate change and environmental considerations into account. The international trade regime can play a role in facilitating more environmentally sound and climate-friendly development. It can also advance the 'green shift' by promoting increased trade in environmental goods and services and by reducing unnecessary barriers to such trade. Trade commitments must be designed to take into account countries' need to implement effective environmental and climate policies, and must facilitate green growth. Policy instruments that can be used in this connection include necessary climate and environmental standards, environmental taxes on goods and services, information and labelling requirements, environmental subsidies and facilitation of increased trade in climate and environmentally friendly goods and services. At the same time, it is important that countries are not permitted to unilaterally implement discriminatory or protectionist measures that unnecessarily obstruct trade.

The Government will:

- *Continue to include a separate chapter on trade and sustainable development in the free trade agreements Norway enters into, as a contribution to achieving international biodiversity targets.*
- *Support efforts to combat environmental crime, including fisheries-related crime, among other things through relevant international processes and programmes.*

4.3.3 Investments and green markets

Introduction

Norway has substantial financial investments abroad, held both by the Government and by private investors. Most of these investments are in Europe and North America (about 80 % of the Government Pension Fund Global and 70 % of foreign direct investments).

There is no clear definition of the term 'green investments'. According to the OECD, green growth means fostering economic growth and development while at the same time ensuring that natural assets continue to provide the resources

and environmental services on which our well-being relies.⁷ Green investments can therefore be understood as investments that promote green growth, including investments that are made taking into consideration environmental issues in the broad sense (including greenhouse gas emissions, air pollution, chemicals, biodiversity and waste management).

Actors in the financial sector, both in Norway and abroad, have shown growing interest in green and sustainable investments in recent years. At the UN Climate Summit in New York in September 2014, a new coalition of institutional investors was launched. Their goal is to substantially reduce the carbon footprint of their portfolios by December 2015. In the past year, several pension funds have been reducing their allocation to coal and petroleum and shifting their assets towards green investments. Several of the funds have highlighted the fact that managing environmental risk and making use of opportunities for green investment are vital considerations in their investment decisions.⁸

Private-sector investments

Environmental risk in the financial sector includes the risk that environmental problems themselves, or restructuring of environmental policy involving stricter regulation or substantially higher carbon prices, will influence economic developments and financial variables in the future.

Actors in the financial sector have been paying growing attention to climate and environmental issues in recent years. For example, institutional investors are to a greater degree assessing and disclosing the environmental risk associated with their portfolios. One system they can use is developed by CDP (formerly the Carbon Disclosure Project), an independent, not-for-profit organisation that collects and publishes environmental information on companies, including their greenhouse gas emissions, contribution to deforestation and water consumption. Identifying the environmental pressure caused by different parts of the

supply chain can help companies to manage environmental risk better.

The white paper *Diverse and value-creating ownership* (Meld. St. 27 (2013–2014)) describes what the Norwegian Government expects in terms of responsible corporate governance, including environmental responsibility, from companies in which the state has an ownership interest. All Norwegian companies, regardless of whether they are privately or publicly owned and of whether they operate in Norway or abroad, are expected to apply good corporate governance practices. The white paper emphasises that the Government expects companies in which the state has an ownership interest to work systematically on corporate governance and seek to be at the forefront in their respective fields. The corporate environmental responsibility of the business sector involves ensuring that environmental and resource use considerations, including the pressure a company puts on the environment, are integrated into financial decision making. In addition to complying with national and international environmental standards, companies should take a proactive approach in order to reduce the adverse environmental impacts of their operations beyond what is stipulated in such standards.

According to the white paper on private sector development in Norwegian development cooperation (Meld. St. 35 (2014–2015)), the Government wishes to provide strong support to Norwegian companies abroad, and is stepping up the efforts to assist companies in new, demanding markets. As part of this support, guidance, dialogue and practical cooperation on challenges posed by local framework conditions and governance issues are being strengthened.

A number of cooperation forums have been established by and for the private sector with the aim of building knowledge and developing systems to address challenges related to biodiversity. Within the EU, this work is being organised under the European Business and Biodiversity Platform. The Natural Capital Coalition (formerly the TEEB for Business Coalition) is a global cooperation forum where the business sector can cooperate to safeguard natural capital, for example by raising awareness of the impacts on business of loss of natural capital. The coalition is seeking to bring about a shift in corporate behaviour and thus avoid unsustainable use of natural resources. The coalition is developing a Natural Capital Protocol and systems for natural capital disclosure and risk assessments.

⁷ Inderst, G., Kaminker, Ch., Stewart, F. (2012), *Defining and Measuring Green Investments: Implications for Institutional Investors' Asset Allocations*, OECD Working Papers on Finance, Insurance and Private Pensions, No.24, OECD Publishing; OECD (2011) *Towards green growth – A summary for policy makers*, OECD Publishing, Paris.

⁸ See for example UNEP et. al (2014) *Financial Institutions taking action on Climate Change* <http://www.unepfi.org/fileadmin/documents/FinancialInstitutionsTakingAction-OnClimateChange.pdf>

The Government Pension Fund Global

The overriding goal for investments by the Government Pension Fund Global is to obtain the highest possible returns at moderate risk. The Fund's position as a long-term investor with a broad global portfolio of equities, bonds and real estate means that climate change and climate policy measures may have implications for portfolio return in future. Climate change has therefore been a key area in the management of the Fund for a long time. Climate change can also be included as one element of a broader risk assessment of business models and the long-term sustainability of companies in which the Fund has invested.

About 6 % of the value of the Fund's benchmark index for equity investments, which at the end of the first six months of 2015 corresponded to about NOK 260 billion, is in companies that obtain more than 20 % of their return from environment-related activities, including renewable energy. In principle, the Fund's equity investments in environment-related companies will increase if their share of the world's equity market rises.

In 2009, it was decided to establish environment-related mandates for the Fund. They have the same risk and return requirements as the Fund's other investments. In the white paper *The Management of the Government Pension Fund in 2014* (Meld. St. 21 (2014–2015)), the Government proposed that the upper limit for such investments should be raised to NOK 30–60 billion. The Storting (Norwegian parliament) endorsed this when it considered the white paper.

In the same white paper, the Government proposed a new conduct-based criterion for observation and exclusion from the Fund's portfolio. This is an ethical criterion, and applies if there is an unacceptable risk that companies contribute to or are responsible for 'acts or omissions that on an aggregate company level lead to unacceptable greenhouse gas emissions'. This proposal was also endorsed by the Storting when it considered the white paper. In the 2016 Norwegian budget, the Government followed up a recommendation to the Storting (Innst. 290 S (2014–2015)) on the white paper, in which the standing committee asked the Government to propose a new product-based criterion for observation and exclusion from the Fund's portfolio for mining companies and power producers that base a substantial proportion of their operations on thermal coal (coal that is used for energy production). In the 2016

budget, this criterion was worded as follows: 'Observation or exclusion may be decided for mining companies and power producers which themselves or through entities they control derive 30 % or more of their income from thermal coal or base 30 % or more of their operations on thermal coal'.

A white paper giving an account of the management of the Government Pension Fund Global is published each year during the spring parliamentary session.

Green bonds

The green bond concept was developed in 2008 by the World Bank and the Swedish bank SEB. These bonds are intended specifically to raise capital to fund environmentally sound investments. The market for green bonds is growing rapidly⁹, but is still a very small proportion of the total world market for bonds. In 2014, USD 36.6 billion was issued in green bonds, three times as much as in 2013.

Several different analysts have pointed out that it may be an attractive proposition for institutional investors to make long-term investments in infrastructure, including in environment-related sectors.¹⁰ Green bonds are a type of financial instrument that to a large extent targets institutional investors, and can therefore be an important way of expanding environmentally sound investments. However, the environmental profile of the green bonds that have been issued is disputed, since there is as yet no specific standard or clear definition of what is meant by 'green bonds'. It is up to the issuer to label bonds as 'green' and to provide information on how funds are used. Several independent bodies currently provide evaluations of green bonds, and Norwegian bodies include CICERO and DNV GL. In addition, the Green Bond Principles provide guidelines clarifying which bonds can be called 'green bonds'. It has been questioned whether issuing green bonds results in more investment in environmentally sound projects than would have been the case if they were not labelled as 'green'. In January 2015, the Oslo Stock Exchange published separate lists of green bonds, and was the first stock exchange in the world to do so.

⁹ OECD Mapping channels to mobilise institutional investments in sustainable energy, 2015

¹⁰ Kaminker, C. et al. (2013), Institutional Investors and Green Infrastructure Investments: Selected Case Studies, OECD Working Papers on Finance, Insurance and Private Pensions, No. 35, OECD Publishing



Figure 4.2 Tropical rainforests contain a large proportion of the world's terrestrial biodiversity. Rainforests also play a vital part in regulating climate and moderating climate change. Norway is contributing to rainforest conservation through its International Climate and Forest Initiative.

Photo: Thomas Martens, Rainforest Foundation Norway

Green equity indices

A number of equity indices focus on climate- and environment-related sectors, but because 'green' is not a clearly defined term, they use a number of different approaches. However, one common feature has been that the composition of these indices has changed considerably over time, which is partly a reflection of the dynamic nature of this market segment and the high level of risk.

The Government will:

- *Encourage and provide opportunities for the Norwegian business sector to take part in European and international cooperation to safeguard biodiversity.*

4.4 Development cooperation

Aichi target 2 is for biodiversity values to be integrated into development and poverty reduction

strategies and planning processes. It also applies to Norwegian development cooperation.

Norwegian aid contributes to the conservation of biodiversity in a number of ways, both through specific programmes and through the integration of biodiversity considerations into development cooperation as a whole. This topic is discussed in the annual budget proposal from the Ministry of Foreign Affairs. The Government's objective is for Norway to play a leading role in integrating environmental issues into development cooperation and to play a part in the green shift internationally.

Norway is a key supporter of programmes that involve systematic competence building in developing countries in the fields of green economy, knowledge-based nature management and tools for green industrial development.

Norway's International Climate and Forest Initiative is seeking to reduce greenhouse gas emissions from deforestation and forest degradation in developing countries. Important rainforest countries are therefore key partners, and Brazil, Guy-

ana and Indonesia have received most funding so far. The main approach used by the Climate and Forest Initiative is to pay for emission reductions in countries that succeed in reducing deforestation and forest degradation. Given the huge value

of biodiversity in forests in developing countries, and particularly rainforests, the Climate and Forest Initiative is also considered to be a very important instrument for safeguarding biodiversity.

5 Sustainable use and good ecological status in ecosystems

5.1 Introduction

The Government's main approach in its biodiversity strategy is to ensure that the nature management regime is sustainable, so that the overall pressure resulting from human activities and use of nature allows Norwegian ecosystems to maintain good ecological status over time as far as possible. This is the main theme of Chapter 5. Other important approaches to safeguarding biodiversity in Norway are action to protect threatened species and habitat types (Chapter 6) and the conservation of a representative selection of Norwegian nature for future generations (Chapter 7).

Many of the Aichi targets are essentially concerned with maintaining well-functioning ecosystems or improving ecological status, particularly numbers 4, 5, 6, 7, 8, 9, 10, 14 and 15. The Strategic Plan for Biodiversity calls for action to ensure that 'ecosystems are resilient and continue to provide essential services' and that 'biological resources are sustainably used', and its targets include action to restore degraded ecosystems and maintain the integrity and functioning of ecosystems. These aims are reflected in one of Norway's national environmental targets for biodiversity, which is that 'Norwegian ecosystems will achieve good status and deliver ecosystem services'.¹

The target of achieving good ecological status is based on the fundamental idea that well-functioning ecosystems benefit society as a whole, and that we have an obligation to pass on healthy ecosystems to future generations. The objects clause of Norway's Nature Diversity Act also highlights the importance of the environment as a basis for human activity, culture (including Sami culture), health and well-being.

Healthy ecosystems are also of decisive importance for nature's capacity to provide ecosystem services that human society depends on, such as pollination of food plants, climate regulation, flood control and clean drinking water. These are vital

for human survival, for supplies of food and other raw materials, and for maintaining strong primary industries. Sustainable forestry, fisheries, aquaculture and agriculture depend on well-functioning ecosystems. Industries that use active substances, enzymes and genetic code from biological material to manufacture medicines, foodstuffs and other products are also responsible for substantial value creation. Moreover, healthy ecosystems are important for public health, for example by providing people with opportunities for emotional and aesthetic experience and for engaging in outdoor activities.

In connection with administrative decisions, it is necessary to find a balance between costs and benefits. In many cases, other public interests are considered so important that activities or developments that will disturb the natural environment are permitted. In other cases, the weight given to other public interests may mean that it is accepted that parts of an ecosystem will not achieve good ecological status. In addition, pressures that are not under national control, such as climate change, ocean acidification and long-range transport of pollutants, may make it impossible to achieve good ecological status in all parts of ecosystems.

In general, the status of Norway's ecosystems is relatively good. A great deal has already been done to safeguard the natural environment, and Norway has introduced a wide range of legal and economic instruments that can be used in building up a sound, ecosystem-based management system. The most important legal instruments are the Planning and Building Act and sectoral legislation such as the Water Resources Act, the Watercourse Regulation Act, the Energy Act, the Pollution Control Act, the Svalbard Environmental Protection Act, the Marine Resources Act, the Aquaculture Act, the Petroleum Act, the Forestry Act and the Land Act, applied together with the Nature Diversity Act. Norway thus has a sound legislative basis for sustainable nature management. The Ministry of Climate and Environment has commissioned a report on experience gained during the first few years of the application of the

¹ Norway's environmental targets in English are listed here: <http://www.environment.no/goals/>

Nature Diversity Act, and Chapters 6, 8 and 9 include some proposals for follow-up measures to improve the application of the Act and make it more effective. The Government also proposes some changes in the application of other legislation for the same purpose, for example amendments to regulations, changes in the weighting to be used when making individual decisions, and improvements in the guidance provided. When it considers the need for new economic instruments or changes to existing instruments, the Government will primarily consider the recommendations of the Green Tax Commission. Further information can be found in the sections of this white paper on individual ecosystems, and in Chapter 9 on the roles and responsibilities of the municipalities and counties.

However, Norway still has work to do in this field. One problem for the Norwegian authorities is the lack of clear, agreed management objectives for 'good ecological status' in most ecosystems, even though 'sustainable' management is specified as a goal in a number of statutes. The exceptions are coastal and freshwater ecosystems and to some extent marine ecosystems. Clearly defined and agreed management objectives for the different ecosystems would provide a better basis for making decisions in cases where a balance needs to be found between different interests and social objectives, and would help to achieve environmentally, socially and economically sustainable development. For Svalbard, there is an ambitious target of maintaining the virtually untouched natural environment, but in this case too, there is a lack of clear management objectives for ecological status. It is therefore difficult to judge whether current use is ecologically sustainable, and one result may be that policy instruments are not used effectively enough. In addition, land conversion and land-use change is still, overall, the most important driver of biodiversity loss in Norway. Furthermore, the Norwegian nature management system has not yet been adapted to take into account changes in ecosystems caused by climate change. In addition, there are specific problems in the different ecosystems.

In this chapter, the Government proposes specific action and tools to improve the sustainability of biodiversity management over time. More general measures are discussed first, followed by more specific measures for each of the major ecosystems. The section on wetlands includes an account of how the Government intends to respond to a request from the Storting (Norwe-

gian parliament) concerning various issues relating to the management of peatlands.

5.2 The Nature Diversity Act

The Nature Diversity Act is one of the most important instruments that was adopted as a result of Norway's first national strategy for the implementation of the Convention on Biological Diversity (Report No. 42 to the Storting (2000–2001)). The Act applies to Norwegian land territory, including river systems, and to Norwegian territorial waters. Its provisions on access to genetic material also apply to Svalbard and Jan Mayen. Certain provisions of the Act also apply on the continental shelf and in the areas of jurisdiction established under the Act relating to the economic zone of Norway to the extent they are appropriate. According to the objects clause, the purpose of the Act is 'to protect biological, geological and landscape diversity and ecological processes through conservation and sustainable use, and in such a way that the environment provides a basis for human activity, culture, health and well-being, now and in the future, including a basis for Sami culture'.

Experience gained so far from application of the Nature Diversity Act has played a part in the development of the Government's biodiversity policy. Since the Act has only been in force for a few years, information on its effects is still limited. This applies particularly to its effects on the ecological status of ecosystems, which can only be assessed over a longer time period. In addition, the Act is only one of a number of policy instruments, and the state of the environment in the long term will depend on the combination of all policy instruments that are applied and the whole range of pressures and impacts on ecosystems.

The provisions of the Nature Diversity Act that are particularly relevant to this chapter are the general provisions on sustainable use, including general principles of environmental law ('principles for official decision-making', Chapter II), the provisions on species management (Chapter III) and the provisions on alien organisms (Chapter IV).

The Ministry of Climate and Environment commissioned a report from the consultancy firm Multiconsult on experience of the application of the principles of environmental law set out in the Act and its provisions on priority species, selected habitat types and exemptions from protection decisions, which was published on 30 September

2014. Additional information was obtained through talks with business organisations and others after the report was published.

The provisions on species management in the Nature Diversity Act were largely retained or transferred from other legislation – the Wildlife Act, the Act relating to salmonids and freshwater fish and the Nature Conservation Act. The provisions on alien organisms in the Nature Diversity Act, together with new Regulations relating to alien organisms, enter into force on 1 January 2016. These new rules will be important in preventing the import and release of invasive alien organisms. However, they will not provide a solution to all the problems associated with invasive alien organisms that are already established in the Norwegian environment. Eradicating, containing and controlling invasive alien organisms requires a great deal of time and resources, and complete eradication is not realistic. Priority measures are discussed in the sections on each ecosystem in Chapter 5.5. The Ministry of Climate and Environment will in consultation with other relevant ministries draw up an overall action plan describing priorities for eradicating, containing and controlling invasive alien organisms.

The provision of the Nature Diversity Act on quality norms for biological, geological and landscape diversity has only been used once, to establish quality norms for wild salmon stocks. This provision was not included when information on the application of the Act was being collected. Quality norms can be useful tools if there is agreement that a species or habitat type requires special safeguards, for example because a population is declining, but it is not clear what needs to be done and several sectors are involved in management. In such cases, establishing a quality norm can encourage the development of a joint knowledge base and joint targets for the management of the species or habitat type.

Multiconsult's report recommends some steps to clarify the scope of the principles of environmental law and provide better guidance on how they should be applied in practice. These are being followed up during the revision of the guidelines on the application of the principles for official decision-making. In addition, the report makes recommendations on the application of the provisions on priority species and selected habitat types, and on improvements of the knowledge base and steps to build up expertise at local and regional level.

5.3 Developing management objectives for good ecological status

As mentioned above, one problem for the Norwegian nature management authorities is the lack of clear, agreed management objectives for 'good ecological status' in most ecosystems, with the exception of coastal and freshwater ecosystems and to some extent marine ecosystems. This results in differing views on the need for action and where to strike a balance between different interests. The Nature Diversity Act will continue to be an important tool for a cross-sectoral approach to sustainable nature management, particularly through general management objectives for species and habitat types, principles for decision-making, and instruments such as the designation of selected habitat types. However, the Act does not provide guidance on specific management objectives for good ecological status to be used in the overall management of each ecosystem.

The Ministry of Climate and Environment will initiate the development of scientifically based criteria for what is considered to be 'good ecological status'. This will be carried out in close cooperation with relevant sectors, and will as far as possible be based on existing criteria and indicators. Defining what is meant by 'good ecological status' is the first step in developing management objectives for ecological status in different areas. It will not necessarily be Norway's objective to achieve good ecological status everywhere. If other public interests weigh more heavily, it may be decided that it is acceptable for parts of an ecosystem not to achieve good status. In addition, pressures that are not under national control, such as climate change, ocean acidification and long-range transport of pollutants, may make it impossible to achieve good ecological status everywhere. The Government will develop management objectives for ecological status in the various ecosystems, and determine which types of areas or which parts of each ecosystem should achieve good ecological status, taking all necessary factors into consideration. Specific management objectives for ecological status are to be established by 2017. The work will include all the major ecosystems except for the areas that come within the scope of the Water Management Regulations.

Once the management objectives for ecological status have been established, the Government will organise the use of policy instruments with a view to maintaining ecological status in areas and

Ecological status

SUGAR KELP FOREST AS AN EXAMPLE

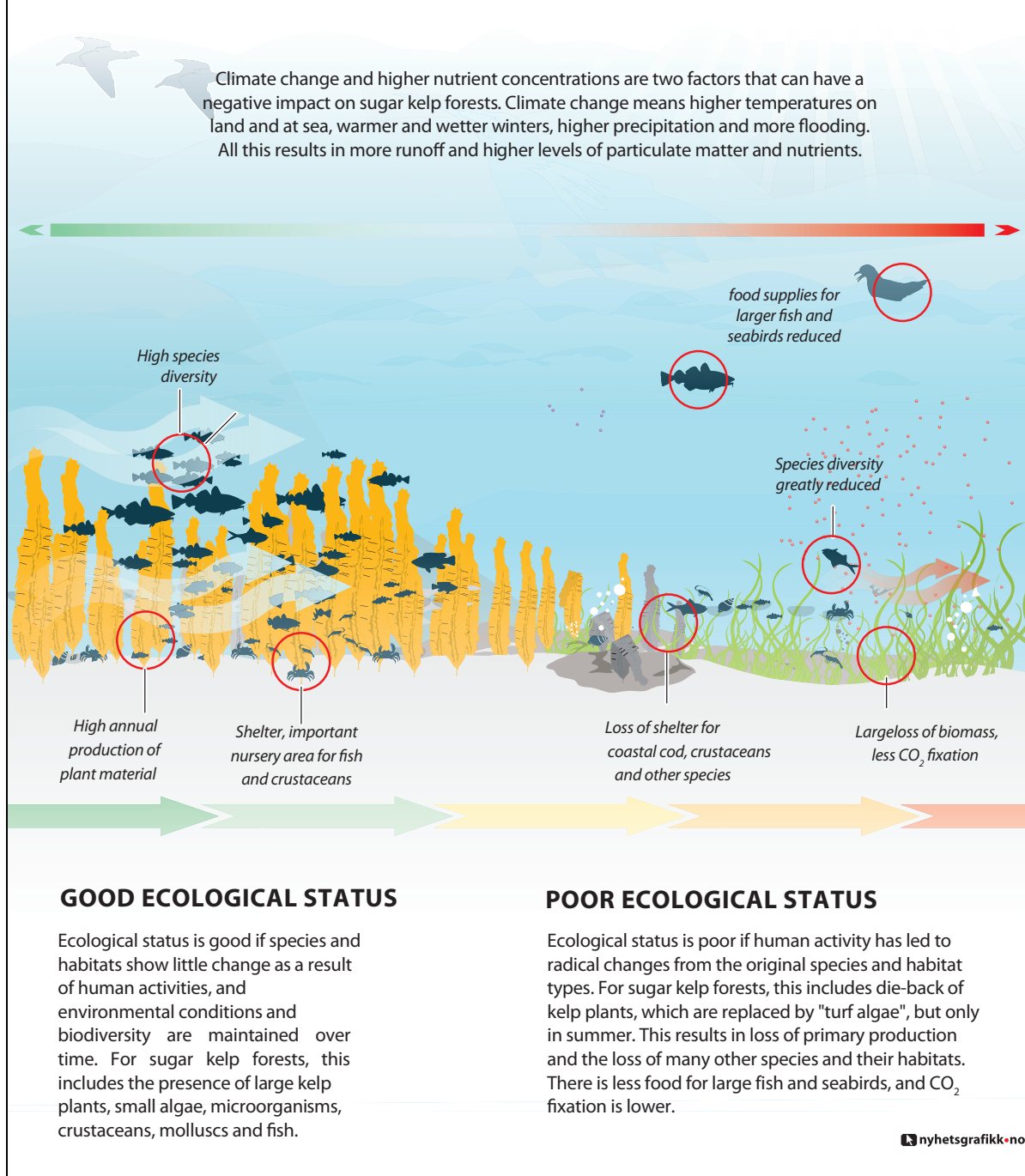


Figure 5.1

An illustration of what is meant by good and poor ecological status, using sugar kelp forest as an example.

Illustration: Nyhetsgrafikk

ecosystems where it is already good enough and improving it in areas where ecological status is poorer than stipulated by the management objectives. The Government will use this system as a tool for making nature management more effective and for setting priorities for restoration projects in accordance with Aichi target 15. The Government's aim is for a management system based on clearly defined objectives for ecological status to be in place by 2020.

While this management system is being developed, the Government will continue to apply sectoral legislation, the Planning and Building Act, the Nature Diversity Act and the Svalbard Environmental Protection Act to reduce pressure on the environment and safeguard areas that are important for biodiversity.

The Government will:

- *Initiate work to clarify what is meant by 'good ecological status', based on scientific and verifiable criteria.*
- *By the end of 2017, establish management objectives for the ecological status to be maintained or achieved in Norwegian ecosystems.*
- *Seek to put in place a management system based on clearly defined objectives for ecological status by 2020.*

5.4 Overall land-use management policy

Given that land conversion and land-use change is still the most important driver of biodiversity loss in Norway today, the Government will seek to ensure that environmental considerations are incorporated into and as appropriate given priority in relevant decisions on land use. This applies to decisions taken by central government authorities and, equally importantly, to decisions taken as part of the municipalities' land-use management responsibilities under the Planning and Building Act. The municipalities are important partners in biodiversity conservation, and their role is discussed in more depth in Chapter 9.

The Government uses two principles as a basis for land-use decisions that affect biodiversity. Firstly, the most valuable species, habitats and ecosystems should be safeguarded in connection with decisions on land conversion and land-use change. This requires good planning procedures and a sound, up-to-date knowledge base. Secondly, if a development or activity entails a risk of

loss of or damage to valuable biodiversity, the preferred solution should generally be to locate it elsewhere. However, depending on the weight given to other important public interests, a different conclusion may be reached. These principles follow from the Nature Diversity Act together with sectoral legislation.

If, after weighing up all the advantages and disadvantages in a particular case, it is concluded that the negative consequences will have to be accepted, the competent authority should consider whether to require mitigation measures in accordance with the legal basis provided by the relevant legislation. In addition, restoration of areas that are damaged by temporary developments or activities should be required once these have ceased. If there are still significant residual impacts, it may be appropriate to lay down requirements for ecological compensation if the relevant legislation provides the legal basis for this. Sections 11 and 12 of the Nature Diversity Act on the user-pays principle and on environmentally sound techniques and methods of operation may have a bearing on the interpretation of the types of requirements that can be used. Ecological compensation does not apply to the area where a development is being carried out, but to restoration, establishment or protection of biodiversity in another equivalent areas, preferably nearby and containing the same type of habitat. Compensation measures may involve restoring degraded habitat, creating new areas of habitat or protecting areas that would not otherwise have been protected. Such measures are often complex in eco-

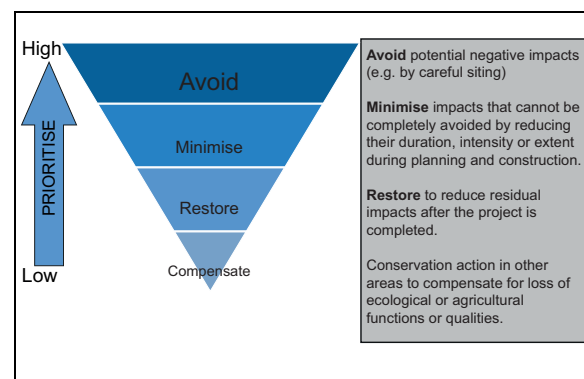


Figure 5.2 Ecological compensation

The figure shows the basic principles of the mitigation hierarchy and ecological compensation. The cheapest and most effective way of reducing negative impacts is always to avoid damage, and the preferred sequence of steps is to avoid or minimise damage, followed by restoration, with compensation as the last resort.

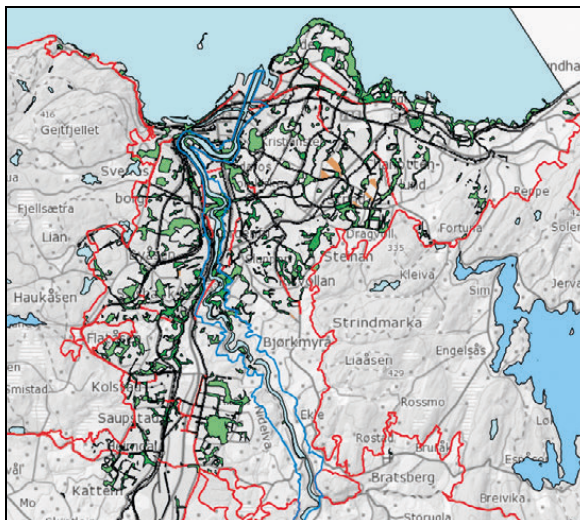


Figure 5.3 Map showing the green structure and the limit of the built-up zone (red lines) in part of Trondheim. The corridor along the river Nidelven is shown in blue. The map was produced using the municipality's digital mapping tool.

logical terms and also costly, and should normally only be considered as a last resort.

One of the main steps the Government is taking to ensure that Norwegian land-use management takes biodiversity properly into account is to obtain better spatial data on species, ecosystems and landscapes, see Chapter 8. Another approach is to strengthen municipal work on biodiversity and build up municipal expertise in this field, see Chapter 9. Furthermore, building up knowledge about the value of nature and ecosystem services, which is discussed in Chapter 4, will give a better basis for finding a balance between different interests. The Government also proposes specific uses of sectoral legislation for various ecosystems in Chapter 5.5 below.

Ecological coherence is of vital importance for maintaining biodiversity. Species need continuous or functionally connected areas of suitable habitat to allow mobility and the exchange of genetic material and ensure long-term survival. Because individual species' needs vary so much, it is not possible to establish general guidelines on what provides ecological coherence. However, it is clear that climate change will make ecological coherence even more important. The habitat in species' existing ranges will change as the climate changes, and many species will have to adapt by shifting to new areas. Areas that are important for ecological coherence may be found in any type of ecosystem. Types of areas that may be important ecological corridors include green spaces in

towns and built-up areas; lakes, river systems and river mouths; and migration routes in the sea and on land. The term 'green infrastructure' includes all such areas.

Green infrastructure is not only essential for biodiversity, but also valuable for people, for example in connection with flood control and outdoor recreation. Such multiple benefits are an important reason why the EU has included the establishment of green infrastructure as one of the targets of its biodiversity strategy.

Land-use planning under the Planning and Building Act is Norway's most important tool for establishing green infrastructure on land and out to one nautical mile from the baseline in coastal waters. Existing protected areas can also function as green infrastructure, and according to the Nature Diversity Act, protected areas may be established to promote the conservation of 'ecological and landscape coherence at national and international level'. The most suitable tools for promoting ecological coherence will vary depending on the species involved and how much it is necessary to restrict the way an area is used to achieve the purpose in each case. The need to improve ecological coherence, particularly in the context of climate change, and how this can be achieved, will be further reviewed.

The Government will:

- *Continue to work towards a land-use management regime that takes biodiversity properly into account by ensuring a sound knowledge base and strengthening local and regional expertise on biodiversity and the values associated with it.*
- *Further review the need to improve ecological coherence and how to achieve this.*

5.5 Management policy for each of Norway's major ecosystems

5.5.1 Marine and coastal waters

Norway's system of management plans for sea areas is a tool for integrated, ecosystem-based management, in other words a management system that promotes conservation and sustainable use of ecosystems. Management plans have now been drawn up for all three of Norway's sea areas: the Barents Sea–Lofoten area, the Norwegian Sea, and the North Sea and Skagerrak. The management plans have been published in the form of white papers submitted to the Storting.



Figure 5.4 Map of Norway's marine management plan areas.

Source: Norwegian Environment Agency/Norwegian Mapping Authority

The purpose of the management plans is to provide a framework for value creation through the sustainable use of natural resources and ecosystem services in the sea areas and at the same time maintain the structure, functioning, productivity and diversity of the ecosystems. The management plans are thus a tool both for facilitating value creation and food security, and for maintaining the high environmental value of the sea areas.

The management plans clarify the overall framework and encourage closer coordination and clear priorities for management of Norway's sea areas. Activities in each area are regulated on the basis of existing legislation governing different sectors. The Government will continue to use the system of marine management plans.

The Government's initiative to develop clearer management objectives for 'good ecological status' in ecosystems (discussed in Chapter 5.3) will make it possible to target action and policy instruments to maintain and achieve good ecological status in marine ecosystems more precisely. The river basin management plans drawn up under the Water Management Regulations are the main

instruments for achieving and maintaining good ecological status in waters out to one nautical mile outside the baseline. The Water Management Regulations are discussed further in Chapter 5.5.2.

Ensuring that maritime space is used in a way that takes proper account of biodiversity is just as important as land-use planning elsewhere. In waters out to one nautical mile outside the baseline, the main instrument for spatial planning is the Planning and Building Act. The Government is updating its advice on municipal spatial planning for areas in coastal waters. The aim is to ensure as much consistency as possible from one municipality to another, and to give clear guidelines for how biodiversity considerations should be incorporated into the planning process. The Government will also assess how marine spatial planning and land-use planning in the coastal zone can best be coordinated. This is important for species, habitats and ecosystems in the transitional zone between sea and land and how they are affected by local developments and pollution. The marine management plans include spatial management measures as tools for ecosystem-based management. The river basin management plans under the Water Management Regulations must include environmental objectives for water bodies. Approved management plans must be used as a basis for the activities of regional bodies and for municipal and central government planning and activities in the river basin district. Measures set out in the marine management plans and the river basin management plans are implemented in the usual way under the appropriate legislation and following normal administrative procedures.

The most important elements of the Government's policy for sustainable management of marine and coastal waters in specific sectors are described below. Measures to protect threatened species and habitats and to ensure protection of a representative selection of Norwegian nature are described in Chapters 6 and 7.

Harvesting living marine resources

The Marine Resources Act provides a framework for sustainable harvesting of living marine resources. It requires management based on the precautionary approach in accordance with international agreements and guidelines, and using an ecosystem approach that takes into account both habitats and biodiversity. Management is also based on the best available scientific information. Harvesting methods and the way gear is used



Figure 5.5 The Norwegian stock of European lobster is no longer considered to be threatened. One of the conservation measures the authorities have introduced is the closure of certain areas to lobster trapping.

Photo: Rudolf Svensen

must take into account the need to reduce possible adverse impacts on living marine resources.

Mapping of the seabed, for example through the MAREANO programme, has documented that fisheries activities are having a considerable impact on benthic ecosystems in certain areas, and trawling has the strongest impacts. Trawls have been in use for more than a hundred years, and trawling has largely been concentrated in the same areas. In recent years, there has been a substantial reduction in trawl hours, partly because more fish have been available, and pressure on benthic habitats has therefore been reduced. The area trawled has also been smaller than in previous years. Technological developments are improving efficiency and resulting in trawling gear that has less environmental impact. The Government will continue to promote the development and use of trawling gear that has as little impact as possible on the seabed, and of devices in trawls that minimise unwanted bycatches.

The Regulations relating to sea-water fisheries contain a general requirement to show special

care during fishing operations near known coral reefs. Many new coral reefs have been registered in Norwegian waters through the MAREANO programme and other projects.

Some fish species, including sandeels, herring and capelin, are defined as key species in ecosystems, and have a large influence on other elements of the biodiversity. They are important prey for a variety of marine mammals, other fish and seabirds, and their stock size has a major influence on populations of other species. Norway has chosen to introduce a new management model for the sandeel fishery in the North Sea. The aim is to build up viable spawning stocks throughout the part of the sandeel range that is within Norway's Exclusive Economic Zone.

The Government will continue to use a number of measures to build up the Norwegian stock of European lobster. Strict regulation of lobster catches will continue. There are still frequent breaches of the rules on lobster harvesting, and control and enforcement at sea will therefore continue. The closure of certain areas to lobster trap-

ping is a suitable conservation measure for a relatively stationary species like the lobster, and has been shown to boost lobster numbers locally. The Government will assess whether further action is needed to prevent the American lobster from becoming established in Norway in addition to the prohibition on importing live American lobsters.

Aquaculture

Aquaculture can have negative environmental impacts. In order to play a part in biodiversity conservation, the aquaculture authorities will take into account all pressures and impacts associated with aquaculture activities, and not only direct impacts at each aquaculture site.

The aquaculture legislation includes a number of important tools designed to safeguard the environment, including requirements for monitoring the ecological status of the seabed below and near aquaculture facilities, criteria for authorising the use of areas for aquaculture and rules on the maximum permitted biomass of fish at each locality. There are also general operating rules, including requirements for fallowing for disease control, technical requirements to prevent fish escapes and rules on combating salmon lice and the removal of escaped farmed fish from rivers. The rules are constantly being further developed, and regulations were recently adopted making the industry responsible for funding measures to reduce the proportion of escaped farmed fish in rivers. The Government is also taking steps to strengthen the knowledge base in these areas.

The Government considers environmental sustainability to be the most important criterion for regulating further growth of the aquaculture industry, and will continue its work in line with the Storting's decisions during its consideration of the white paper on predictable and environmentally sustainable growth of Norwegian salmon and trout farming (Meld. St. 16 (2014–2015)).

Petroleum activities

Environmental considerations are an integral part of Norwegian petroleum activities.

To protect marine ecosystems from pressures and impacts associated with the oil and gas industry, impact assessments under the Petroleum Activities Act are required both before new areas are opened for petroleum activity, and before specific field development projects. Impact assessments are also required before pipeline- and

cable-laying, when fields cease production, and in connection with the disposal of installations. Further conditions apply in certain areas, for example restrictions on when drilling and seismic surveys are permitted in order to protect biodiversity and safeguard the interests of other industries.

An operator must obtain a permit under the Pollution Control Act before starting petroleum activities. Permits include conditions relating to releases to air and sea and preparedness and response to acute pollution, which depend on the vulnerability of the area in question and the available technology. For example, special requirements may be included to avoid adverse impacts on corals and other vulnerable benthic fauna, sea-bird populations, and fish stocks during the spawning season.

This system ensures that environmental considerations are integrated into all phases of petroleum activities from exploration to field development, operations and field closure, and helps to maintain good ecological status in Norwegian sea areas.

Shipping, ports and fairways

A high level of maritime safety and a satisfactory preparedness and response system for acute pollution are essential for preventing damage to biodiversity. The Norwegian Coastal Administration continually seeks to optimise maritime safety, preparedness and response measures. These must be designed on the basis of information about the probability of accidents and their possible consequences for life, health and the environment. In 2016, the Government plans to submit a white paper containing an overall review of maritime safety and the preparedness and response system for acute pollution.

Norway's *National Transport Plan 2014–2023* states that the principles set out in the Nature Diversity Act must be followed when planning, constructing and operating transport infrastructure. Large-scale developments often require an environmental impact assessment, which must include a description of potential impacts on biodiversity.

Shipping in polar waters, as in other parts of the world, is subject to the rules of international conventions adopted by the International Maritime Organization (IMO). The Polar Code, which was adopted by IMO in 2014, is a mandatory international code of safety for ships operating in polar waters. The Code consists of two parts, one on safety and one on environment-related matters. It

sets specific requirements for ships operating in polar waters, for example on ship design, equipment, operations, environmental protection, navigation and crew qualifications. The most important environment-related provisions deal with pollution by oil, chemicals, sewage and garbage released from ships. The Polar Code enters into force on 1 January 2017.

Norway's Act relating to ports and navigable waters is intended to facilitate safe and unimpeded passage and sound use and management of navigable waters in accordance with the public interest. The public interest includes biodiversity considerations. These must be taken into account when considering applications for permits for works under the Act. 'Works' in this connection include quays, bridges, aquaculture facilities, cables, pipelines, dredging and dumping. The Act also includes provisions on the use of navigable waters, aids to navigation and port activities.

Invasive alien organisms

There is a high risk of the introduction of alien organisms when ships discharge untreated ballast

water, and these may displace native organisms. Climate change means that the risk that such organisms will become established is rising. Norway regulates ballast water management through its national Ballast Water Regulations, which entered into force in 2009. The regulations will be revised once the Ballast Water Convention has entered into force, which is expected to happen in the near future.

The Government will give priority to efforts to contain and control the Pacific oyster in accordance with the forthcoming action plan for the species. The Government will continue the current management approach for red king crab, which is to regulate the commercial fishery in the eastern part of its distribution area in Norway and encourage harvesting of all sizes of crabs to control the species further west.

Plastic waste

Sound waste management is essential for preventing marine litter. Dumping of waste is forbidden, and there are requirements to search for and report lost fishing gear. The Government has rein-



Figure 5.6 The Pacific oyster is an alien species in Norway, and there is a high risk that it will have negative impacts on Norwegian coastal ecosystems. The Government will give priority to efforts to contain and control the species.

Photo: Kim Abel/Naturarkivet

forced efforts at both national and international level to prevent littering of coastal and marine areas, and to build up knowledge about the sources of litter, its impacts and possible action against marine litter and microplastics. More support has been made available for voluntary beach clean-up campaigns. A producer responsibility scheme for leisure craft is being considered, and in 2016 the Norwegian Environment Agency is to present a review of other effective national action to deal with marine litter. The Agency will also publish an assessment of possible measures to reduce and prevent microplastic pollution of the marine environment. A cooperation project has been started in which fishermen can enter into a voluntary agreement with the Environment Agency allowing them to deliver waste they retrieve during fishing operations free of charge in port. The waste is then registered and as much as possible of it is recycled. The scheme currently applies to four Norwegian ports, and the data collected will be used in identifying solutions to the problem of marine litter. The Directorate of Fisheries will continue to run its annual retrieval programme for lost fishing gear. The authorities also intend to complete the work of removing abandoned mussel cultivation facilities. Norway will continue to play an active part in international efforts, mainly organised by the UN Environment Assembly (UNEA), the UN Environment Programme (UNEP), the UN Food and Agriculture Organization (FAO), the Convention for the Protection of the Marine Environment of the North-East Atlantic (the OSPAR Convention) and the North East Atlantic Fisheries Commission (NEAFC), to reduce the quantities of plastic waste and microplastics in the marine environment, build up knowledge about microplastics and prevent losses and ensure retrieval of fishing gear.

The mineral industry

In recent years, the mineral industry has shown growing interest in potential mineral deposits on the Norwegian continental shelf. The knowledge base is inadequate at present, and mapping and surveys are therefore the key activities. It will be some time before any commercial extraction of minerals can be started, and this would require more knowledge about the resource base, extraction methods, coexistence with other industries, and benthic species and habitats. Unless precautions are taken, activities on the seabed can damage rare and vulnerable species and habitats. The permanent footprint of mineral extraction should

be minimised. Before any mineral activities can be permitted on the continental shelf, the knowledge base, including knowledge of environmental impacts, must be improved and sound legislation must be in place.

Offshore energy

The Offshore Energy Act entered into force on 1 July 2010. Under the Act, offshore renewable energy production may only be established after the public authorities have opened specific geographical areas for licence applications. Before an area can be opened for offshore wind power development, the Act also requires the central government authorities to carry out a strategic environmental assessment (SEA). One important purpose of drawing up the Offshore Energy Act was to ensure that a framework was in place well before any developments started and to maintain control of spatial planning offshore.

As part of the implementation of the Act, a working group led by the Norwegian Water Resources and Energy Directorate identified areas it considered to be suitable for wind power. The Directorate then conducted an SEA for these areas, which was submitted to the Ministry of Petroleum and Energy in 2013. The SEA was comprehensive, and included an evaluation of environmental, economic and business interests associated with the areas and their suitability in technological and economic terms. The Directorate concluded that five areas should be given priority for wind power developments. None of these has as yet been opened. Under the Offshore Energy Act, environmental impact assessments must be conducted in connection with licence applications, and detailed plans for each project must be drawn up.

5.5.2 Rivers and lakes

Integrated management

Cross-sectoral cooperation on water management under the Water Management Regulations (which incorporate the Water Framework Directive into Norwegian law) is an important tool for achieving good ecological status in Norway's rivers and lakes. The management plans for river basin districts include environmental objectives for water bodies and programmes of measures.

The measures included in the river basin management plans drawn up for the period 2016–2021 are to be operational in 2018 at the latest, so that it

is possible to achieve the national target of good ecological status by 2021. This has involved cooperation between sectors to put together sets of measures to reduce negative impacts and achieve environmental objectives. Further work will be carried out on the impacts of salmon lice and escaped farmed fish on wild salmon stocks. The Government will ensure the coordination of efforts by all relevant sectors to put the programmes of measures set out in the river basin management plans into operation so that the environmental objectives can be met. Decisions on the implementation of specific measures will be taken by the competent authority in each case under the relevant legislation.

Planning for river systems and adjacent areas

According to section 1–8 of the Planning and Building Act, the natural and cultural environment, outdoor recreation, landscape and other public interests in the 100-metre belt along the shoreline and along rivers and lakes must be given special consideration in planning processes. The same section also requires municipalities to consider whether developments that will have a negative impact on the environment should be specifically prohibited in this belt. Most municipalities have now introduced a prohibition against building along rivers and lakes. The Government considers it vital that municipalities and county authorities are aware of the importance of different ecosystems in climate change adaptation. For example, riparian ecosystems and floodplains can moderate the impacts of flooding, and should be retained as far as possible in planning processes. Section 11 of the Water Resources Act gives the municipalities the authority to determine the minimum breadth of the natural vegetation belt to be maintained along river systems to counteract runoff and provide a habitat for plants and animals. The Ministry of Climate and Environment, in consultation with the Ministry of Petroleum and Energy and the Ministry of Agriculture and Food, will ensure that the municipalities receive advice on how to apply this provision.

Works in river systems

River systems are an essential and characteristic element of Norwegian nature, and also an important source of renewable energy. The legislation on river systems makes licences mandatory for all works in river systems that may significantly affect public interests. The competent authority

may lay down necessary conditions for such works. Hydropower developments have brought about the greatest physical disturbance of Norway's river systems, but are also the backbone of the Norwegian electricity system and of vital importance to people's welfare.

As a general rule, a licence is required to construct and operate a new hydropower installation. However, small-scale installations are generally exempt from the licensing requirement and are dealt with under the Planning and Building Act. Licences contain conditions relating to nature management and mitigation measures. The flow dynamics and variation in water flow are generally key to the value of a river system as a landscape element and for outdoor recreation and biodiversity. Licences therefore frequently include a requirement to maintain a minimum water discharge, or environmental flow, in order to maintain more of the connectivity and flow dynamics of the river channel.

During licensing processes, the water resources authorities will attach special importance to adjusting flow regimes to maintain the ecology of river systems in the best possible way. This applies both during licensing of new hydropower installations and procedures to alter the conditions for operation of existing installations. The use of measures to improve ecological status that will limit power production must be considered on the basis of an overall cost-benefit assessment of the effects on public and private interests.

The competent authorities include standard conditions, including conditions relating to nature management, in all new licences for hydropower installations. The conditions relating to nature management have been developed through experience of river system management, and make it possible to require licensees to investigate the impacts of hydropower production on the ecology of river systems, and to take certain steps to reduce the adverse impacts of developments, for example replenishing spawning gravel or removing barriers to fish migration.

Requiring licensees to investigate the long-term environmental impacts of hydropower developments makes it possible to identify whether further mitigation measures are needed. The authorities can also use the accumulated knowledge and experience of the impacts of earlier hydropower developments in determining the conditions that should be included in new licences. Furthermore, this knowledge and experience will provide a better basis for assessing the cumulative environmental effects if new developments are permitted.

The Government intends to make more active use of the standard nature management conditions to improve ecological status in river systems where there are hydropower developments.

The Norwegian river basin management plans point out that many of the current licences for hydropower developments lack the standard nature management conditions.

It is true that about half of all current hydropower licences lack the standard nature management conditions, which have only been included in all new licences since 1992. However, there is legal provision for requiring improvements of ecological status, even though the older licences do not include the modern nature management conditions. The water resources legislation provides for the licensing authority to revise the conditions for licences after a certain number of years, provided that certain requirements are met. This provides a tool for modernising the conditions in licences to bring them more closely into line with current environmental standards. It is possible to incorporate the standard nature management conditions when licences are revised, and subsequently to require the licensee to take action to improve ecological status or to carry out investigations to allow an evaluation of which measures are needed. The problem is that a revision process can be very time-consuming and resource-intensive, and that measures to improve ecological status are needed in many areas affected by older hydropower developments. The scale of the administrative resources required means that it may take a long time to achieve the environmental objectives for rivers where there are older hydropower developments.

The Government will review more efficient ways of making the standard nature management conditions or other effective instruments applicable, in the first instance to river systems regulated by hydropower licences where there are known to be environmental problems. This will be done with a view to requiring action to achieve the nationally approved environmental objectives in the river basin management plans for the period 2016–2022.

Within certain limits, the energy authorities can through a revision process require measures to improve ecological status that will affect power production, for example requirements to maintain a minimum water discharge. This cannot be done using the standard nature management conditions. The Norwegian Water Resources and Energy Directorate and the Norwegian Environment Agency have carried out a joint screening

study of all river systems where revision of hydropower licences can be started by 2022, covering about 395 licences in 187 river systems. The report assesses the environmental qualities that can be maintained through cost-effective measures that will involve some reduction in electricity production. The two agencies recommend giving high priority to 50 river systems where they identified a high potential for significant improvements in ecological status with only a small or moderate estimated loss in power production. On the basis of an overall national cost-benefit analysis, the Ministry of Petroleum and Energy and the Ministry of Climate and Environment have instructed the river basin district authorities that as a general rule, requirements relating to minimum flow and/or water levels in regulation reservoirs are only to be used as a basis for achieving environmental objectives in the 50 high-priority river systems.

A good many hydropower licences will be revised during the first management cycle for Norway's river basin districts. During this period, it may also be appropriate to require measures to improve ecological status in river systems other than the 50 high-priority river systems. This can be done by applying the standard nature management conditions, requiring licensing of older hydropower developments (some of these have never had licences, see the next paragraph), or amending individual conditions in certain hydropower licences. The Government expects sparing use to be made of proposals to require licensing of previously unlicensed developments or to amend conditions in licences in a way that would reduce electricity production. If the competent authorities for the river basin districts nevertheless consider that water flow requirements should be given priority in some of these river systems, they must provide grounds for their conclusions in the management plans. A new cost-benefit analysis must be made during the second management cycle (2022–2027).

There are still some older hydropower developments for which no licences have ever been issued. In special cases, the authorities have the legal power to require licensing of such developments. The authorities will assess on a case-by-case basis whether to use such processes as an opportunity to improve the ecological status of river systems if there are strong environmental grounds for doing so. In such cases, the standard nature management conditions will be included during the licensing process. A better overview is needed of unlicensed hydropower developments,

including hydropower plants, and where they are located. The Ministry of Petroleum and Energy and the Ministry of Climate and Environment will together survey unlicensed developments and draw up an overview.

There may also be other grounds than improvement of ecological status for operational adjustments or altering conditions in licences, for example relating to landscape considerations or outdoor recreation interests. Revision of licences and other tools provided by the water resources legislation can also be used to achieve improvements for these interests. River systems that are protected against hydropower developments are discussed in Chapter 7.3.

Management of wild salmonids

Norway bases its management of wild salmon stocks on international management principles adopted by the North Atlantic Salmon Conservation Organization (NASCO) and on a policy document on the protection of wild Atlantic salmon (Proposition No. 32 (2006–2007) to the Storting). Norway's objective is to maintain and rebuild salmon stocks of a size and composition that safeguards the genetic diversity of the species and makes full use of the productive capacity of salmon habitat.

The system of national salmon rivers and fjords gives about three-quarters of Norway's overall salmon resources special protection in selected river systems and fjords. This system is to be evaluated in 2017. If it is not considered to be providing adequate protection for wild salmon, the Government will assess the need to provide stronger protection against the effects of human activity.

The quality norms for wild salmon lay down guidelines for management objectives for salmon stocks. They clarify what is meant by 'good status' for a wild salmon stock. The Ministry of Climate and Environment will ensure that the classification of the most important salmon stocks in accordance with the norms is continued. If some stocks do not meet the criteria for good status in accordance with the norms, and there are no exemptions from the requirements in or under the norms, the Ministry will, in consultation with the relevant authorities, seek to clarify why good status has not been achieved and draw up a plan for how the norms can be achieved.

The Government will continue efforts to eradicate the salmon parasite *Gyrodactylus salaris* from river systems in accordance with scientific advice,

mainly by treating rivers with rotenone. As of 1 July 2015, the parasite had been eradicated from a total of 22 infected river systems. Treatment of a further 17 river systems had been completed, and it is hoped that they can be declared free of the parasite within the next five years.

Although for many salmon stocks, fishing is not the main threat, regulating fishing in rivers and the sea helps to reduce the overall pressure on wild salmon and thus ensure the survival of certain stocks. New regulatory measures for fishing for anadromous salmonids will be introduced in 2016. These will focus on sustainability and value creation. The Government is also seeking to ensure that fishing in the Tana river system is sustainable from 2017 onwards. Cooperation with Russia on the management of wild salmon in the Finnmark and Murmansk region will be followed up in accordance with a memorandum of understanding between Norway and Russia.

The Government will continue to make use of gene banks to safeguard the genetic diversity of salmon and sea trout stocks and to safeguard stocks that are threatened by *Gyrodactylus salaris*. However, the Government's long-term aim is to be able to restock the rivers from which these stocks originate, and for the stocks to be able to survive in the wild.

The Government will continue the liming programme for rivers and lakes to counteract the effects of acid rain. Liming improves conditions not only for wild salmon, but also for biodiversity in general. There are now 21 salmon rivers in the liming programme, and after many years, a large number of salmon stocks have recovered. Of the wild salmon caught in Norway, 10–15 % are now from rivers that are in the liming programme.

Action to reduce the negative impacts of salmon lice and escaped farmed fish is discussed in the section on aquaculture in Chapter 5.5.1.

Regulation of pollution

Section 8 of the Pollution Control Act states that ordinary pollution from agriculture is permitted unless otherwise specified in regulations issued under section 9 of the Act. Regulations on the storage and use of fertiliser products of organic origin have been adopted to prevent pollution and to promote sustainable soil management and ensure that biodiversity concerns are taken into account when they are used. The Government is revising these regulations, and one of the aims is to reduce pressure on water bodies in agricultural areas.

Some pharmaceuticals that pose a significant risk to the environment have been included on a Watch List under the Water Framework Directive. All the EU member states are required to monitor the concentrations of these substances in water bodies. In addition, the environmental effects of pharmaceuticals are considered when making decisions on whether to grant marketing authorisation for their use in veterinary medicines. Waste water treatment plants are not designed to remove pharmaceuticals. Because of the environmental damage that pharmaceuticals can cause, it is important to inform the public about how to dispose of unused medicines. The Ministry of Health and Care Services has therefore asked the Norwegian Medicines Agency, together with the pharmacies and the pharmaceutical industry, to inform the public about the pharmacies' take-back scheme for unused medicines.

Alien organisms

The new Regulations relating to alien organisms (in force from 1 January 2016) introduce a requirement to hold a permit for the import or release of a long list of aquatic plants and other organisms. Steps to deal with alien fish species will be based on these regulations and on a forthcoming action plan for combating alien exotic fish species. Action to contain and control Canadian pondweed and Nuttall's pondweed will also be organised within the framework of the action plan for the two species.

5.5.3 Wetlands

Introduction

One element of the Government's policy for sustainable use and good ecological status in wetlands is its follow-up of a request from the Storting dated 2 June 2015. The Storting decided to send this request in connection with a debate on proposals for integrated long-term management of peatlands in Norway. The Government was asked to assess relevant issues relating to the management of peatlands in its white paper on Norway's biodiversity action plan and in white papers on agriculture and on the forestry and wood industry.

Threatened species and habitat types associated with wetlands, and action to protect them, are discussed in Chapter 6.4.3, and measures to ensure conservation of a representative selection of wetlands are discussed in Chapter 7.3.3.

Many wetlands are still under considerable pressure, although the situation has improved in some respects in recent years. Because of the importance of wetlands for biodiversity and carbon storage and their potential importance in flood control and drought mitigation, the Government will intensify efforts to improve the ecological status of priority areas so that remaining wetlands are safeguarded.

Internationally, the importance of wetlands has been recognised for many years, and the Ramsar Convention provides a global framework for the conservation and wise use of wetlands. The 168 countries that are parties to the convention have drawn up a fourth strategic plan for the period 2016–2024 that each country is expected to implement. Norway is doing so as part of the action plan in the present white paper. The conservation and sustainable use of peatlands was one of the topics discussed at the 12th Conference of the Parties to the Ramsar Convention in June 2015. A resolution adopted at the conference encourages all countries to limit 'activities that lead to drainage of peatlands and may cause subsidence, flooding and the emission of greenhouse gases.' The Nordic countries played an active part in the adoption of this resolution, and the Nordic environment ministers have agreed to join forces to strengthen efforts for the conservation and restoration of peatlands.

The Government will ensure that the values and benefits associated with wetlands, including peatlands, are given greater weight in the application of sectoral legislation and the Planning and Building Act. This will include providing better guidance on the importance of incorporating the values and benefits associated with wetlands, including peatlands, into municipal land-use planning, and how this can be done. The Government will also encourage municipalities to use natural flood control, including maintenance and restoration of riverbank, wetland and ecotone vegetation, as an integral part of their climate change adaptation work. The official Government expectations for regional and municipal planning make it clear that municipalities and county authorities need to be aware of the importance of different ecosystems for climate change adaptation. This also applies to the county governors, whose responsibilities include providing guidance for the municipalities in climate change adaptation. Ecosystems such as wetlands, river banks and forest can moderate the impacts of climate change, and their conservation should therefore be included in land-use planning processes. The Government expects

municipalities and county authorities to take particular note of natural hazards and future climate change, and to identify important values associated with biodiversity and maintain them through regional and municipal planning. It is important to keep track of developments, and the Government will therefore ensure that the municipalities report on permits for land-use change in wetland areas in the same way as for cultivation of new areas. If important public interests make it necessary to allow developments on peatland, excavated material should as far as is practicable be used in the restoration of other peatlands.

Use of peat

Norwegian potting soil may contain a high proportion of peat extracted from peatland, often imported from other European countries. Peat extraction damages plant and animal habitats and results in greenhouse gas emissions. Industrial peat extraction is one of the major pressures that is causing degradation of peatlands internationally. It is therefore important to make consumers aware that it is possible to use soil that does not contain peat for gardens. The Government will consider requiring producers to provide clear labelling of the contents of soil products. The need for soil improvers and growth media could in principle be met by using other renewable resources. However, phasing out peat may result in more use of replacements, for example imported coir (coconut fibre). It is important to ensure that switching to other products will result in a real environmental improvement. The Government will therefore review the consequences of phasing out the use of peat more thoroughly.

In June 2015, the Storting debated proposals for integrated long-term management of peatlands in Norway, and decided to request the Government to amend Norway's regulations on environmental impact assessment (EIA) as soon as possible to make an EIA mandatory for peat extraction projects below the current limits, i.e. total volume extracted less than 2 million m³ or site surface area less than 150 hectares. This issue will be further reviewed during the revision of the Norwegian regulations to bring them into line with the revised EU Directive 2014/52. The deadline for implementing the directive is spring 2017.

Sustainable forestry to safeguard wetlands

The construction of new drainage ditches in connection with forestry operations is forbidden, but

already existing ditches may be cleared. In certain areas, it may be necessary to maintain old ditches so that timber production does not decline. However, clearing old, more or less blocked ditches in areas where no productive forest has been established can dry out active peatland and swamp forests. The Government intends to revise the regulations on sustainable forestry to prohibit both the construction of new drainage ditches and clearing of old ditches in areas where no productive forest has been established. This will be further discussed in a forthcoming white paper on forestry from the Ministry of Agriculture and Food.

Regulations on new cultivation of land

The updated cross-party agreement on climate policy from 2012 includes a decision to revise the regulations on new cultivation of land to reflect climate change considerations. The Government is considering how to do this, and will among other things commission a review of the impacts of various measures relating to new cultivation of peatland, focusing on their mitigation effect and cost. The option of prohibiting new cultivation in peatland areas will also be considered. The Government will hold a public consultation process on the proposed amendments to the regulations after the review has been published.

Restoration of wetlands

Peatland restoration improves ecological status, and will also improve and increase the areas of suitable habitat for many threatened species. Peatland restoration, together with improvements of ecological status as required by the river basin management plans, is the Government's most important approach to implementing the international target of restoring at least 15 % of degraded ecosystems.

According to the Intergovernmental Panel on Climate Change (IPCC), peatland restoration is one of the most cost-effective ways of reducing greenhouse gas emissions from the agricultural sector globally. A 2010 report on measures and instruments for achieving Norway's climate targets by 2020 (*Climate Cure 2020*) also found this to be a cost-effective measure, with an estimated price of NOK 168 per tonne CO₂. Restoration of peatlands and other wetlands can also be a useful climate change adaptation measure. Intact wetlands, particularly those that are fed by rivers, can provide protection against destructive flooding. In addition, they can reduce the impacts of drought.

Restored peatlands can start to build up a peat layer again and thus store more carbon. However, this is a very slow process. When peatlands are first rewetted, methane emissions will increase. However, in the long term a net increase in carbon storage is expected.

In 2015, the Ministry of Climate and Environment started a three-year pilot project on peatland restoration. The aims for the sites that are included are to stop greenhouse gas emissions, enhance their role in climate change adaptation and improve ecological status. Most of the localities included in the pilot project are within protected areas. At the same time, a project for river system and wetland/peatland restoration was established by a committee of directorates under the Water Management Regulations to ensure the necessary cooperation and coordination of initiatives in these areas. It is intended to facilitate the implementation of Norwegian restoration initiatives, encourage the exchange of information and experience, and assess possible mechanisms for closer coordination of planning and funding of projects where authorities from several sectors are involved.

As part of its efforts to strengthen the national cross-party agreement on climate policy, the Government will draw up a plan for expanding restoration initiatives for peatlands and other wetlands as a climate policy measure in the period 2016–2020. Restoration will be organised so that projects play a part in achieving the Government's goals for climate change mitigation and adaptation and for improvements in ecological status. The Norwegian Environment Agency and the Norwegian Agricultural Agency are responsible for drawing up the plan, which is to be completed in the course of 2016.

5.5.4 Forest

Forest management in Norway is strongly influenced by the forestry legislation and the way it is applied in practice.

Strengthening environmental concerns in forestry

As announced in the 2011 white paper on agricultural, forestry and food policy, the Government will give greater weight to environmental concerns in forestry by making use of the instruments introduced in the Nature Diversity Act and policy instruments for the forestry sector, including environmental inventories, knowledge development and application of the Norwegian PEFC

standard, so that more biomass can be harvested from Norwegian forests while at the same time maintaining biodiversity. This will be discussed further in the forthcoming white paper on forestry policy from the Ministry of Agriculture and Food.

Regulations on sustainable forestry

Regulations on sustainable forestry under the Forestry Act are Norway's key legislation for managing forest areas that do not have statutory protection. The Government considers that any intensification of forestry involving an increase in timber harvesting should be combined with stronger environmental measures in forestry. The Government will discuss this further in a forthcoming white paper on forestry policy.

Grant scheme for forestry management plans and environmental inventories

For many years, the Ministry of Agriculture and Food has provided grants for forest owners who draw up forestry management plans for their properties. Landowners generally engage private companies to obtain the necessary information and draw up the plans, and often many forest owners in the same area will commission forestry management plans at the same time, so that data collection takes place over a larger area.

Since 1990, it has been a condition for awarding grants that forestry management plans also include information on important environmental features of the forest property. Since 2000, there has been a requirement to record important habitats for red-listed species according to a specified method (known as environmental inventories in forest) on the basis of research on red-listed species and their habitat requirements. Environmental information acquired in this way provides a basis for environmental measures carried out done by the owners, and in addition the information from environmental inventories often provides a basis for voluntary protection of forest.

By 2015, about 70 000 areas covering a total area of about 750 square kilometres had been identified through environmental inventories and set aside as key biotopes that are not to be felled. This corresponds to almost 1 % of the total area of productive forest. Since environmental inventories have not yet been carried out for all forest properties, the proportion of productive forest set aside as key biotopes is expected to increase.

Regulations relating to the planning and approval of forestry and farm roads

Norway adopted new regulations on the planning and approval of forestry and farm roads in May 2015. The Ministry of Agriculture and Food will issue a circular on the regulations describing how to proceed if applications are received for the construction of forestry roads where subsequent logging may damage forest areas of high conservation value. The intention is to ensure that the environmental authorities, in consultation with the forestry authorities, investigate whether protection on a voluntary basis is a possibility in such cases. If the forest owner is interested in protection on a voluntary basis, the necessary procedures will be started. If not, the application for road construction will be processed in the normal way in accordance with the regulations.

Management of forest cervids

Moose, roe deer and red deer are the cervids that are mainly associated with forests in Norway. The fallow deer is an alien species, and is found in Østfold county. The Nature Diversity Act and the Wildlife Act and regulations under these acts provide the general framework for cervid management in Norway. The specific regulations on the management of cervids are of key importance. They require the municipalities to determine objectives for stocks of moose, red deer and roe deer in areas where hunting is permitted. The Government considers it important to organise cervid management locally.

Cervid populations in Norway have grown strongly after the Second World War. Moose stocks have for a time been too large for the available grazing resources in parts of the southern half of Norway. Grazing damage as a result of record-high cervid densities is costly for the forestry industry. Large populations of cervids also have a negative effect on traffic safety because the risk of deer-vehicle collisions rises. The Ministry of Climate and Environment will encourage steps to make information on cervids available to user groups and promote knowledge-based management of cervid populations to minimise negative density-related effects such as grazing damage and deer-vehicle collisions.

Invasive alien organisms

Foreign tree species can have negative impacts on native biodiversity. Planting and sowing of such

species is regulated by the Regulations relating to the release of foreign tree species for forestry purposes under the Nature Diversity Act. The Ministry of Climate and Environment will continue to administer the regulations, and will in consultation with the Ministry of Agriculture and Food revise the guidelines on the regulations and publish a new edition. Another aim is to simplify administrative procedures for planting foreign tree species that are to be used as Christmas trees. In such cases, it may be appropriate to require notification rather than an application for a permit. In this context, there will be a focus on control of the spread of foreign tree species.

The spread of foreign tree species from sites where they have been planted earlier can also be a problem, particularly in protected areas. The administrative authorities for these areas will play an important role in containing and controlling the undesirable spread of foreign tree species, see Chapter 7.2 on management of protected areas. The Government will discuss appropriate measures to be used outside protected areas in the forthcoming white paper on forestry policy.

5.5.5 Cultural landscapes

The Government's position is that it is neither possible nor desirable to revert to the agricultural techniques that were common fifty years ago. Nevertheless, action to maintain the ecological status of areas of cultural landscape is important.

The environmental programmes and grant schemes in the agricultural sector are intended to reduce pressures and impacts associated with agriculture and to maintain the cultural landscape. A number of them also result in improvements in agricultural practices and boost production. Most of the environmental grant schemes in the agricultural sector are part of the Agricultural Agreement between the state and the farmers, and are organised in environmental programmes at national, regional and municipal level. The national environmental programme provides a central framework and national goals and includes key grant schemes for the whole country. The regional environmental programmes include grant schemes at county level, adapted to the environmental situation in different parts of the country, and the scheme for specific environmental measures in agriculture is organised at municipal level. A considerable proportion of the funding provided through these schemes is allocated to cultural landscape projects. Funding for projects

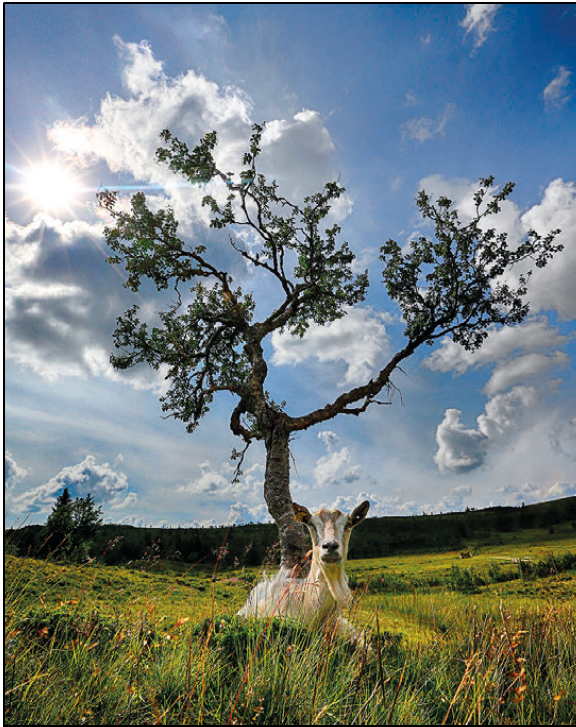


Figure 5.7 Active and targeted management is needed to maintain biodiversity in cultural landscapes. The effects of grazing vary between species and breeds of livestock because of differences in their feeding preferences. Sheep and goats keep down shrubs, benefiting species that are threatened by overgrowing of open landscapes.

Photo: Jan O. Kiese

in a set of selected agricultural landscapes and for cultural landscapes that are World Heritage Sites is being used to maintain farming activities and improve coordination of the management and maintenance of some particularly valuable areas. The Government will continue to use both agricultural and environmental policy instruments that encourage use and active management of the agricultural landscape. This helps to counteract the negative trends that are affecting cultural landscapes – overgrowing of open areas with trees and scrub, and abandonment of previously farmed areas. Support for cultural landscape projects under the environmental programmes, selected cultural landscapes and the World Heritage sites will be continued as appropriate.

The Ministry of Transport and Communications will continue its efforts relating to alien organisms by integrating this work into relevant construction, operation and maintenance projects for transport infrastructure. The aim is to prevent

alien organisms from becoming a threat to valuable biodiversity.

5.5.6 Mountains

The ecological status of Norway's mountain ecosystems varies. Land conversion and land-use change (for example the construction of holiday cabins and infrastructure for water and wind power) and climate change are expected to put more pressure on mountain ecosystems in the time ahead. It is particularly mountain areas near Norway's larger towns that are under pressure, as visitor numbers are increasing and holiday cabins are being built together with access roads and other infrastructure. On the other hand, mountain areas account for a large proportion of the total protected area in Norway. Protected areas and their management are discussed in Chapter 7.

The most important instrument for land-use planning in mountain areas and for ensuring sustainable development outside protected areas up to 2020 is the Planning and Building Act, combined with the principles of environmental law set out in the Nature Diversity Act. The Government expects the Planning and Building Act to be used to ensure sound land-use management and to strike a good balance in cases where there are conflicts of interest in mountain areas generally, and particularly in the buffer zones outside protected areas.

In 2007, to safeguard wild reindeer habitat and ensure sustainable development in mountain areas that support wild reindeer, the Ministry of Climate and Environment set up a programme to draw up regional plans for integrated management of mountain areas that are particularly important for the survival of wild reindeer in Norway (10 national conservation areas have been designated). The Government will use the regional reindeer management plans as a basis for safeguarding wild reindeer and their habitat in connection with development projects and in municipal land-use planning, and to ensure an integrated approach across municipal and county boundaries. The regional management plans must be followed up with action plans and implementation in relevant municipal master plans. We have a sound knowledge of wild reindeer stocks, based on the biology and ecology of wild reindeer, but there is disagreement on the cumulative environmental effects of all projects and developments in wild reindeer habitat. To clarify what the management objectives for species set out in the Nature Diversity Act mean in practice for wild reindeer

and identify which developments have positive or negative impacts on wild reindeer, the Government will consider whether to develop a quality norm for the species. Application of a quality norm could also strengthen the common knowledge base for wild reindeer management.

5.5.7 Polar ecosystems

The polar regions are particularly vulnerable to a changing climate, and ecological status in these areas is increasingly being determined by climate change and other external pressures such as ocean acidification and long-range transport of pollution. There is also increasing activity in Svalbard and the northern parts of the Barents Sea. The expansion of activities and industries including research, education, tourism and space-related activity in Svalbard is expected to continue. This is likely to result in more traffic and activity, and create new challenges for the authorities.

Norway's environmental targets for Svalbard are particularly ambitious. The aim is to retain the extent of wilderness-like areas and maintain the biological and landscape diversity virtually untouched by local human activity. The value of protected areas as reference areas for research will be safeguarded.

The Svalbard Environmental Protection Act, together with regulations under the Act, is the most important instrument for ensuring that the local management regime for Svalbard maintains good ecological status in the archipelago's ecosystems. Subject to the limitations imposed by international law, the Act applies to the entire land area of Svalbard and its waters out to the territorial limit. In most cases, it lays down special provisions on environmental protection in Svalbard rather than making the mainland legislation applicable. Its purpose is to preserve a virtually untouched environment in Svalbard with respect to continuous areas of wilderness, landscape, flora, fauna and cultural heritage. Within this framework, it allows for environmentally sound settlement, research and commercial activities. The Act and its regulations govern most areas of environmental protection in Svalbard, including protected areas, activities that may have an environmental impact, access and passage, protection of the cultural heritage, land-use planning in the settlements, local pollution and waste management, and hunting and fishing. The Government will continue to apply this strict legislation and use it as a tool for adapting the management regime

for Svalbard to a changing climate and a possible increase in the activity level.

The comprehensive protection regime and strict environmental rules set out in the Svalbard Environmental Protection Act and regulations under the Act are a good starting point for dealing with challenges that may arise in the future, because intact ecosystems in themselves make nature more resilient to the impacts of climate change. It is therefore important to maintain the current protection regime.

Important measures have already been introduced in Svalbard in response to the decline in the extent of the sea ice, which has made some areas more accessible and exposed vulnerable species and habitats to more traffic and human activity. For example, ships sailing within the protected areas of Svalbard (which cover most of the territorial waters) are now prohibited from carrying heavy bunker oil.

The Government will in the time ahead strengthen measures to safeguard species and habitats that may come under increasing pressure as a result of climate change and ocean acidification combined with other environmental pressures. In the case of climate change, this applies especially to species that are heavily dependent on ice-covered areas of sea, such as the polar bear and Arctic seals, since their distribution may change considerably and become much more restricted. A changing climate may result in considerable shifts in habitat ranges, and human traffic and activities may spread to new areas. Another factor it may be necessary to consider is the increasing isolation and consequent vulnerability of some species and populations as the loss of sea ice weakens links between the islands within Svalbard and between Svalbard and Arctic islands and mainland areas further east, such as Franz Josef Land and Novaya Zemlya. These considerations must be incorporated into species and habitat management in Svalbard, and also mean that it is vital to develop and update the knowledge base for the public administration.

The ecosystems in the northern part of the Barents Sea and the northwestern parts of the Norwegian Sea are included in the management plans for these sea areas. The marginal ice zone, the polar front and areas near Jan Mayen have been identified as particularly valuable and vulnerable areas and delimited on the maps in the management plans. Additionally, in the management plan for the Barents Sea–Lofoten area, the polar front and the sea areas surrounding Svalbard are identified and described as particularly valuable

and vulnerable areas, but only the area around Bjørnøya has been delimited on maps. The location of both the marginal ice zone and the polar front is being influenced by climate change, and both have shifted further northwards. A new assessment of the most appropriate way of delimiting the marginal ice zone, polar front and sea areas surrounding Svalbard as particularly valuable and vulnerable areas will therefore be made as part of the scientific work leading up to the revision of the management plan for the Barents Sea–Lofoten area in 2020. The marine management plans are further discussed in Chapter 5.5.1 on marine and coastal waters.

To ensure sustainable development in the Arctic and prevent accidents and harmful releases of pollutants, it is vital for the shipping industry to maintain high maritime safety and environmental standards. The recently adopted Polar Code sets out specific requirements for ships operating in polar waters, and enters into force on 1 January 2017. The potential increase in maritime traffic around Svalbard makes it important to ensure a good oil spill preparedness and response system.

Rapid warming is also weakening the climatic barrier to the spread of alien organisms from temperate waters, and there is a growing risk that such organisms may find a foothold and spread further in Svalbard and the Arctic sea areas. An action plan to prevent the introduction and spread of invasive alien species in Svalbard has been drawn up, and measures to contain, control, eradicate and monitor alien species will be implemented in line with the priorities set out in the action plan.

The Government considers it essential to continue concerted and coordinated efforts to limit cumulative effects as far as possible and maintain good ecological status in polar ecosystems.

5.6 The management plan for the Norwegian Sea

5.6.1 Introduction

The management plan for the Norwegian Sea was presented in a white paper in 2009 (Report No. 37 (2008–2009) to the Storting). The intention was to update the management plan for the first time in 2014, as was made clear when the Storting considered the white paper.

The scientific basis for the management plan update was published by the Forum for Integrated Marine Management, the Forum on Environmental Risk Management and the Advisory Group on

Monitoring in April 2015. It contains updated information on the state of the environment, impacts and pressures, and activities and value creation in the Norwegian Sea, and focuses on significant changes that have taken place since the previous report was published in 2008.

The report on the scientific basis refers to the overall conclusion of the 2009 white paper, that the state of the Norwegian Sea environment is generally good. However, the white paper also pointed out that management of the area poses considerable challenges, particularly as regards the impacts of climate change and ocean acidification, overfishing of certain fish stocks, the risk of acute pollution, the decline of seabird populations and the need to protect coral habitats. The new report concludes that the state of the Norwegian Sea environment is still generally good, and the management challenges are still much the same. It is difficult to identify any major changes over such a short period of time (2009 to 2014). There have been no significant changes in activity levels during this period.

The next section provides a brief account of status and trends for the marine environment of the Norwegian Sea since the management plan was published, as described in the report.

5.6.2 The marine environment – ecological status and trends in the Norwegian Sea

Since 2008, it has been documented that the rising CO₂ content of the atmosphere is resulting in measurable acidification of the seawater in the Norwegian Sea. It is very uncertain how fast and in which ways climate change and ocean acidification will affect the Norwegian Sea environment. Studies have shown that the distribution of many benthic organisms has already shifted northwards in response to warmer water.

The Norwegian Sea fish community is dominated by three pelagic species; herring, mackerel and blue whiting. The most important changes in fish stocks since 2007 have been the growth of the mackerel stock and the expansion of its distribution, the decline in the herring stock after 2009 and the decline in the blue whiting stock. However, with strong year classes in 2010 and 2011, the blue whiting stock was higher in 2013 than in the preceding years.

Trends for seabird populations have generally remained unchanged after 2008, so that populations that were showing a declining trend have continued to decline.



Figure 5.8 Kittiwakes.

Photo: Morten Ekker

Many new finds of coral reefs and sea pen and sponge communities have been made through the MAREANO programme. Many coral habitats have also been discovered on the continental shelf in the Norwegian Sea during studies of the seabed in connection with planning of petroleum activities. The new information indicates that corals are more widespread in the Norwegian Sea than was assumed in 2008, but that there are still gaps in our knowledge.

The results of the monitoring programme for pollutants show that the situation in the Norwegian Sea is still generally satisfactory, as it was in 2008.. The main source of pollution is long-range transport with air and ocean currents. Pollutants spread through the entire management plan area, as is demonstrated by the fact that measurable concentrations are found even around Jan Mayen. In addition, there are inputs of hazardous substances from local sources.

In some species, hazardous substances have been found at concentrations above the threshold levels for adverse effects on individual organisms. Surveys have revealed the presence of many new hazardous substances that have not been found previously. Levels of radioactivity in seawater, sediments and biota are generally showing a downward trend.

Results from the seafood safety monitoring programme in the Norwegian Sea show that lev-

els of contaminants are largely below the maximum permitted levels. Seafood from this area is generally considered to be safe.

Releases from the Sellafield processing plant have been reduced, resulting in a reduction in levels of the radioactive substances technetium (Tc-99) and strontium (Sr-90) in Norwegian waters. Other radionuclides that are monitored are showing either a slow downward trend or no change.

Through the MAREANO programme, more information has been obtained on species and habitats in several of the particularly valuable and vulnerable areas identified in the Norwegian Sea management plan: the Iverryggen reef, the Sula reef, the Møre banks and the edge of the continental shelf. More information has also been obtained on seabirds in the Norwegian Sea through the seabird programme SEAPOP. The new knowledge that has been obtained since the valuable and vulnerable areas were identified has confirmed their value.

There is still considerable fisheries activity in the following particularly valuable and vulnerable areas: the Møre banks, Halten bank, Sklinna bank, Vestfjorden and parts of the edge of the continental shelf. In the petroleum sector, the main change since 2008 is that production licences have been awarded for areas closer to several of the valuable and vulnerable areas: the Froan archipelago/Sula reef, the Iverryggen reef, Vestfjorden

and parts of the coastal zone. There has been some exploration drilling along the edge of the continental shelf and close to the Sula reef. There has been no major change in the volume of shipping or the areas used by shipping. The introduction of traffic separation schemes off the coast of Western Norway has routed some shipping further away from the coast, particularly near the Møre banks.

5.6.3 Patterns of activity and pressures and impacts associated with industrial activities

Industrial activities

There are currently 16 oil and gas fields in production in the Norwegian Sea, as compared with 10 in 2008. Oil production from the large fields in the area is dropping. In 2008, 16 exploration wells were drilled; the figures for the years 2009–2012 were 18, 12, 11 and 7 respectively. Thirteen seismic surveys were carried out in each of the four years. Discharges of produced water are expected to fall gradually, to about 2/3 of the 2011 level in 2025.

There has been little change as regards maritime transport in the Norwegian Sea after 2008. Shipping density is highest in the main and secondary fairways along the coast. A little more than half of the total distance sailed in both 2008 and 2011 was inside the baseline. The greatest change in traffic patterns is related to the introduction of the traffic separation schemes off the coast of Western Norway. Oil and chemical tankers and other vessels of gross tonnage 5000 or more follow the recommended routes and now sail further out from the coast.

Since 2006, the number of fishing vessels has dropped, but their average size has risen. In 2006, there were 7300 registered fishing vessels in the Norwegian Sea, while in 2011 the number had been reduced to 6252. Fisheries activity is highest in the same areas as before, in shallow bank areas (the Møre, Halten and Sklinna banks), the Sklinnadjupet trough, and along the edge of the continental shelf. In 2006, the total catch quantity was 770 000 tonnes, while in 2012 it was 707 000 tonnes; in the intervening years, catches were somewhat higher, totalling 967 000 tonnes in 2009 for example. The most important commercial fish stocks are herring, blue whiting, mackerel, saithe, greater argentine and redfish. Almost all of Norway's fish stocks are shared with other countries.

Long-range transport of pollutants

In 2008, it was concluded that ocean currents and atmospheric transport were the most important routes for inputs of pollutants to the Norwegian Sea. Other routes/sources are runoff from land, offshore oil and gas production and shipping. Since 2008, the models for inputs of pollution have been further developed. More recent calculations show that inputs of hazardous substances via ocean currents and atmospheric transport are much higher than previously estimated, but it is unlikely that there has been a real increase in inputs. The earlier estimates of inputs of polycyclic aromatic hydrocarbons (PAHs) were unrealistically low, and new calculations have given values that are about 50 000 times higher for inputs via atmospheric transport and about 2400 times higher for inputs via ocean currents. The estimates for inputs of mercury via ocean currents are also up to 1000 times higher than before. For other substances, the changes are considerably smaller. Thus, the conclusion from 2008 that ocean currents and atmospheric transport are the most important routes has been strengthened. Ocean currents will transport a substantial proportion of substances that enter the Norwegian Sea on to other areas, but a certain proportion will also be degraded, stored in sediments or absorbed by living organisms.

Marine litter

Marine litter in the Norwegian Sea largely originates further south and is transported with ocean currents, but there are also local inputs from sources on land and illegally dumped waste from the fisheries, the offshore industry, shipping and aquaculture. There is only limited information about the quantities of waste in the management plan area.

Environmental risk

The potential environmental impacts associated with oil spills vary considerably from one part of the Norwegian Sea to another. The risk of damage to the environment and living marine resources caused by acute pollution from the oil and gas fields that are currently producing is for the most part considered to be low, because both the probability of accidental discharges to the sea and the probability of more serious consequences in the event of a spill are generally low. Requirements for preventive measures and an emergency prepared-

ness and response system reduce the level of risk further.

Since the volume of shipping in the Norwegian Sea is not expected to increase significantly, no marked increase in the probability of spills from shipping is expected.

Overlapping interests and coexistence between industries

There has been no increase in conflicts of interest between industries in the period 2008–2012. The expected level of activity in future suggests that there will continue to be few conflicts of interest in the Norwegian Sea.

However, an expansion of petroleum activities in the area, the high level of fishing activity, a certain increase in the volume of shipping and growing interest in seafood production may create challenges and a greater need for coordinated spatial management.

5.6.4 Value creation and its importance for Norwegian society

Four sectors are particularly important in the Norwegian Sea management plan area – seafood (fishing and aquaculture), petroleum, maritime transport (including freight, coastal routes and tugboats) and tourism. According to the updated scientific basis, commercial activities in these sectors in the management plan area account for about 24 % of national value added within these sectors and 19 % of total national employment. The report describes value creation in the core activities for the different sectors, and in the largest direct deliveries to these core activities. Spin-off effects beyond this have not been assessed and quantified, although there is reason to believe that they may be considerable. It should also be noted that the Norwegian Sea has a value to Norwegian society beyond value creation in these industries. However, no attempt has been made to quantify the value of ecosystem services from the area that are not included in figures for value creation in the traditional sense.

5.6.5 Assessment of progress towards goals

The management plan includes a set of goals for the management of the Norwegian Sea. There are both general objectives relating to value creation and coexistence between industries, and more specific goals concerning the conservation and sustainable use of the Norwegian Sea, managing

biodiversity, combating pollution, ensuring safe seafood and the risk of acute pollution.

The updated scientific basis includes a review of progress towards these goals using monitoring data on indicators, information on measures that have been implemented and other sources of information.

5.6.6 Stakeholder participation

The Forum for Integrated Marine Management has established a website (www.havforum.no) to encourage the exchange of information on marine management and stakeholder participation in the work.

Stakeholders were given the opportunity to provide input to the updated scientific basis for the Norwegian Sea management plan. The input that was received provided valuable supplementary information during the process of updating the scientific basis.

5.6.7 Further work on the management of the Norwegian Sea

The Government will update the marine management plans as needed. An update of a management plan has a more limited scope than revision, dealing with a restricted number of issues or part of the geographical area of the management plan. The updated scientific basis shows that there have been no major changes in ecological status or the use of the Norwegian Sea since the management plan was published in 2009. On this basis, the Government does not consider it necessary to update the Norwegian Sea management plan at present. The Government has not reassessed the framework for petroleum activities, but bases its position on its political platform for the period 2013–2017 and the four-party cooperation agreement, which state that no petroleum activities are to be started in the following areas: around Jan Mayen, the marginal ice zone, the Skagerrak and the Møre banks. The marine management plans are further discussed in Chapter 5.5.1.

An overall revision of the management plan for each area will be based on a thorough assessment of business development, new knowledge, monitoring results and other information on long-term changes in ecosystems. The Government has also announced, most recently in the white paper on the North Sea–Skagerrak management plan (Meld. St. 37 (2012–2013)), that it intends to carry out an overall revision of the Norwegian Sea management plan in 2025 for the period up to 2040.

The Government is basing its work on this timetable.

6 Safeguarding threatened species and habitats

6.1 Introduction

Some of the Aichi targets are specifically intended to safeguard threatened species and habitats, particularly target 12, which states that ‘by 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained’. Norway’s corresponding national target is that ‘no species or habitat types will become extinct or be lost, and the status of threatened and near-threatened species and habitat types will be improved’. The target refers to species extinction as a consequence of human activity, which does not exclude the possibility that species may be lost as a result of natural processes. Moreover, it follows from the management objectives for species and habitat types in the Nature Diversity Act that habitat and species and their genetic diversity are to be maintained within their natural ranges. All these goals are particularly relevant to threatened species and habitats, in other words species and habitats that Norway risks losing altogether. Neither the national target nor the management objective for species applies to alien organisms.

Ecosystems are complex, and we often lack information about the functions of individual species in an ecosystem and the interactions between them. In many cases, the impacts of species extinction or habitat degradation do not become apparent until some time after the damage has been done. On a number of occasions, species extinction or a severe population decline in a particular species has proved to have cascading effects on other species in the same ecosystem and to cause major changes in the ecosystem as a whole. This means that there are significant risks involved in putting so much pressure on species and habitats that they are at risk of being wiped out. Communities and ecosystems have considerable adaptive capacity, but it is often impossible to know until afterwards whether or not a system will adapt successfully to change.

We know that climate change may result in rapid changes in ecosystems. If there is already a

great deal of pressure on the environment, climate change may be a significant additional stressor. The risk of major ecosystem change will rise if the cumulative environmental effects of all pressures become too great. Such changes may also have substantial social consequences. Action to safeguard threatened species and habitats will reduce the risk of their loss, and thus prevent possible consequences of their loss that cannot be foreseen.

It is also vital to safeguard species and habitats in order to give future generations the opportunity to utilise resources from nature, including those whose potential is currently unknown.

The Government’s proposals in Chapter 5 of this white paper are intended to ensure sustainable use and achieve or maintain good ecological status in Norway’s ecosystems. This is important for threatened species and habitats as well. However, it will often be necessary to take more specific and clearly targeted action in addition to safeguard species and habitats that are at serious risk. International commitments relating to specific species or habitats may also mean that Norway is required to take appropriate action. If a significant proportion of the population of a species or the area of habitat type is found in Norway, and action in Norway can improve its conservation status globally or at European level, this can also be an important reason for Norway to take stronger action.

In this chapter, the Government proposes measures to safeguard threatened species and habitat types. These include both conservation measures to protect species and habitats, and action to reduce the pressures and impacts associated with individual developments. Chapters 6.2 and 6.3 describe the Government’s general proposals for safeguarding threatened species and habitat types respectively, while Chapter 6.4 contains more specific proposals for the different major ecosystems. The Government also sets out general principles for selecting which tools and instruments to use in Chapters 6.2 and 6.3. Before a decision is made on which tools and instruments to use to safeguard a specific threatened species

or habitat, an assessment of any significant economic and other effects will be carried out in the normal way, together with a public consultation. The effects of the action to be taken may vary widely depending on what it is intended to safeguard and what kind of restrictions on use it may involve. After this, the need to safeguard the threatened species or habitat, the value of associated ecosystem services and the effects on other public interests (as specified in section 14 of the Nature Diversity Act) will be weighed against each other to determine whether to apply the proposed tools and instruments. It is important to target the action taken precisely so that species and habitats are given adequate protection without restricting other activities that are beneficial to society more than necessary. Tools and instruments to safeguard threatened species, habitats and ecosystems should promote coordination and sound use of resources across sectors.

Chapter 6.5 deals specifically with action to safeguard genetic resources.

6.2 Safeguarding threatened species

To prevent the loss of species, the Government will continue to use both species-based measures such as regulating harvesting, protecting individual species, designating priority species and establishing quality norms, and area-based measures that are intended to safeguard areas with specific ecological functions for a species. The latter include protecting areas under the Nature Diversity Act, identifying areas with specific ecological functions for priority species, designating selected habitat types, and sectoral measures. The Government will also seek to prevent the loss of species by re-establishing populations and through gene banks and breeding programmes.

The Government will seek to improve the conservation status of threatened species. This is a long-term effort. The Government's first priority will be to improve the conservation status of species that are critically endangered or endangered in Norway and that meet the additional criterion that either a substantial proportion of their European population is found in mainland Norway or in Svalbard, or they are threatened globally or in Europe as a whole. There are population targets for the four large carnivores (wolf, bear, lynx and wolverine) and golden eagle, which are used in the management of these species.

In all, the Norwegian Red List of Species contains 1120 critically endangered and endangered

species, and for 78 of these, 25 % or more of the European population is believed to be found in Norway. They are mainly plants, fungi and lichens and a number of insects and arachnids, but they also include two fish species (spiny dogfish and golden redfish) and four mammals (hooded seal, wolverine, narwhal and bowhead whale). Most of them are associated with forest, cultural landscapes and mountains, and some with wetlands and marine and coastal waters. The largest numbers of critically endangered and endangered forest species are lichens (13 species) and fungi (11 species). Of the 26 mountain species, 16 are vascular plants, and they are primarily believed to be under pressure because of climate change. There are five marine species, the two fish species and three of the mammals. Since many of the 78 species are mainly mountain species, many of them are found in the counties that include a large proportion of mountain areas: Oppland (23 species), Sør-Trøndelag (23 species), Troms (18 species) and Finnmark (18 species).

Of the critically endangered and endangered species in Svalbard, there are six vascular plants and one lichen where 25 % or more of the European population is believed to be found in Norway.

Seventeen of the species that are critically endangered or endangered in Norway are in addition threatened globally or at European level. They include plants, insects, lichens, fish, birds and mammals. In six cases, 25 % or more of the European population is also believed to be in Norway. The six species are a bee, *Osmia maritima*, wolverine, golden redfish, boreal felt lichen (*Erioderma pedicellatum*), hooded seal and spiny dogfish.

In the Government's view, the most appropriate approach for the majority of critically endangered and endangered species will be to use area-based measures that target habitats for a number of species simultaneously, for example protection under the Nature Diversity Act or designation of selected habitat types. Area-based measures will also be the most important approach for most other threatened species. Species-based measures will be used where a species needs protection against direct exploitation or strict protection is needed. It is essential to assess what is the most effective and appropriate approach before selecting the measures to implement.

Certain habitats, often called hotspots for threatened species, support large numbers of threatened species. By protecting these habitats it is possible to safeguard a number of threatened



Figure 6.1 The lapwing is now red-listed as endangered in Norway, after a substantial population decline in recent years. The main reason for the decline is changes in agricultural practices.

Photo: Bård Bredesen/Naturarkivet

species simultaneously. Thus, area-based measures targeting hotspot habitats are generally a more appropriate way of safeguarding threatened species than measures targeting individual species, provided that the main threat to a species is not harvesting or other removal. The Government will therefore consider establishing protected areas under the Nature Diversity Act to cover areas that are hotspots for threatened species. Habitat types for which this may be appropriate are further discussed in Chapter 6.4 for each ecosystem.

When areas are protected under the Nature Diversity Act, landowners and holders of rights are entitled to compensation from the state for financial losses incurred when protection makes current use of the property more difficult. The exact restrictions on the use of an area must be assessed on a case-by-case basis when specific protection proposals are presented, as mentioned in Chapter 6.1. There is already an established system for voluntary protection of forest areas, and voluntary protection should also be tested in other ecosystems. Protection of areas under the Nature Diversity Act is further discussed in Chapter 6.4 for each ecosystem.

Habitats that are important for threatened species can also be designated as selected habitat types under the Nature Diversity Act. The Government will make use of this option if there are so many remaining patches of a particular habitat type that giving other public interests priority in some of these patches will not have a significant bearing on the conservation status of the threatened species associated with the habitat. One solution that will be considered for such habitats is to use the Nature Diversity Act to give statutory

protection to some habitat patches, while others are safeguarded by designation as a selected habitat type. In other cases, it may be appropriate to use a combination of sectoral measures and the Planning and Building Act, perhaps combined with the designation of selected habitat types, if this gives adequate protection.

The provisions of the Nature Diversity Act on marine protected areas and selected habitat types apply in Norway's territorial waters, in other words out to 12 nautical miles beyond the baseline. During work on the management plans for Norway's sea areas, particularly valuable and vulnerable areas have been identified, many of which are at least partly outside Norway's territorial waters. Some of these areas are important for threatened species. The need for measures to safeguard threatened species in these areas (under the management plans or other legislation) must be assessed in the light of the cumulative environmental effects on threatened species and habitats and how these are changing, for example as a result of climate change, ocean acidification and new activities.

The Svalbard Environmental Protection Act applies to the entire land area of Svalbard and its waters out to the territorial limit, subject to the limitations imposed by international law, and includes provisions both on species-related measures and measures relating to areas with specific ecological functions for different species. Fishery policy instruments are also important for the marine ecosystem around Svalbard.

In some cases, areas with specific ecological functions for a species are threatened because they are no longer used, which may for example result in open landscapes becoming overgrown. Here, the Government's primary approach to conservation will be to use economic instruments such as grants towards grazing or active management, if appropriate combined with designation of selected habitat types. Private contracts may be an important supplement in such cases, particularly if few landowners are involved.

If area-based measures are not sufficient to ensure the survival of a species or are not the most appropriate or effective approach, the Government will consider the designation of priority species under the Nature Diversity Act. This makes it possible to prohibit all removal of, damage to or destruction of the species in question. As mentioned above, the Government will first consider this option for endangered and critically endangered species that have a substantial proportion of their European population in Norway.

In doing this, the Government will also be meeting the Act's requirement for the authorities to consider the designation of priority species in cases where there is evidence that the population status or trends for a species are substantially contrary to the management objective for species.

Designation of priority species is a suitable approach if there are direct threats to populations or stands of a species or to areas with specific ecological functions for the species. In particular, this approach will be considered for highly mobile species that range over considerable distances, where protection of their entire range would be too far-reaching, but certain areas with specific ecological functions, for example breeding sites for birds, can be protected. This may be an appropriate approach for both bird and mammal species. Designation of priority species will also be considered if statutory protection of the habitat would be an unnecessarily strict approach to safeguarding the species or if a species is found in many small habitat patches and area-based measures would not be effective. Area-based measures such as the establishment of protected areas will particularly be considered for species that are found in more clearly delimited habitats, such as plants, lichens and fungi, or if species-based approaches are not practical, for example for certain insect species. In some cases, designation of priority species will be the most appropriate measure for ensuring long-term survival.

The group of threatened species that is the Government's first priority for improvements of conservation status is defined at the beginning of Chapter 6.2. It is likely that after a further assessment of these species, only a minority of them will be found to be best served by designation as priority species. This is because many of them are plants, insects, lichens and fungi, and habitat conservation will be more appropriate.

Protection by regulations under the Nature Diversity Act is a suitable way of safeguarding species of plants, fungi and invertebrates that are mainly threatened by harvesting or other removal. However, most such species are already protected under the existing regulations. Terrestrial mammals, birds, reptiles and amphibians (collectively called wildlife species) are protected unless designated as game species. Wildlife species, salmonids and freshwater fish and marine species that are threatened by harvesting will be safeguarded by means of stricter restrictions on harvesting and on the use of fishing gear and other equipment, or if necessary by prohibiting harvesting, until their stocks recover. For exam-

ple, no fishing is currently permitted for European eel, blue ling or golden redfish (see Chapter 6.4.1). In some cases, a longer stock rebuilding period may be accepted after consideration of other important public interests.

The report on experience of the application of the Nature Diversity Act (see Chapter 5.2) shows that there is so far little information on what effect designation as a priority species has in practice. Monitoring results are available for some species, for example the Arctic fox. The Ministry of Climate and Environment will continue these monitoring programmes. The Ministry will follow population trends for priority species generally, and the effects of designating priority species will be assessed after the system has been operative for some years. As far as possible, this assessment will be based on monitoring data.

Regardless of other action and policy instruments, the presence of threatened species and their habitats will be an important consideration in decisions about matters that may have a negative impact on these species, for example in planning processes under the Planning and Building Act and decisions under sectoral legislation. During the decision-making process, the degree of threat to a species must be weighed against other public interests. The more seriously threatened a species is, the more weight must be given to the management objective for species set out in the Nature Diversity Act. Each sector is responsible for incorporating this approach appropriately into sectoral legislation and guidance.

Transport projects can have serious negative impacts on threatened species in the area affected, and the transport authorities will further develop routines and guidance for the sector. For example, guidance on the environmental impact assessment of road projects will be updated.

Environmental crime also adds to pressures on a number of threatened species. The inspection and enforcement work of the Norwegian Nature Inspectorate and targeted use of the environmental coordinator system in the police service facilitates the exposure of such crime so that it can be prosecuted. Norway will continue its efforts to combat fisheries crime at national and international level.

Action on climate change, ocean acidification and long-range transport of pollution does not come within the scope of this white paper, but will in many cases also be very important for safeguarding threatened species and habitats. Other conservation measures may increase species' resilience to climate change. The Government will

assess adaptation of the nature management regime to boost resilience.

To safeguard threatened species, the Government will:

- *Make use of statutory protection and the designation of selected habitat types and priority species under the Nature Diversity Act to provide long-term safeguards for threatened species and areas with specific ecological functions for these species. In the first instance, these measures will be used to improve the conservation status of species that are critically endangered or endangered in Norway and that meet the additional criterion that either a substantial proportion of their European population is found in Norway, or they are also threatened globally or in Europe as a whole.*
- *Ensure that the situation of threatened species is taken into account when central government authority is exercised, for example in decisions under sectoral legislation, when adopting central government plans under the Planning and Building Act, and when allocating grant funding.*
- *By providing guidance and in other ways, encourage the counties and municipalities to take the situation of threatened species into account when exercising their authority, for example when adopting plans under the Planning and Building Act, making decisions under sectoral legislation and allocating grant funding.*
- *Consider the implications of climate change and ocean acidification for the management of threatened species, and adapt the management regime accordingly.*
- *Take steps to improve cooperation between the police and the inspection and enforcement authorities.*

6.3 Safeguarding threatened habitats

As is the case for threatened species, the choice of measures to safeguard threatened habitats will depend on the range of pressures and impacts affecting a particular habitat type.

Unlike populations of a species, which can often recover if the right types of measures are chosen, an area of threatened habitat that is destroyed is often lost for ever. Re-establishing an area of habitat is much more costly than preventing its degradation, and designation of selected habitat types is one approach that can be used to avoid serious negative trends for habitats. Norway currently has a list of 40 habitat types that are considered to be threatened (i.e. have been placed in

one of the categories critically endangered, endangered or vulnerable). Many of them are also important habitats for threatened species.

The Government will use protection of areas and designation of selected habitat types under the Nature Diversity Act, combined with sectoral legislation and grant schemes, to safeguard threatened habitat types. Statutory protection of areas will be considered if there are very few remaining patches of a habitat type and for habitat patches where ecological status is particularly good.

If the main threat to a habitat type is one particular activity that can be restricted tightly enough and over the long term using the relevant sectoral legislation, this approach will often provide good enough safeguards.

The Nature Diversity Act provides the legal authority for designating selected habitat types. One of the important factors when deciding whether to designate a selected habitat type is whether the status or trends for the type in question are contrary to the Act's management objectives for habitat types. The Government will consider the possibility of designation of selected habitat types for each of the threatened habitat types. Under the Nature Diversity Act, special account must be taken of selected habitat types when conservation interests and other public interests are weighed against each other during decision-making processes. The different interests are considered within the framework of the relevant sectoral legislation. Designation of selected habitat types is therefore generally a good cross-sectoral instrument. In addition, the Government considers it positive that this is an instrument that promotes local autonomy and opportunities for municipalities to safeguard habitats through their land-use planning processes. The Government also emphasises the importance of assessing the suitability of selected habitat designation on a case-by-case basis. One element of this assessment should be to consider whether it is possible to integrate the process of weighing up conservation interests against other public interests for selected habitat types into sectoral instruments, either legal or economic instruments or both, or sectoral planning tools.

Designation of selected habitat types can also be useful in the case of habitat types that are threatened because they are no longer being used and actively managed. One proviso is that there must be other measures that can be used to encourage active management, for example grant schemes for maintaining cultural landscapes or

threatened habitat types. Funding is limited, but within the framework of each grant scheme and the other considerations to which it gives weight, it is possible to give higher priority to the most valuable areas of a habitat type and to areas where private stakeholders are interested in carrying out habitat management with support from the public sector. Designation of a selected habitat type does not oblige the authorities to provide funding, but such habitats are likely to be given priority when funding is allocated. The presence of patches of selected habitat types will also be an important consideration if there is a possibility of land-use change at a later date.

Another important consideration for the Government is whether there are so many patches of a habitat type that the loss of some of them is considered to be acceptable. The size of the habitat patches may be another element of the assessment. Designation as a selected habitat type may for example be useful if there are many small habitat patches, and it would not be effective to carry out comprehensive protection procedures for all of these. It can also be a useful tool for larger areas, especially since the requirement to take special account of selected habitat types does not necessarily mean that the whole area must be protected. The management regime for selected habitat types does not prohibit a range of activities in the same way as the rules for protected areas established under the Nature Diversity Act. How a selected habitat type should be safeguarded will depend on what kind of threat there is to the habitat type and whether activities carried out in accordance with sectoral legislation can be adapted to take account of this.

When designating selected habitat types, the Government will also consider whether all areas of a habitat type should be included, or only those of highest ecological status. Important considerations here will be whether there are so many patches of the habitat type that only the best of them need to be included, and whether it is realistic for example to give priority to funding for habitat management for all of them. If there are relatively few high-quality habitat patches, but there is considerable potential for improving ecological status at other sites by habitat management, this should also be taken into consideration.

The report on experience of the application of the Nature Diversity Act (see Chapter 5.2) shows that there is so far little information on what effect designation as a selected habitat type has in practice. Some information to supplement the report can be obtained from statistics on the number of

localities where habitat management is being carried out with funding through the grant scheme for threatened habitats. For example, in 2015 grants for habitat management were awarded for 560 (of 1275) of the traditional hay meadow localities. Hay meadows have been designated as a selected habitat type. In most cases, long-term agreements have been concluded with the landowners. The Ministry of Climate and Environment will continue to monitor trends in selected habitat types, and the effects of designating selected habitat types will be assessed after the system has been operative for some years. As far as possible, this assessment should be based on monitoring data.

Regardless of other action and policy instruments, the presence of threatened habitats will be an important consideration in decisions about matters that may have a negative impact on these habitats, for example in planning processes under the Planning and Building Act and decisions under sectoral legislation. During the decision-making process, the degree of threat to a habitat must be weighed against other public interests. The more seriously threatened a habitat type is, the more weight must be given to the management objectives for habitats in the Nature Diversity Act when decisions are made under other legislation. Each sector is responsible for incorporating this approach appropriately into sectoral legislation and guidance.

Projects in the transport sector can have serious negative impacts on patches of threatened habitat types, and the transport authorities will further develop routines and guidance for the sector so that adverse impacts can be assessed and avoided.

In some cases, the main threat to a habitat type will be climate change, ocean acidification or other types of large-scale environmental change. This is particularly true of some polar and alpine habitats, but climate change is expected to become a growing threat in other regions as well. The Government will therefore assess adaptation of the nature management regime so that other measures can be used to boost the resilience of threatened habitat types to such pressures.

To safeguard threatened habitats, the Government will:

- *Consider designating threatened habitats as selected habitat types where this is considered to be an appropriate approach.*

- *Make use of statutory protection under the Nature Diversity Act if there are very few patches of a threatened habitat or their ecological status is particularly good.*
- *Use sectoral legislation where appropriate to take action, both of a long-term nature and as a rapid response where necessary, to safeguard habitats that are mainly threatened by one particular activity.*
- *Ensure that the situation of threatened habitats is taken into account when central government authority is exercised, for example in decisions under sectoral legislation, when adopting central government plans under the Planning and Building Act, and when allocating grant funding.*
- *By providing guidance and in other ways, encourage the counties and municipalities to take the situation of habitats into account when exercising their authority, for example when adopting plans under the Planning and Building Act, making decisions under sectoral legislation and allocating grant funding.*
- *Consider the implications of climate change and ocean acidification for the management of threatened habitats, and adapt their management accordingly*

6.4 Safeguarding threatened species and habitats in each of Norway's major ecosystems

6.4.1 Marine and coastal waters

Threatened species and habitats in marine and coastal waters are safeguarded in various ways, based on both sectoral instruments and environmental policy instruments. Threatened marine species and habitats are an important element of the work on the management plans for Norway's sea areas. Based on experience gained from the designation of dwarf eelgrass (*Zostera noltei*) as a priority species, the Government will assess which other threatened marine species should be safeguarded in the same way. A review is to be carried out to determine which threatened marine habitats should be designated as selected habitat types. The establishment of marine protected areas under the Nature Diversity Act or sectoral legislation for a representative selection of marine habitats (see Chapter 7.3.1) will be important in safeguarding marine habitats and species. Chapter 5.2 discusses the geographical scope of the Nature Diversity Act, which delimits where these measures can be used.

Norway has a knowledge-based fisheries management regime, which is intended to ensure that the framework for commercial fisheries is as sustainable as possible. Directed fisheries for threatened species including European eel, blue ling and golden redfish have been closed. Most of the other threatened fish species are sharks, skates and rays. Although no direct fishery is permitted for these species, bycatches in other fisheries are a threat to several of them. The Ministry of Trade, Industry and Fisheries will continue efforts to survey the scale of bycatches and reduce bycatches of threatened species. Further knowledge will be built up on stocks, fishing techniques and fishing gear so that bycatches of threatened species and damage to threatened habitat types can be reduced. Bilateral and international cooperation is essential to ensure that shared stocks are fished sustainably, and Norway will continue to give high priority to such cooperation. Cooperation with Russia and the EU on the management of shared stocks is particularly important. The Government will also consider whether further improvements to the status of threatened fish species can be achieved through action on the basis of other sectoral instruments. Monitoring and a ban on harvesting will be continued for threatened whale species.

Norway's seabird populations are changing; many are declining steeply, but not all of them. Norway has internationally important populations of a number of seabirds, and has a special responsibility for the populations of fulmar, cormorant (subspecies *Phalacrocorax carbo carbo*), shag, king eider, common gull, lesser black-backed gull (subspecies *Larus fuscus fuscus*), glaucous gull, great black-backed gull, ivory gull, Brünnich's guillemot, little auk, black guillemot and puffin. More than 25 % of the European breeding population of all of these species is found in Norway.

A number of Norway's seabird populations are threatened, and action needs to be taken to give them better protection. It has been pointed out that management measures at two levels need to be considered – both measures that target threatened seabird populations directly, and ecosystem-based measures, where seabirds are considered as an integral part of the ecosystem.

Measures that target threatened populations directly can include action to reduce pressures such as predation (for example by mink), unwanted bycatches and disturbance. These must be adapted to different species and sites to make them as effective as possible. Action to reduce the mink population along the shoreline and on

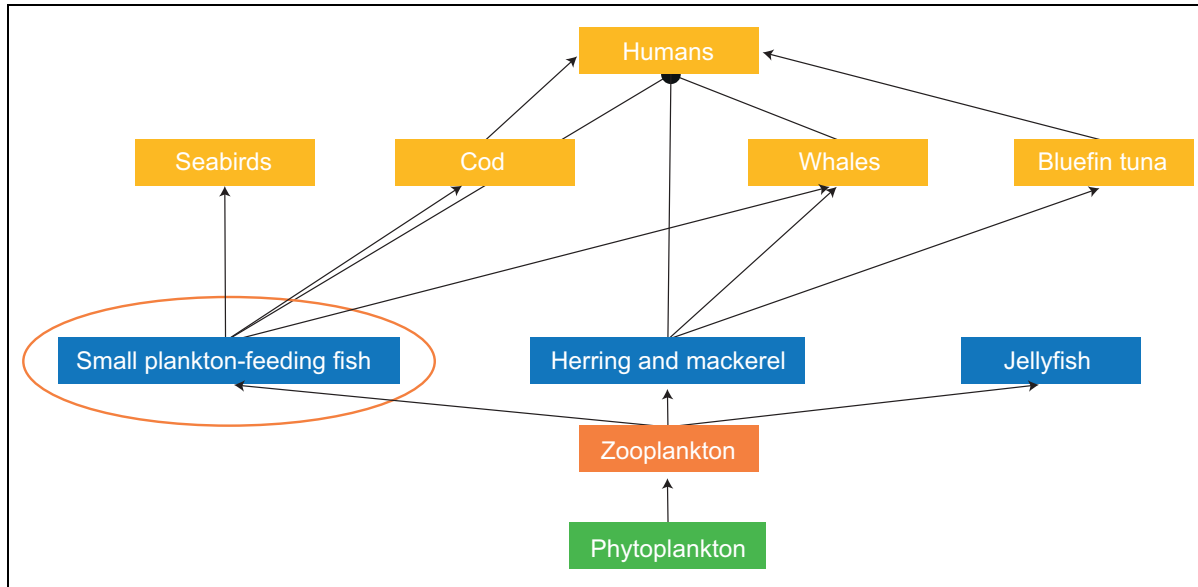


Figure 6.2 A marine food web

Simplified illustration of a marine food web. Small plankton-feeding fish (fish larvae and small schooling fish species) and larger zooplankton species (krill and amphipods) play a key role in energy flow through the ecosystem to higher trophic levels – larger fish, seabirds, marine mammals and humans. Ecosystem-based management is vital for maintaining ecosystem integrity.

coastal islands and skerries will be intensified. Surveys of bycatches and efforts to reduce the scale of seabird bycatches in the fisheries will be continued. For example, the introduction of specific requirements relating to gear and catch methods will be considered in fisheries or areas where bycatches of seabirds are a problem.

Apart from measures to safeguard threatened populations, management measures for seabirds should primarily form part of an ecosystem-based management regime. It is essential to ensure that seabirds, and many other predators in marine ecosystems, have adequate food supplies in the form of small plankton-feeding fish (fish larvae and small schooling fish species) and larger zooplankton such as Arctic krill species. In coastal waters, healthy kelp forests are vital for seabirds and other biodiversity and biological production.

As part of the follow-up to the white paper on the first update of the Barents Sea–Lofoten management plan (Meld. St. 10 (2010–2011)), unintentional bycatches of seabirds during longlining for Greenland halibut and gill netting for lump-sucker have been systematically registered. The aim is to quantify unintentional bycatches of seabirds and review possible preventive measures.

Norway has an extensive monitoring system for marine ecosystems, and has also developed a good seabird monitoring programme. These must be maintained to provide information on status and trends for populations of marine species, and

the results must be linked to knowledge developed about the factors that affect seabird populations and the effect of measures to safeguard them. Long time series of data are vital to this work. Long-term mapping and monitoring of seabirds is organised through the SEAPOP programme, which also includes studies of the areas used by seabirds at different times of year. The Government will continue and further develop systematic mapping and monitoring of seabird populations in all Norway's sea areas through the SEAPOP programme. The development of knowledge about seabirds and their food supplies will continue, and measures that can improve food availability for seabirds will be assessed. This work will involve cooperation between seabird experts, marine scientists and the public administration.

The Pacific oyster is an alien species in Norway, and is a new and growing threat to the European flat oyster in Norway. The Norwegian Biodiversity Information Centre has assessed the Pacific oyster and considers that there is a very high risk that it will displace native Norwegian species. The Government will complete and implement an action plan for containing and controlling the Pacific oyster.

The most seriously threatened of Norway's marine habitats at present is sugar kelp forest, and its ecological status is particularly poor along the Skagerrak coast. This is believed to be due to

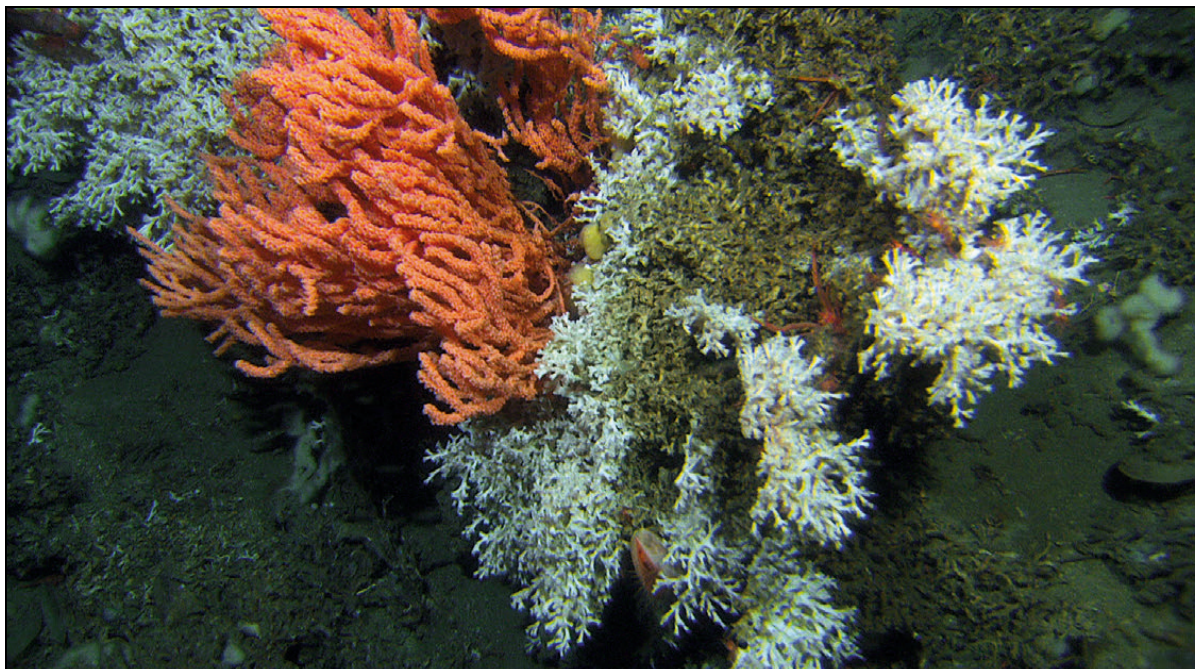


Figure 6.3 A new reef complex was discovered off Sandnessjøen (Nordland) in autumn 2015. Two of the species that form the reef, the stony coral *Lophelia pertusa* (white) and the gorgonian *Primnoa resedaeformis* (orange) can be seen here. Banning bottom trawling is one important way of safeguarding coral reefs.

Photo: MAREANO/Institute of Marine Research

higher inputs of nutrients and more sediment deposition combined with climate change, which is resulting in higher runoff of nutrients and particulate matter from land. Action to improve the situation will include measures that are part of the river basin management plans and, where relevant, measures in municipal action plans for climate change adaptation. The Government will also review other possible measures for reducing inputs of nutrients and particulate matter to important sugar kelp areas, including climate change adaptation measures for extreme precipitation events. A pilot project to re-establish sugar kelp forest will be initiated. International cooperation is also of crucial importance.

There are substantial inputs of nutrients to the Norwegian Skagerrak coast with ocean currents. Norway will continue to give high priority to environmental cooperation with the North Sea and Baltic Sea countries, including cooperation within OSPAR and the EEA Agreement.

The Government will also intensify efforts to protect threatened marine habitats including cold-water coral reefs, which are particularly vulnerable to physical damage, sediment deposition, climate change and ocean acidification. Nine coral reefs have already received special protection

against fishing using gear that is towed along the seabed. Work is in progress to protect more coral reefs in this way, and a public consultation on proposals to protect 10 more areas was held in 2015. The aim is to establish new protected areas in 2016.

The environmental and fisheries authorities will together evaluate how instruments and measures in the two sectors contribute to the conservation of marine habitat types and whether further measures should be implemented.

The environmental and fisheries authorities will also evaluate how information on threatened marine habitats should be made available to and utilised by user groups. This can help to ensure that adequate information is available during activities such as commercial fisheries. The evaluation will specifically include information about the distribution of coral habitats.

In the petroleum sector, requirements to map coral reefs and to take steps to prevent sediment deposition and physical damage to coral reefs and other benthic communities help to prevent damage to threatened marine habitats.

It is important to continue mapping programmes and build up knowledge about cumulative environmental effects in order to address

pressures and impacts associated with the fisheries, petroleum industry and other activities. Management of the marine environment will be based on the best available knowledge about cumulative environmental effects in order to safeguard threatened species and habitats as effectively as possible.

The marine management plans also focus on the conservation of threatened species and habitats. In addition, relevant sectoral legislation contains provisions that are important in protecting threatened species and habitats against pressures and impacts associated with activities such as fisheries, the petroleum industry and maritime transport. The Government will give weight to safeguarding threatened marine species and habitats in the further development of the management plans for Norway's sea areas.

6.4.2 Rivers and lakes

The Water Resources Act and the Watercourse Regulation Act are important tools for safeguarding threatened species and habitats in river systems, both when new developments are planned and when taking steps to improve ecological status in rivers where there are already hydropower developments. When hydropower licences are revised in the years ahead, it will be important to look at possible ways of improving conditions for threatened species and habitats that are affected by hydropower developments. The competent authorities will also make more active use of the option of requiring licensing of older non-licensed hydropower developments to reduce damage to threatened species and habitats. In addition, the energy authorities and the environmental authorities will make more active use of the standard nature management conditions in licences to require action to reduce damage to threatened species and habitats.

No fishing for eels is permitted in Norway because there is concern about the population status of the species in Europe as a whole. Other methods of reducing the negative impacts of human activity on eels have also been reviewed, including steps to reduce barriers to migration in rivers. The environmental authorities, in cooperation with other relevant authorities, will consider how to respond to the proposals in the review.

In line with the general principles for selecting tools and instruments to safeguard threatened species and habitats set out in Chapters 6.2 and 6.3, the Government will use a combination of designation of selected habitat types and pro-

tected areas, as well as relevant sectoral legislation and the Planning and Building Act, to safeguard threatened habitats and habitats that are important for threatened species in rivers and lakes. These include inland deltas, oxbow lakes and other features of meandering rivers, large sand and gravel banks, the spray zone near waterfalls, calcareous lakes and lakes and ponds that are naturally free of fish. The Government will give priority to areas that are already protected against hydropower developments or where it is not realistic for other reasons to carry out hydropower developments. Calcareous lakes have already been designated as a selected habitat type, and the Government will consider the establishment of protected areas as a supplement for certain of these lakes. Oxbow lakes and other features of meandering rivers are considered to be particularly poorly served by conservation measures so far, given their significance for several important species groups. The Government will therefore give priority to these habitats. The establishment of protected areas in freshwater habitats is also discussed in Chapter 7.3.2.

The Government will continue measures that have been initiated to deal with particularly invasive alien organisms in Norwegian rivers and lakes. These include action to deal with signal crayfish, pike (outside its natural range) and Canadian and Nuttall's pondweeds. Information activities are also important for preventing the illegal release of fish and avoiding the spread of invasive organisms with boats and fishing gear.

In addition to land-use change, pollution puts pressure on threatened species in rivers and lakes. Acidification, nutrient runoff from agricultural areas and industrial releases can all have negative impacts, either separately or in combination. The Government will therefore continue its efforts to prevent pollution from harming threatened freshwater species.

6.4.3 Wetlands

Pressures on wetland species and habitats are largely associated with various forms of land conversion and land-use change or with pollution. In line with the general principles for selecting tools and instruments to safeguard threatened species and habitats set out in Chapters 6.2 and 6.3, the Government therefore considers that area-based measures will be the most important approach to safeguarding threatened wetland species and habitats. They will also make a contribution to climate change adaptation.

In accordance with its general policy for threatened species and habitats, see Chapters 6.1 and 6.3, the Government will in the case of wetland ecosystems particularly consider the protection of selected breeding, staging and moulting areas for critically endangered and endangered bird species. In some cases, it may be appropriate to designate priority wetland species, see the criteria for this in Chapter 6.2. The Government will also consider protection under the Nature Diversity Act for selected lime-rich lowland mires, which are particularly important for threatened species. To safeguard patches of threatened wetland habitats that are not given statutory protection under the Nature Diversity Act, the Government will consider the designation of selected habitat types. Further, the Government will give priority to habitat management in protected wetland areas in order to improve the conservation status of threatened species, and will continue and step up peatland restoration as a climate policy and biodiversity measure, both within and outside protected areas. Peatland restoration can also help to improve the conservation status of threatened species.

Hay fens are a threatened habitat and already designated as a selected habitat type. The Government will continue existing grant schemes so that more sites can be safeguarded, and will monitor trends in land use for this habitat type and assess whether stricter protection of a large number of sites is necessary.

The Government will consider the designation of more threatened wetland habitats as selected habitat types, particularly raised bogs, ombrotrophic mires near the coast, lowland spring fens and active marine deltas. Conservation measures for palsa mires are considered to be adequate provided that the county conservation plan for wetlands for Finnmark is implemented, see Chapter 7.3.3. Further protection measures would probably not safeguard the palsa mires any more satisfactorily, since they are threatened mainly by climate change.

6.4.4 Forest

Many of the critically endangered and endangered species associated with forests belong to species groups that are found in fairly clearly delimited habitats. The main threats are related to land use (forestry) and land conversion, not to harvesting and other removal. In line with the general principles for selecting tools and instruments to safeguard threatened species and habi-

tats discussed earlier, suitable approaches for safeguarding threatened forest species are area-based measures such as establishing protected areas, setting aside key biotopes that are not to be felled, and designating selected habitat types and priority species (together with areas with specific ecological functions for these species).

Key biotopes that are set aside and not felled safeguard habitats for threatened and near-threatened species, and this has positive effects on many species. By 2015, about 70 000 areas covering a total area of about 750 square kilometres had been identified as key biotopes through environmental inventories. This corresponds to almost 1 % of the total area of productive forest. Since environmental inventories have not yet been carried out for all forest properties, the proportion of productive forest set aside as key biotopes is expected to increase.

The Government's position is that protecting more forest will have substantial positive effects on a large proportion of the threatened forest species in the areas concerned. Forest protection is intended to safeguard areas that are important for threatened species and to build up networks of protected areas including a representative selection of different forest types, geographical areas and climatic conditions. Thus, establishing nature reserves in forest areas is an effective way of safeguarding a large number of threatened species that require a wide range of different ecological niches and are found in many different geographical areas. There is a need to expand protection of forest areas, see Chapter 7.

Forest habitats that are important for threatened species and should be safeguarded by protection under the Nature Diversity Act include lime-rich broad-leaved forest (oak, beech and lime) and several types of old-growth forest.

The area-based measures discussed above will not adequately safeguard all threatened forest species. Certain species have such small populations that chance events could cause their extinction in Norway. For these, the Government will consider designation as priority species. This is dependent on adequate information about the species in question. Designation as priority species or species protection will also be considered for species that are mainly threatened by direct exploitation (for example that are collected or harvested for sale). Finally, designation as priority species will be considered for some wildlife species that are not particularly closely associated with one specific habitat.

The problems that can arise when cervid populations become too large are mentioned in Chap-

ter 5. There is little to suggest that large cervid populations alone are the reason why any species are threatened. However, the general elements of cervid management described in Chapter 5.5 will reduce any negative impacts of cervids, which may also benefit threatened species.

Management of the threatened forest-dwelling large carnivores (wolf, brown bear and lynx) and the golden eagle is based on the Bern Convention, the Nature Diversity Act and the 2004 and 2011 national cross-party agreements on carnivore management. The 2011 agreement specifies that there must be a clear division into zones where the carnivores are given priority and others where livestock have priority.

The regional carnivore management boards are responsible for drawing up carnivore management plans and updating them regularly. The plans must clearly identify the zones where carnivores have priority and those where livestock have priority. They must also set out proposals for the use of funding on measures to prevent and reduce carnivore-human conflicts in accordance with the dual goals of the management regime. The management plan areas are not based on municipal or county boundaries.

The carnivore and livestock zones in the management plans can be adjusted to separate carnivores and livestock even more clearly, both spatially and temporally. This will create a more predictable situation for livestock farmers and help in achieving the population targets for the large carnivores. With this in mind, the management plans must 1) seek the optimal spatial coordination of carnivore and livestock zones between regions and in cross-border areas, 2) ensure that carnivore breeding zones overlap as far as possible, and 3) take into account carnivore biology, distribution and population connectivity and the availability of suitable habitat. Livestock zones should be delimited so that they are continuous, provide for predictability in carnivore management and make livestock farming viable in practice.

Several habitat types in Norwegian forests are threatened. One of them, calcareous lime forest, is considered to be vulnerable and is already a selected habitat type. Other threatened habitat types include coastal spruce and pine forest (a large proportion of their range is in Norway) and forest types that are spring-fed or on calcareous soils. A number of these habitats are also important for threatened species. The most important pressures vary from one habitat to another, but include forestry, land conversion and mining.

The Government will consider whether to designate more selected habitat types in forest. Since there are a number of pressures on such habitats, and they are regulated under different legislation (including the Forestry Act, the Water Resources Act, the Watercourse Regulation Act, the Energy Act, the Mineral Resources Act and the Planning and Building Act), the Government's view is that the cross-sectoral approach required for selected habitat types will have a positive effect on these forest habitats. However, designation of selected habitat types does not afford strict protection. For threatened habitats that are only found at a few localities in Norway, such as forest on ultramafic soils and beech and lime forest on lime-rich soils, and for particularly valuable areas of all threatened forest habitat types, the Government will therefore consider protection of areas under the Nature Diversity Act as well as or instead of designation of selected habitat types.

6.4.5 Cultural landscapes

The main threat to most species and habitats in the cultural landscape is the discontinuation of active use (grazing and haymaking), followed by overgrowing of the open landscape. The Government's main approach to safeguarding threatened species and habitats in the cultural landscape is therefore to provide a framework that encourages grazing on a commercial basis (using schemes that are part of the Agricultural Agreement), in combination with grant schemes to promote habitat management and grazing where there are threatened habitats.

Intensification of agriculture and land-use changes can also have negative impacts on cultural landscapes.

The conversion of agricultural areas for other purposes can result in habitat fragmentation and reduce the connectivity of ecological networks and natural corridors in cultural landscapes. To reduce the negative impacts on threatened species, the Government will promote the use of coordinated regional land-use and transport plans. This will also reduce the pressure for new cultivation of other areas, which may include important habitats. In a few cases, designation of priority species associated with the cultural landscape may also be appropriate, in accordance with the criteria set out in Chapter 6.2.

Three semi-natural habitats – hay meadows, hay fens and coastal heathland – have already been designated as selected habitat types. Hay meadows have been a selected habitat type since

2011, and have shown a positive trend, with an increase in the number of sites that are being actively managed. This is partly because it is possible to apply for grants for habitat management of selected habitat types. The Government will use the experience that has been gained as part of the basis for assessing whether designation of selected habitat types is a suitable measure for other threatened habitats associated with cultural landscapes.

One problem for many of the species associated with hay meadows is that these are isolated habitat islands, often at considerable distances from each other. The Ministry of Climate and Environment will in consultation with other relevant ministries consider which other types of areas, for example species-rich road verges, can function as part of ecological networks.

Invasive alien species are already having a negative impact on several habitats in cultural landscapes, such as sand dunes, open areas on shallow lime-rich soils and semi-natural meadows. The Ministry of Climate and Environment will therefore in consultation with other relevant ministries identify pathways of introduction and particularly vulnerable areas and habitats in cultural landscapes, so that action can be taken specifically to prevent the spread of invasive alien species.

A combination of general measures to promote the maintenance of farming activities and measures specifically to safeguard particularly valuable areas, together with information activities, will have the greatest positive effect on threatened species and habitats in cultural landscapes. The scheme for selected agricultural landscapes is a good example of the second category, and is designed to safeguard a representative selection of valuable Norwegian agricultural landscapes. Under the scheme, multi-year agreements are concluded with landowners, who undertake to manage the land in a way that safeguards both the overall cultural landscape and the threatened species and habitats in the areas. The Government therefore intends to continue the scheme.

There are also some naturally open lowland habitats, and the main threats to these are often physical disturbance and pollution. Open lowland areas are often important elements of the landscape in addition to supporting threatened species, so that establishing protected areas under the Nature Diversity Act can be an important measure. The Government will therefore review open lowland areas where there are threatened habitat types, and consider whether the protection of areas is an appropriate step.

6.4.6 Mountains

Considerable areas of the Norwegian mountains are already protected as national parks or other types of protected areas. Many of the threatened mountain species are found in these areas. Only a small number of developments might be enough to cause the regional extinction of or a serious population decline in these species. More than half of the threatened mountain species (34 of 64 species), and most of the threatened mosses and vascular plants, are found in lime-rich areas. The Government therefore considers it important to map lime-rich areas in the mountains in more detail to develop an overview of any such areas outside the existing protected areas. If there are many lime-rich areas and threatened species that are not adequately safeguarded by the existing protected areas, the Government will consider protection under the Nature Diversity Act for the most important localities and designation as selected habitat types for the rest. Moreover, the Ministry of Climate and Environment and other relevant ministries will provide clear guidance on how to safeguard valuable and threatened mountain species and habitats, and species that need large, continuous areas of habitat, with reference to sectoral legislation and the Planning and Building Act.

Caves have been identified as a threatened habitat type in Norway. The Government proposes designation as a selected habitat type as a way of safeguarding caves that are affected by quarrying, land-use changes, hydropower developments and pollution. However, designation as a selected habitat type does not make it possible to regulate access, tourism and other recreational uses. The Government will therefore consider protection under the Nature Diversity Act and restrictions on access for localities where this is the main pressure. Restrictions on access should be accompanied by a strategy for visitor access to each cave to ensure a good balance between conservation and use.

Management of the threatened large carnivores and golden eagle in the mountains is based on the Bern Convention, the Nature Diversity Act and the 2004 and 2011 national cross-party agreements on carnivore management. Culling of wolverine by licensed hunters is not effective enough at present, and the Government therefore wishes to test some new measures to improve the efficiency of the cull. The Government's policy for management of large forest carnivores is described in Chapter 6.4.4.

6.4.7 Polar ecosystems

General efforts to maintain good ecological status in polar ecosystems are described in Chapter 5, and will also be the most important way of safeguarding threatened species and habitats in the polar regions. Many of the instruments described in Chapter 5 will also be appropriate for targeted measures to safeguard threatened species and habitats. Climate change is a rapidly growing threat to species and habitats in Svalbard, and in addition there has been an expansion of many types of activities both in and around the archipelago. The Government will adapt the management of Svalbard to these changes.

In Svalbard, the strict regime under the Svalbard Environmental Protection Act and associated regulations, and the extensive protected areas, provide a high level of protection against environmental pressures from local activity. The land areas and territorial waters of Jan Mayen (except for two areas where human activity is permitted) have been designated as a nature reserve. This also helps to protect threatened species and habitats in Svalbard and on Jan Mayen. Measures to safeguard threatened species and habitats will be incorporated into the management plans for the large protected areas in Svalbard in the light of climate and environmental change and changes in human activity. Outside the protected areas, threatened species and habitats will be further safeguarded through targeted application of the Svalbard Environmental Protection Act where necessary to counteract environmental pressures.

The Barents Sea–Lofoten and Norwegian Sea management plans focus on the conservation of threatened species and habitats, including Arctic species and habitats. Both the management plans and sectoral legislation that is important for the protection of threatened marine species and habitats are discussed further in Chapter 6.4.1.

A number of the threatened species in the Arctic are migratory species or have populations that are shared by more than one country. International cooperation is essential for effective conservation of these species and their habitats. The Government will strengthen cooperation under the Bonn Convention and within the framework of the Arctic Council on the management of migratory species and populations that are shared between several countries, focusing particularly on threatened species. Special weight will be given to cooperation on species that are dependent on the Arctic sea ice.

Norway has drawn up a national polar bear action plan which focuses on closer monitoring of the population. The polar bear monitoring programme will be further developed on the basis of the plan. Cooperation between the five polar bear range states – Canada, Greenland/Denmark, the US, Russia and Norway – was strengthened with the adoption of a circumpolar action plan at the meeting of the parties to the Agreement on the Conservation of Polar Bears in September 2015.

More knowledge needs to be built up about threatened species and habitats in the Norwegian part of the Arctic, and more systematic evaluations need to be carried out. It is particularly important to learn more about the implications of climate change for threatened species and habitats in the Arctic. The Government will further develop the knowledge base for the red lists of threatened species and habitat types in Svalbard, focusing on marine habitats and habitats associated with sea ice.

Since climate change is a significant and growing pressure on species and habitats in the polar regions, the Government's efforts to combat climate change will be especially important for threatened species and habitats in the Arctic.

6.5 Genetic resources

Biodiversity exists at different levels. Genetic diversity means variety at the level of genes and genetic material, and in genetic make-up between individuals of the same species. This diversity provides the basis for evolutionary adaptation of species to different physical surroundings and climatic conditions. In-situ conservation of genetic diversity is part of the overall effort to safeguard biodiversity. The international framework for this work is set by the Convention on Biological Diversity and the Nagoya Protocol on Access and Benefit-sharing under the Convention, and the International Treaty on Plant Genetic Resources for Food and Agriculture. In Norway, the Norwegian Environment Agency is responsible for coordinating initiatives for in-situ conservation of genetic diversity.

Aichi target 13 under the Convention on Biological Diversity is about maintaining the genetic diversity of cultivated plants and farmed and domesticated animals and their wild relatives. This genetic diversity includes valuable traits that can improve the adaptive capacity of agriculture to climate change and give greater resistance to diseases.

The agricultural sector has a special responsibility for monitoring, conservation and sustainable use of national genetic resources for food and agriculture. Norway is involved in international cooperation under FAO to achieve Aichi target 13, among other things through the adoption of global plans of action for genetic resources for food and agriculture. The Norwegian Genetic Resource Centre, which is part of the Norwegian Institute of Bioeconomy Research, is responsible for implementing and updating Norway's national action plans for the conservation and sustainable use of genetic resources in farm animals, forest trees and crops, including the wild relatives of food plants.

Ex-situ conservation of genetic resources for food and agriculture takes place primarily in sperm banks, seed banks, clone collections, museums, arboreta and botanical gardens, while in-situ conservation involves the active use of populations of farm animals and crop plants, and the conservation of genetic diversity in natural populations of forest trees. The Government will continue Norwegian participation in Nordic gene bank cooperation through NordGen (the Nordic Genetic Resource Center) under the Nordic Council of Ministers and operation of the Svalbard Global Seed Vault as a repository for duplicates of seed collections from the world's gene banks. In addition, active cooperation with private- and public-sector actors will be used to maintain stands of forest trees, clone collections, sperm banks and seed banks of genetic resources for food and agriculture.

Conservation strategies for traditional breeds of farm animals, crop varieties and forest trees are based on the principle that genetic resources for food and agriculture are best safeguarded by using them in farming and forestry. Conservation efforts can make it possible to produce specialised products and products with attractive qualities that can provide income for farms and local communities and thus ensure sustainable resource use. Grant schemes for environmental measures in agriculture and forestry provide important support for these efforts. The Agricultural Agreement also includes grant schemes for farm animal breeds of conservation value, and the scheme for native endangered cattle breeds will be expanded to include endangered breeds of sheep, goats and horses that are native to Norway.

In-situ conservation of forest trees and of wild relatives of crop plants can be achieved by safe-

guarding specific habitats and areas where they grow, for example by sustainable use and habitat management. One advantage of in-situ conservation is that plants can adapt to a changing climate and other changes in environmental conditions. Establishing protected areas and other measures under the Nature Diversity Act can make an important contribution to this work. Other measures may include habitat management for hay meadows and ensuring that the conservation of genetic resources is included in operational management plans drawn up in accordance with section 47 of the Nature Diversity Act. It is important that both environmental and agricultural grant schemes are maintained, among other things to safeguard threatened species and habitats.

The Norwegian Genetic Resource Centre is currently running a project on in-situ conservation of crop wild relatives in protected areas in Norway. The project has identified more than 200 species in the Norwegian flora that are either utility plants themselves or related to important food or feed plants, and that should be maintained in their natural habitats. In this way, their natural genetic diversity and traits that are specially adapted to the climate and growing conditions in Norway can be safeguarded and continue to develop. In-situ conservation is also being used for forest genetic resources, and gene conservation units for forest trees have been established in 23 protected areas (nature reserves). Genetic resources that are important for commercial forestry are maintained both in selected forest stands and in seed orchards. Seeds from important stands of forest trees are kept in NordGen's seed collection and in the Svalbard Global Seed Vault to provide information on changes in genetic composition over time. Chapters V and VII of the Nature Diversity Act provide the legal framework for this work. The environmental authorities are responsible for following up the Act by developing further legislation and agreements on the collection and use of genetic material obtained from the natural environment.

We currently know too little about how genetic diversity is being affected by factors such as habitat fragmentation and degradation or climate change. The Government therefore considers it important to continue knowledge development, including through national mapping and monitoring programmes, and to develop good conservation strategies, for example using action plans and management plans.

7 Conservation of a representative selection of Norwegian nature

7.1 Introduction

Aichi target 11 is specifically about using area-based conservation measures for long-term conservation. Norway's corresponding national target is that 'a representative selection of Norwegian nature will be maintained for future generations'. Promoting the conservation of 'the full range of variation of habitats and landscape types' is specifically mentioned in section 33 of the Nature Diversity Act in a list of the objectives of establishing protected areas. Others include the conservation of endangered natural environments and major intact ecosystems. Long-term conservation measures can play a part in achieving several of the Aichi targets at the same time. This is also discussed in Chapter 6, where the protection of areas under the Nature Diversity Act is mentioned as an appropriate way of safeguarding threatened species and habitats. The Government will seek to achieve both national and international targets for long-term conservation through a combination of protection of areas under the Nature Diversity Act and relevant sectoral measures. In this context, relevant measures are long-term in nature and give effective protection against relevant pressures on geographically defined areas of biodiversity importance. Examples of sectoral measures are the scheme for setting aside key biotopes in forest that are not to be felled, prohibiting the use of certain types of fishing gear under the Marine Resources Act, and protecting river systems or parts of them against hydropower developments. If such measures are to fulfil their purpose, the areas involved must be managed in a way that maintains their conservation value in practice.

As is the case for measures to safeguard threatened species and habitats, it is important to target area-based conservation action so that species and habitats are given adequate protection without restricting other activities that are beneficial to society more than necessary. The procedural rules and requirements for environmental impact assessment in legislation for various sec-

tors will ensure that the knowledge base is as good as possible and that biodiversity considerations and other public interests are weighed against each other before decisions are made. According to section 8 of the Nature Diversity Act: 'Official decisions that affect biological, geological and landscape diversity shall, as far as is reasonable, be based on scientific knowledge of the population status of species, the range and ecological status of habitat types, and the impacts of environmental pressures. The knowledge required shall be in reasonable proportion to the nature of the case and the risk of damage to biological, geological and landscape diversity.'

7.2 Choice of long-term conservation measures

In Norway, the only long-term conservation measure, apart from the designation of priority species, that gives protection against environmental pressures across sectors is statutory protection of areas under the Nature Diversity Act (and previously the Nature Conservation Act) or the Svalbard Environmental Protection Act. Protected areas are established by the King in Council. The Storting (Norwegian parliament) has issued guidelines for the implementation of protection plans, for example in a 1992 white paper on the national park plan and through the annual budget proposals.

Sectoral measures include rules and schemes that give areas some form of protection against relevant environmental pressures, usually protection against a specific type of development or activity. In the Government's view, such measures will often be sufficient if the development or activity in question constitutes the main threat to the area. However, they must provide effective, long-term protection against the development or activity in delimited areas of particular conservation value. Some sectoral types of protection apply to more than one type of development or activity. For



Figure 7.1 Bog asphodel in flower in Rago national park in Nordland. Norway has safeguarded a representative selection of its dramatic mountain scenery by implementing the national park plan.

Photo: Kjersti Gram Andersen

example, the Protection Plan for Watercourses (see Chapter 7.3.2 on rivers and lakes) gives protection against both hydropower developments and other types of development. The Government's proposals for the use of sector-specific measures are discussed below in the sections on each major ecosystem.

Considerable areas of Norway already have statutory protection. The Government therefore considers that no large-scale expansion of this form of conservation is needed. However, protection of forest on a voluntary basis will be expanded, and work on marine protected areas will continue. In the other major ecosystems, there is a limited need to supplement protected areas to include habitat types that are currently poorly represented (see more details in Chapter 7.3). The Government will consider whether the protected areas are likely to be resilient to future climate change. The Government will also evaluate whether the ecological network approach, as used for example in work under the Bern and Ramsar Conventions, is clearly enough reflected in Norway's selection of protected areas and their ecological coherence. The Government concludes

that the current protected areas need to be supplemented, but only to a limited extent, to correct weaknesses in the system, and it will be resource- and cost-effective to organise this at county level.

As a general rule, the Government will make use of protection on a voluntary basis when establishing protected areas on privately owned land. So far, this form of protection has only been used for forest.

Where appropriate, protection on a voluntary basis should also be tried out in other ecosystems than forest. The Government also considers it important to seek political agreement at local level on the implementation of protection processes.

Important areas that are publicly owned should be safeguarded by statutory protection, and steps will be taken to ensure that relevant stakeholders have satisfactory opportunities for participation in the protection processes.

The national park plan proposed the establishment of 40 new protected areas and the expansion of 14 existing areas. All but four of the proposals have been implemented. Two of the proposals that have not been implemented are in Finnmark county (to establish Muvrrešáhpi national park

and Goahteluoppal protected landscape, and expand Øvre Anarjohka national park), one is in Nordland (Tysfjord/Hellemobotn national park) and the fourth is in Troms (Trieriksørøysa national park). There has been a great deal of local opposition to these proposals, especially in Finnmark and Nordland. The Government does not wish to proceed with these proposals unless political agreement on the establishment of the protected areas can be achieved locally, in the municipalities that would be affected. The proposed Trieriksørøysa national park was intended to form part of a continuous protected area in Norway, Sweden and Finland, but this has not so far been a priority for Sweden or Finland. In the Government's view, it is not appropriate to proceed with this proposal either, unless the municipality itself wishes to do so and trilateral cooperation on the process can be organised.

In some cases, individuals, organisations or municipalities propose the establishment of national parks under the Nature Diversity Act. The Government considers such initiatives to be very constructive. However, if the Government is to proceed with such proposals, there must be political consensus on this in the municipalities involved, they must meet the scientific criteria for establishing protected areas, and protecting any such area must be consistent with the budgetary priorities for protection of areas.

Both individuals and a range of public interests are affected by the establishment of protected areas. Good, inclusive administrative procedures are of crucial importance in ensuring that stakeholders, including landowners, municipalities, interest groups and sectoral authorities, feel that protection decisions are legitimate. Sections 41 to 43 of the Nature Diversity Act describe the procedures to be followed, and these were further elaborated in 2015 in a circular from the Ministry of Climate and Environment. During the administrative process, the conservation value of the area that is to be protected must be clearly identified, together with the other interests that must be taken into consideration.

A sense of local ownership and identity, the principle that decisions should be taken at the lowest possible administrative level, and a combination of local knowledge and scientific knowledge are a good basis for sound management of protected areas. Administrative authority for the national parks and other large protected areas in mainland Norway has been delegated to management bodies consisting of politicians from the municipalities and counties involved, and repre-

sentatives appointed by the Sámediggi (Sami parliament) in areas where there are Sami interests. Landowners and other stakeholders can take part in the management of these areas through membership in advisory committees appointed by the management bodies. Administrative authority for the smaller protected areas, mainly nature reserves, smaller protected landscapes and habitat management areas, is delegated to the relevant municipalities if they wish to assume this responsibility. In Svalbard, the Governor is responsible for inspection and enforcement in the protected areas and for taking any steps considered necessary to achieve the purpose of the protection. The Governor is also responsible for drawing up management plans through processes involving the participation of local stakeholders and the Longyearbyen Local Administration. Management plans are approved by the Norwegian Environment Agency in consultation with the Directorate for Cultural Heritage.

Norway's protected areas support valuable biodiversity, and with a long-term management approach that is in line with the purpose of protection, they can provide an important basis for local, nature-based value creation. The national parks and large protected landscapes in particular provide a basis for the development of nature-based tourism. Local management of these areas makes it possible for a municipality to coordinate the management of protected areas with land-use management in the rest of the municipality, and to facilitate nature-based tourism in and around the protected areas.

The ecological status of protected areas must be maintained or improved to comply with the purpose of the protection decisions. Until now, routines for monitoring whether the ecological status of protected areas is being maintained (or improved in line with the purpose of protection) have not always been adequate. A system is therefore being developed for monitoring and reporting on specified ecological or landscape qualities of protected areas and trends in these qualities. This system will be a sound basis for effective and appropriate management of protected areas.

The Government will give priority to sound management of the existing protected areas. There are requirements to draw up operational and in some cases strategic management plans for many of the protected areas. These will specify what needs to be done to maintain conservation value, make arrangements for access and use, etc. This will provide predictability for all stakeholders. The Government would like to emphasise

that all management plans must comply with the framework set by the regulations establishing the protected area in question and the provisions of the Nature Diversity Act. The Government considers it important that management plans take the implications of climate change for efforts to maintain the conservation value of protected areas properly into account. This is particularly important in Svalbard, where the climate is changing very rapidly. In mainland Norway, the Norwegian Nature Inspectorate plays an important role in maintaining the conservation value of protected areas, both through its inspection and enforcement activities and through its other functions – habitat management, providing advice and information, facilitating public access and monitoring ecological status.

Private conservation agreements can also play an important part in safeguarding Norwegian nature. However, they may not provide long-term protection, and can only give protection against pressures and impacts that the private landowner can influence.

To safeguard a representative selection of Norwegian nature for future generations, the Government will:

- *Improve the management regime for existing protected areas, among other things by making it more efficient and more clearly targeted, in order to maintain the conservation value of protected areas and ensure that they become more resilient to climate change and more intensive use.*
- *Protect habitats and ecosystems that are currently underrepresented under the Nature Diversity Act.*
- *Consider adjustments to the boundaries of protected areas and if appropriate the expansion of protected areas to improve ecological networks and resilience to climate change.*
- *Test protection on a voluntary basis in ecosystems other than forest.*
- *Make use of and if necessary further develop other area-based conservation measures so that they provide effective, long-term protection against relevant environmental pressures.*

7.3 Protection of areas in each of Norway's major ecosystems

7.3.1 Marine and coastal waters

Marine protected areas may be established in Norway's territorial waters, extending up to 12 nautical miles beyond the baseline. The Govern-

ment's policy is to continue cross-sectoral marine protection under section 39 of the Nature Diversity Act to ensure that a selection of representative, distinctive and threatened underwater habitats along the coast and in territorial waters is safeguarded for future generations. The objective is for these areas, together with areas that are safeguarded under other legislation, to form a network of marine protected areas that will safeguard ecosystems, habitats and species.

Marine areas may also be included when protected areas on land, such as national parks and nature reserves, are established. Within such areas, all activity that may reduce conservation value is regulated in accordance with the purpose of the protection. Activities that are not contrary to the purpose of protection will still be permitted. Marine protected areas can serve several purposes at once. In addition to protecting areas that are of importance for biodiversity against environmental pressures, they can be important reference areas for research and monitoring.

In addition to the areas that have been given cross-sectoral protection, there are many areas that are protected against various types of fishing activities under the fisheries legislation. For example, a number of areas are protected against the use of fishing gear and techniques that can damage coral reefs, see Chapter 6.5. The Ministry of Trade, Industry and Fisheries will in consultation with the Ministry of Climate and Environment review whether these measures are sufficient to protect a representative selection of habitats against relevant fisheries activities. The two ministries will among other things consider safeguarding a more representative selection of coral habitats either under section 66 of the Regulations relating to sea-water fisheries or under section 19 of the Marine Resources Act. The ministries will also assess the ecological coherence of marine protected areas.

7.3.2 Rivers and lakes

About 15 % of Norway's total area of freshwater is now protected or proposed for protection under the Nature Diversity Act. Nevertheless, a number of habitats are poorly represented in protected areas. These include oxbow lakes and other features of meandering rivers, large sand and gravel banks, the spray zone near waterfalls (especially outside Eastern Norway) and lakes and ponds that are naturally free of fish. Most of these are habitats for a range of threatened species. The Government will therefore consider some supple-

mentary protection of areas in rivers and lakes. Protection processes that make the selection of protected areas more representative and that at the same time safeguard threatened species will be given priority. The Government will also give priority to statutory protection of valuable areas that are already protected against hydropower developments through the Protection Plan for Watercourses. The Government will consider options for protection of lakes and rivers on a voluntary basis.

Through the Protection Plan for Watercourses, 389 river systems or parts of river systems are protected against hydropower developments. They include a wide variety of river systems and types of rivers, and the plan plays an important part in the conservation of a representative selection of Norway's rivers and lakes. The conservation value of these rivers must also be taken into account in development projects in other sectors. This is required by the Water Resources Act and Norway's national policy guidelines for protected river systems. Nevertheless, some developments do take place in protected river systems that reduce their conservation value. The Government will seek to ensure that the conservation value of protected river systems is maintained, or restored if developments have had negative impacts that prove to have reduced their conservation value. The conservation value of protected river systems is to be safeguarded through application of existing legislation, especially the Planning and Building Act and the Water Resources Act. The Government will also assess whether parts of the protected river systems need to be further safeguarded by protecting areas under the Nature Diversity Act.

7.3.3 Wetlands

County conservation plans for wetlands have resulted in the establishment of more than 600 nature reserves. Overall, a good proportion of the area of peatland has been protected, particularly in the mountains, but the areas included are not very representative in geographical terms, particularly in the southern parts of the country and along the coast. Wetlands other than peatland in the southern half of Norway are underrepresented. The Government will consider supplementing protected wetland areas, particularly in the lowlands and coastal areas. Areas adjoining existing Ramsar sites will be given priority. The Government will consider the county wetland conservation plan for Finnmark as part of the county-

level supplementary protection of areas. The Government notes that wetlands have particularly important climate-related functions. Peatlands are a major carbon sink. Open alluvial systems, inland deltas and peatlands regulate water flow and provide protection against erosion and natural hazards. They can therefore play a part in climate change adaptation and help to reduce damage to vital infrastructure. The Government will attach importance to this when considering supplementary protection of areas under the Nature Diversity Act.

7.3.4 Forest

The Government will continue its long-term forest conservation work, mainly in the form of protection under the Nature Diversity Act for publicly owned forest and protection on a voluntary basis for privately owned areas, in both cases following the provisions of the Nature Diversity Act concerning compensation. Through cooperation between the environmental authorities and the forest owners' organisations, the Government will establish good procedures for rapid evaluation of forest areas of high conservation value for protection on a voluntary basis if their value is threatened by the construction of forest roads, logging or other forestry activities. Examples of such areas are forest where a high proportion of the area is set aside as key biotopes that are not to be felled, and large continuous forest areas containing species and habitats found in areas with little infrastructure development.

Relatively little of the large forest areas in low-lying parts of Eastern Norway has been protected. It will be important to establish new nature reserves in this region, including larger protected areas, and it will also be necessary to protect forest where important environmental qualities can be developed in the long term.

Various measures can be used in forest as a way of achieving Aichi target 11 on area-based, long-term conservation. Conservation measures under other legislation and in other sectors can be used for this purpose in addition to the establishment of nature reserves and national parks in forest under the Nature Diversity Act, which provides protection against a number of environmental pressures. However, other area-based conservation measures must provide effective, long-term protection of areas that support valuable biodiversity.

Key biotopes in forest are delimited areas that are considered to be important for the conserva-

tion of biodiversity. Requirements to carry out inventories of key biotopes and safeguard them are included in the voluntary forest certification schemes used in Norway, PEFC and FSC, and in the forestry legislation. For example, section 5 of the regulations on sustainable forestry requires forest owners to ensure that the value of important habitats and key biotopes is safeguarded in accordance with the guidelines in the Norwegian PEFC standard. By 2015, about 70 000 areas covering a total area of about 750 square kilometres had been identified as key biotopes through environmental inventories. This corresponds to almost 1 % of the total area of productive forest. Since environmental inventories have not yet been carried out for all forest properties, the proportion of productive forest set aside as key biotopes is expected to increase.

There are certain habitats, such as recently burned areas and successional stages of broad-leaved forest, that are naturally important for threatened species for a limited period of time only. To maintain the diversity of such habitats and the species associated with them, new localities will need to be established regularly. The voluntary certification schemes include guidelines for changing and replacing key biotopes, with requirements for documentation. Experience so far indicates that in general, a long-term approach is being taken to conservation of key biotopes and their value for biodiversity.

In the Government's view, key biotopes in forest should count towards Norway's achievement of Aichi target 11 on representative, long-term conservation in forest ecosystems. As a basis for Norway's future reporting on progress towards this target, the Ministry of Climate and Environment will in consultation with the Ministry of Agriculture and Food, and after dialogue with PEFC on technical matters such as data quality, clarify the criteria for and the scope of key biotopes that can be included in these reports.

Forest conservation is long-term work and must therefore be continued after 2020. The Government will expand the scope of voluntary forest protection. An evaluation of forest conservation will be carried out with a view to identifying measures that can contribute to the conservation of a representative selection of Norwegian forest ecosystems and valuable biodiversity.

The Government's aim is to ensure that area-based forest conservation incorporates the areas that are most important for critically endangered species and habitats, in addition to a representative selection of forest ecosystems, see Chapter 6

on threatened species and habitats. This requires a good overview of where the forest areas of highest conservation value are to be found. As a basis for effective forest conservation, the Government therefore intends to initiate habitat mapping of all old-growth forest that may be of conservation value. Habitat mapping in regions and forest types that are underrepresented at present will be given priority in the years ahead.

7.3.5 Cultural landscapes

Only a relatively small proportion of most of the habitat types in cultural landscapes that are important for biodiversity has statutory protection. In addition, conservation of a representative selection of cultural landscapes requires their active use or management. To ensure the conservation of a more representative selection of cultural landscapes, the Government will consider protection of some areas under the Nature Diversity Act, combined with measures such as habitat management for certain sites where there are rare habitat types or that are of very high quality. Furthermore, the Government will improve the management of semi-natural habitats within existing protected landscapes in order to maintain their conservation value. The Government will consider the use of voluntary agreements on the use and conservation of valuable cultural landscapes as a supplement, but emphasises that such agreements can only be applied to the way landowners use the areas involved, and that they do not ensure long-term conservation in the event of changes in ownership.

7.3.6 Mountains

About 35 % of the area of Norway above 900 metres above sea level is protected under the Nature Diversity Act, and roughly 75 % of the total area of Norway's national parks is in the mountains. This is the result of the implementation of the 1992 national park plan. The proposals in the national park plan have been implemented, with the exception of a few areas in the northernmost counties, mainly Finnmark (see Chapter 7.2). For Norway as a whole, a representative selection of mountain ecosystems has now been protected. In the Government's view, there is therefore no need to expand the area of mountain ecosystems in order to make the selection more representative (but see Chapter 6 for a discussion of the conservation of threatened species and ecosystems). The Government will seek to ensure that the con-

servation value of existing protected areas in the mountains is maintained or if necessary restored. The preparation of management plans is an important tool in this context.

7.3.7 Polar ecosystems

Protected areas in Svalbard and Jan Mayen cover most of the land areas and territorial waters of the islands. In Svalbard, the protected areas were supplemented and expanded in the period 2002–2006, on the basis of a geographical analysis of the protected areas and their representativeness. The Government considers that the major ecosystems in Svalbard and on Jan Mayen are all adequately

represented. However, the knowledge base is not good enough for us to determine whether the protected areas are ecologically representative of all Svalbard's nature. The main task now is to ensure that the protected areas in Svalbard and Jan Mayen are managed in accordance with the purpose of protection, so that all habitats are properly safeguarded. The Government considers the management plans for the protected area to be the most important tool in this context. The Government's proposals for long-term conservation measures under the fisheries management regime are discussed in the sections on marine and coastal waters.

8 Improving knowledge on biodiversity

8.1 Why is knowledge so important?

Norway's policy is that biodiversity management must be knowledge-based. This was one of the key elements of the 2001 white paper on Norway's biodiversity policy (Report No. 42 to the Storting (2000–2001)), and is one of the principles on which the Nature Diversity Act is based (section 8). Moreover, Article 112 of the Norwegian Constitution gives every person a right to a healthy environment whose productivity and diversity are maintained and to information to enable them to safeguard this right. A sound knowledge base is essential to fulfil these rights. The Environmental Information Act (Act of 9 May 2003 No. 31 relating to the right to environmental information and public participation in decision-making processes relating to the environment) requires both public authorities and undertakings to hold environmental information. The authorities are also required to make environmental information accessible to the public, and both authorities and undertakings must disclose the environmental information they hold to anyone who asks for it, unless the Act specifically provides for the information to be exempted from public disclosure. A sound knowledge base is vital for good management and for choosing the right measures to achieve national biodiversity targets. Aichi target 19 states that 'By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.' Internationally, high priority is being given to strengthening the science-policy interface, and to ensuring that information is widely shared and applied.

The public administration needs knowledge and information of various kinds. This includes spatial data on the natural environment obtained by mapping and remote sensing, and monitoring data to provide information about trends in ecological status and the causes of change. Information about species (taxonomy), their relationships (systematics) and their ecology is also needed. Knowledge about ecological interactions is vital

for the public administration and for sound management, and this and other ecological knowledge is built up through research. In addition to research results, various types of syntheses, risk assessments, scenarios and cross-disciplinary assessments are compiled, and provide valuable information as a basis for management.

Major social and economic change is currently taking place and putting pressure on biodiversity. Knowledge in the field of social sciences, including economics, is therefore vital in addition to scientific knowledge.

A shared, robust knowledge base makes it easier to agree on decisions and ensures that decision-making processes are more effective. Various types of knowledge and information are discussed further in the rest of this chapter.

In order to make good decisions that will safeguard the environment, it is essential that a sound interdisciplinary knowledge base is available for decision makers and the general public, and that this knowledge is applied. The environmental authorities have a responsibility for making sure that the necessary knowledge is available, and that priorities for new knowledge building are based on interdisciplinary analyses of where knowledge needs are greatest.

8.2 Mapping biodiversity and establishing maps of ecological information for Norway

Land conversion and land-use change resulting in habitat degradation and fragmentation is the most serious threat to biodiversity today. It is essential to have spatial data on species, habitats and landscapes so that biodiversity can be taken properly into account in planning and decision making. Spatial data can be obtained by conventional mapping of biodiversity and by remote sensing. A number of geographical information systems (GIS) are available that can capture such data.

Good, up-to-date ecological data is vital for sound planning and for finding good, integrated solutions for projects and developments of all

sizes. If information is available at an early stage, it is much easier to take valuable biodiversity into account. A sound knowledge base can therefore reduce conflict. Decision-making processes will also become more predictable and effective, since there is less need for the time-consuming process of obtaining supplementary information. This will benefit projects in sectors including transport and energy.

In recent years, Norway has been giving priority to building up knowledge about the distribution of species and habitats, but there are still major knowledge gaps to be filled. In February 2015, the Storting (Norwegian parliament) debated a proposal on measures for knowledge-based management of Norwegian nature. The Standing Committee on Energy and the Environment pointed to the need to learn more about species, habitats and ecosystems. A majority of the committee agreed that they expected the present white paper to describe more specifically how Norwegian nature and biodiversity is to be mapped.

The Norwegian Environment Agency is starting to use a new system for classifying and mapping habitats, ecosystems and landscapes in Norway, and has in cooperation with the Norwegian Biodiversity Information Centre begun drawing up the necessary guidance documents and technical infrastructure. The Government will continue the work of mapping nature and biodiversity and nature in Norway, in accordance with the recommendation from the Standing Committee on Energy and the Environment.

Through this process, georeferenced ecological data will be obtained and will be used to create a collection of map layers showing ecological data, including where in Norway species and habitats are found. There will be other map layers for specific environmental variables, which will provide information on where in Norway conditions are suitable for particular habitats or species. Some ecological spatial data are already available from various databases. Examples include data on biodiversity in protected areas, data in the *Naturbase* portal (habitat types, species, protected areas and areas set aside for outdoor recreation), species data from the Species Map Service run by the Norwegian Biodiversity Information Centre, and data on land resources. Specific legislative instruments apply to some categories of mapped areas. Relevant types of ecological information include bedrock, soil water content, seawater salinity and topography.

The *Naturbase* portal run by the Norwegian Environment Agency is currently an important source of spatial data on habitats, and the Species Map Service run by the Norwegian Biodiversity Information Centre provides spatial data on species. Quality assurance is being carried out for the data already uploaded to *Naturbase*. In future, the Biodiversity Information Centre will play an important part in supplying and coordinating spatial data on habitats, ecosystems and landscapes classified using the new Norwegian system. Geographical areas for which the data is currently incomplete will be given priority in the Government's initiative for nature and biodiversity mapping.

Map layers for ecological data are currently available through various institutions in publicly available national datasets. Some of these are modelled, while others are based on field surveys. Some map layers can be used directly as nationwide datasets showing environmental variation. Others will need to be further developed or updated before they can be used in this way. The Government will ensure that over time, a good basis for the analysis and modelling of Norwegian nature is built up through cooperation and the development of such datasets. If maps of the entire country showing ecological gradients are available, this will save time and money, for example by making it possible to decide on more precise priorities for further mapping of Norwegian nature.

The Government considers it necessary to continue mapping of species, habitats and ecosystems, landscapes and ecosystem services in Norway. In the context of land-use management, mapping to obtain biodiversity data that is needed in day-to-day decisions on land use and other issues that influence environmental pressures is particularly important. On this basis, the Government will give highest priority to mapping of habitats that are threatened, important for many different species, provide key ecosystem services, or are particularly poorly mapped. Priority will also be given to geographical areas where mapping will provide most benefits for society, including areas both on land and at sea where the level of human activity is high and that are under great pressure, and areas where climate change is expected to result in rapid change. The new Norwegian system for classifying habitats, ecosystems and landscapes is to be used as the basis for public-sector mapping of Norwegian nature, in accordance with the Storting's decision. As part of this work, the Government will assess the need to supplement

the classification of marine habitats and ecosystems to provide more complete coverage of the range of Arctic marine habitats and ecosystems, including those in icy waters.

A larger-scale initiative to map nature and biodiversity in Norway will require adequate infrastructure, and cooperation between a number of key bodies involved in the production of relevant map layers will have to be organised and coordinated. These bodies include the Geological Survey of Norway, the Norwegian Mapping Authority and the Norwegian Meteorological Institute. The Norwegian Biodiversity Information Centre has developed expertise in this type of coordination through its work on red lists and geographical species information, and the development of the new Norwegian system for classifying habitats, ecosystems and landscapes.

The Government will:

- *Continue ongoing mapping programmes for nature and biodiversity in Norway up to 2020.*
- *Continue the MAREANO programme for mapping of the seabed in Norwegian waters.*
- *Integrate existing data on key environmental variables from various sectors with spatial data on nature and biodiversity in Norway.*
- *Further develop and improve databases containing spatial data on biodiversity.*
- *Continue the work of identifying and mapping particularly valuable and vulnerable marine areas and mapping of old-growth forest of conservation interest.*

8.3 Monitoring

The natural environment changes constantly, in some cases as a consequence of human activity. We need to understand environmental trends over time and the causes of change. This knowledge can be acquired through monitoring data obtained by field observations or from satellite data, and through research based on monitoring data. Monitoring programmes provide long time series of data. They generally need to be followed up by research to build up knowledge about ecological relationships and the causes of change. Building up knowledge about ecological status and trends in ecosystems requires monitoring programmes for a representative selection of key indicators for different ecosystems, in addition to data from reference areas. Developing an understanding of environmental pressures and relationships

between pressures and ecological status requires monitoring of important pressures such as land conversion and land-use change in addition.

A number of monitoring programmes have already been established and are providing information on trends in Norwegian ecosystems. Some are run by the environmental authorities and some by other sectors. Biodiversity is now being monitored to some extent in all Norway's major ecosystems.

However, the current monitoring system is still inadequate for a number of environmental pressures and species groups, certain ecosystems are less well covered, and the system does not provide sufficiently representative or complete geographical coverage. In the Government's view, the Norwegian environmental monitoring system should be reviewed to identify any changes needed to obtain a sound knowledge base and complete geographical coverage. It is important to have an overview of trends for those species groups (particularly key species) and habitats we know little about at present, or that are expected to be under growing pressure in future. More knowledge is also needed about environmental pressures and impacts. A better knowledge base, including knowledge about the impacts of various types of projects and measures, will make it possible to assess changes in biodiversity more accurately. It is vital to be able to do this so that action to safeguard biodiversity can be more clearly targeted and developments that affect valuable and threatened species and habitats can be avoided. Monitoring programmes for coastal waters, cultural landscapes and wetlands are particularly incomplete. There are also substantial gaps in the knowledge base for water resource management under the Water Management Regulations, despite improvements in recent years. Norway is at the forefront of developments internationally as regards marine monitoring. The Institute of Marine Research runs extensive long-term monitoring programmes for Norwegian sea areas. A number of time series have been running for many decades. Despite this, monitoring of marine biodiversity does not fully cover the ecological interactions and complexity of marine ecosystems.

In the Government's view, it is also important to monitor environmental pressures, including land-use change and climate change. New model-based tools for land-use management are needed to make it possible to model the cumulative effects of all proposed projects and developments, and to include the projected responses of ecosys-

tems to climate change. This is of crucial importance for assessing the impacts of different pressures on the environment and the cumulative effects in specific areas. Surveillance monitoring of ecological status in coastal waters needs to be improved. Long time series are needed to understand the causes of change in ecosystems. Monitoring programmes are needed as a basis for identifying appropriate measures for achieving the target of good ecological status, including meeting the requirements of the Water Management Regulations. They are also needed to gather sufficient data to make use of the Nature Index for marine and coastal waters.

New satellite-based technology is making it possible to improve environmental monitoring and make it more effective. The Copernicus programme is the EU Earth observation and monitoring programme, and includes resource management, environmental and climate monitoring and emergency management and security. The Government will continue Norway's active role in the Copernicus programme, and will assess when and how the environmental authorities can benefit by using satellite data from the programme. Monitoring of biodiversity and of the impacts of land-use change and climate change will be of particular interest in cases where the satellite data provide sufficient management-relevant information. The quality of satellite data is improving and access to the data is becoming easier, providing a better basis for developing new management tools based on models used in landscape ecology. These can make it possible to model and analyse the effects of land conversion and habitat fragmentation, and barrier effects resulting from existing and planned developments. They will also make it possible to take into account the projected responses of biodiversity to climate change in planning processes. These tools and models will also be useful in planning transport and energy infrastructure projects and smaller-scale projects, and will provide a better basis for assessing the cumulative effects of developments across sectors.

The Government will:

- *Ensure that monitoring programmes for ecological status in all Norway's major ecosystems are ecologically and geographically representative. This will include steps to strengthen monitoring of ecological status in freshwater and coastal water bodies.*
- *Ensure that there is public access to all monitoring data collected by all types of research instituti-*

ons using public funding, with the exception of sensitive data.

- *Assess how satellite data can be more widely used in planning processes and in monitoring changes in biodiversity and in land use nationally and internationally.*
- *Further develop indicators of land use and other environmental pressure indicators, including identifying suitable indicators for ocean acidification and climate change.*
- *Consider the development of analytical tools for planning processes, for analysing status, trends and the causes of trends, and for analysing the cumulative effects of different types of developments and pressures in an area.*
- *Continue and further develop the mapping and monitoring programme for seabirds.*
- *Develop methods and tools for monitoring climate-related changes in biodiversity.*
- *Develop indicators for ecosystem services.*

8.4 Research and development and education

The environmental authorities need knowledge derived from research to understand ecological interactions, ecological functions, causal relationships and the effects of different policy instruments. In addition, research based on monitoring data is needed to build up this kind of knowledge. Despite considerable progress in recent years, there are still gaps in our knowledge of biodiversity and ecosystems. This is a very complex field, covering everything from genetic variation at population level to the dynamics of ecosystems. A great deal of research has been devoted to establishing explanatory models for observed changes in individual populations. More recently, growing attention has been focused on higher-level ecosystem interactions, greatly helped by the development of more advanced analytical tools and the growth in computer capacity. At the same time, our knowledge needs have become more complex. Research on resources, pressures and environmental change is needed to develop knowledge-based solutions for social and industrial development. This means that research needs to be better integrated and more interdisciplinary, with closer links between research in the natural sciences, social sciences and humaniora.

There are major unmet research needs relating to biodiversity and ecosystem services. Both research and monitoring initiatives are needed to strengthen the knowledge base on the most

important pressures affecting biodiversity and ecosystem services, including land-use conversion and land-use change, climate change and ocean acidification. Some research on biodiversity and climate change is included in Norway's large-scale programme on climate research, KLIMA-FORSK. However, there is a clear need for research focusing specifically on questions relating to the loss of biodiversity, and for stronger integration of research on biodiversity, climate change and other environmental issues. Research on land-use change must have a place in new research programmes that will continue environmental and marine research.

The Government expects the new MILJØ-FORSK programme (Programme for Environmental Research for a Green Transition) to fund research that will help to meet the knowledge needs relating to biodiversity discussed earlier in this chapter. In the Government's view, there is also a need for the Research Council of Norway and the ministries that fund research to strengthen their cooperation and scale up co-funding across sectors. A good framework should also be provided for stronger cooperation between environmental and industry-oriented research programmes.

Internationalisation, and European research cooperation in particular, has helped to improve research results. Horizon 2020 is the world's largest research and innovation programme, with funding of EUR 80 billion available over a seven-year period (2014–2020). Research groups, the public sector and companies in Norway can take part in the same way as colleagues and competitors in other European countries. Research and funding are being divided between three programme sections: excellent science, industrial leadership and societal challenges. Seven key societal challenges have been identified. These are health, demographic change and wellbeing; food security, sustainable agriculture and forestry, marine and maritime and inland water research, and the bioeconomy; secure, clean and efficient energy; smart, green and integrated transport; climate action, environment, resource efficiency and raw materials; Europe in a changing world – inclusive, innovative and reflective societies; and secure societies – protecting freedom and security of Europe and its citizens. In June 2014, the Government presented a strategy for research and innovation cooperation with the EU. One of its goals is greater Norwegian participation in Horizon 2020.

International knowledge generation processes such as the work being carried out by the Intergovernmental Panel on Climate Change (IPCC) have been very important for Norwegian climate research. The Government values this work and also wishes Norway to play an important role in the recently established Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), which is modelled on the IPCC. Its work focuses on the importance of biodiversity and ecosystem services for human well-being. It takes an interdisciplinary approach and will in the next few years generate knowledge and make recommendations in areas such as pollination and food production, invasive alien species, policy support tools such as scenario analysis, valuation methodologies and global assessments of status and trends. The IPBES has a Technical Support Unit on Capacity Building in Trondheim in Norway, which is to assist with the capacity building part of the work programme. The unit is located in the premises of the Norwegian Environment Agency, which is also Norway's national focal point for the IPBES. The Government will continue Norway's involvement in the work of the IPBES and will encourage Norwegian experts to play an active part in this international cooperation and in formulating mandates, methodology and tools for its work.

The establishment of Norwegian research centres such as the Fram Centre in Tromsø, the Bjerknes Centre for Climate Research in Bergen and the Oslo Centre for Interdisciplinary Environmental and Social Research (CIENS) strengthens research groups and promotes broader-based interdisciplinary cooperation. However, in the field of the conservation and use of biodiversity and ecosystem services, there has been no centre responsible for cross-disciplinary applied research and for communicating results. Given the requirements for knowledge-based management that follow from the Nature Diversity Act, implementation of the Convention on Biological Diversity, the establishment of IPBES and the growing priority being given to ecosystem services (for example in Official Norwegian Report NOU 2013:10 on the value of ecosystem services), the Research Council of Norway has supported a review of the case for establishing such a centre by the Norwegian Institute for Nature Research, NTNU (the Norwegian University of Science and Technology) and the Norwegian Biodiversity Information Centre. As a follow up to the review, the Centre for Biodiversity and Ecosystem Services (CeBES) has now been established through



Figure 8.1 The national park centres play an important role in communicating information about nature and the outdoors. Here a school class is learning about Norway's national parks.

Photo: Norwegian Mountain Museum/Visitors' Centre for Jotunheimen, Reinheimen and Breheimen National Parks

formalised cooperation between NTNU, the Norwegian Institute for Nature Research, the Norwegian Institute of Bioeconomy Research (NIBIO) and SINTEF. The aim is for the Centre to become a national hub for innovative, interdisciplinary research and development and dissemination, and thus contribute to national and global efforts for biodiversity conservation and sustainable development. The Research Council is also supporting the scheme for Centres of Excellence in research.

Species and habitats have lost ground as a research field and study area at Norwegian universities and colleges in recent years. The Storting has also called attention to this. The Ministry of Education and Research (via funding for the Research Council of Norway) and the Ministry of Climate and Environment (via funding for the Norwegian Taxonomy Initiative run by the Norwegian Biodiversity Information Centre) have together strengthened researcher recruitment to the field by providing strategic funding for the national Research School in Biosystematics. The school was established with co-funding from the Research Council, and is a good platform for coop-

eration with other Nordic countries. The research school cooperates with similar initiatives at Nordic and European level, and is administered by the Natural History Museum at the University of Oslo. The Government considers it to be very important that research groups at universities and colleges are large enough to ensure that expertise in such basic fields is not lost. The Government will continue to support the Research School in Biosystematics.

The foundation for future expertise in and research on biodiversity and the environment is laid during primary and secondary education. Curricula, teachers' qualifications and the content of teaching plans all play a vital part in giving pupils an insight into and understanding of the world's major environmental problems. Knowledge about biodiversity, important drivers of biodiversity loss and possible solutions to the problems must all be included in the teaching programmes. It is also important that these subjects are taught in a way that encourages the recruitment of students and researchers, both to the subject itself and to more interdisciplinary research

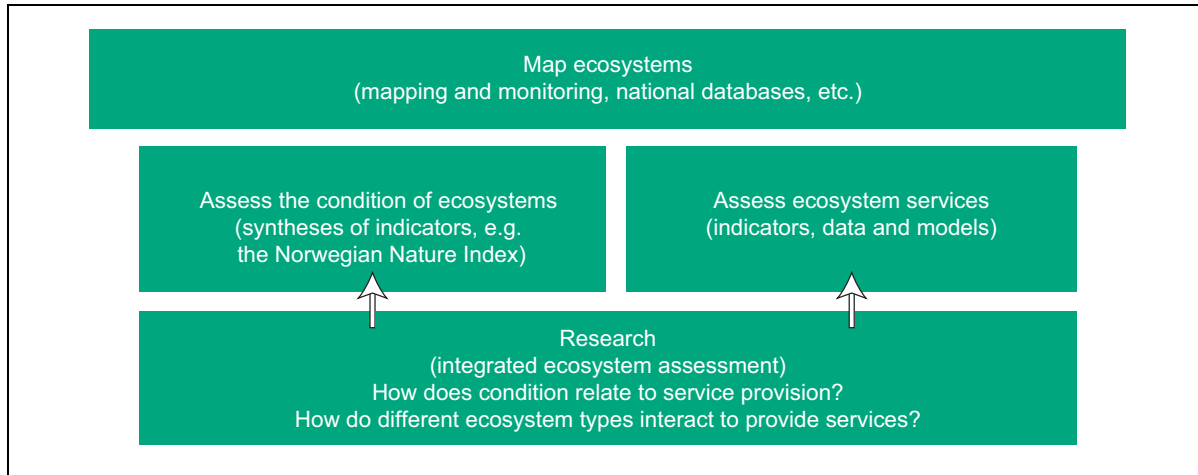


Figure 8.2 Mapping ecosystems and their services

Outline of a common framework for mapping ecosystems and their services, based on Figure 2 in EU Technical Report 2014 – 080, *Mapping and Assessment of Ecosystems and their Services*. The figure shows that an assessment of ecosystem services should be based on both mapping and monitoring data and a synthesis of information provided by indicators that give a picture of the overall condition of an ecosystem. In addition, research and analysis are needed to understand more about how the condition of ecosystems is related to their capacity to provide ecosystem services.

into complex environmental problems and solutions. The Sustainable Backpack programme will be continued. This is a nationwide initiative by the Ministry of Education and Research and the Ministry of Climate and Environment to support Norwegian schools in implementing Education for Sustainable Development (ESD). From the school year 2016/2017, the Government is introducing one extra lesson a week in the natural sciences, which schools may teach in year 5, 6 or 7. This will mean that pupils receive an extra 40 hours' teaching in the natural sciences.

The Government's long-term plan for research and higher education emphasises the need for more knowledge about the most serious environmental threats, including the loss of biodiversity. It also identifies the need to learn more about interactions between climate change and other environmental pressures and how different environmental and climate-related measures can support each other. The Government will address these knowledge needs as part of the work of implementing the long-term plan.

The EU has developed a common assessment framework for mapping ecosystems and their services in the EU countries (see Figure 8.1). This involves assessing ecosystem condition on the basis of data from mapping, monitoring and databases and using relevant indicators, and assessing ecosystem services provided by different types of

ecosystems on the basis of selected indicators, data and models. This framework will be used as a basis for the European assessment report to be drawn up for the IPBES, and will therefore also have implications for the Norwegian data used in the report. Norway has done a great deal to improve the knowledge base on biodiversity in recent years, by scaling up funding for mapping programmes, through the Norwegian Taxonomy Initiative and monitoring programmes, and by producing knowledge syntheses. Thus, good progress has already been made in Norway in synthesising information from indicators so that overall ecosystem condition or ecological status can be assessed. However, Norway has not yet identified relevant indicators and data for assessing ecosystem services, and there are no reviews of the overall relationship between ecological status and the provision of ecosystem services. Norway will continue to support the work of the IPBES. In connection with this, the Ministry of Climate and Environment will initiate a review of selected ecosystem services in consultation with relevant sectors. The work will be based on existing knowledge.

The Government will:

- *Continue funding for the Research School in Biosystematics.*
- *Continue to support the work of the IPBES.*

8.5 Traditional knowledge

Traditional knowledge about sustainable management of the natural environment has been a key element throughout Norway's history. Traditional knowledge has been kept alive by coastal fishermen who also graze livestock on coastal heaths and islands, through traditional Sami reindeer husbandry, and by farmers who have supplemented conventional arable land with hay fens, transhumance and summer farms, and wild reindeer hunting. People have used natural resources for food, medicine and as raw materials (for example for clothing and building materials), and there are many customs, rituals and a large body of traditional lore linked to different species. Most of the land area of Norway is or has been used in some way by people. Coastal waters have also been actively used in a variety of ways. Traditionally, people harvested a much wider range of resources than they do today. In many areas, this has resulted in the development of characteristic biotopes, each with its specific fauna and flora. Traditional knowledge can explain a great deal about today's landscapes, and is important for people's sense of pride in their local history and culture and for maintaining its integrity. Traditional knowledge is often not written down, but consists of experience and knowledge that is passed down through the generations in oral form and through its practical application.

Section 8 of the Nature Diversity Act requires the authorities to attach importance to any traditional knowledge that is available when making official decisions that will affect Norwegian nature. Traditional knowledge is often valuable for the public authorities in decision-making processes. Such knowledge is vital when semi-natural habitats and landscapes are being restored and managed. The provisions of the Nature Diversity Act are based on similar provisions in the Convention on Biological Diversity (Article 8 j)). Regulations on traditional knowledge associated with genetic material are being drawn up under the Nature Diversity Act. They will implement Norway's obligations under the Nagoya Protocol on Access and Benefit-sharing. The regulations are intended to ensure that the interests of indigenous and local communities are safeguarded and respected when others make use of their traditional knowledge on genetic material.

In recent generations, there has been a steep decline in traditional knowledge of nature in Norway, and more and more of our cultural and natural heritage is being lost. This means that local

communities' traditional knowledge of species and landscapes, and not least, our awareness of our own place in nature, is gradually disappearing. Museums and archives in Norway have collected and systematised information about traditional uses of nature, particularly traditional agriculture, but also use of uncultivated areas. Information has also been collected in connection with research on topics such as the cultural landscape. A great deal can be done to improve contact between people working in the scientific and cultural heritage fields. Little use has been made of this source material by the environmental authorities, and little has been done to make empirical knowledge available to people working in other fields and to the general public. Traditional knowledge must be made accessible in accordance with guidelines under the Convention on Biological Diversity, and it is essential to ensure that access is given with the consent of indigenous and local communities. This is particularly important when giving access to traditional knowledge relating to genetic material developed by indigenous and local communities.

In Sami areas of Norway, traditional knowledge is being retained because nature is still being used in the traditional ways. This means that there is a large body of knowledge unique to the Sami culture that it is important to safeguard for both current and future generations. Little has been done to synthesise knowledge relating to Sami traditions and other traditional knowledge in Norway and make it accessible.

Two projects on traditional knowledge of nature initiated by the Government are currently in progress, one specifically on Sami traditional knowledge and one on people and the natural heritage more generally. They are both making a valuable contribution to collecting and systematising traditional knowledge, but this is far from enough to safeguard traditional knowledge for the future. In addition, Norway is participating in cooperation under the Arctic Council on the integration of traditional knowledge into projects dealing with indigenous peoples' use of species and ecosystems in the Arctic.

The Government will:

- *Continue work to safeguard, systematise, collect and communicate traditional knowledge that promotes sustainable use, and facilitate interdisciplinary cooperation.*
- *Continue to spread information about traditional ways of using nature, increase awareness of*

the importance of safeguarding biodiversity and encourage local participation and engagement in the management of protected areas.

8.6 Access to information

Knowledge can only be applied if databases and map applications are used to make information publicly available. The information must be easy to find and use, and it must be presented in a way that is suitable for a variety of user groups. Access is currently provided through many different databases and applications, developed for a variety of purposes, dealing with many different topics and targeting different user groups.

Norway has made good progress in developing tools and services to provide information on Norwegian nature. This is partly because there is national consensus on data sharing: that institutions holding environmental data should have agreements to share this with others, within a common framework and using common standards. Nevertheless, information is still somewhat fragmented. Applications and databases should be further developed and improved to take advantage of technological developments. This will make it easier for municipalities to make use of the information in their day-to-day work, and also help other users and the general public.

On 19 December 2014, Norway adopted regulations on environmental impact assessment for plans under the Planning and Building Act and for projects under sectoral legislation. These include provisions intended to ensure that impact assessments maintain high scientific standards and that data collected in connection with an impact assessment can be re-used. Guidelines on recognised methodology and the databases to be used for uploading data have been published.

The Government will:

- *Ensure that data and databases for biodiversity maintain high quality.*
- *Further develop, improve and simplify national databases to ensure good access to environmental information for decision makers and the general public, and consider better coordination of databases and more widespread sharing of data.*
- *Improve Norway's land-use and environmental statistics.*
- *Ensure that as far as possible, all environmental data collected are uploaded to public databases.*

8.7 Syntheses, risk assessments and analyses

The public administration also needs information from various types of syntheses and risk assessments, and projections and scenarios for future trends. This information must be provided by experts in the relevant fields. Examples of such products in Norway include the Red List of Species and the Norwegian Red List for Ecosystems and Habitat Types. These are both based on risk assessments – of the risk that species will become extinct in Norway and that habitats will be lost, respectively. Others are the publication *Alien species in Norway – with the Norwegian Black List* (based on ecological risk assessments for alien species), and the Norwegian Nature Index. Projections and scenarios of future pressures on biodiversity are important because they allow predictions of change and make it possible to adapt the management regime accordingly. We need knowledge of this kind about climate change and ocean acidification, and also about other important pressures such as habitat fragmentation. Knowledge about future impacts of climate change is based on climate models. The IPCC is responsible for assessing and summarising knowledge about global- and regional-scale climate change in its reports, and the IPBES for producing reports of the same type on biodiversity and ecosystem services. Similar reports are also published at national level; for example, Norway published a report on the impacts of climate change in the Norwegian Arctic in 2010. There is also a good deal of regional cooperation on syntheses and assessments of biodiversity, for example within the framework of the Arctic Council.

The Government considers it important to continue to present syntheses of knowledge such as those mentioned above. They provide information that forms an important basis for the work of the public administration, and is also valuable for the general public and decision makers.

The Government will:

- *Ensure that Norwegian Biodiversity Information Centre presents regular updates of the red lists for species and for habitat types and ecosystems.*
- *Ensure that the Norwegian Biodiversity Information Centre presents ecological risk assessments for alien species, and a Norwegian black list, every five years.*

- *Ensure that the Norwegian Nature Index is updated every five years.*
- *Develop and apply methodology and tools for establishing and displaying projections of ecosystem change and shifts in the distribution of species and habitats in response to climate change, ocean acidification and other pressures.*
- *Give priority to cooperation with neighbouring countries and within the framework of the Arctic Council on the preparation of regional syntheses and projections of pressures on biodiversity.*

9 Responsibilities of local and regional authorities

9.1 Nature as a resource for Norway's municipalities

Nature itself is one of the most important resources for Norway's municipalities. It is the basis for human settlement and industrial and commercial activities, provides opportunities for recreation and contributes to people's sense of identity. Municipalities are showing a growing interest in broad-based value creation based on both natural and cultural resources. The municipalities take all these factors into account in their planning, since this is important in making local communities attractive to business and industry and as places to live. It should therefore be part of the local authorities' responsibilities to ensure proper management of the natural environment.

- c. protect the natural resource base for the Sami culture, economic activity and way of life,
- d. facilitate value creation and industrial and commercial development,
- e. facilitate good design of the built environment, a good residential environment, a child-friendly environment and good living standards in all parts of the country,
- f. promote public health and counteract social inequalities in health, and help to prevent crime,
- g. incorporate climate change considerations, for example in energy supply, land-use and transport solutions,
- h. strengthen civil protection by reducing the risks of loss of life, injury to health and damage to the environment and important infrastructure, material assets, etc.

9.2 Land-use planning as an instrument for biodiversity management

9.2.1 General application of the Planning and Building Act

The Planning and Building Act provides the municipalities with a very important instrument in their efforts to safeguard Norwegian nature. Together, all the individual decisions made under the Act strongly influence the development of Norwegian society and how successfully biodiversity is safeguarded in both the long term and the short term. Large, robust municipalities with good nature management capacity and expertise can play an effective role in achieving national and international targets relating to biodiversity.

Section 3-1 of the Planning and Building Act requires municipal plans to:

- a. establish goals for the physical, environmental, economic, social and cultural development of municipalities and regions, identify social needs and tasks, and indicate how these tasks can be carried out,
- b. safeguard land resources and landscape qualities and ensure the conservation of valuable landscapes and cultural environments,

A healthy natural environment is essential for achieving most of these purposes, but the degree to which nature and environmental considerations are incorporated into municipal plans varies considerably from one municipality to another. Municipal plans often make it clear which areas should be used for development and commercial activities, but are less specific about areas that should be safeguarded.

Aichi target 2 highlights the importance of integrating the values of biodiversity into local development strategies and planning processes. In Norway, the municipalities play a key role in drawing up such strategies and plans. A good planning process can identify important components of biodiversity in a municipality and areas that are important for connectivity and ecological coherence. Systematic planning can also clarify what additional information is needed about nature in a municipality. A good planning process is one that ensures that residents, interest organisations, the business sector, landowners and others all take part, and where regional and central government authorities also participate and provide guidance from an early stage. Planning processes that integrate biodiversity considerations will make an important contribution to Norway's achievement of Aichi target 2.

Planning routines for housing developments, industrial development, transport infrastructure and other sectors that also incorporate biodiversity considerations require land-use management based on close cooperation and clear priorities. Preparation of the social and land-use elements of the municipal master plan also gives the municipal authorities the opportunity to consider both land and water areas of the municipality as an integrated whole. The social and the land-use elements of a municipal master plan can both appropriately be used to set overall long-term priorities, including priorities for the conservation of important species and habitats. In addition, the Planning and Building Act's provisions on zoning plans allow for more detailed specification of how biodiversity is to be safeguarded. The provisions on both the land-use element of the municipal master plan and zoning plans provide for areas to be designated as green structure (nature areas, green corridors, recreation areas and parks); as agricultural areas, areas of natural environment, outdoor recreation areas and/or reindeer husbandry areas; and areas for use or conservation in the sea and river systems and along the shoreline. In the land-use element of a municipal master plan, it is also possible to designate zones where special considerations apply, for example as regards outdoor recreation, the green structure, the landscape, or conservation of the natural or cultural environment – for example in buffer zones around national parks or protected landscapes. The same zones may be designated in the zoning plan, or alternatively, their purpose can be achieved by specifying permissible types of land-use and laying down other appropriate provisions. When processing building applications, the municipality can influence matters such as where buildings are placed on a site, which can be important for biodiversity conservation. Provided that certain conditions are met, municipalities may grant exemptions from the provisions of their plans. This means that the strictness or leniency of the practice they follow when considering exemptions may have implications for trends in ecological status in the ecosystems concerned.

Regional plans are drawn up by the county authorities. They are particularly important for habitats and species whose distribution extends across municipal and county boundaries. The regional approach has for example been used in drawing up plans for the seven national conservation areas for wild reindeer in the mountains in the southern half of Norway. Such plans can contain binding regional planning provisions on land use.

In the case of transport infrastructure projects, the central government transport authorities can reach agreement with the municipal and regional planning authorities to take over part of their normal role in preparing regional and municipal sub-plans and zoning plans. This is set out in section 3-7 of the Planning and Building Act. Transport infrastructure plans are processed and adopted in accordance with the Act's ordinary provisions. This means that the county authorities normally make decisions on regional sub-plans and the municipalities on municipal sub-plans and zoning plans. However, in the case of major transport infrastructure projects, central government land-use plans may be drawn up instead. In such cases, the Ministry of Local Government and Modernisation has the authority to make planning decisions. The Government has indicated that central government land-use plans will be more widely used for large-scale transport projects.

Regional master plans and municipal master plans that include guidelines or set a framework for future developments, and zoning plans that could have substantial effects on the environment and society, must include a description and assessment of the effects of the plan on the environment and society, including its effects on biodiversity. This is required by the regulations on environmental impact assessment for projects under the Planning and Building Act. The purpose is to ensure that the possible impacts of developments are taken into account, and to ensure an open process in which all stakeholders can make their opinions heard. Norway has two sets of regulations on environmental impact assessment, for plans under the Planning and Building Act and for projects under sectoral legislation. Guidelines have been published on recognised methodology, the databases to be used for uploading data, and on Appendix III of the regulations on how to assess whether a project will have significant effects on the environment and society.

Some sectors have drawn up further guidance on environmental impact assessment within their areas of responsibility, as the transport sector has done.

9.2.2 Municipal sub-plans for biodiversity

Land-use conversion and land-use change is the most important driver of biodiversity change in Norway today. It is therefore vital to ensure that there is an integrated planning system in which effects on biodiversity are considered for larger areas and larger numbers of projects and develop-

ments at the same time. The land-use element of the municipal master plan is a key part of the long-term basis for municipal planning. It is intended to show how community development is linked to future land use, and how important areas of natural environment will be safeguarded. It is required to indicate both development and conservation needs. Identifying important habitats and ecosystems and analysing their connectivity and ecological coherence is a complex task that requires an overall analysis. It is a challenging task to integrate such analyses into work on a municipal master plan, and as a result there is considerable variation in how fully biodiversity is included in municipal planning processes.

If the overall framework for land-use and community development, including biodiversity considerations, has already been assessed, clarified and incorporated into the municipal master plan, it will be possible to deal with detailed plans for housing developments, commercial activities, infrastructure development and other matters more quickly and predictably. This will benefit local communities, the business sector and other stakeholders. At present, detailed planning processes are in a number of cases delayed by time-consuming conflicts between environmental and other interests. To a large extent, these conflicts should have been resolved during the preparation of municipal master plans. More purposeful work to identify biodiversity values during the preparation of municipal master plans would pave the way for better integrated and more predictable municipal nature management. It would also put the municipalities in a better position to implement their land-use policy.

Section 11-1 of the Planning and Building Act provides for the municipalities to draw up municipal sub-plans for specific topics. Municipal sub-plans for biodiversity, in which biodiversity of local, regional and national importance is identified and taken into account, will provide valuable input for more thorough processes to find a balance between different interests when the land-use element of the municipal master plan is prepared. In the Government's view, a better framework is needed to encourage municipalities to obtain an overview of biodiversity within their boundaries and identify species and areas that it is important to safeguard, and to do so at an early stage of preparations for the municipal master plan.

Municipal sub-plans for biodiversity would not be legally binding, but their preparation would provide opportunities for broad participation and political discussions about priorities. A biodiver-

sity plan would be adopted through a political process, and would provide guidelines for how biodiversity considerations should be incorporated into the municipal master plan, for example by specifying permissible types of land-use, laying down other appropriate provisions or designating areas where special considerations apply. The county governors would, as they normally do, give the municipalities information on biodiversity and guidance on the best ways of incorporating biodiversity considerations into their plans. There is no provision for making objections to a municipal sub-plan, but in the Government's view, the planning work would provide good opportunities for dialogue and cooperation between municipalities and county governors at an early stage. This could reduce or prevent conflict and objections at a later stage, during the preparation of municipal master plans.

Under the procedural requirements of the Planning and Building Act, local residents, interest groups, the business sector and others would need to be involved in the planning process for municipal biodiversity plans, thus supporting the goal of strengthening local democracy. The planning process would not only clarify which nationally and regionally important biodiversity municipalities should safeguard, but would also be an opportunity for them to identify locally important biodiversity. Where appropriate, municipalities could also seek to create synergies between biodiversity conservation and safeguarding outdoor recreation areas that are important for local residents. The identification of biodiversity of national importance would also be useful for the central government.

The Government would like to emphasise the importance of leaving it to the municipal councils themselves to decide whether or not to start the preparation of a municipal biodiversity plan. In many cases, it will be easier to draw up the land-use element of the municipal master plan if a biodiversity sub-plan is already in place. Nevertheless, municipalities must be able to incorporate biodiversity considerations directly into the land-use element of the municipal master plan without first preparing up a biodiversity sub-plan if they consider this to be a better approach. There is no question of requiring municipalities to draw up biodiversity sub-plans. However, the Government will encourage municipalities to do so and will take steps to facilitate this approach. The central government could provide financial assistance for the preparation of biodiversity sub-plans as one way of encouraging this.

Municipalities that draw up biodiversity sub-plans will incur costs, but these may be partly offset by efficiency gains in the subsequent planning process. Work on municipal biodiversity sub-plans will also supplement the work being done at central government level on valuing and safeguarding biodiversity and ecosystem services. It will also boost biodiversity expertise in the municipalities. The Government will initiate a pilot project on municipal sub-plans as a biodiversity conservation tool. It may also be appropriate to include other models for incorporating biodiversity into municipal planning processes in the project. The pilot project will be carried out in selected municipalities in 2016 and 2017, and will then be evaluated.

Inter-municipal cooperation on incorporating biodiversity considerations into municipal planning processes would be useful. It would allow close coordination across municipal boundaries. This would benefit biodiversity directly and could also be important in ensuring the smooth running of road construction projects and other major infrastructure projects.

The Government will:

- *Initiate a pilot project on the use of municipal sub-plans as a biodiversity conservation tool.*

9.3 Municipal capacity, expertise and commitment

The municipalities must have sufficient administrative capacity, sound scientific expertise in nature management, knowledge about biodiversity in the municipality and adequate management expertise to be able to draw up good plans that ensure sustainable management and land use and prevent the loss of biodiversity. An Official Norwegian Report (NOU 2013:10) on the values related to ecosystem services highlights the crucial importance of strengthening the expertise of the municipal sector to ensure sound management of ecosystems and ecosystem services.

If municipalities are actively involved in biodiversity conservation, public interest and engagement may also be stimulated. This in turn can help to keep biodiversity on the municipal policy agenda over time. But this kind of positive feedback only works if municipal politicians, the local administration and residents all feel a sense of ownership of the biodiversity values that need to be safeguarded. In this context, the Government would like to emphasise that it is up to the munici-

palities themselves to define which areas, species and habitats it is particularly important to safeguard at local level. The municipalities must register and map such areas as a basis for including them in biodiversity sub-plans, see Chapter 9.2.2. This work will be an important supplement to the conservation of areas of national importance, as described in Chapters 6 and 7. The Government will consider more closely how registration and mapping of locally important areas, species and habitats should be organised.

The Directorate for Cultural Heritage is currently running a programme to modernise cultural heritage management and make it more effective. For this to be successful, it is essential to build up cultural heritage expertise in the municipalities. The Directorate has drawn up guidelines to assist the municipalities in drawing up cultural heritage sub-plans. The Government will consider whether elements of this programme are also applicable to efforts to build up municipal expertise and engagement on biodiversity. The Government is also seeking to simplify the administrative system for uncultivated areas.

The Government has also initiated a reform of local and regional government, which is intended to result in more robust municipalities with the necessary scientific expertise and capacity. The Government's efforts to build up knowledge about nature and make this available will provide a vital basis for continued municipal work on biodiversity in the planning context, see Chapter 8.

The Government will:

- *Ensure that there is adequate scientific expertise in nature management in the municipalities.*

9.4 The municipal revenue system

National parks and other protected areas are established to safeguard national interests and meet international obligations. They can be seen as public goods of substantial value, but the municipalities that are directly affected only benefit from them to a limited extent. Revenue from nature-based tourism, for example, does benefit the municipalities, but the overall national value derived from these areas may be much greater than this. And although protected areas do have a value for local communities, the way they can be used is restricted, and this may entail a risk of the loss of municipal revenue: protection may hamper the development of commercial activities in pro-

tected areas. The municipalities do not receive any financial compensation for these potential losses, although they take the risk on behalf of the nation as a whole. This situation has been highlighted by two Official Norwegian Reports, NOU 2009:16 on global environmental problems and Norwegian policy, and NOU 2013:10 on the values related to ecosystem services. Both reports recommended changes so that there is better harmony between responsibilities and incentives. In NOU 2013:10, one of the recommendations is to carry out a review of a system of economic incentives for municipalities to safeguard biodiversity and ecosystem services. The report also recommends reconsidering whether to use a model that includes a municipality's environmental efforts and performance as criteria when block grants are allocated.

In principle, block grants are intended to allocate funding to the municipalities on the basis of their real needs in terms of expenses, using criteria that the municipalities themselves have no control over. Rewarding actual environmental efforts and/or performance would therefore be in conflict with the principles for awarding block grants. A criterion based on the total protected area in a municipality would be technically possible to use, and this is determined by central government decisions, not by municipal decisions. However, this criterion would reflect a potential loss of revenue, not necessary expenses, and there is little reason to assume that a possible loss of revenue is proportional to the area protected. Moreover, protected areas may also offer opportunities for value creation in municipalities, as mentioned earlier, and this can be difficult to include in the calculations. This issue has already been discussed in the 2011 proposition to the Storting on local government, and the Government maintains its position that this should not be included in the set of criteria for allocating block grants to the municipalities.

9.5 Guidance on integrating biodiversity into planning processes

The municipalities are required to take overall central government and regional interests into account in their planning. New official Government expectations for regional and municipal planning were adopted by royal decree on 12 June 2015. The county and municipal councils must use them as a basis for work on regional and municipal

planning strategies and plans, and they also apply to central government participation in these planning processes. The Government expectations highlight the importance of identifying and safeguarding important species, habitats and ecosystem services.

Section 11-1, second paragraph, of the Planning and Building Act makes it clear that municipal master plans must take municipal, regional and central government interests into account. Moreover, the objects clause of the Local Government Act requires arrangements to be made for rational and effective administration of common municipal and county interests within the overall framework of Norwegian society and with a view to sustainable development.

The Government considers it important that the municipalities have a considerable degree of freedom to set land-use management priorities. At the same time, there are many divergent and sometimes conflicting interests that must be identified and weighed up against each other during planning processes. The central government administration must clarify which components of biodiversity are of national or regional value and must therefore be given special consideration, and must provide the best possible knowledge base on biodiversity for use in municipal land-use planning. It is also a central government responsibility to provide guidance with a view to moderating the cumulative environmental effects of human activity. Documents that have been produced relating to the Planning and Building Act include guidelines on planning the green structure in towns and built-up areas and on planning holiday housing.

To ensure that national and significant regional interests are taken into account, relevant central government and regional bodies and the Sámediggi (Sami parliament) are entitled to raise objections to drafts of the land-use element of municipal master plans or zoning plans. Other municipalities that are affected may also raise objections if the issues involved are of significance to them. The right to put forward objections is contingent on a preceding administrative process allowing real participation by and cooperation between the sectoral authorities, the county and the municipality. To prevent unnecessarily large numbers of objections concerning biodiversity, the Government considers it important for the county governor to provide information and advice on valuable biodiversity in the municipalities involved at the earliest possible stage of planning processes. A good dialogue between the

county governor and the municipalities will be conducive to land-use planning that strikes a satisfactory balance between biodiversity interests and other public interests.

The Government wishes to strengthen local democracy, reduce the number of objections to plans and facilitate a greater degree of local adaptation of land-use policy. Its main approach is to encourage more use of thematic municipal sub-plans, is intended to make it easier for the municipalities to incorporate biodiversity conservation into planning processes. To give the municipalities a more predictable framework, the Government will draw up better guidance documents that clarify how they are expected to include biodiversity considerations in their planning activities. In this connection, the Government will also review existing guidance material with a view to improving and simplifying the documents. Revision of the guidelines for planning in coastal waters has already been started.

Climate change adaptation is becoming a particularly important task for the municipalities. The ecosystem services provided by nature can play a major role in climate change adaptation, particularly regulating services such as natural flood control, water purification and protection against erosion. Another factor that must be taken into consideration in connection with climate change is whether special measures will be needed for habitat types that may be particularly seriously affected by climate change. The municipalities will have a substantial need for advice in this field in the time ahead.

The Government will:

- *Continue to develop guidance material for municipalities on how to integrate biodiversity conservation into their activities.*
- *Develop guidance material for municipalities on how they can make use of ecosystem services in their climate change adaptation work.*

9.6 Biodiversity in towns and built-up areas

Many towns and built-up areas in Norway are in or near productive areas in the lowlands and along the coast, which have always been attractive areas for human settlement. Biodiversity was originally very high in these areas, and they still contain patches of natural habitat and habitats used by many threatened and other species. Connections

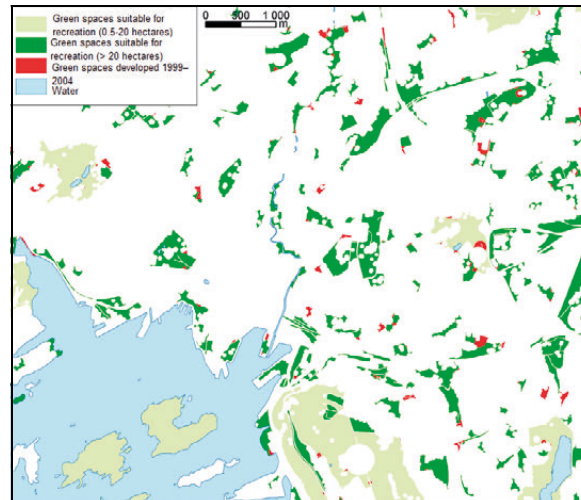


Figure 9.1 Green spaces in Oslo

Green spaces in Oslo and areas lost in the period 1999–2004
Source: Engelién with more 2005

between the different green spaces in towns and other built-up areas make it possible for many species to move between them, thus promoting the spread of biodiversity and genetic diversity. Green spaces are also important because they give people opportunities for enjoying the outdoors and outdoor recreation and play. At the same time, there is constant pressure to allow development of these areas. In built-up areas, artificial habitats can often function as substitute biotopes for species in built-up areas. Innovative examples of this include green roofs and walls.

Some towns have begun to restore areas of natural habitat. This can be encouraged through urban planning and development processes. A number of culverted rivers and streams have been re-opened so that they form part of the green structure.

Although towns and built-up areas are heavily modified ecosystems, there is considerable potential for retaining areas within them that are of importance for biodiversity. Safeguarding the environment also has positive effects on people's well-being and the quality of their lives.

Green spaces in towns and built-up areas are under pressure, and the total area of such spaces is declining. At the same time, many threatened species and habitats are found in and around urban areas. The Government therefore considers it important that existing instruments, particularly the Planning and Building Act, are used to safeguard biodiversity in towns and built-up areas, and that the municipalities receive sound guidance on how to do this.

Many outdoor recreation areas in and near towns and built-up areas are also valuable for biodiversity. Work in the outdoor recreation sector is therefore also important for biodiversity conservation in towns. Two examples of initiatives that are relevant in this connection are the national strategy for outdoor recreation and a programme run by the Norwegian Environment Agency to encourage more physical activity, especially by children and young people, and to safeguard more outdoor recreation areas near people's homes.

The Government considers it important to give priority to biodiversity conservation in towns and built-up areas. One approach that can be useful is cooperation between private- and public-sector landowners in developing and managing green

spaces of various types and sizes. Programmes such as the initiative for development of the Groruddalen area of eastern Oslo, which involves cooperation between the City of Oslo and the Government, are valuable for the area involved. They also provide opportunities for exchanging information with other towns and for developing examples of good practice. The first ten-year period of the Groruddalen initiative is coming to an end, and it will be continued for another ten years from 2017. Local community development will be one of the three main themes from 2017. This will include developing green spaces and waterways near residential areas, which will also play a part in the conservation of urban biodiversity.

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