MILJØVERNDEPARTEMENTET

Ministry of the Environment

Summary in English: Report No. 42 to the Storting (2000-2001)

Norwegian biodiversity policy and action plan – cross-sectoral responsibilities and coordination

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ISBN 82-457-0366-4

www.kursiv.no

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0 Summary

Norway's action plan for the conservation of biodiversity was presented to the Storting (Norwegian parliament) in the form of a white paper. The English translation consists of three chapters of the white paper: the introduction (Chapter 1), a presentation of a coordinated approach to the conservation and sustainable use of biological diversity (Chapter 2) and a description of a new policy towards knowledge-based management of biological diversity (Chapter 3). Chapter 3 presents the government's most important priorities, a new management system for biodiversity and joint action for the period 2001–2005.

The white paper is a political tool for use in Norway's efforts to follow up the Convention on Biological Diversity. It is subtitled «Cross-sectoral responsibilities and coordination» in direct reference to Article 6 of the convention, which states that all sectors must take responsibility for integrating biological diversity considerations into their administrative tasks.

The most important conclusion drawn by the government in the white paper is that it is necessary to establish a new management system for biological diversity (see Figure 1). Three cross-sectoral priority areas will be of particular importance in ensuring that the value of Norway's biological diversity is maintained. The government will give special priority to the following areas in the period 2001–2005 (see Figure 1):

1. National programme to survey and monitor biological diversity
2. Coordination of legislative and economic instruments
3. Information, research and expertise

The new management system for biodiversity will help Norway to make progress towards a number of goals:

- the conservation and sustainable use of biological diversity
- simplifying the public administration and making it more effective
- the transfer of more authority and responsibility from the central to the municipal level
- making it easier for decision-makers to weigh up different public interests
- making planning processes more cost-effective
- making land-use management more predictable, for example for the Ministry of Transport and Communications, Ministry of Defence, Ministry of Local Government and Regional Development and Ministry of Trade and Industry

The new management system for biodiversity will require the identification of areas that are of great importance for biological diversity. To obtain this information, surveys and monitoring programmes must be initiated. In addition, a species data bank is to be established (see Figure 1).

Information on areas of great value for biodiversity must be readily available. This will provide the factual basis for management at central, regional and local level.

To ensure the conservation and sustainable management of biological diversity, legislative and economic instruments must be coordinated. They must also focus on areas that are of great value for biodiversity (see Figure 1).

Work is already in progress on the legislative instruments. A committee has been appointed to evaluate the legislation on biological diversity and relevant sectoral legislation. Another committee is evaluating amendments to the Planning and Building Act to ensure that it takes biodiversity concerns more fully into account.

A review of all economic instruments that may have an impact on biological diversity will also be initiated. The review will consider changes in existing policy instruments and the need for new ones that clearly target areas of great value for biological diversity.

The government's new management system is to be knowledge-based. Information, research and expertise will constitute the scientific basis for the development of the new system, which is to be built up in the period 2001–2005.

These three priority areas are the main elements of the new management system for biological diversity. To make the system operative, steps must be taken to improve and coordinate surveys and monitoring of biodiversity (see Figure 1).

The government will also give priority to action

by the 17 ministries within the framework of the following main tasks:

1. Identifying cross-sectoral and sectoral responsibilities and coordinating the use of policy instruments
2. Coordinating and improving knowledge of biological diversity
3. Ensuring sustainable use of biological resources
4. Avoiding undesirable introduction of alien species
5. Ensuring sustainable land use
6. Avoiding pollution
7. Enhancing international cooperation.

Using the seven main tasks as a framework, the Sámediggi (Sami parliament) and the following ministries made contributions to the white paper that included about 300 different actions:

- Ministry of Agriculture
- Ministry of Children and Family Affairs
- Ministry of Culture and Church Affairs
- Ministry of Defence
- Ministry of Education and Research
- Ministry of the Environment
- Ministry of Finance
- Ministry of Fisheries
- Ministry of Foreign Affairs
- Ministry of Health
- Ministry of Labour and Government Administration
- Ministry of Petroleum and Energy
- Ministry of Social Affairs
- Ministry of Trade and Industry
- Ministry of Transport and Communications

These actions are not included in the English summary. Chapter 3 was drawn up on the basis of the conclusions reached in Chapter 2 and the actions listed by the ministries and the Sámediggi. These were used to draw up a new management system for biological diversity in Norway.

The white paper on biological diversity (Report No. 42 (2000–2001) to the Storting) was presented to the Storting in spring 2001. The English translation has therefore been updated to take account of changes in the structure of the central government administration, changes in protected areas and deadlines for the implementation of measures that are being implemented.

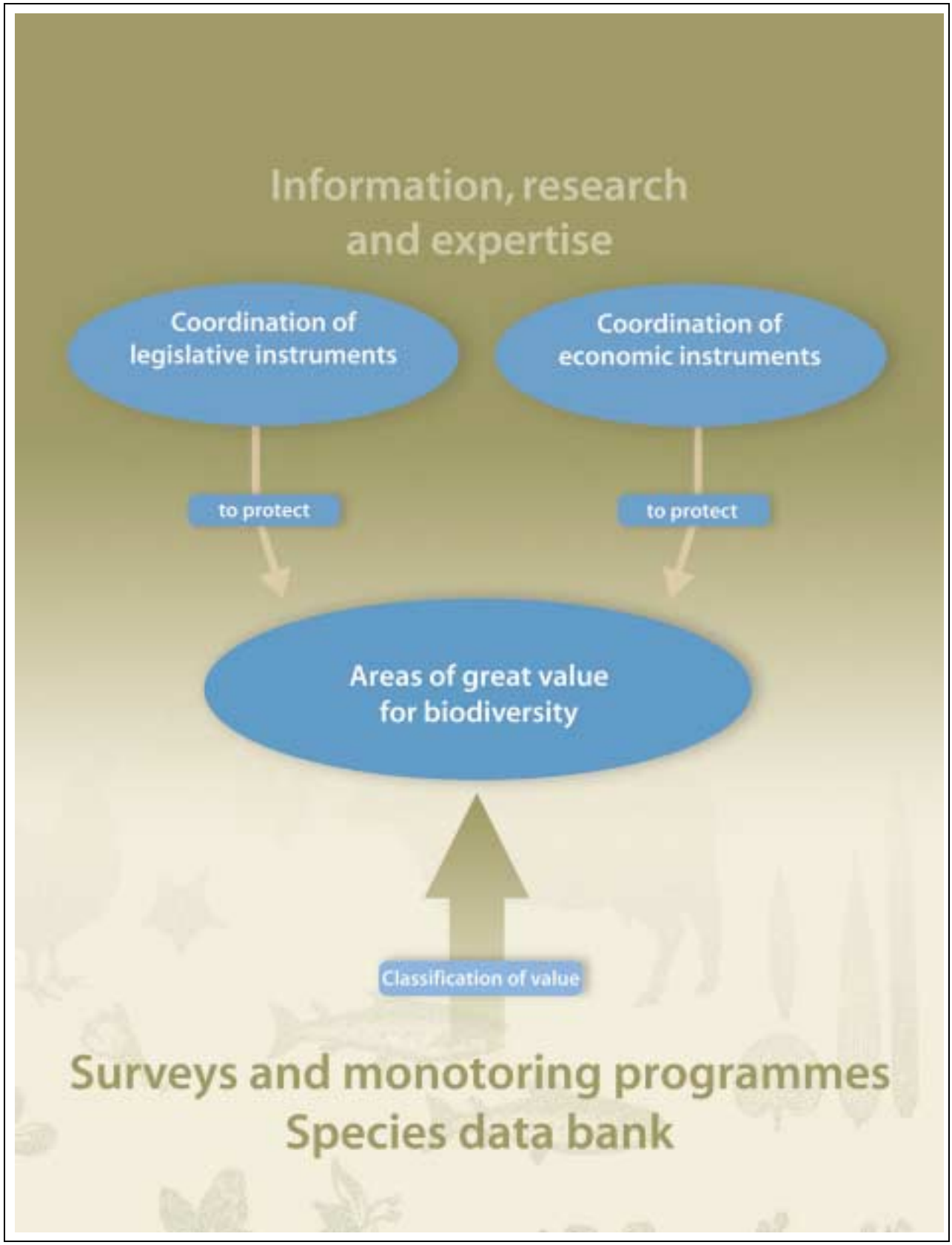

Figure 1: Areas of great value for biological diversity are to be identified. This is to be done by means of surveys, monitoring programmes and the development of a species data bank. Legislative and economic instruments are to be adapted to protect the most valuable areas. Information, research and expertise are to be used for quality assurance of the system and to develop it into a useful tool for all parts of the central government and local administration.

1 Introduction

People are a part of the diversity of life on earth. And the rich diversity of living organisms is the basis for our very existence, for economic growth and for the quality of people's lives and their well-being (see Box 1.1). The world's biodiversity has evolved naturally over millions of years. This is a dynamic process, and involves the disappearance of some organisms and the evolution of new species. Only a small proportion of the overall diversity of species has been domesticated or cultivated, but these species are of vital importance for global food production. Population growth, rising consumption and accelerating technological developments have resulted in losses of biological diversity that are many times greater than the natural rate of loss. In Norway, we believe that at least 130 plant and animal species have been lost in the past 150 years. The UN has stated that «the adverse effects of human impacts on biodiversity are increasing dramatically and threatening the very foundation of sustainable development» (cf. *Global Biodiversity Assessment*, UNEP 1995). It is therefore essential to take steps to conserve biodiversity. The concept of biological diversity is defined in Figure 1.1.

Biological diversity can be looked upon as nature's own form of insurance. Every species shows a range of genetic diversity that makes it adaptable to stresses or changes in external conditions, such as pollution or climate change. Thus, genetic variation acts as an insurance that enables species to survive over time and under varying environmental conditions. Similarly, species diversity is important for the functioning and long-term survival of ecosystems. And ecosystem diversity is a form of insurance for the sustainable development of human societies in the future.

Given this background, it is obvious that biological diversity is a vital resource for every human society, and that current losses of biodiversity must be stopped. This requires a coherent policy, which can only be achieved through binding cooperation in which all sectors and interest groups assume their share of the responsibility. Even though the responsibility of all sectors for sustainable conservation and use of biological diversity is an accepted principle in Norway, a new policy is needed to ensure that our efforts are coordinated. The white paper describes the new policy and sets out the action that is to be taken in the period 2001–2005.

The Government's objective in publishing this white paper is to bring about changes in the way our society is organized and thus in the driving forces that are currently resulting in losses of biological diversity, so that they become progressively less of a threat to the conservation and sustainable use of biological diversity.

1.1 Implementation of the UN Convention on Biological Diversity – challenges at international level

The UN Convention on Biological Diversity is a clear expression of the world community's concern over current losses of biological diversity and its recognition of the need to take steps to counteract this through the conservation and sustainable use of biodiversity. At the same time, the benefits arising out of the utilization of genetic resources must be shared fairly and equitably. The convention also includes provisions on burden-sharing between the parties. Negotiations on the convention were completed in 1992, and it has now been ratified by 183 countries. Norway ratified the convention in 1993. The convention is a process-oriented framework convention, which means that it lays down overall goals, principles and the general obligations of the parties, while more specific obligations are to be developed through protocols and work programmes drawn up under the convention. All parties are required to take measures for the conservation and sustainable use of biological diversity by developing national strategies, plans and programmes that must apply to all sectors of their societies. This imposes a heavy burden on developing countries, which are responsible for stewardship of a large proportion of the world's biological diversity. To ensure equitable burden-sharing, the industrial countries have undertaken to provide financing, transfers of technology and take other action to ensure that benefits arising from

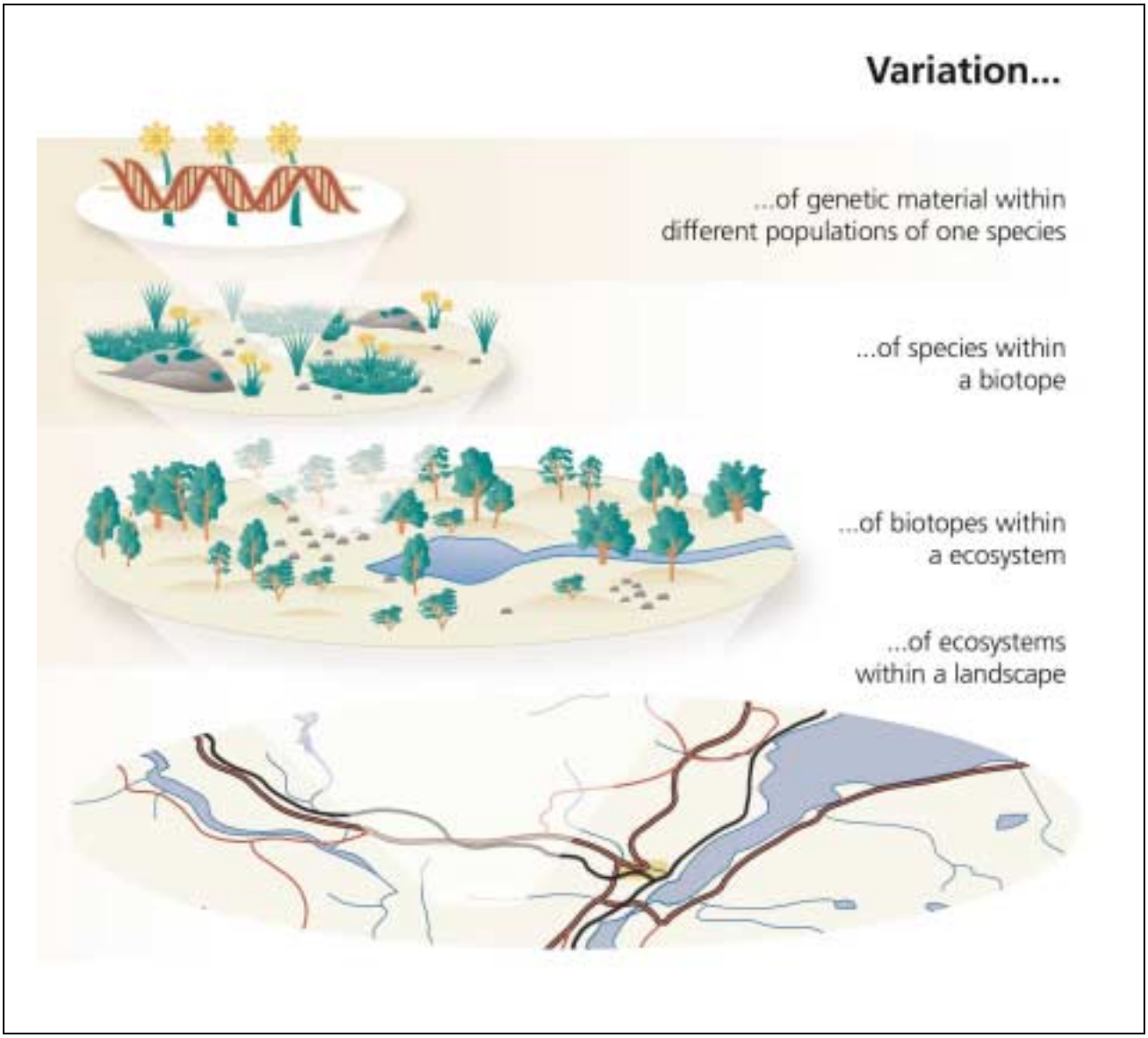

Figure 1.1. Biological diversity, or biodiversity, is the variability among living organisms (plants, animals and microorganisms) and their genetic material and the ecological complexes of which they are a part. It can be divided into the diversity of ecosystems and biotopes, species diversity and genetic diversity.

biological diversity are shared fairly with developing countries.

Further development of the convention internationally is a major challenge. One important advance was the negotiation of the Cartagena Protocol on Biosafety. This was opened for signature in May 2000, and has so far been signed by more than 100 countries: Norway has already ratified it. The protocol deals with trade, technology and economic activity involving living modified organisms, and demonstrates the willingness of the international community to take responsibility for ensuring a positive course of development in this field. It is important to build on the foundation provided by the adoption of the protocol.

Implementation of the convention will involve a number of major challenges. These include safeguarding access to genetic resources and the benefits arising from their use. Steps must also be taken to to ensure that important sectors of society shoulder their share of the responsibility for development of the convention. The conservation and sustainable use of forests, marine and coastal areas, agricultural biodiversity and inland waters are considered to be particularly important. Finally, it is important to improve coordination between the convention and other international environmental agreements such as the UN Framework Convention on Climate Change and the Convention to Combat Desertification. Another important task

Box 1.1 Values assigned to biological diversity

- *Direct use values*: the value of biological resources that are used for food, medicines, stimulants, art, clothes, buildings and fuel, as well as the use of components of biodiversity for play, recreation, tourism, teaching and research.
- *Indirect use values*: the value of life-sustaining processes and ecosystem services such as biological production, soil formation, cleansing of air and water, regulation of local and global climate, carbon, nitrogen and other cycles, ecological stability and the ability of the environment to mitigate the effects of environmental pressures such as pollution, flooding and drought. These values are an essential basis for human existence and economic activity.
- *Option value*: value that is not used or recognized at present. This may include both direct and indirect use values as described above, and includes for example the use of currently unutilized genetic resources both in traditional cultivation and breeding and in gene technology to manufacture new products that have direct use value.
- *Intrinsic values (also known as non-use or passive values)*: values that are based on ethical and moral considerations, for example related to the desire to know that a species exists, to the opportunities open to future generations and the quality of their lives, and to the desire to maintain the landscape and natural environment as part of our heritage and a source of aesthetic experience.

will be to improve coordination between trade agreements and environmental agreements.

1.2 Implementation of the UN Convention on Biological Diversity – challenges at national level

Like an increasing number of other important tasks for Norwegian society, the conservation of biological diversity in Norway presents cross-sectoral challenges. The principle that all sectors must take responsibility for the pressure they put on the environment has been put into practice in the last few years, and many sectors have made important progress towards sustainable management of biological diversity. Exploiting the opportunities offered by purposeful cooperation between the authorities responsible for administration of the various sectors will enable us to make even better arrangements for sustainable management of biological diversity. At the same time, our knowledge of biological diversity has grown and the need for coordinated efforts by the public authorities has become more apparent in various fields. Cross-cutting instruments and measures are frequently needed in priority areas related to biological diversity, and this makes new demands on the coordination of the public administration. In response, Norway needs a cross-sectoral national action plan for the management of biological diversity according to the principles of the convention.

In 1994, the Ministry of Fisheries, the Ministry of Defence, the former Ministry of Education, Research and Church Affairs, the Ministry of Agriculture, the Ministry of the Environment, the former Ministry of Industry and Energy, and the Ministry of Transport and Communications all drew up sectoral action plans for the conservation of biological diversity. Norway described these in its 1998 report to the 4th Conference of the Parties (COP) to the convention. The action plan that has now been presented to the Storting in the form of a white paper is the result of cooperation between 17 ministries. The action plan forms the basis for cooperation within the public administration on principles for following up the convention and the specific action to be taken.

The white paper on biological diversity is based on Report No. 58 (1996–1997) to the Storting on an environmental policy for sustainable development and Reports No. 8 (1999–2000) and 24 (2000–2001) on the Government's environmental policy and the state of the environment in Norway.

The white paper deals mainly with the conservation and sustainable use of biological diversity. However, a number of measures that belong to other priority areas are included here because they are important in relation to biodiversity. Thus, the white paper also provides support for environmental policy efforts in areas such as outdoor recreation, the cultural heritage, climate, hazardous chemicals, the northern areas, environmental considerations in connection with the Antarctic Treaty and Local Agenda 21 (LA 21).

1.3 About the white paper

The white paper is a political tool for use in Norway's efforts to follow up the Convention on Biological Diversity. It is subtitled «Cross-sectoral responsibilities and coordination» in direct reference to Article 6 of the convention. Article 6 requires the parties to draw up national plans for the conservation and sustainable use of biological diversity and to ensure that all sectors take responsibility for integrating biological diversity considerations into their administrative tasks, both within each sector and in cooperation between sectors.

The white paper describes action that is to be taken during the four-year period 2001–2005. Chapter 2 contains an analysis of the government's strategy for conservation and sustainable use of biological diversity, in order to identify the main joint tasks and the role of the central government authorities in translating the global perspective of the convention into national and local action. New environmental policy initiatives are to be introduced to ensure coordination between sectoral authorities and a coherent central government approach to the use of policy instruments and to dealing with cross-cutting challenges. On the basis of the main tasks identified in Chapter 2, 17 ministries and the Sámediggi (Sami parliament) made contributions to the white paper that include about 300 different actions. These are not included in the English summary. Chapter 3 draws together conclusions on how to structure a joint effort by the entire public administration on the basis of the main tasks identified in Chapter 2 and the material presented by individual ministries and the Sámediggi. The contribution from the Sá mediggi is an important element of Norwegian efforts to follow up the Convention.

2 A coordinated approach to the conservation and use of biological diversity

2.1 Vision, targets and strategy

2.1.1 Vision

The government's vision is for Norway, in accordance with its obligations under the Convention on Biological Diversity, to play its part in the following by means of national action and international cooperation:

1. safeguarding the world's biological diversity,
2. making use of the values associated with biological diversity to the benefit of human society as a whole,
3. ensuring that benefits and burdens are equitably distributed within and between generations and communities.

Norway is only directly responsible for managing a small fraction of the world's overall biological diversity, but the species and ecosystem diversity found in the country is important and in some cases unique both in the Nordic region and globally. We also manage some of the most productive marine areas in the northern hemisphere. Our national policy will mean that Norway assumes its share of the global burdens, as the principle of conservation and sustainable use of biological diversity set out in the Convention requires. Action at national level to follow up the Convention is of crucial importance for development opportunities and economic growth in Norway, for the quality of people's lives and for their welfare (see Box 1.1, chapter 1). It is also essential to maintain Norway's credibility internationally.

2.1.2 Targets

When considering the targets for conservation of biological diversity set out in Report No. 58 (1996–1997) to the Storting, the Standing Committee on Energy and the Environment stated in Recommendation S. No. 150 (1997–1998) that Norway's target must be to maintain viable populations of all known organisms and to continue efforts to identify as yet unknown species. This has been incorporated into the government's strategic objective and the seven national targets set out in Report No. 24 (2000–2001) to the Storting, see Box 2.1.

In the Convention on Biological Diversity, the precautionary principle underlies the objective of limiting or preventing serious reduction or losses of biological diversity. The precautionary principle was launched at a conference in Norway in 1990 to follow up the report of the World Commission on

Figure 2.1 Divers: from top to bottom, red-throated diver (Gavia stellata), great northern diver (Gavia immer), black-throated diver (Gavia arctica). All three species are red-listed. Red-throated and black-throated divers are classified as «declining, care-demanding» and great northern as «rare». Water-colour by Annegi Eide.

Box 2.1 Goals for conservation and sustainable use of biological diversity

Strategic objective:

The environment shall be managed in a way that maintains the diversity of habitats and landscape types and ensures that there are viable populations of naturally-occurring species: this will ensure that biological diversity can continue to evolve.

National targets:

1. A representative selection of Norwegian habitats shall be protected for future generations.
2. Major disturbance (such as infrastructure development) shall be avoided in endangered habitats, and in vulnerable habitats important ecological functions shall be maintained.
3. The cultural landscape shall be managed in such a way that biological diversity, the historical and aesthetic value of the landscape and its accessibility are maintained.
4. Harvesting and other use of living resources shall not cause species or populations to become extinct or endangered.
5. The introduction of alien species through human activity shall not damage or limit ecosystem functions.
6. Populations of endangered species shall be maintained or restored to viable levels.
7. The needs of future generations shall be taken into account when managing soil resources that are suitable for cereal productions.

Environment and Development. It gained international acceptance in the Rio Declaration in 1992, and is a basis for both the Climate Change Convention and the Convention on Biological Diversity. The principle states that «where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation».

Implementing the objectives of the Convention on Biological Diversity requires that ecological systems and their functions are taken into consideration as fully as possible. This idea has been further elaborated internationally as a framework for action under the Convention, known as the ecosystem approach. At the 1999 Trondheim conference, the twelve principles of this approach, also known as the Malawi principles, were agreed on. They may be briefly summarized as follows:

1. Management should be based on all types of information, including scientific, traditional and local knowledge, to maintain ecosystem functioning and ensure that human activity takes place within the tolerance limits of the natural environment.
2. Management should be evaluated on a continuum from intensive use to strict protection.
3. Management should be planned so that it is adapted to temporal ecological variations and effects on neighbouring ecosystems.

The government considers the precautionary principle and the ecosystem approach to be fundamental management principles for all administrative sectors in Norway.

2.1.3 Strategy

To intensify the effort to ensure the conservation and sustainable use of biological diversity by means of coordinated policies and actions, the government has drawn up the following strategy in earlier white papers:

1. The causes of loss of biological diversity must be addressed.
2. Biological diversity shall be used sustainably.
3. Endangered and vulnerable components of biological diversity shall be protected and if necessary restored.

The government considers that the objective of a strategy that requires a cross-sectoral approach must be to reduce losses of biological diversity effectively. This means that the various tasks must be put in order of priority and that action to achieve specific goals must be practical and cost-effective.

The rest of this section contains an analysis of the strategy in order to identify the main tasks that should be given priority in the period 2001–2005.

1. The causes of loss of biological diversity must be addressed

It is less costly to prevent environmental damage than to repair it. And a preventive strategy does not only result in cost savings: it also reduces conflict. The government therefore considers it very important to address the causes of loss of biodiversity. These are many and varied, but the most impor-

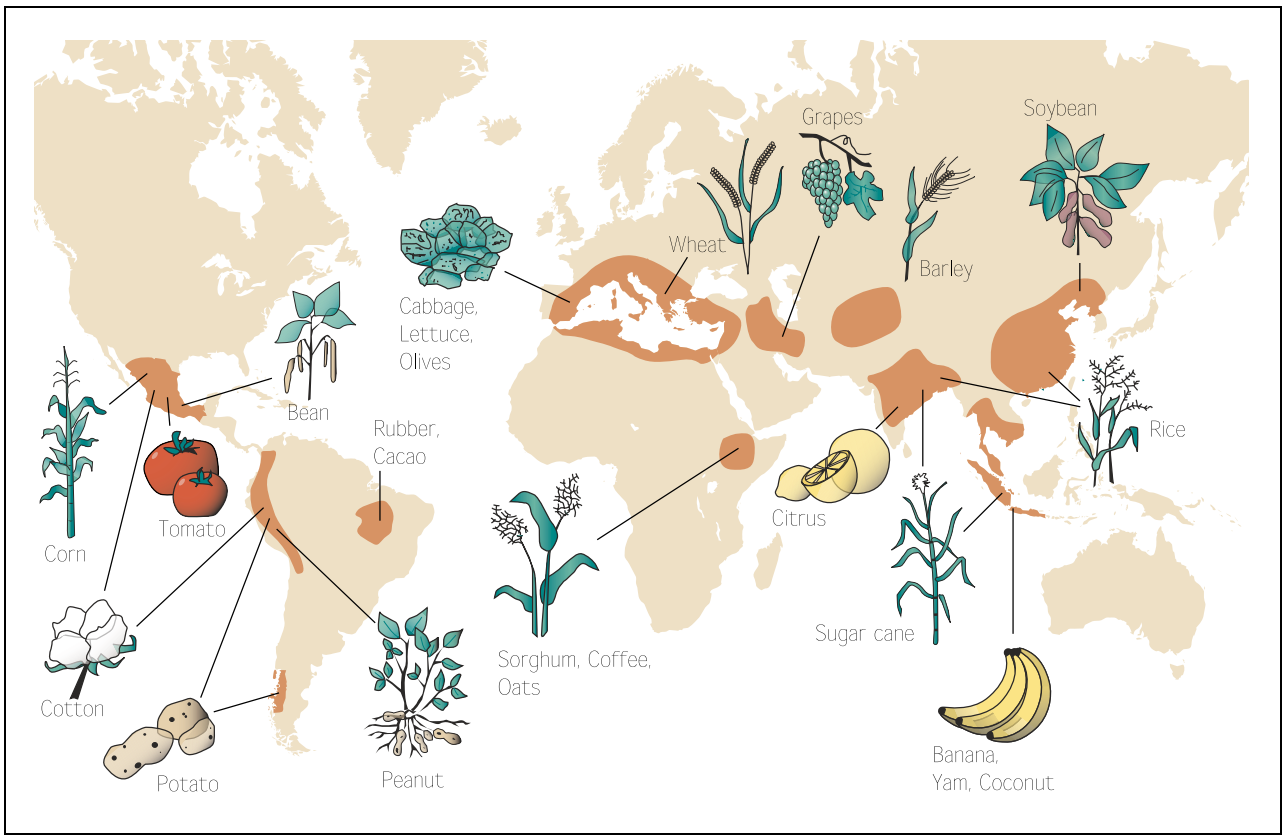

Figure 2.2 All cultivated plants have been bred from wild species. The map shows the original areas of distribution for wild plants that now provide centres of genetic diversity for major crops.

Source: Primack, R.B., 1993. Essentials of Conservation Biology. Sinauer Associates, Sunderland, Mass.

tant direct causes are changes in land use, overexploitation of biological resources, pollution and the introduction of alien species. Such direct causes are the result of underlying factors, or driving forces, that arise from the way human society is organized.

Two important driving forces behind the loss of biological diversity are rising consumption and population growth. Technological advances, increasing globalization and trade, transport and the introduction of alien species also add to the pressure on the environment. Many of the choices we make as a society today are governed by the needs of the market economy. However, as a general rule, the market can only reflect the direct use values of biological diversity. Indirect use values, option value, and intrinsic value are not normally included in a market-based approach. All in all, these developments mean that an active government policy for the conservation and sustainable use of biological diversity is needed to counteract the driving forces that are currently causing losses of diversity. It is only possible to implement such a policy if all sectors assume a share of the responsibility and coordinate their efforts.

Another fundamental reason for the loss of biodiversity is our lack of knowledge. For example, estimates of the number of species that exist in the

Box 2.2 An example of direct benefits from complex ecological interactions

The day-flying moth *Urania fulgens*, of northern South America and Mexico, provides an example of how complex interactions between species can provide ecological goods. The caterpillars of the moth feed exclusively on trees and vines of the genus *Omphalea*. When the caterpillar population reaches locally high levels the plants become heavily defoliated, and this heavy defoliation causes the trees and vines to produce protective chemical toxins. As the plants in a location become unpalatable the moths begin to migrate to new areas. In this case, the toxic plant compounds, which have been shown to be effective against the HIV virus *in vitro*, are produced only from the interaction between plant and moth and only when moth populations reach a threshold intensity.

Source: UNEP 1995, Global Biodiversity Assessment

world today are still so uncertain that they vary from seven to 20 million. In Norway, the total number of species is estimated at 60 000, but only about two thirds of them have been identified.

There are similar gaps in our knowledge of species biology and of how ecosystems function. We therefore need a coordinated effort including surveys and monitoring of biological diversity and research and development. And it is equally important to improve access to information for decision-makers and the general public. Information technology has opened up new opportunities to store, spread and analyse information on biological diversity, thus making it possible to integrate biological diversity considerations into planning processes.

2. Biological diversity shall be used sustainably

The Convention on Biological Diversity defines sustainable use as «... the use of components of biological diversity in a way and at a rate that does not lead to the long-term decline of biological diversity, thereby maintaining its potential to meet the needs and aspirations of present and future generations.» This definition is valid for both direct and indirect uses of biological diversity. In other words, sustainability is a requirement regardless of what kind of pressure is being put on the environment, and whether we are talking about the use of biological and genetic resources and land use or the introduction of alien species and pollution. Species diversity is dynamic and is influenced by the interactions between people and the environment. Sustainable use of biological diversity is thus of crucial importance for all sectors, whether we are considering the harvesting of biological production in the agricultural, forestry and fisheries sectors, the use of non-living resources such as minerals, hydropower, oil and gas, or the use of land for residential, industrial and transport purposes.

There is another important way in which people influence biodiversity. We deliberately alter organisms and then release them in the environment for particular purposes. Species whose evolution has been influenced by humans to satisfy their own needs are called domesticated or cultivated species (see Figure 2.2). Hundreds of plant and animal species have been domesticated or cultivated, but they only make up about 0.01 per cent of the world's species diversity. Nevertheless, these are the species that feed the entire human population of the world. Their genetic diversity provided the basis for crop varieties and livestock breeds that give high yields and that are adapted to a wide variety of growing conditions, cultivation methods and quality standards.

With the rising demands for efficiency and high yields in food production, there has been a steady reduction in the number of varieties and breeds of domesticated species. In other words, specialization is reducing the range of variation in the genetic material of these species, and thus restricting the choices and development potential available in the future. This trend must be counteracted by a policy that ensures that both genetic variability within species and access to this variability are maintained in the interests of future food and agricultural production.

Gene technology has given us opportunities to alter the characteristics of plants, animals, fungi and micro-organisms. It has opened up almost unlimited possibilities for the use of genetic diversity, and increased its potential value correspondingly. Used in the right way, gene technology can become one of our most important tools in the future. But the release of genetically modified species and the introduction of domesticated or wild species can cause serious damage and have adverse effects on health, biological diversity and the economy. Even small numbers of organisms that are only slightly different from those that occur naturally can cause a great deal of damage if they or their genes spread at the expense of native species. Production, trade, transport and tourism have resulted in a substantial increase in the spread of alien species, both intentionally and accidentally. One example is the spread of the salmon parasite *Gyrodactylus salaris*, which has had serious economic consequences in Norway. We need to focus more on this trend and take steps to reverse it.

The overall effect of population growth and rising consumption is to put severe pressure on the environment, which becomes apparent for example through the adverse impacts of pollution. This threatens biological diversity both globally and locally. Acid rain, emissions of hazardous chemicals and greenhouse gas emissions are the anthropogenic pollution problems that have the greatest impact on biological diversity. In the long term, climate change may have serious consequences, although some components of biological diversity have the ability to fix greenhouse gases and thus act as a buffer against climate change. As a general rule, pollution damages ecosystems. However, within certain limits ecosystems can repair themselves and render pollutants harmless, so that their productivity is not permanently affected. One important task is therefore to clarify the effects of

Figure 2.3 National parks in Norway. For more information, see State of the Environment Norway, http://www.environment.no
Source: Directorate for Nature Management.

various types of pollution in relation to the objective of ensuring conservation and sustainable use of biological diversity.

3. Endangered and vulnerable components of biological diversity shall be protected and if necessary restored

The Convention on Biological Diversity naturally gives high priority to the protection of threatened and vulnerable components of biological diversity. Norway's Report No. 8 (1999–2000) to the Storting on the Government's environmental policy and the state of the environment in Norway includes a list of 56 ecosystems that are endangered or vulnerable and therefore of particular importance for biodiversity. These are grouped into seven main types as described in the manual on surveys of ecosystems and identification of the value of biological diversity published by the Directorate for Nature Management.

Norway's 1998 national Red List (published by

the Directorate for Nature Management) contains 3062 species, of which 1725 are placed in the categories extinct, endangered, vulnerable and rare. The threats are particularly serious for endangered and vulnerable wild species and a number of cultivated plant varieties and livestock breeds. To save some of these species, ex-situ conservation measures (i.e. measures outside their natural habitat) are also necessary. For example, material may be collected in gene banks, as has been done for some stocks of Atlantic salmon, livestock breeds and crop varieties. The Atlantic salmon provides a good example of the economic value that may lie in new uses of biological diversity: salmon farming has become one of Norway's largest export industries in the last 25 years.

About 9.35 per cent of the Norwegian mainland is currently protected in some way pursuant to the Nature Conservation Act (Figure 2.3). After the Storting considered Report No. 62 (1991–1992) to the Storting on a new nationwide plan for national parks and other large protected areas, it was decided that the target should be to increase this proportion to 12–13 per cent. Most of this will consist of national parks in largely mountainous areas, and only a small proportion will be in low-lying productive areas where species diversity is high and there are important ecosystems. The need to safeguard a representative selection of ecosystem types is met mainly through county protection plans and protection plans for coniferous forest. The purpose of protecting areas pursuant to the Nature Conservation Act is to safeguard a representative selection of Norwegian nature and some of the most valuable areas of natural environment. Protected areas are also intended to serve as reference areas for comparison with developments in other areas.

In Svalbard, almost 60 per cent of the total land area is protected as national parks or nature reserves (Figures 2.4 and 2.5).

Even when areas or species have been protected, control and inspection measures must be continued to maintain conservation value, and an active management regime is often needed as well. A selection of protected areas forms the basis for the conservation of biodiversity, but the remaining 90 per cent of the country, where no special protection measures are in force, must also be managed sustainably. This is of central importance in following up the Convention. Agricultural landscapes are very valuable in biological, historical and cultural terms, but their value can only be maintained by active use. Such landscapes are also constantly changing, and it is a challenge to maintain or restore biodiversity in such areas.

2.2 Main tasks

The Government's *vision*, *targets* and analysis of the *strategy* for the conservation and sustainable use of biological diversity provide a basis for identifying the following seven main tasks for the period 2001–2005:

1. Identifying cross-sectoral and sectoral responsibilities and coordinating the use of policy instruments
2. Coordinating and improving knowledge of biological diversity
3. Ensuring sustainable use of biological resources
4. Avoiding the undesirable introduction of alien species
5. Ensuring sustainable land use
6. Avoiding pollution
7. Enhancing international cooperation.

2.2.1 Identifying cross-sectoral and sectoral responsibilities and coordinating the use of policy instruments

2.2.1.1 Cross-sectoral and sectoral responsibilities

Components of biological diversity are renewable resources that can be utilized on a long-term basis, but only if they are managed sustainably. Non-renewable resources, on the other hand, can only be extracted and used once. Sound management of both types of resources is needed to satisfy the needs of human society, but all utilization of resources will have consequences for the resources, the environment and society. Sustainable use of all types of natural resources is therefore an overriding objective in the management of biological diversity.

The Government's position is that all authorities, industrial sectors and other relevant actors must play their part in efforts to ensure the conservation and sustainable use of biological diversity. The ministries are responsible for integrating biological diversity concerns into their administrative responsibilities, and for encouraging subordinate agencies, industrial sectors and voluntary organizations in areas related to their spheres of responsibility to follow up the national targets for biological diversity. The following principles and responsibilities are intended to apply to the central government administration in its efforts to ensure the conservation and sustainable use of biological diversity:

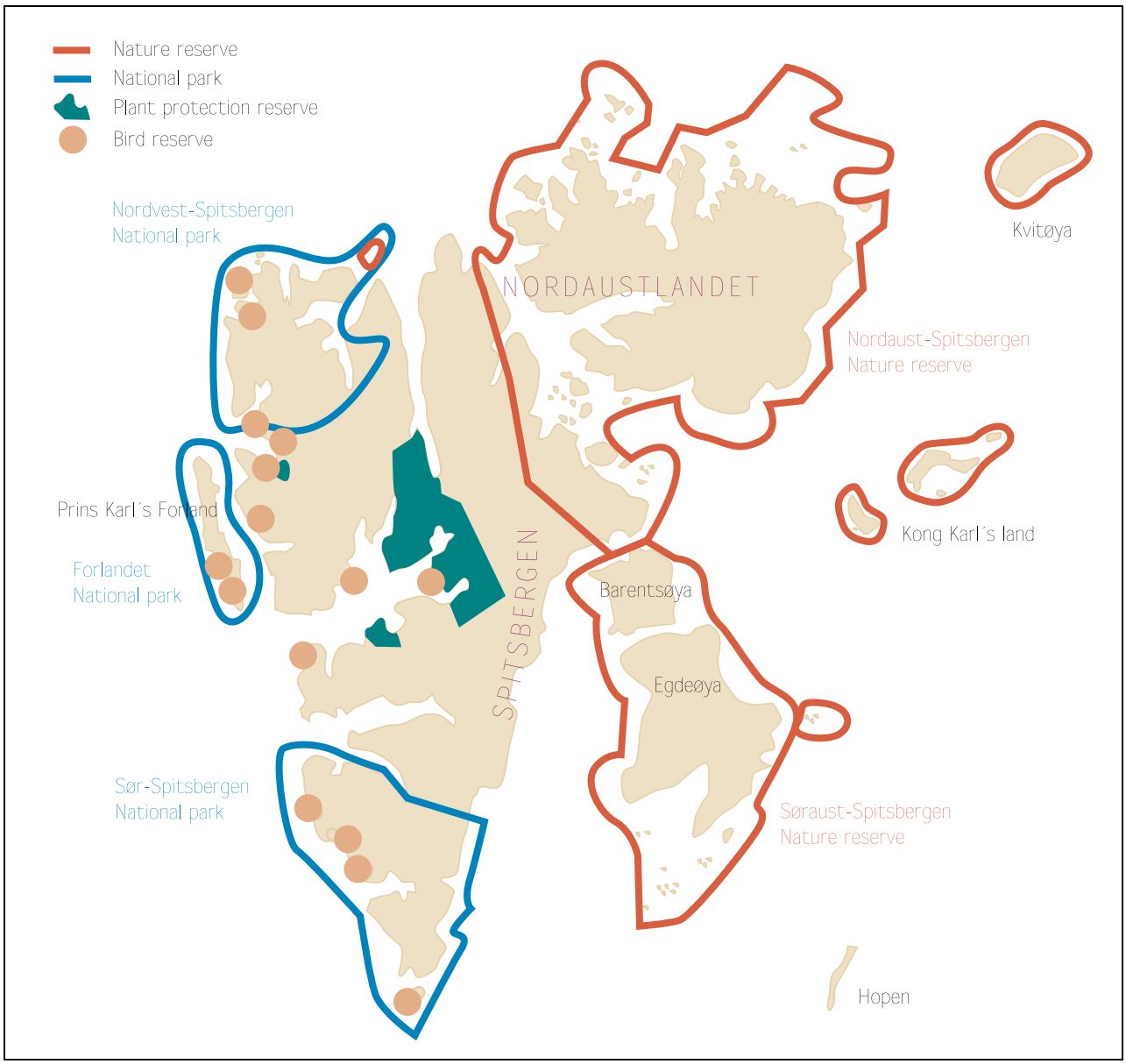

Figure 2.4 Protected areas in Svalbard. These are protected pursuant to the 1925 Svalbard Act. There are plans to establish new protected areas in autumn 2002

Source: Norwegian Polar Institute.

1. Each ministry shall maintain an overview of the environmental impact of activities within its field of responsibility, and shall survey and monitor biological diversity in accordance with the national programme (see further details in Chapter 3.2.2).
2. In principle, each ministry is administratively and financially responsible for action within its own sphere of responsibility. This must be explicitly laid down wherever the ministry's authority is exercised and includes action to ensure the conservation and sustainable use of biological diversity, preventive measures, restoration, and the mitigation of adverse effects on biological diversity associated with activities within the ministry's sphere of responsibility. Every ministry is expected to follow up these requirements.
3. The ministries shall actively seek cross-sectoral cooperation in order to make the conservation of biological diversity more effective and to make joint efforts possible. Any agreements on cooperation frameworks or the division of responsibility shall be financially binding. Such cooperation is the basis for the actions described for each of the main tasks in Chapter 3.
4. Wherever possible, the responsibility for action shall be delegated to the local level. This will

Figure 2.5 Kovalskifjellet cliffs in South Spitsbergen National Park.The largest colony of Brünnich's guillemots in Svalbard nests here and on the neighbouring cliffs. Photo: Vidar Bakken/ARC.

make it possible to take local choices and priorities into account within the framework of national targets and priorities.

5. Each ministry is expected to provide reports and other information on environmental trends and impacts and on the costs of planned or implemented actions included in the annual budgets within its own sphere of responsibility.

These principles are primarily intended to apply to current and future policy instruments and activities. However, vulnerable elements of biological diversity may also be associated with areas where the form of land use has changed. The national programme to survey and monitor biological diversity should help to improve our knowledge of such areas as well, and to identify cases where they should be evaluated separately so that their value for vulnerable elements of biological diversity is maintained or restored.

The administrative responsibilities of the ministries relating to biological diversity can be divided into three categories.

1) Some ministries have sectoral responsibilities for the management of biological resources. This applies particularly to the Ministry of Agriculture, the Ministry of Fisheries and the Ministry of the Environment. These have all developed substantial expertise and experience relating to the sustainable management of biological resources. Their activities have direct impacts on biological diversity, but to different degrees and in different ways. The ministries have used their expertise to implement measures both separately and jointly and thus fulfil their sectoral responsibilities under the Convention.

2) Other ministries have sectoral responsibilities for the use of physical resources: these involve various types of uses and developments that may have impacts on biological diversity. The ministries particularly concerned here are the Ministry of Defence, the Ministry of Fisheries, the Ministry of Local Government and Regional Development, the Ministry of Trade and Industry, the Ministry of Petroleum and Energy and the Ministry of Transport and Communications. The scope of their responsibilities is wide, and they deal with matters of major public interest that can have substantial impacts on biological diversity. Several of them have developed considerable expertise and have taken steps to incorporate biological diversity concerns into their activities.

3) A third group of ministries has sectoral responsibilities that indirectly influence the management of both biological and physical resources and the conservation and sustainable use of biological diversity. These are the Ministry of Children and Family Affairs, the Ministry of Justice, the Ministry of Cultural Affairs, the Ministry of Local Government and Regional Development, the Ministry of Education and Research, the Ministry of Health and the Ministry of Social Affairs. The Ministry of Labour and Government Administration also plays a role here because it has administrative responsibility for overall management processes and regional administration. This group includes several ministries that have a very important role to play in the establishment of new processes and types of action that should be used as a basis for conservation and sustainable use of biological diversity as set out in the white paper.

The Norwegian public administration must take steps to implement Article 8j of the Convention, which lays down that parties must «respect, preserve and maintain knowledge, innovations and

practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity». The parties have drawn up a separate work programme for this field, which in the Norwegian context must be related to the traditional way of life and culture of the Sami people. All authorities that play a part in the management of land and natural resources in areas used or settled by the Sami are expected to evaluate whether measures are in accordance with Article 8j in their planning and management activities. The Government will for example make use of reports produced by the Sami Rights Council on Finnmark county and other areas of particular importance for Sami culture and land use to ensure that the requirements of Article 8j of the Convention are fulfilled.

2.2.1.2 Coordinating the use of policy instruments

A complete analysis of policy instruments for the conservation and sustainable use of biological diversity is a very complex task. There are many driving forces, sectoral targets and needs to be taken into account, and our knowledge of biological diversity and causal relationships is far from complete. It has therefore been necessary to restrict the scope of the analysis. The focus has been on ensuring the development of cost-effective instruments that meet the both the need for coordination and sectoral needs. International conditions must also be taken into consideration.

Legislative instruments

The Convention on Biological Diversity provides a new international framework for comprehensive management of the environment. It is the first major international agreement that so clearly focuses on the links between use and conservation of biodiversity and on the equitable sharing of benefits. Norway's legislation on biological diversity should reflect these principles, and should be based on internationally agreed premises for management of the environment and sectoral responsibilities. A cohesive legislative framework must be developed, in which sectoral legislation provides the best possible support for targets and obligations relating to biological diversity. The government will consider whether it is most appropriate to draw up a single act on biological diversity or to regulate various issues in already existing acts.

The requirement for all sectors to incorporate biological diversity concerns into sectoral legislation relating to natural resources was first introduced when the Storting considered Report No. 46 (1988–1989) to the Storting on environment and development. The results can be seen in legislation for which both the Ministry of the Environment and other ministries are responsible. Examples include the Gene Technology Act, the section of the Land Act describing its purpose, regulations pursuant to the Forestry Act, the legal authority to lay down prohibitions or restrictions on aquaculture operations provided by the Aquaculture Act, and the new Water Resources Act. However, experience shows that considerably more can be done, both in applying the legislation and in its further development.

There are currently many acts of legislation that provide the authority to make decisions on activities with an impact on biological diversity, but that leave considerable room for the use of discretion. We must ensure that such discretionary decisions are based on the best possible information about impacts on biological diversity. The main gaps in Norwegian legislation dealing with the management of biological diversity are as follows:

- The legislation relating to disturbance and development of endangered and vulnerable ecosystems and habitats for endangered and vulnerable species is not properly coordinated. The various sectoral acts must be considered together, and an appropriate balance must be found between protection and sustainable use. There are also weaknesses in the current Nature Conservation Act, which deals with classical nature conservation. It is important to carry out a review and evaluation of these matters and to use the conclusions reached as a basis for any changes.
- The existing legislation does not link the protection of species closely enough with their habitats. For example, the basis for better protection of wild plants must be evaluated.
- The legislation does not deal adequately with the introduction of alien species.
- There is no legislation regulating access to and the use of naturally occurring genetic resources.
- The relationship between human impacts on the environment/traditional knowledge and biological diversity should be better reflected in the legislation.
- Supplementary rules are needed on compensation and restoration in cases where biological diversity is adversely affected by illegal developments.
- At present, the Planning and Building Act is not

formulated to provide optimal protection for biological diversity when decisions involving land use and the use of natural resources are to be taken. The government has appointed a committee to review the planning legislation, and one of its tasks is to review the provisions on land use and the use of natural resources (cf. section 2.2.5).

Economic instruments

Until now, there has been little emphasis on economic instruments as a means of safeguarding biological diversity in Norway or internationally. However, they are a familiar and important tool for example in pollution control policy and in the agricultural sector, where environmental taxes, grants and subsidies are used to provide economic incentives for environmentally-sound operations. The market rarely reflects the real value of biological diversity, and there has been little integration of biodiversity concerns into the economy.

During its deliberations on Report No. 58 (1996–1997) to the Storting, the Storting unanimously stated that a systematic review of the expenditure side of the central government budget was needed in order to remove subsidies that have a negative impact on biological diversity.

The same white paper also included plans for a review of whether to introduce taxation of the use of the environment in the form of a land use tax. This work is at a preliminary stage and should be considered in conjunction with similar international work based on the «User Pays Principle». This is a parallel to the «Polluter Pays Principle» (which states that no-one has a right to pollute and that polluters must bear the costs of preventing and controlling pollution), but is concerned with use of the natural resource base. The reasoning behind this is that biological diversity is a public good that in many contexts is not priced, but that is often depleted or lost as a result of commercial developments. The principle underlying the introduction of a land use tax is that anyone who uses important elements of biological diversity, which is a public good, should in return pay a tax to society. In particular, taxation will be considered in the case of developments that are not in accordance with national targets and that significantly deplete public goods that are of importance for sustainable use. One purpose of such taxation is to ensure that the use of biodiversity does not come into conflict with the agreed national targets. It will apply to developments that involve a change in existing land use. A land use tax could become a cost-effective policy instrument, but it would be a new element of land-use management and would therefore raise a number of questions.

There has been no real tradition of economic valuation of biological diversity in Norway up to the present, but requirements to mitigate damage have been enforced for many years in specific areas: for example, requirements to stock watercourses with fish after regulation. These issues have also been in focus internationally for many years – for instance, there has been long-term research into ways of valuing biodiversity in economic terms. Resources of this kind, which often have no direct market value or link with the market, are very difficult to compare with other goods and services. The OECD (Organization for Economic Cooperation and Development) has recently published *Handbook of Biodiversity Valuation: A Guide for Policy Makers*. This focuses on the nature of values associated with biological diversity and the methodological approaches that can be adopted to assign values for policy purposes.

Organizational mechanisms and instruments

Instruments of this type are as a general rule adapted to the way sectoral responsibilities are assigned in the Norwegian public administration. However, the problems and challenges we have to deal with are becoming increasingly cross-sectoral, and the conservation and sustainable use of biological diversity is a good example. It is therefore essential to improve coordination across administrative sectors and levels.

The government's result monitoring system has been presented in several white papers (Reports No. 58 (1996–97), No. 8 (1999–2000) and No. 24 (2000–2001) to the Storting). It includes regular reports using a system of key figures based on the national targets for environmental policy. The national targets are used in drawing up sectoral targets that in turn are used to devise the measures listed in the ministries' sectoral environmental action plans. All the ministries are required to report annually on the results they achieve to the environmental authorities. The result monitoring system is still being developed, and few key figures are operative for biological diversity at present. It will be necessary to evaluate the national targets and key figures for biodiversity regularly with a view to establishing an optimal system that achieves its purpose and is practical for all sectors of the public administration.

At the beginning of 2001, the following ministries had completed sectoral environmental action

plans: the Ministry of Defence, the Ministry of Transport and Communications, the Ministry of Petroleum and Energy, the Ministry of Fisheries, the Ministry of Local Government and Regional Development, the Ministry of Trade and Industry, the Ministry of Agriculture and the Ministry of Education and Research. No final decision has been taken on revision of the action plans. The purpose of this white paper is to ensure that the various ministries coordinate their efforts to follow up the Convention on Biological Diversity and the principles of sustainable development. It will be particularly important to ensure coordination of action and policy instruments introduced by the public administration in areas such as biological diversity, outdoor recreation, the cultural heritage and certain other priority areas.

Information

A coordinated information strategy is needed involving all the sectors, and each of them must take responsibility for ensuring that information is made available and provide guidance on its use within the sector and for relevant target groups.

Children and young people will be tomorrow's users and managers of biodiversity, and are therefore a particularly important target group. With the increasing urbanization of society, we are losing knowledge of the values associated with biological diversity (see Box 1.1 in Chapter 1). It is important to focus on improving levels of knowledge at all levels from primary to upper secondary school, and to focus on interdisciplinary project work in accordance with the latest reform of the curriculum (L97). The Norwegian Environmental Education Network, which is coordinated by the Ministry of Education and Research, and support for the children's organization Inky Arms Eco-Detectives are examples of interministerial cooperation targeting children and young people.

People who make decisions in fields such as the harvesting of biological resources, transport, production and trade, recreation and tourism, development and other forms of land use are all important target groups for education, training and the use of the available data. A publicly-appointed committee has evaluated the rights and duties of various actors as regards the provision of environmental information pursuant to Article 100 b of the Norwegian Constitution, and whether amendments to the existing legislation are needed. This is partly in response to the Aarhus Convention, which Norway signed in 1998, and whose objective is that «each Party shall guarantee the rights of access to information, public participation in decision-making, and access to justice in environmental matters.» This will be given priority in efforts to follow up sectoral and cross-sectoral responsibilities and to promote greater public participation through Local Agenda 21 and the involvement of voluntary organizations and other actors.

Cooperation with voluntary organizations

Voluntary organizations play an important role in efforts to follow up the Convention on Biological Diversity. Their overall expertise in the field of biodiversity means that they have a great deal to offer. Through their activities and participation in the public debate, these organizations make a valuable contribution to efforts to conserve biological diversity. They play a central role in educational and advisory work, particularly where children and young people are the target groups. Many of these organizations also have considerable expertise in environment and development issues. Their combined expertise is useful for local authorities in their efforts to register and map biological diversity. The organizations therefore have an important role to play in Local Agenda 21 processes. They also have a part to play in voicing the interests of the public in local planning processes and other political decision-making processes. Furthermore, they are important in cooperation between peoples, both because they have international networks and because they can initiate small-scale local cooperation projects.

Conservation and sustainable use of biological diversity is an important issue for a number of the voluntary organizations, including the Norwegian Society for the Conservation of Nature/Friends of the Earth Norway, the Norwegian Association of Hunters and Anglers, and SABIMA (the Norwegian Council for the Conservation of Biodiversity). Other organizations involved in this work include 4-H and forestry and gardening organizations.

The kind of work these organizations do can be exemplified by SABIMA, which focuses mainly on biological diversity. This is an umbrella organization for 13 different societies, all dealing with different aspects of biology. Their overall membership totals about 15 000 and includes most of Norway's biological expertise. SABIMA has for example run 10 regional courses that provided theoretical and practical training in surveying and valuing biodiversity for the Directorate for Nature Management. They were intended as a supplement to the directorate's manuals for the municipal programme to survey biological diversity and

identify and classify its value. SABIMA's other activities include registering biodiversity and taking part in Local Agenda 21 processes, and it plays an important role as an environmental NGO and as a source of expertise for various sectoral authorities, organizations and business and industry.

2.2.2 Coordinating and improving knowledge of biological diversity

There are many gaps in our knowledge of biological diversity today, and a coordinated effort including surveying, monitoring, research and development is needed to close them. It is just as important to improve access to this knowledge for decision-makers and the general public. To meet these needs, the government has followed up the decision announced in Report No. 58 (1996–1997) to the Storting and has initiated a five-year programme involving the central and local authorities to provide a better basis for decisions concerning biological diversity (See figure 2.6). The programme has three phases:

I. Identification of the information currently available and of gaps in our knowledge.
II. Steps to encourage surveys of biological diversity and the identification and classification of its value, to be organized at municipal level.
III. Establishment of a national monitoring programme for biological diversity.

The purpose of phase 2 is to complete surveys and mapping of areas that are important for biological diversity by 2003, and to classify their value. The monitoring programme is intended to provide information on changes in species distribution, abundance, etc. and in ecosystems over time, and the causes of such change.

Information technology will be an important tool in work on biodiversity, but this requires coordination of different systems and steps to make them more accessible for all users. The competent authorities should ensure that national standards are used for mapping. Geographical information systems (GIS) are a priority area for the Norwegian Mapping Authority. They can be used to provide clear information on most topics of relevance to land use and to produce time series that show changes, and maps can be combined to illustrate causal relationships. New technology can be employed to make the results even more useful, for example by combining satellite data with other types of data.

It is considered very important to develop cost-effective methods of surveying and monitoring biological diversity, and the use of new technology for this purpose is therefore being reviewed. This is a field that is developing rapidly, and the environmental authorities have been working closely with the Norwegian Space Centre since 1993. At present, ways of using satellite data to survey and monitor biological diversity are limited in Norway, but they should be further developed in close cooperation between the environmental authorities, the Norwegian Space Centre and other relevant actors. However, if satellite data are to be used on a large scale in surveying and monitoring biodiversity, specific user needs must be satisfied and several sectors must be involved.

Surveying biological diversity

The Ministry of the Environment has carried out a four-year nationwide programme to provide better data on land use and classify areas used for different purposes according to their value. The programme had a wide scope to ensure that it encompassed all information on the value of different areas that could be useful in municipal land-use planning. The programme included a number of projects, the largest of which was called AREALIS. This is still being continued, and is a national project designed to make land-use, environmental and planning information readily available to municipalities and counties. AREALIS is a digital information system that is being developed through cooperation between national, regional and local authorities. Land use data gathered by the municipal surveys of biological diversity and identification and classification of its value is being made available through AREALIS. This will provide information on which ecosystems are most important as regards the conservation of biological diversity. The Directorate for Nature Management has produced guidelines for surveys of biodiversity, including a list of 56 particularly important types of ecosystems that should be identified and mapped. The survey of ecosystems, together with other data sets, will provide a basis for mapping all the most important area for biological diversity.

The other area that must be given priority to obtain a satisfactory survey at ecosystem level is gathering data on marine ecosystems. This is necessary to gain an overview of all important ecosystems in Norway and satisfy the national targets for biodiversity. A good deal of work is also needed to map the distribution of endangered and vulnerable species, i.e. the red-listed species. Another important task is to ensure that data currently held by universities, other research institutions, voluntary

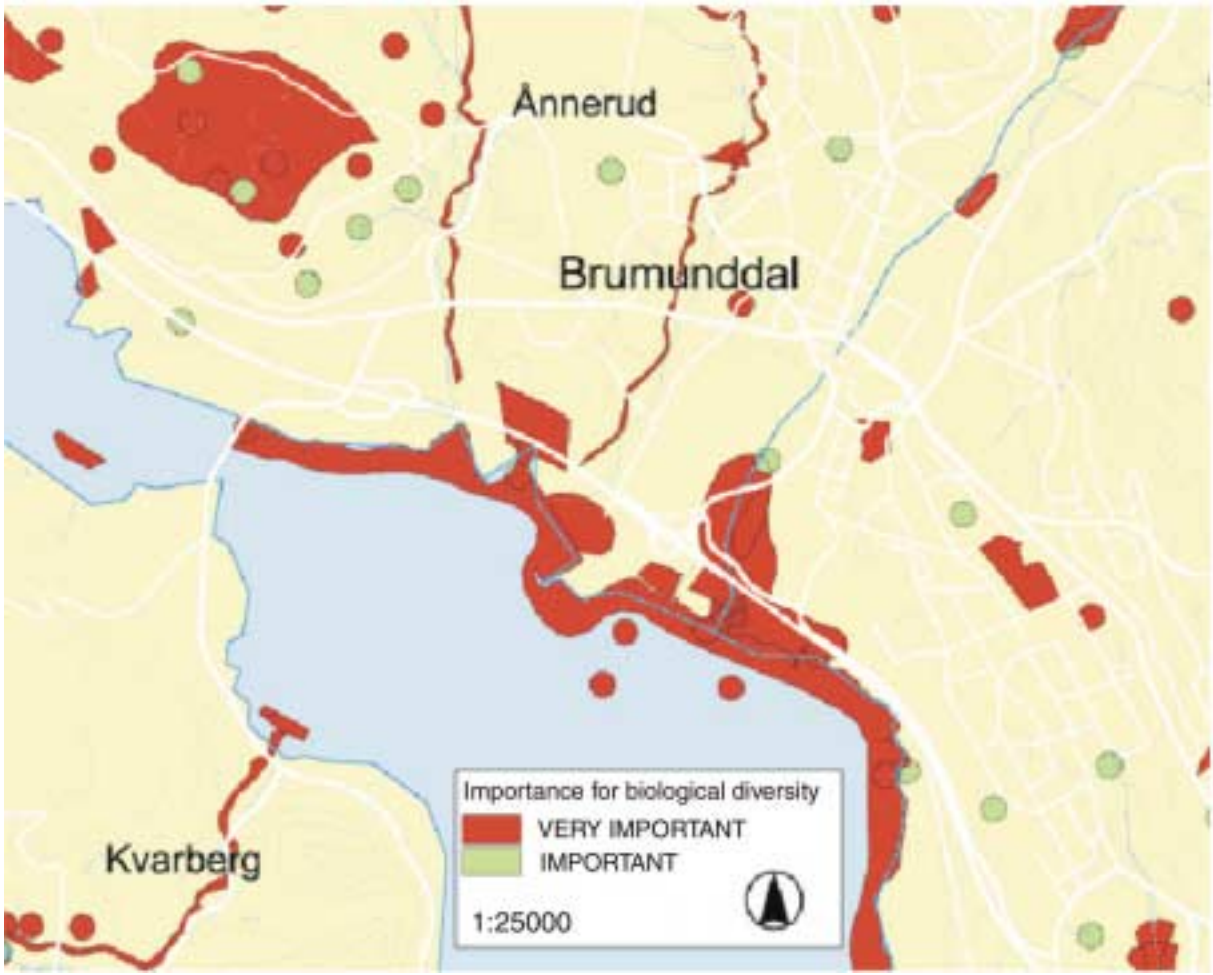

Figure 2.6 Surveys of biological diversity provide an important basis for land-use planning and the management of natural resources. At present, 170 of Norway's municipalities are taking part in surveys of biodiversity organized by the Ministry of the Environment and the Directorate for Nature Management. The map shows the area around Brumunddal in Hedmark county.

Source: Ringsaker municipality and Directorate for Nature Management.

organizations and the public administration are made accessible. This work should lead to the establishment of a national species data bank.

Monitoring biological diversity

Until now, environmental monitoring programmes in Norway have focused mainly on pollution and on species and natural resources that are of economic importance today. Other components of biological diversity and ecosystems and species that are valuable in other ways or have economic potential have generally not been included in monitoring programmes. There has been little systematic monitoring of the impact of changes in land use, harvesting, pollution and the introduction of alien species on biodiversity. It is therefore a high priority task to establish a coherent monitoring programme for biological diversity. The results will be made available through joint information channels for the various sectors, including AREALIS, the species data bank and a portal for environmental information on the Internet.

The Directorate for Nature Management has drawn up a plan for a national monitoring programme for biological diversity in cooperation with several sectors. The plan proposes monitoring of eight mainecosystem types: agricultural landscapes, forest, mountains, coastal areas, fresh water, mires and wetlands and the Norwegian Arctic. It is based on already established monitoring programmes organized by several different ministries, but includes proposals to expand such programmes, new topics and coordination in a nation-

al monitoring programme. Access to the data collected by surveys and monitoring programmes is necessary to enable the authorities to manage biodiversity along the lines determined by the government on the basis of the Convention on Biological Diversity.

Responsibility for surveying and monitoring biological diversity

All the ministries share the responsibility for gathering more data on biological diversity. This follows from the principle that sectoral authorities are responsible for monitoring and reporting on environmental impacts within their own sectors. Furthermore, each ministry is responsible for making its own data available by ensuring that data sets are compatible, and for making sure that wherever possible, data are accompanied by geographical coordinates. The government considers it important to improve cooperation between the ministries by means of an interministerial programme in order to ensure that programmes to survey and monitor biological diversity use a uniform methodology and are cost-effective. A system must also be developed for accessing data on the conservation and sustainable use of biological diversity and for the exchange of such data between databases under different ministries.

Separate monitoring programmes have been developed for the northern areas. Data collection for the environmental monitoring programme for Svalbard and Jan Mayen (MOSJ) started in 2001. The environmental monitoring programme for the Norwegian and Russian Arctic seas (MONRA) is still in the planning stage, and data collection has not yet started.

The Ministry of Agriculture and the Ministry of Fisheries are responsible for surveying and monitoring biological diversity within their spheres of responsibility, and for providing data on trends in environmental pressures in the same fields. The two ministries are responsible for valuable elements of Norway's biodiversity and major biological resources, and therefore have a particular responsibility, together with the Ministry of Education and Research and the Ministry of the Environment, for ensuring that data are made accessible and for ensuring that databases are compatible.

The Ministry of Agriculture is responsible for surveying and monitoring genetic resources of importance for food production, crop varieties, livestock breeds, and the introduction of alien species or genetically modified organisms connected with the agricultural sector. Together with the Ministry of the Environment, the ministry is also responsible for surveying and monitoring agricultural landscapes and forested areas. The Ministry of Fisheries is responsible for surveying and monitoring commercially important marine species, and has well-established programmes for this purpose. It also has a responsibility for promoting surveys of the effects of harvesting resources and surveys of other marine species and their habitats that are vulnerable or of particular importance for biodiversity.

The Ministry of Defence, the Ministry of Transport and Communications, the Ministry of Petroleum and Energy and the Ministry of Trade and Industry are responsible for surveys and data collection as a basis for development projects and other activities within their spheres of responsibility. They are also required to monitor the effects of their activities on biological diversity.

The Ministry of Education and Research is administratively responsible for the universities and the natural history museums, which have a substantial and expanding knowledge base as regards biodiversity. One of the ministry's special responsibilities is to provide a framework enabling these institutions to take an active part in cooperation to establish a species databank. It is also important for the ministry to make its own data available in the species databank. This includes data on threatened and vulnerable species.

Research and development

There is a pressing need to improve our knowledge of biodiversity. This includes both a basic knowledge of ecological interactions and a knowledge of the challenges that may arise from the interplay between the natural environment and our use of it. Such knowledge is needed to give a better understanding of causal relationships and to make appropriate choices as regards management of biodiversity and which measures to implement. This means that research must be given priority, especially research involving cooperation between the natural and social sciences. Research on biological diversity must also be better coordinated. Moreover, it is important to obtain data that will provide a better basis for decision-making on the basis of political targets and targets for the management of biological diversity for all administrative levels, from local to regional to national, and for all relevant sectors. Basic research on biodiversity is mainly carried out at the universities and colleges. Most applied research takes place within

programmes organized or financed by the Research Council of Norway, at applied research institutions such as the Institute of Marine Research, and as in-house research organized by business enterprises. It is important to forge closer ties between all these institutions and provide better opportunities for research cooperation both at national level and internationally, especially within the EU and the OECD.

In Report No. 39 (1998–1999) to the Storting on research at the beginning of a new era, the government emphasized that environmental concerns are cross-cutting and should be incorporated into research in all sectors. The white paper requires all sectors to take responsibility for ensuring that environmental research is integrated into and specifically considered in their research and development strategies. Moreover, Report No. 58 (1996–1997) to the Storting states that research on biological diversity and the impact of sectoral activities on biological diversity is the responsibility of each sectoral authority, and must be integrated into all relevant areas in the Research Council's work.

In order to follow up these points, cooperation with the Research Council should be established. In this connection, Norway's participation in the UN Millennium Ecosystem Assessment should be reviewed. The assessment started up internationally in 2001 and will focus on the consequences of the loss of biodiversity. The UN Secretary-General has asked member states to take part in this work, for example by carrying out national assessments. The project was first discussed at a meeting hosted by Norway in July 2000.

2.2.3 Ensuring sustainable use of biological resources

Introduction and principles

In Norway, agriculture, forestry, fishing, whaling and sealing, aquaculture, and various outdoor activities such as hunting, angling, and collecting berries and mushrooms involve the direct use of biological resources. These areas are important in the management of biodiversity. Both directly and indirectly, the primary industries and harvesting of biological resources on uncultivated land account for a large proportion of wealth creation in Norway and are important for employment, especially in outlying districts. The government's targets for the conservation and sustainable use of biological diversity will also help to make it possible to continue activities based on the use of renewable biological resources. Thus, wealth creation in the primary industries and harvesting as a part of outdoor recreation can be further developed: these activities also have positive effects on the quality of people's lives, their well-being and sense of identity, and provide opportunities for experiencing the natural environment.

The agricultural sector can help to maintain an integrated and living agricultural landscape by retaining some of the traditional forms of use and landscape types, protecting the cultural heritage, conserving biological diversity, and maintaining variation in the landscape and opportunities for recreation. Agricultural activities are also important for the maintenance of biodiversity associated with cultural landscapes. New technology and growing demands for efficiency in harvesting and production have resulted in changes in harvesting and farming techniques, and to the abandonment of traditional forms of use. Intensive farming and the abandonment of farmland or of particular forms of management can be a threat to species that are adapted to specific living conditions. Some types of cultural landscapes such as meadows, wooded pastures, hay meadows and semi-natural pasture are changing character or becoming overgrown. A substantial proportion of Norway's threatened and vulnerable species, about 30 per cent, are associated with such habitats in the agricultural landscape. However, compared with much of Europe, Norway still has considerable areas of such semi-natural vegetation types, and their value can be maintained by taking steps to maintain traditional farming and management techniques.

About half of Norway's species diversity and half of all threatened and endangered species in the country are associated with forests, and forestry operations are listed as an important threat to many red-listed species. This means that another priority area of Norway's efforts to conserve biodiversity is to strike a balance between ecological and economic considerations in the forestry industry by adapting it better to the environment. The forestry sector already has a good overview of its resource base and a tradition of sustainable use, but this sector too will meet new challenges related to surveying and valuing forest biodiversity, improving knowledge of particular species and understanding ecosystems better. One important task is to improve the quality of the Norwegian Red List and develop it into a more functional tool for the forestry industry in its efforts to conserve forest species. The Ministry of the Environment and the Directorate for Nature Management have started cooperation with the Ministry of Agriculture to this end.

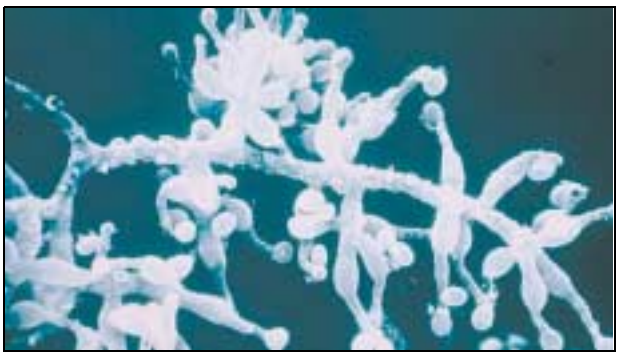

Figure 2.7 The fungus Tolypocladium inflatum from which Cyclosporin A has been produced. Occurs on the Hardangervidda, a Norwegian mountain plateau. Photo: Norvartis

The fisheries and aquaculture industry has become one of Norway's largest export industries, with a potential for very significant economic growth. Economic growth based on management of living marine resources is dependent on a comprehensive regulatory system that includes both measures to ensure sustainable harvesting of stocks and appropriate technical regulatory measures, for example on the use of selective gear, bycatches, minimum sizes, mesh sizes and the closure of fishing grounds. The number of aquaculture facilities is rising rapidly, and the industry is growing fast in economic terms as well. This has resulted in various forms of pressure on the environment, conflict with other user groups and problems for the industry itself. Although the industry has already solved many of its problems and taken steps to reduce its environmental impact over the years, there are still challenges to be met as regards the impact of aquaculture on biodiversity, not least because the industry's own goal is continued rapid expansion. The most important tasks are to prevent the escape of farmed fish and to resolve conflicts relating to land use in the coastal zone. Administrative bodies for fisheries and aquaculture must also continue the development of the legislation, survey marine biological diversity and find ways of taking environmental concerns more fully into account.

Close cooperation between the Ministry of Agriculture, the Ministry of Fisheries and the Ministry of the Environment is important in systematic efforts to take environmental concerns into account in the harvesting of renewable biological resources, and thus ensure the conservation and sustainable use of biological diversity. The three ministries therefore cooperate systematically, and one particularly important task is carrying out uniform surveys and monitoring of Norway's biological resources. The Ministry of the Environment is also responsible for coordinating this work by developing national targets and indicators and auditing the results that are obtained.

Genetic resources and gene technology

The foundation for species diversity lies in the genes and genetic diversity. Genetic resources provide the basis for breeding domesticated species and for the development of varieties and populations of species that are adapted to specific habitats. People have so far only made use of a tiny proportion of the known genetic resources of the world. There are an estimated 80 000 plant species in the world that could be used for food, but in practice, very few of them are used in food production: and there are roughly 50 000 species of vertebrates, only about 30 of which are widely used in agricultural production. About 200 aquatic species of plants and animals are used for food and in other products. A growing number of fungi and microorganisms are being used for food production, fermentation processes, industrial processes and medicine production. Almost 40 per cent of our medicines have been developed from wild plants.

Genetic variation in domesticated plants and animals can be preserved by the use of these species in agricultural production today. Modern livestock and crop plants have been bred from traditional domesticated breeds and varieties and from wild species, and these ancestral stocks must also be preserved to maintain genetic diversity. One important and cost-effective means of preserving genetic resources is to use gene banks, and the Nordic countries have established gene banks both for plant genetic resources and farm animals under the Nordic Council of Ministers.

Both wild species and domesticated varieties are important resources for cultivation in the future, and genetic diversity is a form of life insurance for every species in the world. There are several Norwegian examples of the economic potential of naturally-occurring genetic resources. The interest being shown in the genetic resources of marine biodiversity and in breeding programmes to make use of fisheries resources indicates that people are aware of this potential. For example, Norwegian farmed salmon were developed by breeding from around 20 of the most suitable wild salmon stocks. The aquaculture industry that has grown up now has an export value of more than NOK 10 billion per year (about EUR 1.25 billion). And a Swiss company has achieved profits

of the same order by manufacturing the substance cyclosporin, which prevents the body from rejecting transplanted organs. Cyclosporin was originally discovered in a fungus that occurs on a Norwegian mountain plateau, the Hardangervidda (Figure 2.7).

According to the Convention on Biological Diversity, states have sovereign rights over their genetic resources and the authority to determine access to them. Parties to the Convention undertake to facilitate access to such resources for other signatories, but based on the principle of prior informed consent and on mutually agreed terms. The country of origin must be guaranteed a fair and equitable share of the results of research and development and the benefits arising from the utilization of genetic resources. Developing countries are the stewards of the largest proportion of the world's genetic resources today, but it is the industrial countries that have the technology needed to exploit these resources.

So far, 50–60 developing countries and three industrial countries have drawn up national legislation governing access to genetic resources and the benefits arising out of their use. Depending on how such legislation is formulated, it might cause problems for the exchange of plant genetic material between countries. Norway took part in the negotiations to develop a mechanism based on the International Undertaking on Plant Genetic Resources for Food and Agriculture in order to ensure access to these resources. However, Norwegian legislation is inadequate in this field. It contains very little in the way of provisions on access to and conditions for access to Norwegian genetic resources, and no provisions on the use by Norwegian nationals of any genetic resources they take to other countries.

Access to genetic resources is also related to the issue of patents on inventions involving biological material. EU Directive 98/44 on the legal protection of biotechnological inventions (known as the biotech patents directive) lays down as a general rule that inventions concerning products consisting of or containing biological material shall be patentable in the same way as inventions using other materials. Both products and processes for the production of plants, animals and micro-organisms, and biological material from such organisms, i.e. genes, cells and tissues, are considered to be patentable. Biological material from the human body is also patentable, but the directive prohibits the patenting of human beings as such. The directive also states that the following shall not be patentable: plant and animal varieties, essentially biological processes for the production of plants or animals, and inventions whose commercial exploitation would be contrary to ordre public or morality (for example processes for cloning human beings).

A patent can only be granted for an invention. Patents are not granted for discoveries, such as the sequencing of a genome. However, if biological material that exists naturally is isolated and cultured outside its natural surroundings, and the inventor has in addition found a way of using the material to solve a technical problem (e.g. in the manufacture of a medicinal product), the result may be considered to be a patentable invention. According to current practice, the material is considered to exist in another form than the naturally occurring one, and constitutes an invention.

A patent granted pursuant to the directive gives the holder of the patent the right to make commercial use of the invention for a limited period of time (normally 20 years), but no more than this. A patent does not for example give the holder any right to make practical use of the invention. This is regulated by other legislation – in the case of biotechnological inventions, the relevant Norwegian legislation is the Gene Technology Act.

It has been claimed that the types of patents permitted by the directive will result in activities that are in conflict with the objectives of the Convention on Biological Diversity, for example ensuring that countries retain rights over their own genetic resources and ensuring fair and equitable sharing of the benefits arising from the utilization of genetic resources. It has also been claimed that the directive allows patents of such broad scope that it may in practice hinder competition and further product development.

In June 2000, the Norwegian government decided to appoint an interministerial working group to consider what could be done to meet the main objections that have been raised to the objective, both in Norway and internationally, if it is incorporated into the EEA Agreement. The group's report was submitted to the Minister of Justice on 2 November 2000. The actions proposed in the report will be further reviewed by the committee appointed to review legislation on biodiversity (see Chapter 3) and by the relevant ministries (this work will be coordinated by the Ministry of Justice).

In the World Trade Organization (WTO), Norway will maintain that states must have the power to refuse patents on plants and animals under the TRIPS Agreement (Agreement on Trade-Related Aspects of Intellectual Property Rights).

Genetically modified organisms are plants, ani-

mals, fungi and micro-organisms whose genetic make-up has been altered by means of gene or cell technology. If an organism's genetic make-up is altered or genetic material is transferred from other organisms, it may acquire new properties such as resistance to pesticides or insect pests. Gene technology has the potential to give us many products that can be useful in fields including medicine, food production and industry, or that can be used as pesticides or for combating pollution. However, the technology can also create problems related to biological diversity and health. Genetically modified crops that tolerate pesticides or are resistant to insect pests may hybridize with wild-living species and transfer these properties to them, or have other unintended effects on ecosystems. Organisms that have been made resistant to antibiotics may transfer the genes for resistance to pathogenic bacteria, thus indirectly contributing to the problems of dealing with resistant pathogenic organisms. Although the probability of this happening is low, there is a possibility of very serious consequences if antibiotics are no longer effective. Thus, the risks associated with the use of gene technology, especially the long-term risks, can be difficult to evaluate. This is an important reason for Norway's strict legislation in the field. The Gene Technology Act lays down that the production and use of genetically modified organisms must be ethically and socially justifiable, in accordance with the principle of sustainable development and without detrimental effects on health and the environment. The government considers it necessary to continue a policy of strict regulation and control of the production and control of living genetically modified organisms.

To ensure coherent administration of gene technology, several ministries must cooperate closely. This applies particularly to the Ministry of Agriculture, the Ministry of Fisheries, the Ministry of Health, the Ministry of Social Affairs, the Ministry of Trade and Industry and the Ministry of the Environment. This field involves important foreign policy interests as well, particularly as regards policy vis-à-vis Europe and the WTO. The Ministry of Foreign Affairs therefore also plays an important role in this cooperation. The Ministry of Health coordinates administration of the contained use of genetically modified organisms, for example in laboratories, while the Ministry of the Environment is responsible for coordination between the ministries as regards the release of and trade involving genetically modified organisms. Gene technology is a rapidly changing field, and Norway is heavily influenced by international developments. It is therefore important to take preventive action nationally, as follows:

1. A prohibition against genes for resistance to antibiotics in foods and feedstuffs. Strict criteria must be used to evaluate whether such genes are to be permitted in other genetically modified products .
2. When national funding is provided for the development of gene technology, research on health, the environment, ethics, social benefits and sustainability shall as far as possible be made an integral part of the research projects.
3. Environmental impact assessments pursuant to the Gene Technology Act relating to trade in and the release of genetically modified organisms must be carried out in a way that will also help to improve levels of knowledge and expertise at national level.
4. Norway will continue its efforts to persuade the EU to make its legislation in this field stricter and more in line with Norway's.
5. Priority must be given to support for building up expertise in the control and inspection of production and use of genetically modified organisms in developing countries.

In its efforts to follow up the Cartagena Protocol on Biosafety, the government will give special priority to global rules for labelling and tracing genetically modified organisms and to striking a balance vis-à-vis WTO rules.

2.2.4 Avoiding the undesirable introduction of alien species

People have been responsible for the introduction of alien invasive species throughout history and in all parts of the world, both within and between continents. Species have been introduced both deliberately and accidentally. Through ratification of the Convention on Biological Diversity, Norway has undertaken «as far as possible and as appropriate» to «prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species». This undertaking has been incorporated into the national targets set by the government, and will be one of the most important challenges we have to meet in the future. In addition, there will always be a certain natural flow of new species into ecosystems. This is not included in the concept «introduction of alien species».

There are two main reasons why the introduction of alien species is more difficult to deal with than many other serious environmental problems.

Figure 2.8 Many of Norway's most important salmon rivers are infested with the salmon parasite Gyrodactylus salaris, which was introduced into Norway with salmon smolt from Sweden. Photo: Tor Atle Mo.

Firstly, it is very difficult to predict the impact of introducing species to ecosystems where they do not occur naturally. The deliberate introduction of a species may result in the desired effects, but in many cases there is a negative impact and the results are not as anticipated. Secondly, it is generally difficult to reverse the introduction of a species. If an introduced species becomes securely established, experience shows that it is almost impossible to eradicate it from the ecosystem. In Norway, the following species are good examples of this: the waterweed *Elodea canadensis*, sycamore *(Acer pseudoplatanus)*, mink (*Mustela vison*), Canada goose (*Branta canadensis*), the kelp *Sargassum muticum*, minnow (*Phoxinus phoxinus*) and the salmon parasite *Gyrodactylus salaris* (Figure 2.8).

The expansion of trade, tourism and travel, and the elimination of border controls between Norway and the rest of Europe, mean that the introduction of alien invasive species is a growing problem for Norway. Legislation and control systems must be expanded and improved to prevent the introduction of alien micro-organisms, fungi, plants and animals that are a threat to biological diversity. It is particularly important to develop a better basis for predicting the effects of new species on natural ecosystems.

There will be few other ways of dealing with the environmental consequences of imports, other than through the existing control system for plant import, which largely targets weeds, diseases and insect pests on agricultural plants. There are currently no restrictions on the import of timber from European countries.

Recently, the introduction of marine organisms has also become a problem, especially the unintentional introduction of species with ballast water. Because of the growing volume of oil exports, far greater volumes of ballast water are now discharged into Norwegian waters, together with any organisms living in the ballast. This can result in the establishment of new species. The scale of the problem is illustrated by the fact that more than 18 million tonnes per year of ballast water from various parts of the world is released into the harbour area near the crude oil terminal at Sture near Bergen.

Figure 2.9 Remaining areas of wilderness-like habitat in Norway in 1998 and areas of such habitat lost in the period 1940–1998. Wilderness-like areas are defined as being more than 5 km in a straight line from major infrastructure development.

Source: Directorate for Nature Management.

As regards fresh-water organisms, we have accumulated some knowledge and experience of the effects of alien invasive species. There are many examples both from Norway and from other countries of substantial costs associated with the introduction of species. One well-known example is the unintentional introduction of *Gyrodactylus salaris* to Norwegian salmon rivers, which has resulted in substantial losses. Ecological and economic problems related to the introduction of alien species were discussed at a conference on the issue in 1996, one of several conferences hosted by Norway under the Convention on Biological Diversity.

The introduction and import of plants, animals and micro-organisms to Norway are regulated by a number of acts and regulations, which are intended to prevent diseases and protect commercial interests and natural ecosystems. The legislation and administrative system are designed to meet sectoral responsibilities, including those related to biodiversity. However, it is clear that national legislation and international agreements need to be reviewed in order to improve coordination and ensure that the legislation and administration are consolidated and cover all aspects of this issue. This will require a joint effort to build up expertise on alien species.

2.2.5 Ensuring sustainable land use

Larger and larger areas of Norway are being affected by various forms of development and activities that have an impact on biological diversity. If we are to succeed in maintaining biodiversity and ensuring sustainable use, all actors and sectoral authorities must follow up the national targets that have been set, see Chapter 2.1. It is also important to plan follow-up measures so that particularly valuable areas and ecosystems are given priority. This means large continuous areas of natural environment that meet the following criteria:

1. There is little disturbance of the environment.
2. They include threatened and vulnerable ecosystems.
3. They are particularly representative of Norway's biological diversity.
4. The ecosystems are rare, unique or have special biological functions
5. They provide habitats for threatened, vulnerable, rare or commercially important populations and species.
6. They are suitable for cereal production for human consumption.

Construction and other developments that require large areas of land may be in conflict with the target of ensuring conservation and sustainable use of biological diversity. This may be true both of single major developments and of the overall effect of a number of smaller projects. All authorities that have administrative responsibility for changes in land use are expected to integrate biodiversity concerns into their policies, legislation, plans and activities. In the longer term, good systems should be developed for reporting the scale and type of disturbance in areas that have been identified as comprising threatened or vulnerable ecosystems. Other activities may include building up expertise and developing advisory material for subordinate agencies and relevant sectors.

In order to meet society's needs, we have to make use of land and resources. This has consequences for both natural and cultivated biological diversity. In the last 40–50 years, breeding programmes and technological advances have increased plant and livestock production and greatly increased the efficiency of agriculture. These changes were necessary, but they have also result-

ed in many changes in the agricultural landscape and put great pressure on biodiversity. Road construction has also had a major impact: in the last 30 years, the total length of the public road system and forest roads in Norway has risen from 90 000 km to more than 200 000 km. The total length of the forest roads is now 65 000 km, and in addition, there is a total of 50 000 km of tractor tracks in forest and uncultivated areas. Hydropower developments and the facilities associated with them also involve a change of land use with major consequences for biological diversity. However, 20 per cent of Norway's hydropower potential has been permanently protected against development. This is one case where society has decided that the intrinsic value of the natural environment takes priority over the substantial economic benefits that can be gained by its development and use.

A white paper on the forestry sector (Report No. 17 (1998–1999) to the Storting) drew attention to the fact that forests include areas of special environmental value, such as wilderness-like areas without recent traces of infrastructure development and areas along permanently protected watercourses. The white paper indicated that more restrictions on forestry activities should be introduced in such areas than in other areas of forest.

Registration of areas without major infrastructure development in the period 1988–1998 has shown that 74 per cent of the reduction in size of these areas during the ten-year period was a result of road construction in the agricultural sector (Figure 2.9). Forest roads are often built with the help of public grants. In a number of cases, the roads would probably not be constructed if no grants were available, because the areas in question are not very productive and operating costs are high.

The remaining areas of forest without major infrastructure development are very valuable for outdoor recreation and for the opportunities they offer to experience undisturbed nature, and may also be important in terms of biodiversity. They often include large continuous areas of old-growth forest, and are therefore important for species that are dependent on large areas of this type of habitat. In addition, a number of Red List species that need a stable microclimate and specific habitats are likely to have relatively large, viable populations in such forests. Road construction followed by intensive felling in such areas results in fragmentation of the old-growth forest, and can have a negative impact on various species because the size and quality of their habitats is reduced. Road construction generally results in more traffic in nearby areas and is often followed by the construction of cabins: these changes may have a negative impact on species that are sensitive to disturbance.

Both economic and other instruments should be used to ensure that the environmental quality of large areas of old-growth forest is maintained.

More knowledge of the value of such areas for biological diversity is needed. As a continuation of the «Living Forests» project, a review of the literature on the importance of old-growth forest for biodiversity is to be made. In addition, the Ministry of the Environment and the Ministry of Agriculture, together with the Directorate for Nature Management, are starting cooperation to gather more information on species, develop quality assurance routines for the Red Lists, etc. This cooperation is based on processes that are already under way and is also to be linked to work on the species data bank and environmental monitoring. The cooperation is intended to include work on undisturbed areas of forest and on threatened and vulnerable forest species in order to improve our knowledge of the issues discussed above.

The Planning and Building Act is an important legislative instrument as regards land use and the conservation of biological diversity. It was discussed in some detail in Report No. 29 (1996–1997) to the Storting on regional planning and land-use policy. The purpose of the act is to ensure coordinated planning as a basis for the use and protection of land and other natural resources. It provides the legal authority for several different types of planning processes:

1. The act gives the municipalities responsibility for adopting municipal master plans, including the land-use part of such plans, and local development plans. Both types of plans are legally binding provided that the plans adopted are in agreement with the framework and targets set by national and regional authorities.
2. Within the same system, the municipalities can adopt plans dealing with specific topics or specific areas. The relevant central authorities have both a right and a duty to play a part in municipal planning processes in order to ensure that national policies are taken into consideration and implemented. This is an important element of municipal planning.
3. The act lays down that county plans may include guidelines for municipal-level planning, and if necessary also for planning across municipal boundaries.
4. According to the act, the government may lay down national policy guidelines that must be used as a basis for municipal and county planning, by any relevant sectors when they partici-

pate in municipal planning, and in the municipalities' own sectoral activities if so decided.
5. The act lays down that if necessary, the central authorities may require the adoption of a local development plan, for example if required by important considerations of the public interest, and regulations may be laid down pursuant to the act, for example giving guidelines for how biological diversity considerations are to be taken into account in decisions on the use of land and natural resources.
6. The act also contains provisions requiring environmental impact assessment before any decision is made to start major development projects.
7. The act also contains provisions on building applications. These specify the types of building projects and projects involving alteration of the terrain for which a permit is required, and thus the projects for which the various plans have legal effect.

The legislation for a number of administrative sectors contains provisions relating to land use in addition to provisions regulating the sector itself. Important examples are the Land Act, the Forestry Act, the Nature Conservation Act, the Cultural Heritage Act, the Act relating to Salmonids and Fresh-water Fish, the Roads Act, the Watercourse Regulation Act, the Water Resources Act, the Energy Act and the Pollution Control Act.

The municipalities have responsibilities and exercise authority pursuant to a number of acts relating to specific sectors. It is important for both the municipalities and the administrative bodies responsible for these sectors to take active steps to fulfil their responsibility for the conservation and sustainable use of biological diversity in areas where they have authority, for example by resolving conflicts by means of open and transparent planning processes. The same applies to the central authorities for these sectors. The interests of particular actors and overall policy considerations must be weighed up and used as a basis for decisions.

Sustainable land use is essential to prevent the loss of biological diversity. In addition, certain areas must be protected against use, in some cases by means of direct protection measures to safeguard threatened and vulnerable species and their habitats. The sectoral legislation for which the environmental authorities are responsible is largely designed to ensure conservation and sustainable use of biological diversity. Other sectoral authorities are administratively responsible for legislation that is primarily intended to ensure economic growth, and where the degree to which the principle of sustainable use is incorporated varies. Both environmental and other sectoral legislation must be developed in such a way that biological diversity concerns are properly incorporated.

In the most recent white paper on the Government's environmental policy and the state of the environment in Norway (Report No. 24 (2000–2001) to the Storting), the government approved a new national target for biological diversity which reads as follows: «The needs of future generations shall be taken into account when managing soil resources that are suitable for cereal production.»

Only about three per cent of the total area of Norway is used for agriculture, and only about one third of this is suitable for cereal production for human consumption. Long-term conservation of soil resources is therefore an important element of Norway's environmental policy. Long-term conservation of areas where cereal for human consumption can be grown is important because these resources are in scarce supply. It does not matter whether or not such areas are in active use for agricultural production today, provided that they are not irreversibly developed for other purposes.

The municipalities and control of land use

Biological diversity is part of the municipalities' natural resource capital. It provides the basis for local wealth creation and for the local population's welfare and sense of identity. Norway's municipalities control and influence land use in both the public and the private sector through the Planning and Building Act. This means that the municipalities have a very important part to play in safeguarding national biodiversity by following up the government's targets and thus helping to ensure that the objectives of the Convention are achieved. Both the Local Government Act and the Planning and Building Act give Norwegian municipalities a great deal of authority and a high degree of autonomy, but this also means that they must take an independent responsibility for maintaining up to date information on their own land and natural resources, including biological diversity. The municipalities' knowledge of these issues and the way they approach them will be of crucial importance in efforts to safeguard biodiversity in the years ahead.

The municipalities and the Ministry of the Environment have cooperated in a number of ways to build up local environmental expertise and ensure that national environmental targets are followed up

by the local administration. The most extensive cooperation project, the local environmental development programme, ran from 1991 to 1996, and plans for it were set out in Report No. 34 (1990–1991) on environmental protection at local level. In its response to the white paper (Recommendation S. No. 190 (1990–1991)), the Storting stated that local politicians must take their share of the responsibility for efforts to follow up national targets, both to ensure that obligations under international environmental agreements are met and to improve the quality of the local environment. It also emphasized that one important task for the municipalities was to strengthen environmental protection efforts by building up expertise, particularly in land-use planning, nature management and general ecology. Furthermore, the Storting stressed the importance of an approach based on solidarity in the widest sense of the word, including all forms of life and future generations, and concluded that ecological considerations must be used as a basis for all local administration and all decisions at municipal level.

In order to follow up the principles described above as regards the Convention on Biological Diversity, important tasks will be to develop methodology, produce guidelines and information material and develop the available databases, for example by means of GIS technology. These are tools that are being prepared for the municipalities for use in planning processes, both for the land use part of the municipal master plan and for plans focusing on biological diversity, in which the municipalities can identify and classify areas of particular importance for biodiversity.

The Directorate for Nature Management has drawn up manuals describing standardized methods for surveying and classifying valuable biological diversity: there are separate manuals for ecosystems, wildlife, marine biodiversity and freshwater localities. The Norwegian Red List of threatened species, last published in 1999, identifies the threatened species that are to be given priority in surveys of biodiversity. The manual on surveying ecosystems was prepared in cooperation with several sectors and deals with the valuation of biological diversity.

The manuals should be used by all sectors involved in surveys of biodiversity, and are a useful tool for municipalities that are taking part in the voluntary programme to survey biological diversity and identify and classify its value, which was started in 1999. By the end of 2000, about 170 municipalities had begun to survey and classify the value of different areas within their boundaries, so that the programme is making an important contribution to a nationwide survey of biodiversity. The valuation of areas according to their importance for biological diversity will be an essential basis for planning in accordance with both national targets and the principle of sustainable use of biodiversity. At a later stage, it will be useful for the municipalities to make annual reports to the central authorities on the consequences of changes in land use in the areas that are most important for biological diversity, and the status of surveys and planned municipal activities. It is planned to develop routines for reporting as part of the KOSTRA project, which is developing a system of annual reporting from the municipalities to the central administration.

Agenda 21 was adopted at the Rio conference in 1992 together with the Convention on Biological Diversity. This is a global plan of action based on the idea of dialogue across administrative boundaries and other dividing lines in society, such as the responsibilities and roles of authorities, business and industry and voluntary organizations. Participation by indigenous peoples is considered very important, and local authorities are urged to take their share of responsibility for the process through the development of Local Agendas 21. In Norway, the municipalities have indicated their willingness to participate through the Fredrikstad Declaration, adopted at a conference held in 1998 in the town of Fredrikstad. This marked the beginning of the Local Agenda 21 process in Norway. The declaration has been endorsed by about half of all Norway's municipalities and all the counties. The Ministry of the Environment is cooperating with the Norwegian Association of Local and Regional Authorities and the Sámediggi (Sami parliament) in efforts to facilitate and encourage local participation through Local Agenda 21 processes. At local level, land use, resources, wealth creation, welfare, and provision for children and young people are all elements that are important in relation to sustainable management of biological diversity.

Other sectoral legislation, for example the Water Resources Act, also provides the legal authority for decisions on the location of developments that may have a significant impact on land use. Biodiversity concerns will be given considerable weight when the pros and cons of the proposed location of such projects are being weighed up.

2.2.6 Avoiding pollution

Pollution is an important cause of the loss of biological diversity, and national targets relating to

Box 2.3

TBT (tributyltin) is an endocrine disruptor that has negative effects on reproduction and is extremely toxic to marine organisms. Serious environmental effects caused by TBT have been documented along the Norwegian coast. For example, the use of TBT in antifouling paints for ships has caused female dogwhelks to develop male sexual organs and thus become sterile. This phenomenon is called imposex, and can threaten whole populations of dogwhelks along the coast.

Figure 2.10. Dogwhelk (Nucella lapidus). The species is found from Gibraltar to Greenland and is common all along the Norwegian coast. Photo: Erling Svensen.

pollution are therefore important in relation to the conservation and sustainable use of biological diversity. One important task in this field is to document the impacts of pollution. Changes in the pollution load can be used as an indicator for changes in biological diversity. All inputs of pollutants have some biological effect, and efforts to combat pollution have been given high priority for many years. Municipal discharges and emissions from industry and agriculture are well-known: much has already been done to reduce pollution from these sources, and they are followed up continuously. Other priority areas of great importance for biodiversity are more complex to deal with and in their impacts. The most important are acidification, emissions of hazardous chemicals and emissions of greenhouse gases.

Acidification

Although international agreements have resulted in substantial reductions in emissions of sulphur and nitrogen from Norway and the rest of Europe in the last 10–15 years, acidification is still one of the most serious threats to the environment in Norway. Between 80 and 90 per cent of acidifying substances originate from other countries in Europe and enter the Norwegian environment as a result of long-range transport. Sulphur and nitrogen in air and precipitation are monitored by a nationwide network of measuring stations in order to register trends in the deposition of acidifying substances. Calculations show that critical loads for acidification of surface water are exceeded across almost 20 per cent of the country. Even if the full reductions set out in the new Gothenburg Protocol under the Convention on Long-range Transboundary Air Pollution are achieved, critical loads for acidification will still be exceeded across 7–8 per cent of Norway after 2010. Most of the area affected will be in the southern half of the country. Sulphur emissions are mainly related to industrial processes and metal production, while emissions of nitrogen are largely generated by coastal shipping and road traffic. The action that has been taken to reduce acidification is a good example of how successful cooperation across sectoral and national borders can help to safeguard biodiversity.

Hazardous chemicals

Emissions and use of hazardous chemicals constitute one of the most serious threats to biological diversity worldwide. Hazardous chemicals enter the Norwegian environment both as a result of direct releases to air, water and soil from Norwegian sources and as a result of long-range transport via the atmosphere and ocean currents. The large volume of international trade in products that contain hazardous chemicals is also an important cause of their dispersal across national borders. During the last 50 years, the numbers and quantities of chemicals used have risen alarmingly. There are now 8 000 – 10 000 chemical substances in about 50 000 chemical products on the Norwegian market. Many of these substances are harmful to health and the environment, and most end up in the environment sooner or later and may thus have an impact on the state of the environment. A number of chemicals are only very slowly degraded in the environment and can therefore accumulate in food chains, thus representing a serious threat to biological diversity. The most dangerous chemicals, including persistent organic pollutants

Box 2.4 Polar bears and hazardous chemicals

It has been shown that the long-range transport of pollutants to the Arctic via the atmosphere, ocean currents and ice has negative effects on polar bears in the Svalbard region. Special attention is being paid to PCBs. An international survey in 1998 showed that concentrations of PCBs in polar bears in this area are up to six times the levels found in Alaska and three times those in Canada. PCBs can be traced back to emissions in North America and Europe. Experiments have shown that PCBs weaken the immune system of polar bears. The numbers of white blood cells and the amounts of antibodies they produce against diseases are reduced on exposure to the levels of PCBs found in Svalbard and the Barents Sea. Heavy loads of PCBs have also been shown to have a negative impact on the production of sex hormones, stress hormones, hormones that regulate metabolism, and Vitamin A. In recent years, 1.5 per cent of all polar bears that have been tagged have been females with abnormally developed male sexual organs. No such individuals have been registered in the American or Canadian Arctic. One hypothesis is that the level of intersex or pseudohermaphroditism is caused by high concentrations of PCBs. Cancer tumours in the adrenal cortex or ovaries of female bears secrete male sex hormones that can be transferred to their cubs via the placenta. Suppression of immune function caused by PCBs has also been demonstrated in the glaucous gull. Indications of reduced survival rates have been found in populations of both polar bear and glaucous gull. Recent research on polar bears and persistent organic pollutants has also shown measurable concentrations of brominated flame retardants and the pesticide toxaphene.

Figure 2.11 Adult female intersex polar bear from south-eastern Svalbard with a partly-developed male sexual organ. Photo: Andrew Derocher, Norwegian Polar Institute.

such as PCBs and dioxins, can cause damage even at very low concentrations. Hazardous chemicals can reduce fertility or damage the immune system, the nervous system and other internal organs and thus threaten individuals, populations and species. For example, earlier releases of heavy metals such as lead, copper, cadmium, mercury and zinc from mines and industry have harmed or wiped out living organisms in a number of lakes and streams. Residues of pesticides have been found in many streams and rivers as a result of run-off from intensively farmed areas. In some cases, they have been found at concentrations close to those that may have a negative impact on aquatic ecosystems. Some river systems that were previously unaffected are now believed to be under constant pressure from the deposition of hazardous chemicals as a result of long-range atmospheric transport. Such chemicals gradually accumulate in animals and plants and in bottom sediments, and can damage the fauna and flora if concentrations reach critical levels. In addition, acidification of the aquatic environment releases hazardous metals. High concentrations of lead have been found in the liver and kidneys of black grouse and willow grouse in southern parts of Norway. The lead originates largely from long-range transport of air pollutants. The levels are currently under those that cause mortality or reproductive failure in these species.

There are very high concentrations of hazardous chemicals in bottom sediments and biological material from many fjords where substantial inputs of pollution from land-based industry, mining and built-up areas have persisted for long periods of time. Disruption of the hormonal system has also been observed in animals such as dogwhelks that live in the marine environment (see Box 2.3 and Figure 2.10). This is probably caused by exposure to chemicals that mimic the effects of hormones, and can threaten populations of the species that are affected.

Discharges of oil-contaminated drill cuttings from offshore petroleum activities have resulted in the pollution of large areas of the sea floor around petroleum installations with oil and chemicals. As much as 100 km^2 can be affected around a single installation. Organic compounds such as PCBs, which are only very slowly biodegraded, rapidly become concentrated in the short food chains of the Arctic. The concentrations that have been registered in animals at the top of food chains, including mammals such as polar bears (see Box 2.4 and Figure 2.11) and seabirds, are well above the levels at which damage is expected to appear.

Climate

The UN Framework Convention on Climate Change, like the Convention on Biological Diversity, was adopted at the Rio conference in 1992. The Convention on Climate Change laid the first vital foundation for international efforts to prevent anthropogenic climate change caused by emissions of greenhouse gases. It entered into force in 1994, and in 1997 the Kyoto Protocol was adopted under the convention. The protocol lays down specific emission commitments and opens the way for emissions trading and other flexible mechanisms to achieve these commitments.

Climate change could have very serious negative impacts on biological diversity. It is therefore of crucial importance that the Convention on Climate Change is followed up effectively and that work under this convention and the Convention on Biological Diversity is well-coordinated at both national and international level. Management of forest resources offers one good example of the need for coordination. The Intergovernmental Panel on Climate Change (IPCC) has calculated the global potential for carbon sequestration in forests for the period 1995–2050. About 80 per cent of the potential is in tropical forests, which also contain 50–90 per cent of the world's overall biological diversity. Thus, the protection of these areas against deforestation and clearing for plantation-type forestry should be a priority for both conventions as a means of avoiding developments that undermine their objectives.

The IPCC's calculations also indicate that the Nordic forest areas as a whole will be of little importance globally for CO_2 sequestration, since they only account for 0.04 per cent of the total potential. Nevertheless, the annual uptake of CO_2 by Norwegian forests is substantial in relation to Norwegian emissions. In 1995, uptake by forests was equivalent to 37 per cent of total Norwegian CO_2 emissions. In addition to sequestration of CO_2 by forests, wood has a positive effect as regards climate change when it is used to replace the use of fossil fuels.

In the Nordic countries, including Norway, more than half of all biological diversity and more than half of all threatened and vulnerable species are associated with forests. The work of following up the white paper will include a review of how coordinated strategies can be drawn up to take maximum advantage of synergies in the further development of the two Rio conventions.

2.2.7 Enhancing international cooperation

The Convention on Biological Diversity is to be further developed on the basis of its provisions and through new agreements in the form of protocols. The Ministry of the Environment is coordinating this work in Norway. The parties to the Convention have decided to develop the content of its provisions further by means of thematic work programmes addressing marine and coastal biodiversity, agricultural biodiversity, forest biodiversity and the biodiversity of inland waters, and a programme of work on the implementation of Article 8(j). Norway considers it important to ensure that operational principles, criteria and indicators for the sustainable use of biological diversity are developed in the work programmes. Norway is particularly well-qualified to contribute to the work programmes on marine and coastal biodiversity and the biodiversity of inland waters.

It is of crucial importance to ensure that there is a sound scientific basis for following up the Convention. This is an essential basis for achieving sustainable use of biodiversity. Sound knowledge is needed to meet the challenges posed by the Convention and to develop a joint understanding of the need to implement the right measures. It is a weakness of the Convention on Biological Diversity that it has no associated scientific body to serve the same purpose as the IPCC does for the Climate Change Convention. At the Fifth Conference of the Parties (COP 5) in 2000, Norway proposed the use of scientific panels, and received support for this. Norway has also arranged three conferences and a workshop in Trondheim to provide a forum for scientific dialogue between representatives of industrial and developing countries on central topics under the Convention. These have focused on basic knowledge, building up expertise, and formulating recommendations that for further cooperation under the Convention. Norway plans to continue this series of conferences, which have been

jointly arranged by the Ministry of the Environment, the Ministry of Foreign Affairs, the Ministry of Agriculture, the Ministry of Fisheries and relevant UN bodies.

The commitments to national action under the Convention lay heavy burdens on developing countries, which are stewards of a substantial proportion of the world's biological diversity. To ensure equitable distribution of benefits and burdens, the industrial countries have undertaken to help developing countries by contributing financing, transfers of technology and appropriate action. The Global Environment Facility (GEF) is the financial mechanism for global action under the Convention. The GEF has invested about USD 0.75 billion in projects to address the loss of biodiversity, and by doing this has triggered co-financing from other sources totalling almost USD1.25 billion. The Norwegian government supports the use of GEF funding to encourage the implementation of the Convention in developing countries. The equitable distribution of benefits and burdens is an important principle of the Convention, and also emphasizes its development dimension. Support for the Convention is therefore a central element of Norwegian environment and development programmes, based on developing countries' own priorities in their national strategies and action plans for implementation of the Convention. Norway seeks to ensure that projects on conservation and sustainable use of biological diversity within the framework of its environmental assistance focus on the implementation of developing countries' national strategies and action plans for following up the Convention. There is special emphasis on institutional development, capacity-building and local participation.

Norway will focus particularly on cooperation in the Nordic region and in Europe to follow up and develop the Convention. This is important for Norway because of the close economic and political ties within the region, and because biological diversity and many of the most important environmental pressures are transboundary in nature. Norway will follow up the action plan for sustainable development in the Nordic region adopted by the Nordic Council of Ministers. This is entitled *New Bearings for the Nordic Countries*, and covers the period 2001–2004. The plan is based on a strategy with a 20-year perspective for the development of a sustainable Nordic region. The strategy involves wide-ranging commitments for the Nordic countries at both national and Nordic level. The following priority areas will be important: strengthening Nordic participation in international processes, following up the Cartagena Protocol, promoting public access to the countryside, developing methods for monitoring biological diversity, the importance of safeguarding cultural landscapes, safeguarding the variation in Nordic landscape types, intensifying work on the Arctic environment, continuing the development of a gene bank for Atlantic salmon and developing hunting within the framework of sustainable development. Action within each of these priority areas is discussed in the chapters of the white paper contributed by individual ministries. It will also be very important to cooperate more closely with the EU on following up the Convention, for example on EU directives that are related to biological diversity. Cooperation on the Pan-European Biological and Landscape Diversity Strategy will also be continued. The strategy is sponsored by the Council of Europe and UNEP's Regional Office for Europe, and is an important element in implementation of the Convention on Biological Diversity.

The content and provisions of the Convention on Biological Diversity must be taken into account and promoted in all relevant international fora within nature management, industry, trade, European cooperation, human rights, democracy-building and development cooperation. If Norway is to play its part here, all the country's international activities must be coordinated effectively. All sectors must therefore ensure that the importance of the Convention is recognized in their international activities, in consultation with the Ministry of the Environment and the Ministry of Foreign Affairs.

3 A new policy: towards knowledge-based management of biological diversity

An analysis of the seven main tasks discussed in Chapter 2 and the contributions by individual ministries shows that joint efforts are needed in three areas:

1. Surveys and monitoring programmes to identify and classify the value of biodiversity.
2. Coordination of legal and economic instruments to provide a better basis for joint management of biodiversity.
3. Coordination of information, research and expertise as a scientific basis for management of biodiversity by all sectors.

The most important conclusion drawn by the government in the white paper is that it is necessary to establish a new management system for biological diversity. This conclusion is the result of a joint process involving all Norway's 17 ministries. The new system is discussed in more detail in section 3.1, and the joint action that is to be taken as part of each of the seven main tasks listed in Chapter 2 is described in section 3.2.

3.1 Main conclusion of the white paper: a new management system for biodiversity is needed

A new management system needs to be established in Norway to prevent unnecessary loss of biological diversity. The new system will require the identification of areas that are of great value for biodiversity. To obtain this information, surveys and monitoring programmes must be initiated, including the establishment of a species data bank (see Figure 3.2).

Information on areas of great value for biodiversity must be readily available. This will provide the factual basis for management at central, regional and local level.

To ensure the conservation and sustainable management of biological diversity, legislative and economic instruments must be coordinated. They must also focus on areas that are of great value for biodiversity (Figure 3.2).

Work is already in progress on the legislative instruments. A committee has been appointed to evaluate the legislation on biological diversity and relevant sectoral legislation. Another committee is evaluating amendments to the Planning and Building Act to ensure that it takes biodiversity concerns more fully into account.

A review of all economic instruments that may have an impact on biological diversity will also be initiated. The review will consider changes in existing policy instruments and the need for new ones that clearly target areas of great value for biological diversity.

The government's new management system is to be knowledge-based. Information, research and expertise will constitute the scientific basis for the development of the new system, which is to be built up in the period 2001–2005 (Figure 3.2).

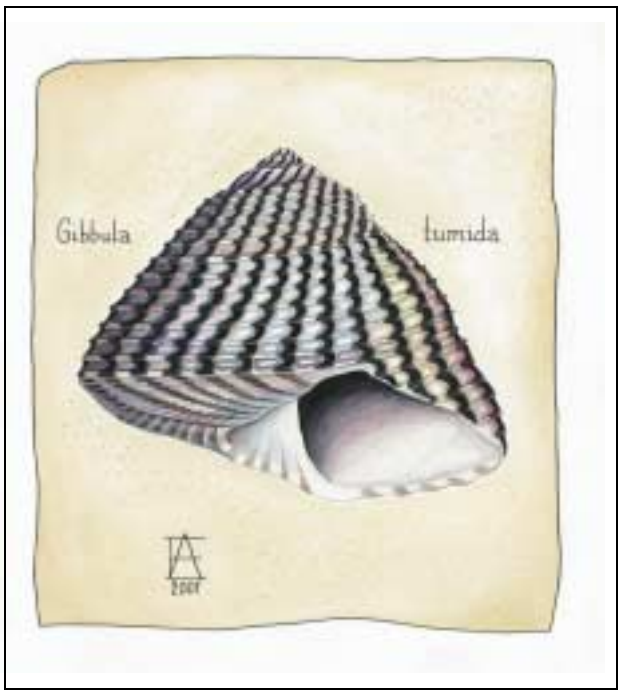

Figure 3.1 The topshell Gibbula tumida is found all along the Norwegian coastline. It is common from the littoral zone and down to a depth of about 130 m. It lives on small algae and dead algal material. Water-colour by Annegi Eide.

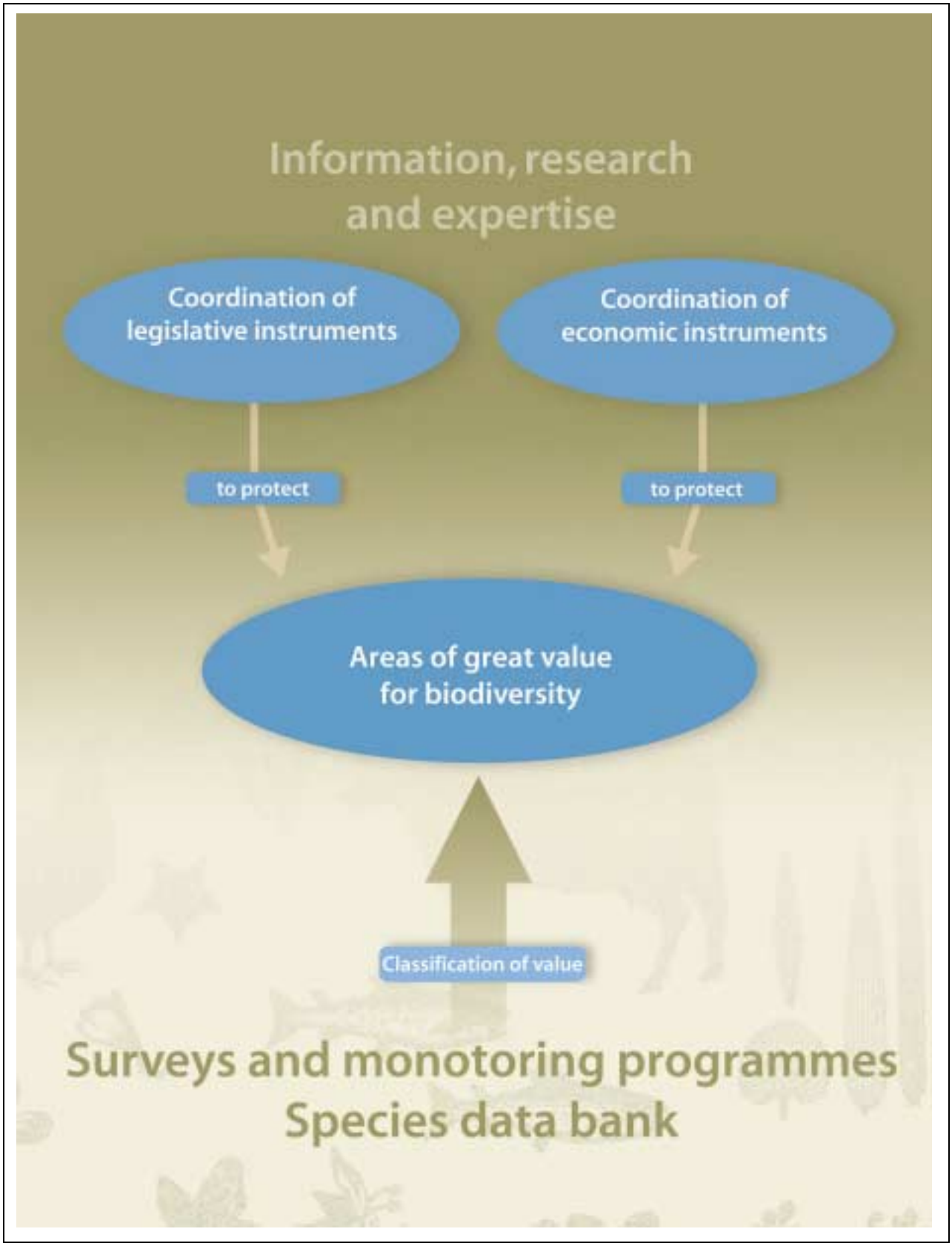

Figure 3.2 Areas of great value for biological diversity are to be identified. This is to be done by means of surveys, monitoring programmes and the development of a species data bank. Legislative and economic instruments are to be adapted to protect the most valuable areas. Information, research and expertise are to be used for quality assurance of the system and to develop it into a useful tool for all parts of the central government and local administration.

3.2 Joint action forming part of the seven main tasks in the period 2001–2005

3.2.1 Identifying cross-sectoral and sectoral responsibilities and coordinating the use of policy instruments

3.2.1.1 Cross-sectoral and sectoral responsibilities

The Storting and the government have clearly laid down the responsibility of all sectors for sustainable management in relation to both biodiversity and consumption. This responsibility has been established in various official documents, including:

- Act of 16 July 1999 No. 69 relating to public procurement,
- Report No. 46 (1988–1989) to the Storting on environment and development,
- Report No. 58 (1996–1997) to the Storting on an environmental policy for sustainable development,
- Report No. 40 (1998–1999) to the Storting on consumer policy,
- White papers on the government's environmental policy and the state of the environment in Norway (Reports No. 8 (1999–2000) and No. 24 (2000–2001) to the Storting).

This chapter contains the government's proposals for measures that require joint action, based on the description of cross-sectoral and sectoral responsibilities in Chapter 2 (section 2.2.1.1).

3.2.1.2 Coordinating the use of policy instruments

Legislative instruments

A committee appointed by the government is to consider whether a separate act relating to biodiversity should be proposed, and if so how its scope is to be delimited in relation to that of sectoral acts dealing with this field (box 3.1). The committee is also to consider whether the existing Nature Conservation Act should be incorporated into a new biodiversity act. Moreover, the committee will review the ways in which it would be appropriate to link a new biodiversity act to other legislation under the Ministry of the Environment, particularly the Wildlife Act, the Act relating to salmonids and fresh-water fish, the Cultural Heritage Act, the Outdoor Recreation Act and the Act relating to motor traffic on uncultivated land and in watercourses.

Box 3.1 Coordination of legislative instruments

The government has appointed a committee to review a new legislative basis for coordinated management of biodiversity. The committee is to evaluate the legislation that should be incorporated into a single act relating to biodiversity. It will also consider the relationship between this and existing acts. The mandate of the committee also includes a review of the legislation governing the introduction of alien invasive species and the legislation governing access to and the use of naturally occurring genetic resources. Other issues within the mandate of the committee are described in Chapter 2.

The Planning and Building Act is not being considered by this committee, but by a separate committee appointed to review the planning legislation.

The government will consider whether national policy guidelines for biodiversity should be drawn up. These should be coordinated with other relevant policy instruments, including the national programme to survey and monitor biological diversity. A high level of precision can be achieved by linking the national policy guidelines to GIS-based data sets.

The evaluation of new legislation on biological diversity is to include a review of general principles for the conservation and sustainable use of biological diversity, which are to apply to all sectors. This is to be based on the current distribution of responsibility and authority between the Ministry of the Environment and other ministries. Legislation for the various sectors will be retained: this includes the Forestry Act, the Land Act, the water resources and energy legislation, the Aquaculture Act, the Act relating to sea-water fisheries, the Act relating to seeds and other propagative material, the Act relating to plant health, the Act relating to animal health and the Act relating to pesticides.

One desire expressed by several ministries is for work to be started on the regulation of access to and the equitable sharing of the benefits arising from the utilization of genetic resources, partly as a way of following up the report from the interministerial working group on the EU biotech patents directive. This will be another of the tasks of the committee reviewing legislation on biodiversity.

The ministries involved have also asked for steps to be taken to strengthen the legislation and control routines relating to the introduction of alien species. This is another of the committee's tasks, but immediate action may also be needed where there is a risk of damage to biological diversity. Under the existing legislation, it is already possible to ensure that the deliberate release of alien species is based on comprehensive risk analyses that include adverse effects on biodiversity, and to require monitoring programmes to be carried out. The government will also establish control routines and satisfactory coordination between the authorities in this field, so that the undesirable import and spread of alien species can be more effectively prevented and detected at an early stage. In order to do this, expertise in the field must be strengthened, and advisory material will be developed for subordinate agencies and relevant branches.

The Planning and Building Act governs decisions on land use and the use of natural resources, and is therefore an important legislative instrument for safeguarding biological diversity. In all, about 80 per cent of the total area of Norway has been designated as agricultural areas, areas of natural environment and outdoor recreation areas in approved municipal master plans. The government will consider possible changes in the rules that apply to areas in these categories.

The Planning and Building Act is also a tool for weighing up the importance of different user interests and purposes in lakes, rivers and in relation to coastal areas. The management of marine resources is largely governed by sectoral legislation.

Open and democratic planning processes pursuant to the Planning and Building Act help to maintain a balance between business and industrial activities, conservation, and compensatory measures, so that integrated solutions can be found for society as a whole and developments are based on the sustainable use of resources.

Economic instruments

The state administers many different economic schemes including grants, subsidies, taxes, and loan and guarantee schemes. The primary purpose of all of these arrangements is to stimulate developments in specific fields that will benefit society as a whole, in accordance with the government's policies. However, it is important to ensure that these arrangements are administered in such a way that they do not unnecessarily conflict with the government's objective of ensuring the conservation and sustainable use of biological diversity. This means that it is necessary to consider changes in economic schemes for those areas that are identified as being particularly important for biodiversity (see Figure 3.2).

A similar review will be necessary in connection with the incorporation of biodiversity concerns into the criteria for the official eco-labelling systems and into consumer policy measures relating to sustainable production and consumption.

Many development projects can have irreversible effects on biological diversity. In such cases, the developer uses up or depletes assets of value to society as a whole, and benefits from this in financial terms. This is why it is relevant to consider a separate land use tax that the state or municipal authorities could, subject to further conditions, levy on a developer to compensate for develop-

Box 3.2 Coordination of economic instruments

The Ministry of Finance and other ministries that are involved are to start a review of the use of economic instruments in 2001 and put forward any proposals that are formulated in the course of 2003.

The tasks included in the review are as follows:

- To identify state-level financial arrangements, grants, subsidies, transfers, and financing, loan, guarantee and compensation schemes that have an impact on biodiversity.
- To review all these arrangements to evaluate what impact they have on biodiversity, and to consider how they can be altered to take into account biodiversity concerns or incorporate criteria or conditions to avoid damage to or loss of biodiversity.
- To propose amendments on the basis of the review, including a time schedule giving an order of priority and specifying who is to be responsible for further work.
- To review the possibility of introducing a land use tax. This review will take into account the review of legislative instruments and other green taxes.
- To take steps to ensure that the use of economic instruments by the various sectors to conserve biological diversity is reflected in their budgets.

Box 3.3 Coordination of information and expertise

The Ministry of the Environment will, in consultation with the Ministry of Education and Research, the Ministry of Labour and Government Administration, the Norwegian Central Information Service and other relevant ministries, propose joint action to improve the flow of information and build up expertise. This will be important in the development of the new management system for biological diversity. One step should be to develop an interministerial information strategy for biological diversity.

ments in areas of particular value for biological diversity (Box 3.2).

Organizational instruments

The white paper makes it clear that there are wide variations in the information available in different sectors and the expertise they possess to take biodiversity concerns into account. A recurrent theme in the chapters by individual ministries is the need for more information and to build up administrative capacity in the field of biological diversity (Box 3.3).

The committee appointed by the government to review the legislation on environmental information presented a report on its recommendations in 2001. The committee recommended that stricter requirements should be introduced for all sectors to provide information on aspects of their activities that may have a significant impact on the environment. Provisions to this effect were included in a draft act on the right to environmental information. They include a statutory requirement for the public authorities to obtain information on the state of the environment and a duty to make such information available to the public. To fulfil the requirements proposed by the committee, it will be essential for the ministries to cooperate more closely on information and expertise in this field.

In order for Norway to follow up its commitments under the Convention on Biological Diversity satisfactorily, a high degree of coordination of policy instruments and cooperation between sectors will be required. Three important conclusions can be drawn from experience gained during the development of the result monitoring system, from the action plans for biological diversity produced by seven ministries in 1994 and from the sectoral environmental action plans:

1. It has been easier for each sector to identify and carry out pollution-related measures than it is to do the same in the fields of nature management and biodiversity. This is because pollution control policy deals with measurable problems, because of the way the legislation is designed and because the required results can be quantified, whereas the value assigned to areas and resources is largely based on qualitative assessments.
2. In pollution control policy, requirements relating to emissions, the use of chemicals and re-use are largely determined by standards that are the same for all administrative sectors. This makes cross-sectoral control possible. To achieve the same results for biodiversity, better data must be obtained through surveys and monitoring programmes. This will form the basis for management by all sectors.
3. The results of pollution control measures are generally immediately apparent to local communities. In contrast, measures to protect biological diversity maintain the status quo and do not have obvious short-term results. This affects the level of motivation for action and control measures to meet biodiversity concerns in the central and local authorities. It also influences the reasoning that can be used in discussions with business and industry and voluntary organizations.

These conclusions are in general agreement with those of the 17 ministries involved, and demonstrate the need for greater joint efforts across sectors.

Cooperation with voluntary organizations

Steps to follow up important action described in this white paper will be greatly helped by the participation of voluntary organizations. It will be particularly important to support NGOs such as SABIMA (the Norwegian Council for the Conservation of Biodiversity) and make use of their broad-based, nationwide biological expertise and practical experience. The development of cooperation between voluntary organizations and the central government will be a priority in the period 2001–2005. Funds will be earmarked for municipal surveys of biodiversity by the organizations.

Box 3.4 National programme to survey and monitor biological diversity, including the establishment of a species data bank

Aims of the programme

A national programme is to be established to survey and monitor biological diversity, including ecosystems, species and genetic resources. The programme will provide a framework for coordinated efforts to obtain information on biological diversity and thus enable Norway to manage its natural environment in accordance with the target of conservation and sustainable use of biological diversity.

The aims of the programme are to obtain information on:

- the location and value of areas that are important for biological diversity
- changes in biological diversity over time
- the causes of such changes and proposals for action
- evaluation the effects of action that is taken.

It must also be possible to incorporate the results into the national system for result monitoring by the various sectors. Furthermore, the results must document to extent to which the national targets and strategic objectives set by the government are being achieved, and meet requirements for reporting at Nordic and European level and for other international reporting. Important results are to be presented in the periodic white paper on the Government's environmental policy and the state of the environment in Norway and will be made available on the Internet. The results of the programme are to be available to the public.

Progress plans

- The cross-sectoral committee is to start its work in 2001.
- The establishment of a species data bank is to start in 2001. This work is to proceed rapidly, so that the data bank has been established and is operative by 2003.
- By 2003, a coordinated system for surveying and monitoring biological diversity is to be available, including agreed criteria for classifying the value of habitats. Data for areas whose value has been classified are to be entered in a GIS-based database linked to the AREALIS project. A similar system should be developed for recording data from marine areas. By 2003, these databases will be operational and available to the public administration.
- By 2005, all elements of the national programme are to be operative. Data collection will continue.

Progress will depend on allocations in the annual budgets.

Organization

The work is being headed by the Ministry of the Environment, which is responsible for coordination and the progress of the programme. The Directorate for Nature Management is functioning as the secretariat. The Ministry of Fisheries, Ministry of Agriculture, Ministry of Petroleum and Energy, Ministry of Education and Research, Ministry of Transport and Communications, Ministry of Defence, Ministry of Local Government and Regional Development, Ministry of Trade and Industry and the Research Council of Norway are important participants. The Research Council is responsible for advice on the R&D component of the programme. A committee consisting of representatives of the ministries involved will follow up the work. Working groups at directorate level will be appointed as needed, and may include representatives of other relevant institutions. A working group to oversee the development of a species data bank will be appointed as soon as possible. International expertise will be drawn into the work as needed.

The committee's tasks

1. Evaluation of current status and proposals for an integrated survey and monitoring programme

When the Directorate for Nature Management was preparing its plan for monitoring of biological diversity, a list was drawn up of current programmes of relevance to monitoring and surveying biological diversity. The Directorate also made proposals for which of these programmes should be included in an integrated national programme. The committee is to review and evaluate this material. Since the Directorate published its report, several more survey and monitoring programmes have been started. In addition, the development of the result monitoring system has been started.

Box 3.4 continues

Box 3.4 continue

The committee is therefore to:
- establish a species data bank
- identify the projects and programmes in the various sectors that meet the recommendations of the plan for monitoring of biological diversity drawn up by the Directorate for Nature Management
- obtain an overview of the resources and costs currently involved in surveys and monitoring of biological diversity in various sectors
- identify important gaps in the current surveys and monitoring programmes
- put forward proposals for the expansion or alteration of existing activities and if appropriate propose new activities or programmes
- suggest priorities for activities and programmes in order to create an integrated national programme to survey and monitor biological diversity.

2. Coordination and data management

To coordinate activities in the national programme more closely and make it more cost-effective, the committee is to:
- consider the scientific and administrative coordination of various surveys and monitoring projects and put forward proposals for improvement
- clarify who owns the rights to the data collected, for example pursuant to the Copyright Act
- draw up guidelines for administration of the data from sectoral projects to improve their cross-sectoral accessibility. In this connection, projects such as AREALIS, MAREANO, the species data bank, the reference system for environmental information and State of the Environment Norway should be evaluated
- Ensure that the necessary links to relevant Nordic, European and global agreements and processes are in place.

3. Responsibilities and funding

The six principles for the responsibilities of sectoral authorities in connection with surveys and monitoring of the environment set out in this chapter, and the principles and responsibilities described in Chapter 2, must be used as a basis for the proposed national programme.

The committee is to:
- propose specific tasks and allocate responsibilities to the various sectors.
- make cost-benefit analyses of the programmes and activities that are proposed.
- within the financial framework that is defined, put forward proposals for funding for a national programme to survey and monitor biological diversity, and seek to find an agreed model for contributions from each sector. The committee should also make recommendations for the distribution of responsibility for funding between the municipalities and the state.
- develop annual budgeting and other routines.

3.2.2 Coordinating and improving knowledge of biological diversity

3.2.2.1 Surveying and monitoring biological diversity

Knowledge of Norway's biological diversity and its geographical distribution is an essential basis for national management of biodiversity. The Convention on Biological Diversity also requires parties to the convention to make overall surveys of their biological diversity and monitor its status and trends.

The government will therefore initiate a national programme to survey and monitor biological diversity. We still lack an agreed methodology for mapping ecosystems and land use. Standard methods are also needed for classifying areas according to their value for biological diversity and measuring these parameters quantitatively, and the data available are inadequate. The pollution control authorities were in much the same position up to the end of the 1980s, when a state pollution monitoring programme with a yearly financial framework of NOK 40 million (ca EUR 5 million) was started up. Through this programme, it was possible to develop an overview that has enabled the Norwegian administration to work systematically and effectively to reduce pollution. The Government intends to use a similar system to develop the management of biodiversity.

To establish an integrated programme to survey and monitor biological diversity, it will be necessary to start more systematic programmes to collect data on groups such as threatened and vul-

nerable species (Red List species), domestic species and alien species. The government will establish a species data bank (see Box 3.4) as requested by the Storting (Recommendation S No. 256 (1999–2000)). The species data bank will also contain relevant information on mapped localities.

The ministries involved have together drawn up a mandate for a committee appointed to establish a national programme to survey and monitor biological diversity and a species data bank (Box 3.4). The mandate can be elaborated as necessary by the Ministry of the Environment in consultation with the relevant ministries. This can be done if it is necessary to include more topics to ensure that the quality of the national programme is as high as possible.

The government will seek to ensure that the environmental data collected are made publicly available, in accordance with Article 110 of the Norwegian Constitution and the objective of the Aarhus Convention. This is also a basic premise of the draft act on the right to environmental information. Data on biodiversity must therefore be collected using standardized methods. The government will ensure that land use and environmental information is readily accessible by making spatially-referenced data from various surveys and monitoring programmes available, for example through AREALIS. This is a national project designed to make land-use, environmental and planning information readily available to municipalities and counties.

The provisions of the Planning and Building Act relating to environmental impact assessment include requirements to investigate whether a project is likely to have a negative impact on biodiversity. One step that should be taken vis-à-vis all sectors is to ensure that all surveys of biodiversity required by these provisions are compatible with and included in central databases.

At present, surveys and monitoring programmes are being organized by a number of ministries. The chapters of the white paper written by individual ministries indicate that many of these programmes do not adequately meet sectoral and cross-sectoral responsibilities relating to biological diversity. The programmes must therefore be adapted or developed so that they contribute effectively to the national programme to survey and monitor biological diversity. Some of the existing programmes are discussed below.

An important element of efforts to survey and monitor biological diversity is to obtain data on land use by the agricultural and forestry sectors in relation to biological diversity. It should be possible to develop existing registration and monitoring systems to generate more complete data for these sectors as well. It is important to ensure that the data are available to all authorities and to the general public, which is a basic premise of the draft act on the right to environmental information.

As regards agriculture, there is limited information on biological diversity in cultural landscapes, including both cultivated and uncultivated areas. However, a monitoring programme has been started up in cooperation between the Ministry of Agriculture and the Ministry of the Environment. This deals with baseline monitoring and result monitoring of the agricultural landscape, and reveals changes in the landscape, but does not include cultivated areas in the mountains. The programme must be further developed to satisfy the requirements of an expanded survey and monitoring programme for all cultivated and uncultivated agricultural areas.

A rather similar programme has been started to survey and monitor the state of lichen grazing resources in inland parts of western Finnmark county. This is financed through the reindeer husbandry agreement. It is primarily concerned with reindeer grazing, but could be expanded.

Forestry measures, either alone or in combination, have an impact on biodiversity by altering the structure and age composition of the forest, the distribution of different types of forest and the accessibility of areas of forest. It is therefore important that valuable areas are registered and mapped in a way that can be utilized by the forestry industry. The «Living Forests» cooperation project and the forest certification schemes can provide momentum in this work. A major project to survey areas that are valuable for biological diversity is already under way, organized by the Ministry of Agriculture. The first phase, which included the development of methodology, was completed in 2000, and a registration scheme is now being put into practice. Environmental information from schemes of this type, which receive public grants, will be made publicly available.

Surveys and monitoring of biological diversity are one of the priority tasks of the Ministry of Fisheries. The ministry and the Institute of Marine Research have continuous time series of data from surveys and monitoring programmes dating back more than 100 years, particularly for oceanography and commercial fisheries. The ecosystem approach and multi-species models are used in resource management and are continually updated. The Institute of Marine Research plays a central role in surveys of fisheries, aquaculture, marine

mammals and kelp harvesting, and is taking part in data collection through the AREALIS project. Surveys and monitoring programmes include species, their habitats and the impacts of harvesting and other environmental pressures. An inter-disciplinary group has recently put forward a proposal for a large-scale mapping project entitled «MAREANO – Marine Areal Database for the Norwegian Sea».

The Ministry of Petroleum and Energy has general responsibilities for natural resource management, particularly as laid down by the new Water Resources Act, and is responsible for managing about 340 permanently protected watercourses and for the development of hydropower plants and the transmission grid. The Norwegian Water Resources and Energy Directorate has considerable expertise and a large volume of data that will make an important contribution to surveys and monitoring of biological diversity in lakes, rivers and associated areas. Other responsibilities of the Ministry of Petroleum and Energy include laying down requirements for monitoring the effects of oil-related activities on marine biodiversity and for ensuring that the results are made available to other sectors.

The Ministry of Education and Research has administrative responsibility for the country's four universities and their natural history museums. The ministry has also provided part of the funding for a project to transfer data on the museums» collections to GIS-based databases. This makes information much more easily accessible for management and decision-making processes centrally and locally. It is important for the ministry to take responsibility for the continuation of the project, which will contribute to the species data bank.

The nationwide programme to survey biological diversity and identify and classify its value, and surveys and monitoring programmes under the Ministry of the Environment are discussed in Chapter 2.

Principles for sectoral responsibilities for surveying and monitoring the environment

Surveying and monitoring the state of the environment and factors that have an impact on it is an essential basis for the development of environmental targets and policy instruments. When sectoral authorities and municipalities are given greater and more independent responsibility for following up and implementing environmental policy, the environmental authorities must ensure that an adequate knowledge base is available to them. Functioning systems for surveying and monitoring the environment are essential for integration of environmental policy into the various sectors and for greater delegation of authority for environmental

Box 3.5 Coordination of research

To strengthen research on biodiversity and improve cooperation across sectors, the Ministry of the Environment, in cooperation with the Ministry of Education and Research and the Research Council of Norway, is to arrange an open research forum for biological diversity in 2001 and again in 2003. The discussions should include participants from research institutions, the administration and NGOs, and the aim should be to achieve a common understanding and agree on recommendations relating to the topics below. The first forum should propose measures to be initiated and the second should evaluate how these have been followed up. The three central topics should be as follows:

- What can be done to ensure better integration of biological diversity concern into research in different sectors, thus strengthening sectoral responsibilities for the management of biological diversity?
- Should Norway carry out a national millennium ecosystem assessment? The forum should also discuss what should be included in the assessment.
- Should a national assessment panel on the pattern of the IPCC be established, and if so, which tasks should be given priority? The panel could for example make scientific analyses of the action and types of development that should be given priority in conserving biological diversity. At the Fifth Conference of the Parties to the Convention on Biological Diversity, the parties decided to start scientific assessments relating to diversity.

The forum itself will discuss further details of the topics to be discussed.

protection to the municipalities. Good data from surveys and monitoring programmes will become increasingly important, and such data are therefore given high priority in the result monitoring system for environmental policy.

The general principles set out below are to be used as a basis in developing the national programme to survey and monitor biological diversity.

Principles for the sectoral authorities' responsibilities for surveys and monitoring of the environment

1. The sectoral authorities are responsible for surveying and monitoring their own share of environmental pressures, including the impacts of harvesting on ecosystems.
2. The sectoral authorities are responsible for carrying out surveys and monitoring the state of the environment in areas where they are responsible for a substantial share of environmental pressures.
3. The sectoral authorities are responsible for identifying the effects and costs of environmental protection measures that are implemented.
4. Each sector is responsible for quality assurance of data collected during surveys and monitoring programmes and for ensuring that they are accessible.
5. The environmental authorities are responsible for ensuring satisfactory monitoring of the state of the environment in Norway. They have a special responsibility for maintaining a broad overview of the state of the environment and cultural heritage in Norway, and for monitoring environmental trends. The environmental authorities also have a general responsibility vis-à-vis other sectors for coordination of surveys and monitoring, and for ensuring that other sectors carry out quality assurance of their environmental data.
6. Comprehensive surveys and monitoring of the environment require extensive resources and good coordination of activities to ensure that funds and expertise are used effectively and duplication of effort is avoided. Extensive cooperation between the sectoral authorities and the environmental authorities is therefore essential.

3.2.2.2 Research and development

In their individual chapters, the ministries describe both single-sector and cross-sectoral research programmes on biodiversity. Several ministries express the opinion that research on biological diversity should be strengthened across sectoral and institutional boundaries (Box 3.5).

Box 3.6 Avoiding the undesirable introduction of alien species

- Review proposals for amendments to the legislation to improve the way Norway responds to introduced alien species and the spread of such species, see Box 3.1.
- Improve border controls to deal with introduced species, and establish a permanent reception facility for these species.

This will be an important task for the Research Council of Norway in cooperation with the ministries, as laid down in the national programme to survey and monitor biological diversity. The Research Council is expected to contribute to the development of knowledge related to environment and development. In addition, it plays a central role in coordinating research policy. The Research Council should therefore evaluate methods and research topics that can further improve integration in fields such as surveys and monitoring of biological diversity and the development of expertise. At some of Norway's universities and colleges, more capacity is needed for field work in certain areas. Expertise in these areas is required to obtain information on biological diversity as required by the draft act on the right to environmental information.

The Ministry of Education and Research has stated that Norway's research effort is to be expanded and that long-term basic research will be given priority. The government also wishes the focus on environmental research to be continued and strengthened by means of a special research effort in areas involving both environment and energy issues. This will also have a positive effect on research on biological diversity.

3.2.3 Ensuring sustainable use of biological resources

Principles

A country's national wealth depends on the state of its natural environment, supplies of natural resources, its production capital, human resources, and foreign trade and the balance of payments. If they are well managed, the components of the national wealth give a return on capital and are a source of

Box 3.7 Sustainable land use

One important measure in connection with sustainable land use is delegation of authority to the municipal level. The new management system for biological diversity, cf. Figure 3.2, will facilitate delegation by coordinating signals from central government agencies better.

This follows up the principle that authority should be delegated to the lowest possible level, as set out in the convention, and the government's objective of simplifying the public administration. To make it possible to delegate authority to the local level and ensure efficient local management of biological diversity, the new management system must be established and put into operation.

The work of the committee appointed to review the planning legislation will also be important in ensuring that biodiversity concerns are taken into account when authority is delegated to municipal level.

welfare. Degradation of natural resources reduces opportunities for production and consumption. The objective of sustainable management of biodiversity also entails seeking a path of economic development which avoids pressures on the environment in excess of nature's carrying capacity or that reduce biological diversity. Activities that damage biodiversity either directly or indirectly are generally intended to obtain short-term economic benefits for varying numbers of people. Such activities have long-term costs that are impossible to calculate, but the losses affect all of us. We can see examples of this on a limited scale if a farmer cuts down the entire forest capital belonging to a farm before handing it on to the next generation, in the overfishing of herring and capelin stocks and the subsequent closure of the fisheries, or in the failure of those responsible for salmon management to prevent the loss of salmon stocks in certain rivers.

Because of the lack of a comprehensive overview and of ways of calculating the annual losses of economic and other values associated with biological diversity, we have traditionally assessed developments individually and on the basis of the immediate economic benefits they can offer. Cross-sectoral cooperation on the actions proposed in the white paper, particularly surveying and classifying the value of biological diversity and monitoring programmes, is intended to bring us a step closer to more comprehensive and sustainable management of this element of our national wealth. This is also in accordance with the duty of the parties to the Convention on Biological Diversity to use the precautionary principle in following up the convention.

3.2.4 Avoiding the undesirable introduction of alien species

Globally, the anthropogenic introduction and establishment of new species is now considered to be one of the greatest threats to the maintenance of biological diversity. Introduced species often replace or wipe out local species or populations. The introduction of invasive alien species to the marine environment via shipping and aquaculture is a growing problem. There are larger numbers of bigger and faster ships sailing the world's oceans than ever before, and this increases the probability that organisms will survive and be moved to new areas with ballast water and as fouling organisms on ships' hulls. It is estimated that on a global basis, about 3000 different marine species are being moved from one sea to another at any given time.

Norway has many different types of species-poor ecosystems that are vulnerable to new, alien species. Norway also forms part of the north-western coast of Europe, and still has large continuous areas of distinctive and varied natural habitat that are important to preserve for future generations. As a result of the growth in trade, tourism and travel and the elimination of border controls between Norway and the rest of Europe, Norway may find that the introduction of alien species causes growing environmental problems. The rising number of cases where alien species are detected by customs stations is already giving an indication of a rise in the number of introductions.

In most cases, the deliberate introduction of alien species today is associated with agriculture, horticulture, fisheries and hobby activities. These cases are dealt with under legislation for the appropriate sectors. However, Norway's legislation does not contain adequate provisions regulating the introduction of plants and invertebrates. There is a pressing need for comprehensive legislation to prevent the introduction and spread of alien species. One of the main challenges will be to devise a joint central government strategy for the use of policy instruments, so that gaps in the legislation are closed and impact assessment is required before any introductions of new species to the environment. This work will be included in the deve-

Box 3.8 Avoiding pollution

Biodiversity concerns will be given greater weight in pollution control policy. One measure will be to use pollution monitoring programmes to reveal the impact of pollution on biological diversity. This can for example be done by using suitable biological indicators to clarify the impact of pollution. This has already been done in the case of acid rain, where the geographical distribution of acidification, critical loads and the impacts on different ecosystems have been surveyed and changes have been followed through pollution monitoring programmes. In the government's view, this should be evaluated in the national programme to survey and monitor biological diversity.

lopment of coordinated legislation for biological diversity.

Together with the review of the legislation, the activities of the authorities with responsibilities in this area must be coordinated. It will be natural for the Ministry of the Environment to be responsible for coordination until improved legislation for this field has been adopted.

In this connection, more knowledge of the sources of introductions and clarification of the responsibilities of the competent authorities in this field is needed. Information to the various sectoral authorities will also be important. The customs authorities are often in the first line in such cases, and they urgently need to improve their knowledge in this field to meet growing internationalization.

Contingency planning in this field must also be improved: how do we deal with the illegal import of alien species, and how do we deal with accidental introductions and limit the damage caused by introduced species? Quarantine and facilities for keeping species that have been introduced illegally are two problems that arise in connection with the introduction of alien species (see Box 3.6).

3.2.5 Ensuring sustainable land use

Report No. 34 (1990–1991) to the Storting on environmental protection at local level set out extensive plans for improving municipal expertise in the field of nature management, and resulted in the local environmental development programme that was implemented by the Ministry of the Environment. The municipalities used the programme and organized activities under it in many different ways, as would be expected given the wide variations in size, tasks and priorities from one municipality to another. However, a general result of the programme was that municipalities provided more resources for and gave higher priority to nature management. The Local Agenda 21 process, with its emphasis on public participation, has provided further impetus in this direction, and so has the higher priority that many municipalities have given to environmental and biodiversity concerns in their application of the Planning and Building Act. So far, about 170 municipalities have chosen to take part in the nationwide programme to survey biological diversity and identify and classify its value.

Local Agenda 21 and the participation of NGOs are important and necessary elements of the management of biological diversity at national level. FRIFO, an umbrella organization for Norway's largest outdoor recreation associations, organizes cooperation between these associations at county level, particularly to deal with developments involving major changes in land use. There are also many other organizations that are active in areas such as outdoor recreation, protection of the cultural heritage and conservation of biological diversity. Examples include the Norwegian Society for the Conservation of Nature/Friends of the Earth Norway, Nature & Youth, Inky Arms Eco-detectives, WWF-Norway, the Environmental Home Guard and SABIMA (the Norwegian Council for the Conservation of Biodiversity). However, small municipalities have only limited resources, and 70 per cent of all Norwegian municipalities use less than the equivalent of one full-time position on land use management and other matters that come within the scope of the Planning and Building Act. Steps to strengthen Local Agenda 21 efforts, especially the participation and assistance of NGOs, should therefore continue to be given priority in the period covered by the white paper.

The committee appointed to review the planning legislation has already submitted the first part of its report. The final report, including proposals for amendments to the Planning and Building Act, will be submitted at the end of 2002. The committee is considering a number of issues related to special statutes and to the planning legislation. These include strengthening the legal authority for national policy guidelines and decisions, for designating areas for particular purposes (as agricultural areas, areas of natural environment and outdoor recreation areas) in municipal master

Box 3.9 Enhancing international cooperation

In international efforts to conserve biological diversity, Norway will give special priority to the following:

- contributing to the harmonization, coordination and simplification of international environmental agreements
- contributing to further development of the Convention on Biological Diversity, for example by negotiating protocols
- helping to arrange global and regional expert meetings
- intensifying scientific cooperation between the various environmental conventions
- seeking to ensure that the WTO system and the environmental agreements together promote the objective of sustainable development
- ensuring that the WTO system and the environmental agreements are mutually supportive
- reviewing the relationship between the Convention on Biological Diversity and the TRIPS Agreement and working to ensure that environmental considerations are better integrated into multilateral trading rules
- supporting the developing countries in their efforts to take part in and implement the Convention on Biological Diversity
- continuing to host the Trondheim conferences on biodiversity dealing with important issues relevant to the Convention on Biological Diversity. This is part of Norway's assistance to capacity-building under the convention.

plans, and for soil conservation and the protection of beaches, cultural landscapes and biodiversity. The report also proposes amendments to strengthen provisions relating to particularly valuable uncultivated areas in the Planning and Building Act and link them to county plans and municipal master plans. Coordination with the municipal land-use planning process and appropriate legal authority will be an essential basis for safeguarding areas that have been surveyed and classified on the basis of their value for biological diversity.

The core areas for the conservation of biological diversity are areas that are already protected under the Nature Conservation Act, those for which some form of protection is proposed (new national parks and large protected areas, areas included in regional protection plans for coniferous forest and the remaining county protection plans) and the remaining large areas of undisturbed natural environment. The Ministry of the Environment, in cooperation with the Ministry of Fisheries, is now starting to develop a similar network of protected areas in marine and coastal waters, and the protection plans for watercourses provide extensive protection for river systems. Nevertheless, most of the area of Norway will always be outside protected areas, and this is also where most human activity will take place. To avoid disturbance in areas of particular value for biological diversity, these areas must be clearly identified and it must be possible to take steps to ensure that, wherever possible, they are sheltered from land-use changes that reduce biodiversity.

3.2.6 Avoiding pollution

Pollution control policy is important in relation to management of biodiversity, and several of the ministries emphasize this in their chapters. This policy area is also thoroughly dealt with in the sectoral environmental action plans. The white paper does not deal with pollution control policy as such, but with the links between this and biological diversity. Chapter 2 identifies acidification, climate change and emissions of hazardous chemicals as particularly important in relation to biodiversity because of their widespread and long-lasting impacts. They are also more complex to deal with and require more closely coordinated management than other problems. There are close relationships between the international agreements on long-range transport of pollutants, the Climate Change Convention and the Convention on Biological Diversity.

3.2.7 Enhancing international cooperation

All Norwegian public authorities share the responsibility for following up the Convention on Biological Diversity. This responsibility also applies in all forms of international cooperation in which they are engaged. This is discussed in the chapter by the Ministry of Foreign Affairs, which is responsible for coordination of foreign and development policy.

Further development of the Convention on Biological Diversity is a major task, and will involve important matters that are the subject of discussion in international environmental policy, such as better coordination between the global environ-

mental agreements and between environmental and trade agreements.

3.2.7.1 Coordination of environmental agreements

The development of a stronger institutional structure for international environmental governance was a central topic at the informal ministerial meeting of environment ministers held in Bergen in 2000. The meeting pointed to the need to coordinate existing international structures and agreements in the environmental field. This will involve many challenging tasks, including the following:

- evaluation of possible gaps in binding international agreements that need to be closed in order to solve high-priority international environmental problems
- harmonization, coordination and simplification of international agreements
- mechanisms for compliance, control and effective implementation
- organizational coordination and improvements
- practical cooperation on follow-up (research, reporting, analyses of the state of the environment).

Norway is giving priority to this work, and believes that enhanced synergy and better coordination of conventions and agreements related to biological diversity will make it possible to find better solutions to environmental problems in this field. It is natural to consider drawing up a new system using the Convention on Biological Diversity as a basis and including the most important substance of all these agreements. Norway has maintained a high profile in work under the Convention and intends to continue this approach in efforts to coordinate the Convention on Biological Diversity with other important environmental conventions.

Experience gained from work under the environmental conventions will also be used in broader-based efforts to strengthen international environmental governance that have been started under the UN Environment Programme (UNEP).

3.2.7.2 The relationship between environment and trade agreements

Within the UNEP system, a clear need has been identified for a body to act as a counterweight to the World Trade Organization (WTO) in environmental matters. The multilateral environment agreements are too weak in relation to the system of agreements in the economic sectors, including the financial, trade and industrial sectors. One reason for this is that they lack stronger and more unifying international organizations and instruments. The strength and authority of the WTO must be seen against the background of its long history and fundamental features of its development. Nevertheless, there appears to be a need to strengthen the international architecture of environmental agreements and coordinate them better.

To improve the coordination of environment and trade agreements, they must be considered together to a greater degree as multilateral agreements are further developed. For example, the international trade regime is to a large degree based on standards set by experts in the appropriate fields. One way of ensuring that environmental considerations are given higher priority is therefore to develop standards that incorporate fundamental environmental requirements, either by giving the environmental agreements a role in the development of standards or by recognizing the environmental conventions as competent to set standards under the WTO system.

Norway has an administrative system where coordination between the environment and trade sectors functions well, and is therefore in a good position to work actively towards the above developments internationally. To start with, we will try to cooperate with organizations that are accepted as competent to set standards within the WTO system. One interesting initiative in this context is the proposal from the International Plant Protection Convention (IPPC) for collaboration with the Convention on Biological Diversity as regards alien species and GMOs (genetically modified organisms). In the long run, this may result in the Convention on Biological Diversity becoming responsible for setting standards within the WTO system (see Box 3.9).

3.2.7.3 Development cooperation

The fundamental goals of Norwegian development cooperation coincide with the main objectives of the Convention on Biological Diversity: sustainable use and conservation of biological diversity and equitable distribution of benefits. One priority in Norwegian development cooperation will be to obtain more information on the economic and direct and indirect use value of biodiversity in relation to both ecosystem services and products. Other priorities will be training and education, advisory services, capacity-building and institutional cooperation in the administrative systems of partner countries.

3.2.7.4 Marine resources, the Arctic and indigenous peoples

Marine resources, the Arctic and indigenous peoples are particularly relevant fields of cooperation for Norway. High priority will be given to promoting sound management of marine resources in international waters and further developing international law in this field. Sustainable use with a sound scientific basis is not in conflict with the conservation of biological diversity. This is an important principle that will primarily be used in relation to decisions in the International Whaling Commission (IWC) and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (the CITES Convention). The principle is already laid down in the Convention on Biological Diversity.

There are four main issues that should receive attention in relation to Arctic ecosystems. The first is the transport of pollutants that accumulate in food chains, which in recent years has been recognized as a problem for certain marine mammals and Arctic bird species. Secondly, there is the environmental pressure caused by harvesting of natural resources, especially marine resources, in northern areas. The third problem, which has also become more urgent in recent years, is the introduction of alien species that may cause environmental damage or injury to health. Finally, exploration for oil and gas is in progress in both the Norwegian and the Russian sectors of the Barents Sea. Large deposits have already been found in Russian waters. Oil and gas activities may become a serious threat to Arctic ecosystems. These areas will be addressed in Norwegian foreign policy. In addition, Norway is involved in a programme for the conservation of Arctic flora and fauna through the cooperation the Ministry of Foreign Affairs is coordinating in the Arctic Council and other relevant fora.

Norway has an indigenous population, the Sami. Articles 8 and 10 of the Convention require the parties to respect the rights of indigenous peoples and encourage their participation in the management of biodiversity. These matters are being dealt with at national level through the work of the Sami Rights Council and other initiatives. In addition, the Ministry of Foreign Affairs will seek to ensure that Norway actively supports indigenous peoples through its international participation in the Convention. The programme of work on the implementation of Article 8(j) adopted at the Fifth Meeting of the Conference of the Parties (COP 5) in May 2000 will be particularly relevant for Norway's international participation, which must also include participation by the Sami population.

3.2.7.5 Other fora

The Convention on Biological Diversity is being followed up in various international fora in addition to work within the system of the Convention itself. For example, regional cooperation has been organized in the form of the Pan-European Biological and Landscape Diversity Strategy, which is sponsored by the Council of Europe and UNEP's Regional Office for Europe. This work has been continued in the form of a strategy for biological diversity for the EU and the Nordic Council of Ministers. The Nordic Council has published a report on Nordic implementation of the Convention on Biological Diversity.

The fundamental principles and directions set out in the report from the Nordic Council of Ministers are followed in the white papers on the Government's environmental policy and the state of the environment in Norway (Reports No. 8 (1999–2000) and 24 (2000–2001) to the Storting) and are being further followed up through the action listed in the white paper.

Published by:
Royal Ministry of the Environment

Additional copies may be ordered from:
Statens forvaltningstjeneste
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E-mail: publikasjonsbestilling@ft.dep.no
Fax: +47 22 24 27 86

Publication number: T-1414
Translation: Alison Coulthard
Coverdesign: Seedesign as

Printed by: www.kursiv.no, Oslo 8/2002