

**Danish Nature -
status, trends and recommendations
for future biodiversity policies**

**Wilhjelm Committee
2001**

Title: Danish Nature – status, trends and recommendations for future biodiversity policies

Issued by: The Wilhjelm Committee 2001

Secretariat: Danish Nature and Forest Agency

Haraldsgade 53
DK-2100 Copenhagen Ø
E-mail: sns@sns.dk
Homepage: www.sns.dk

Cover: Page Leroy-Cruce

ISBN:

Copies: 100

Number of pages: 71

Paper quality: Cyclus Office 90g

The report can be downloaded from the homepage of the Danish Nature and Forrest Agency, or purchased from “Miljøbutikken”, Læderstræde 1-3, DK – 1201 Copenhagen K, phone: +45 33 95 40 00, fax: +45 33 92 76 90, e-mail: butik@men.dk

The Wilhjelm Committee in brief

The Wilhjelm Committee was appointed by the Danish government in march, 2000. The task of the Committee was to prepare a report as a basis for a government action plan on biodiversity and nature conservation. As chairman of the committee was appointed former minister Nils Wilhjelm.

The committee was composed of 35 members representing farmers’ - and fishermen’s associations, non-governmental organisations, research institutions, government agencies and local government associations.

The Committee’s work is a contribution to the government’s preparations for the World environmental summit on sustainable development, 2002. The Committee submitted the report to the government on august 23, 2001.

The secretariat of the Wilhjelm Committee

The Committee was served in the secretariat functions by a task force within the Danish Nature and Forest Agency. Members of the secretariat was:

Head of division Henrik Knuth-Winterfeldt
Head of section Henrik Wichmann
Biologist Tine Nielsen Skafte
Agronomist Jørn Jensen
Hortonomist Lone Bjørn
Senior Assistant Ingelise Johansen

Danish Nature – status, trends and recommendations for future biodiversity policies

Summary - Danish nature needs targeted action.

In relative terms, Denmark is one of the European countries with the largest arable land area. Conversely, this means that Denmark is one of the European countries with the fewest natural areas in relation to total land area. One of the reasons for this is that the natural resources of Denmark are well suited to agricultural use, a process which socio-economic pressure has accelerated.

During the past 20-30 years, Danish enterprises and authorities have made continuously growing efforts to support nature protection and reduce environmental impacts. These efforts have borne good results, but cannot alleviate the negative impacts on wild plants and animals and their habitats. Despite improvements in the protection of the remaining natural areas, their deterioration has continued for the past 20 years. The quality of Denmark's nature and biodiversity has never been so poor. This is due to the fact that natural habitats are too constricted, contain too many nutrients and too little water, and that natural areas are fragmented and overgrown. Furthermore, the poor quality is also caused by the inability of nature and natural habitats to cope with both contemporary intensive farming, and the widespread decline of extensive farming.

The deterioration of nature is the reverse side of the positive development in welfare during the past 150-200 years, a period that has seen population increase fivefold yet managed to ensure a historically high level of individual welfare. Nobody imagines that we should return to the Danish landscape of 150-200 years ago. However, we do need to provide better conditions for nature and biodiversity so that, among other things, the number of species is not eroded further due to human activity.

Over the years, industrialisation has attempted to contain the dynamism of nature. Thus, many areas have radically changed character due to the intensification and increased efficiency of agriculture and forestry. This has encompassed the draining of wetlands and farming land, the conversion of large grazing pastures to cultivated fields as well as increased use of fertilisers and pesticides. In addition to this, airborne nitrogen pollution is introduced from agriculture, traffic, and the power industry, combined with the leaching of nutrients into the aquatic environment. Today, the majority of forested areas are plantations, with large expanses of trees homogenous in type and age. These are often conifer types not native to Denmark, and are particularly vulnerable to climate change. The shallow Danish waters suffer from nutrient and chemical pollution, and fishing, notably trawling, has altered the nature of the seabed in a number of areas. The possibilities for nature to develop dynamically have become severely limited.

The natural characteristics of the Danish landscape and climate have previously ensured that there were many different species of wild plants and animals in relation to the size of the country. Nevertheless, a serious decline in wild plants and animals has been observed. Approximately 30 per cent of those species included on the 1997 Danish Red List are acutely threatened and vulnerable. Approximately 340 species have become extinct since 1850, for the most part due to human activity.

The 1992 Rio Convention on biodiversity clearly expressed an international commitment to nature protection. Denmark and 180 other countries, including all the Member States of the European Union, have signed the Convention. The goal is for sustainable development and assuring the opportunities of future generations. Likewise the work to ensure biodiversity in Denmark is part of the process of ensuring sustainable development, including the possibility of utilising nature for both productive and recreational purposes. Therefore the desire expressed for rich nature in a rich society also reflects a desire to maintain and develop the historically high level of human prosperity, welfare, and living standards in Denmark.

As concerns nature issues, the EEC Bird Protection Directive, the EEC Habitat Directive and the Danish Nature Protection Act are concrete and binding results of the goal of sustainable development. The ambitions of the EU were expressed in the conclusions of the June 2001 European Council meeting, which stated that the biodiversity decline must be stopped by 2010 at the latest.

It is in light of the above that we should regard the work of the Wilhjelm Committee on building the foundations for a national action plan for biodiversity and nature protection. Biodiversity is the basis of a significantly large part of human opportunities for development, both in terms of production and recreation. Diversity in nature is an abiding requirement for a welfare society in both national and global perspectives.

In the long-term, the extinction of some species cannot be avoided. Today, the present cause of concern is the greatly accelerated rate by which species are destroyed through human activity. The global destruction of species has now surpassed the natural rate of species decline more than 100 times, partly as a consequence of climate change, deforestation, cultivation, and pollution.

The protection of nature and biodiversity is not merely a question of protecting species of plants and animals. It is also a question of ensuring the healthy functioning of ecosystems. Ecosystems perform a variety of services that are essential for production in agriculture, forestry, and fishing. For example, these include the nutrient cycle, the breakdown of waste products, the hydrological cycle, climate regulation, the pollination of cultivated plants, the production of fertile soil, and the maintenance of a biologically reproducible fish stock. Ensuring biodiversity is therefore an important factor in ensuring sustainable development.

Nature protection also aims to increase opportunities for outdoor recreation and experiencing nature, both of which have a positive influence on human well-being and quality of life.

Accessibility to a broad knowledge base is of central importance when making the necessary priorities and decisions for ensuring biodiversity and promoting sustainable development. It is nonetheless important to realise that science cannot give us definitive answers to all the questions we feel we need answered before reaching a decision. Therefore knowledge-based decisions must be supplemented with decisions taken on the basis of the precautionary principle.

Ensuring biodiversity is a multifaceted challenge. In recognition of this, the Committee has prioritised six interrelated focus areas for future Danish nature policy:

- Better protection of existing nature.
- More nature – more space and better interconnectedness and coherence.
- A better basis for target-specific nature management.

- Continued strengthening and focusing of sector efforts.
- Better interplay between local and national interests in nature.
- Continuation of international efforts.

Since nature issues are subject to the same financial constraints as other important issues in society, it is necessary to prioritise our efforts. In relation to such difficulties, the Committee recommends that the first stage in prioritisation must as far as possible encompass the identification of changes in nature and biodiversity as well as the quantification of these changes. As an important first stage in such prioritisation, the Committee has therefore identified important changes in nature and in certain cases quantified them.

In connection with the prioritisation of efforts in nature management, the Committee recommends that a specific basis for decisions be found in order to enable the assessment of direct and indirect costs and benefits. Furthermore, this is a requirement if nature protection is to be efficient.

The Committee has presented a large number of recommendations and highlights the following as having the highest priority in the nature protection perspective:

- **Enhancement of nature management initiatives:** Nature management should be enhanced. This includes nature management carried out by the Danish State, regional authorities, and municipal authorities, and nature management carried out by agriculture and forestry.
Reasons: Overgrowing due to the decline of extensive farming and in particular the addition of airborne nutrients is one of the biggest threats to many natural and semi-natural areas and the wild plants and animals they contain. Therefore enhanced nature management is an important initiative for obtaining favourable conservation status in the international nature protection areas (Natura 2000 sites) with accompanying species; in the natural and semi-natural habitat types that are protected by Section 3 of the Nature Protection Act (Section 3 areas); and in areas under conservation orders. Nature management initiatives could be targeted at the most valuable natural areas using nature quality planning. A range of instruments is required in the promotion of targeted nature management by landowners, enterprises, and authorities. These include voluntary agreements such as the agri-environmental schemes; management plans for areas under conservation orders, establishment of common grazing etc.
- **Securing natural forests, designation of 10 per cent of forested areas for biodiversity:** Initially, the natural forests, which are the last remnants of the original Danish forests, should be secured. As well as this, 10 per cent of forested areas at all times should be set aside as untouched forest and other types of forest with special emphasis on biodiversity.
Reasons: Forests with a long, uninterrupted history – natural forests – display particularly valuable biodiversity, including the original gene pool of native trees and shrubs. Untouched forest, and other forest types with the primary objective of maintaining biodiversity, possesses great potential for the development of greater biodiversity. This diversity can also be spread to surrounding forests. Furthermore, these types of forest provide alternative and exciting experiences for visitors.
- **Consideration of nature in agricultural grant schemes should continue to be emphasised:** Increased emphasis should be given to consideration of nature by changing the

designation of Particularly Sensitive Agricultural areas (PSA areas) so that they cover areas with important nature interests to a larger extent. Agri-environmental schemes should also be altered so that to a greater degree they support management, protection, and development of nature in areas of special nature interest. This should be supported by the development of other voluntary schemes.

Reasons: This proposal would create better possibilities for grazing on semi-natural areas with different land-management schemes. For example, these include agri-environmental subsidies and designation of field margin strips according to the set aside scheme. Furthermore, the proposal creates the possibility of limiting pesticide and fertiliser inputs to natural areas, as well as the conversion of intensively farmed land to semi-natural land. This is important in order to improve the quality of nature and interconnectedness of semi-natural areas. It is also important in improving the quality of Natura 2000 sites and river valleys, and in the establishment of national natural areas.

- **Buffer zones around particularly vulnerable nature:** Restrictions should be introduced on ammonia discharges in the vicinity of particularly vulnerable natural areas in connection with point source discharge and the spreading of fertiliser. These restrictions should initially be based on a 300-metre buffer zone designated around particularly vulnerable natural areas, according to a specific assessment. Within these buffer zones, limits should be placed on ammonia emissions from livestock sheds and manure facilities. Requirements would also be placed on manure spreading technology. These should be based on assessments of the condition and vulnerability of individual locations, the nature of the terrain and prevailing wind conditions etc. At the same time, it is a precondition that there would be a gradual reduction in ambient levels of ammonia discharge. Possible problems in relation to existing livestock farming within the buffer zones have not been taken into consideration.
Reasons: The goal of the buffer zones is to reduce the local effects of ammonia nitrogen in particularly vulnerable natural areas. The initiative is important for ensuring biodiversity in heaths, dunes, raised bogs, dry grassland, and lobelia lakes. Such areas are losing their characteristic vegetation. For example, heaths are becoming grassed over, dunes are being overgrown, and dry grassland, which account for 485 species on the Danish Red List, display a decline in the diversity of plant species.
- **Establishment of national natural areas:** A government decision should be made on the establishment of six national natural areas. These should be selected as part of the follow up on the EEC Nature Protection Directives and as a consequence of the importance of the areas for national biodiversity. The national natural areas could be established through the development of core areas owned by the Danish State, or by funds for the promotion of nature. These core areas would also include areas that are administrated by the Danish State through its sovereignty over coastal waters. This development should be implemented following an investigation and on a voluntary basis.
Reasons: National natural areas would provide the opportunity, in large areas, of protecting rare and threatened species as well as whole ecosystems where the natural ecological processes flow more freely. This would be achieved through ensuring interconnectedness between natural areas, encouragement of ecosystem processes such as free dynamics, succession and spreading of species within the areas and out to adjacent areas. Special opportunities would be created for outdoor recreational activities.

- **More nature in and around watercourses:** Primarily, a concentrated effort should be made in order to restore naturally meandering watercourses and adjacent meadows. Secondly, 100,000 ha of adjacent meadows, dry grassland and salt meadow should be restored.
Reasons: Watercourses and adjacent meadows possess a large potential for the development of a diverse plant and animal life and for the restoration of ecological cohesion, including dispersion corridors. Meadows and meandering watercourses naturally retain nutrients and require less watercourse maintenance.
- **Establishment of trial marine natural areas:** One or more marine areas should be designated and placed under restrictions in relation to use in accordance with regulations on Danish State sovereignty of coastal waters. This should be implemented on a trial basis with monitoring and evaluation. This trial could include a ban on the use of specific types of fishing equipment, on mineral exploitation and dredging for stones.
Reasons: Danish waters contain major natural assets, also in an international context. The trial areas would contribute to the protection of large cohesive ecosystems in the sea and create areas where nature is given more room, just as the corresponding areas on land. Furthermore, the areas would act as valuable reference sites for research.
- **Nature monitoring:** Nationwide, uniform nature monitoring should be established as soon as possible. This is necessary in light of the pressing need for increased knowledge on the state of and developments in nature, including the effects of political and administrative measures. This should include monitoring all aspects of terrestrial nature, and would improve our knowledgebase on biodiversity through monitoring the aquatic environment.
Reasons: Nature monitoring is a fundamental tool for following developments in nature at national and regional levels. The programme would supplement the sporadic or non-existent knowledge on developments in relation to specific types of natural habitats and species. It would also provide broader knowledge on the causes of such developments. Monitoring is obligatory in relation to ensuring that favourable conservation status for Natura 2000 sites and species is achieved.
- **Nature quality planning:** Uniform nature quality planning should be implemented as a part of regional planning. This is necessary in light of the need for increased knowledge on the state of and developments in nature, and the need for improved targeting and prioritisation of initiatives in nature protection. Nature quality planning could be implemented in connection with the 2005 revision of regional planning.
Reasons: Nature quality planning would provide the necessary foundations for the targeting and prioritisation of initiatives in nature protection. This planning would form part of the basis of the decisions on the designation of PSA areas and the implementation of agri-environmental agreements. It would also form the basis of public-sector nature management and nature restoration measures, the restoration of meadows alongside watercourses, of dry grassland and of salt meadows and the establishment of ecological dispersal corridors. Nature quality planning also provides the opportunity to continuously assess the effects of nature management.

Finally, the Committee recommends that a national action plan for biodiversity and nature protection be evaluated at regular intervals. For example, this could be as part of the nature and

environmental policy statement that is presented to the Danish Parliament every four years, though the action plan would first be evaluated in 2007.

The work of the Wilhjelm Committee

This report presents the proposals of the Wilhjelm Committee for the foundation of a national action plan for biodiversity and nature protection. One of the reasons that the Danish government requested the Committee to formulate these was as part of its preparations for the Johannesburg 2002 World Summit on Sustainable Development (also known as Rio+10).

The Committee regards the report and its recommendations as part of Denmark's further preparations in the European process, a process that is clearly reflected in the conclusions from the Swedish Presidency of the European Council's Gothenburg meeting in June 2001. For example, some of the targets stipulated by the conclusions were the halting of biodiversity decline by 2010 at the latest and protection of biodiversity as a target for the Common Agricultural Policy.

The Committee regards this report as a set of recommendations that can contribute to the elaboration of parts of the Danish Strategy for Sustainable Development, drawn up by the Danish Government in June 2001.

The report of the Committee is addressed to the Danish Government and contains proposals for prioritised efforts in the promotion of biodiversity and nature protection. The Committee has highlighted the international obligations and national goals and strategies for the promotion of biodiversity and nature protection, as well as relevant action plans. Furthermore, the Committee has examined previous initiatives in relation to our international obligations and national targets and strategies. On this basis, proposals are presented here for where efforts can be prioritised in order to meet the targets, primarily using nature-related criteria.

TEXT BOX:

The conclusions from the Swedish Presidency of the European Council's Gothenburg meeting in June 2001 state that:

The relationship between economic growth, consumption of natural resources and the generation of waste must change. Strong economic performance must go hand in hand with sustainable use of natural resources and levels of waste, maintaining biodiversity, preserving ecosystems, and avoiding desertification. To meet these challenges, the European Council agrees:

- That the Common Agricultural Policy and its future development should, among its objectives, contribute to achieving sustainable development by increasing its emphasis on encouraging healthy, high quality products, environmentally sustainable production methods, including organic production, renewable raw materials and the protection of biodiversity.
- That the review of the Common Fisheries Policy in 2002 should, based on a broad political debate, address the overall fishing pressure by adapting the EU fishing effort to the level of available resources, taking into account the social impact and need to avoid over-fishing.

Halting biodiversity decline with the aim to reach this objective by 2010 as set out in the 6th Environmental Action Programme.

TEXT BOX END

The report contains a presentation of the Committee's proposals for initiatives in the nature area during the coming years.

Due to time and capacity constraints, the Committee has decided not to deal with a number of topics which could be covered by the terms of reference. This applies to urban nature, a range of issues in the area of pollution and a range of sectors that affect nature more indirectly, for example, traffic, power generation, industry and households. The Committee recommends that these topics be included in an overall assessment in connection with the drawing up of the Danish government's action plan.

Neither has the Committee worked on questions dealing with access to nature, in that these are dealt with by a special committee established by the Government (the Access Committee). Likewise, the Committee has not dealt with hunting issues or issues of genetically modified organisms (GMOs). The Committee has also only sporadically dealt with issues of geodiversity, other non-biological parts of ecosystems, and the effects of climate change. The Committee assumes that these will be dealt with further in the analysis of possible climate changes that forms part of the Government Strategy for Sustainable Development and long-term nature protection work.

Similarly, time and capacity constraints have prevented the Committee from carrying out an assessment of the overall socio-economic state budgetary, and enterprise-related consequences of the report's recommendations. However, a number of financial reviews have been carried out and are presented in the report. In order to ensure the most appropriate basis for decisions in relation to priorities in the nature area, the Committee recommends that a specific basis for decisions be prepared. The reason for this is as far as possible to enable an assessment of the relationship between the direct and indirect costs and benefits of the Committee's recommendations.

Nature in Denmark – status and trends

The foundations of the work of the Committee are represented by an assessment of the present status of conditions and trends in nature based on a number of special surveys and causal analyses. On the basis of this, the overall conclusion of the Committee is that trends in the condition of nature and biodiversity in Denmark are almost entirely negative. Furthermore, it seems that this negative development will continue, especially if extra initiatives are not taken. The reason for this is that a number of the main influences will continue to have effect, even if action is taken immediately. Combined with this is the fact that there is certain time lag effect when nature adjusts, which will be seen in the form of decline in certain species and natural habitat types.

There are holes in the scientific material on the condition of nature, and many connections between causes and effects remain unknown. Research and development is therefore required as well as the extension of condition and trend monitoring in nature. However, it is the clear view of the Committee that the condition of nature and the main influences on it today are well enough understood so as to provide us with an adequate basis from which we can proceed with the necessary extra initiatives for nature in forthcoming years.

The main tendencies in the conditions of and trends in nature as well as the most important explanations of these trends are summarised in the following.

TEXT BOX

What does biodiversity mean?

Biodiversity means diversity of all living organisms of all types, including terrestrial, marine, and freshwater ecosystems and the ecological complexes of which they are part. Diversity includes both intra- and inter-species diversity as well as ecosystem diversity. Biodiversity is assessed at three levels:

1. Diversity in the interaction between species and their surroundings in ecosystems.
2. Diversity of different species of plants and animals, including micro-organisms. The genetic diversity or hereditary variation found between different individuals and populations of the same species (genes, gene pools).
3. Ecosystems and their vital functions, as well as habitats, species and genetic diversity which are all covered by the terms “nature”, “nature resources”, and “nature capital” in this report.

END OF TEXT BOX

Nature does not have enough space

Denmark is one of the countries in Europe with most land area under the plough, since a large part of the country is well suited to cultivation. Therefore, in relative terms we are also one of the countries with the fewest natural and semi-natural areas, i.e. bogs, meadows, dry grassland, heaths etc. Furthermore, both natural and agricultural areas are under pressure from the demands on space from urbanisation, roads, and other infrastructure requirements.

When viewed in a long-term perspective, there has been a drastic decline in natural areas in Denmark. The greatest extent of open types of natural and semi-natural habitat, i.e. dunes, heaths, salt meadows, meadows, dry grassland and bogs, was seen at the beginning of industrialisation in the first half of the nineteenth century. At this time, these habitats comprised up to 60 per cent of total land area. Today, such areas account for less than nine per cent of land cover, as they have lost their main economic importance as grazing areas.

The pattern has been the same for small biotopes. In five areas surveyed in the east of Denmark, 70 per cent of all earth and stone walls and dikes disappeared between 1884 and 1984, as a result of societal development. There are also fewer old hedgerows. It is especially ponds and the smallest of the small biotopes that have disappeared, and are today incorporated into cultivated areas. In the 1970s and 1980s, a pond or marl pit disappeared once every three days. An investigation in the municipality of Aarhus shows that 70 per cent of all ponds and marl pits have disappeared since 1900. The total length of open ditches and small watercourses is estimated to have declined by 90 per cent. A large number of watercourses have been straightened, canalised or have been subjected to rigorous maintenance. Only about two per cent of the remaining watercourses today follow a naturally meandering course, many of these being the result of watercourse restoration projects.

Forests have developed differently. Two hundred years ago, only three to four percent of land cover was accounted for by forests. Since then, many forests have been planted and sown, such that today forests account for 10 per cent of land cover. Of this, a little over one third is deciduous forest, while almost two thirds is coniferous forest with tree species which are not native to Denmark. Most of the deciduous forest has been planted during the course of time, and it is estimated that there are now less than 35,000 hectares of natural forests, that is forests with natural origins. A small portion of forested area is made up of deciduous forest with long unbroken forest continuity, which is of great importance for forest biodiversity.

In line with societal development, over 55,000 ha of wetlands have been drained as a result of land reclamation projects. One of the results of this has been the reduction of shallow water marine areas and adjoining salt meadows. Public sector nature management has restored about 2,000 ha of wetlands since 1989.

A number of activities at sea decisively influence the habitats for marine biodiversity. Fishing, dumping of material and mineral exploitation alter the conditions for bottom-dwelling plants and animals. Furthermore, the annual return of oxygen depletion to large areas of Danish waters has a negative impact on the survival and distribution of many marine species.

There are different types of natural habitat at sea, just as there are on land. One example is stone reefs; a natural habitat type particularly rich in species. Amongst other things, stone dredging has had detrimental effects on these. Another example is the shallow water eelgrass meadows, and their associated animal life, including shellfish, fish, and birds. In the 1930s the larger part of eelgrass areas disappeared due to sea temperature changes and fungal attacks. As a result of this a number of coastal areas were severely eroded. Following this the eelgrass spread again, only to begin retreating once more from the 1960s onwards as a result of the large amounts of nutrients in the sea and the blooming of algae that led to poorer light conditions for the eelgrass.

Today, all of the main types of natural habitat on land, apart from remaining areas of natural forest, are protected in terms of area size by legislation or other means. However, this protection does not ensure the quality of natural and semi-natural areas, for example, in relation to pollution from nutrients and substances harmful to the environment, which represents one of the largest contemporary problems in relation to nature protection. Marine natural habitat types are only protected to a limited degree, though. Furthermore, there are some legal complications in relation to the protection of dry grassland and certain bogs.

The area size of natural and semi-natural areas and small biotopes is now stable, and for certain types of small biotopes and lakes there has been a little progress. A number of laws have been introduced, most recently the 1992 Nature Protection Act, and there has been an increase in information and subsidy schemes for afforestation, planting hedgerows and game coverts, laying waterholes, restoring watercourses, and so on. These initiatives, combined with the initiatives of landowners, hunters, and public and private sector nature restoration, have led to a halt in the decline in the size of our natural areas, which have again begun to grow slowly. Between 1989 and 1998, subsidies were given to nature management projects covering a total of 8,000 hectares of natural area. These initiatives have created an important platform for ensuring and improving the condition of nature in the future.

Water has disappeared from the landscape

The Danish landscape has been drained extensively. Past land reclamation and drainage projects, implemented to create space for cultivation and afforestation, are the reasons that there are only few wetlands remaining in the Danish landscape. From 1960 onwards water abstraction for use in households, industry and irrigation has further contributed to drying out the landscape. Drying out of watercourses can especially be seen in areas where major ground water abstraction for towns takes place. Up to 80 per cent of the Danish land area is affected by draining, and bogs, swamps and meadows account for only four per cent of land cover.

Many watercourses are subject to quite rigorous maintenance in order to ensure effective drainage, and this is to the severe detriment of their value as habitats for plants and animals. There are only a few areas with natural interplay between watercourses and adjacent meadows that are intermittently flooded and fertilised by these watercourses. Furthermore, many watercourses partially or completely dry out periodically.

The 1992 Nature Protection Act has halted the direct drainage of small lakes and bogs. One objective of the Water Supply Act is to ensure that water abstraction does not occur to such a degree that it hinders the fulfilment of environmental targets. Today, this means that water for irrigation may only be retrieved from groundwater and not from watercourses and lakes. In order to prevent cave-in of banks along natural watercourses with general or high targets, riparian strips have been set aside which may not be worked upon. In the follow up to the Aquatic Environment Plan II, there is ongoing work to restore watercourses and lakes, dig new waterholes, and establish meadows. Damming watercourses is generally no longer permitted. This range of initiatives is contributing to the prevention of further drying out of the landscape.

Nutrients pollute

The continued addition of nutrients such as nitrogen and phosphorus (eutrophication) is a problem in all natural areas on land, in lakes, fiords and at sea. In all areas the addition of nutrients causes an increase in the production of organic material, alterations in biodiversity and in most places also a

decrease in biodiversity. For example, most threatened plant species have a preference for nutrient-poor and stable environments. However, a majority of Danish areas have become nutrient-rich, disrupted, or often both. Whilst the landscape of the past was characterised by a diversity of hardy plants, it is today characterised by homogenous and widely dispersed competitive and pioneer plants. Likewise, the mass blooming of algae and oxygen depletion in lakes and marine areas are an effect of eutrophication.

The emissions of ammonia from livestock sheds, manure storage facilities, and manure fertilisation poses a particular problem for thousands of natural areas that are especially sensitive to the airborne nitrogen found in ammonia. During the last decade, however, ammonia emissions from agriculture have been reduced by more than 30 per cent. Sales of fertilisers to agriculture have dropped by 37 per cent in the last 15 years, whereas levels of manure use have remained stable. The levels of ammonia emissions vary from region to region, but still generally exceed the tolerable levels for many natural habitat types. Other sources also contribute to the overall nitrogen impact, including transport, energy generation, and contributions from abroad.

Pollution of watercourses and lakes by organic substances and nutrients from wastewater remains a significant impact factor, even though a significant reduction in this type of pollution has been effected during the last 25 years. As a result, many watercourses now have greater populations of small animal species that require clean water. Nonetheless, only 40 per cent of all watercourses meet the targets set in the regional plans for their environmental condition, particularly due to poor physical conditions. Danish lakes have, however, become clearer. This is because additions of phosphorus to lakes, on average, more than halved during the period 1989-97. Even so, only 30 per cent of all lakes meet the targets set for their environmental condition in the regional plans. This situation is very much brought about by diffuse contributions of phosphorus from agricultural soil, as well as by the aggregate quantities of phosphorus currently found on lake bottoms as the result of many years of wastewater discharges.

The quantities of nutrients discharged into Danish waters, particularly of phosphorus, have been reduced. On the basis of model calculations, the average reduction in leaching of nitrogen from arable land is estimated at 32 per cent during the period 1990 to 1999. Nevertheless, nutrient emissions remain the main reason that the quality targets have not been met in 34 out of a total of 40 near-shore marine areas.

Leaching of phosphorus from cultivated land and the aggregate quantities of phosphorus on lake bottoms combine to lead to continued eutrophication in lakes and certain marine areas, as high levels of manuring/fertilisation and discharges of phosphorus in urban wastewater have accumulated high levels of phosphorus in soil and the aquatic environment over the years. Even though studies show that the average annual contribution of phosphorus to agricultural soil has dropped by approximately 20 per cent during the last 15 years, it is estimated that this source of pollution will increase in significance in the years to come, unless action is taken to prevent this.

Many semi-natural habitats become choked or overgrown

Semi-natural habitat types, used for grazing and hay harvesting, were once of great value to agriculture. Today, this type of area no longer performs this function, and as a consequence many of them are no longer grazed or mowed. The special and varied conditions of life promoted by grazing and mowing disappear when these areas become overgrown by tall herbs, eventually forming thickets. Draining and contributions of nutrients aggravate this situation and cause natural and semi-

natural habitat types that previously changed slowly – due to changes in or cessation of old agricultural practices – to change much more rapidly today.

Attempts have been made to prevent semi-natural habitats from becoming overgrown, e.g. through grazing schemes for large-scale adjoining meadow areas (administered by the Directorate for Food, Fisheries, and Agri Business); through nature management carried out by counties and the Danish Forest and Nature Agency; through subsidies for continued extensive grazing and mowing, particularly of meadows and dry grasslands; and through county initiatives on nature management. As yet, however, these efforts have been insufficient.

Intensive production

Within agriculture and fishery, production has gradually become more intensive. This process has been a clear priority on the part of society as a whole.

Until 200 years ago, there was no clear distinction between production areas and natural areas. A minor proportion of all land was used for intensive crop rotation, while most of the land was used extensively for grazing and hay harvesting. Today, more than 90 per cent of all agricultural land is used for intensive crop rotation. Several factors have contributed to reducing the total area accounted for by natural areas within Danish arable land, including increased mechanisation and specialisation, as well as a subsidy policy that has, in many cases, promoted intensification at the expense of concerns for nature. A number of initiatives have, however, been instigated in order to improve biodiversity within the Danish agricultural land.

The growth in Denmark's total forest area throughout the last 200 years or so is of considerable significance to sylvan animals and plants. The majority of the total forest area is cultivated in accordance with a principle known as managed forestry. A number of the measures employed in planned forestry has a negative impact on forest biodiversity, not least clear-cutting, even stands, removal of dead wood, soil preparation, draining, and use of non-native species in short rotations, especially large areas of conifers. Open grazing forests, clearings, and transitional zones between woodland and open land have become rare. Today, a number of initiatives are being taken within forestry in order to preserve and improve sylvan biodiversity. Poor economy within the forestry sector has prevented increases in intensification during the last decade, except as regards cultivation of decorative greenery and Christmas trees.

Fishery has a direct impact on the species fished. For some populations, more than 50 per cent of the total biomass is removed each year due to fishery. As a result, several commercially significant species of fish, such as cod and plaice, are currently outside the biologically safe framework, which means that there is a risk that some populations may collapse. Moreover, certain types of fishing involve large-scale secondary catches of non-target species, including fish, birds, and marine mammals alike. In this way, fishery contributes to changing population compositions in terms of both species and age for organisms within marine ecosystems.

Production plants for processing fish and shellfish in marine or in fresh waters have a number of specific effects in the local areas and users' immediate surroundings, including effects from nutrients and a number of subsidiary materials. An extension of saline-based fish and shellfish breeding is expected in the years to come.

Lack of continuity

Areas where nature has been left undisturbed forever or for a very long time are characterised by what is known as long-term continuity. Natural and semi-natural areas with long-term continuity contain more species of plant and animal life, including more rare and specialised species, than natural and semi-natural areas which have been used for e.g. agricultural activity or which have been fertilised, even if such farming has only been carried out for a short period of time. This means that for many natural and semi-natural areas, it is not feasible or possible to recreate their original species profile within a short timeframe. Consequently, there is a particular need to ensure that existing natural and semi-natural areas with long-term continuity do not deteriorate.

These valuable areas may be considered a type of “bank” or “source”, where many of Denmark’s rare and endangered plant and animal species can survive, and from which such species can spread to other existing or restored natural areas. This means that conservation of these valuable natural areas is a basic precondition for ensuring biodiversity.

Natural and semi-natural areas are too small

Plants and animals living within small habitats are particularly prone to disappearing. All other things being equal, small natural areas contain fewer habitats than large ones. Ecological processes such as substance cycles, succession, food chains, population fluctuations, etc., face much more adverse conditions in small areas. Also, the natural dynamics (e.g. erosion, flooding or sand drift) that are a prerequisite for many of Denmark’s indigenous habitats cannot be accommodated within small natural areas.

When natural areas are small, they are more susceptible to impacts from the surroundings, and such impacts affect relatively large proportions of the area. There is a considerable edge effect, e.g. in the form of airborne dispersion of nutrients and pesticides, etc.

Natural and semi-natural areas are too far apart

In the Danish landscape, the various natural and semi-natural areas are spread out as large or small areas, divided by cultivated land, roads, railroads, and built-up areas. Nature becomes increasingly separated. This division has two consequences: firstly, populations of individual species become smaller and more isolated from each other, and secondly, such division brings about more direct contact – a more extensive interface – between nature and e.g. arable land or roads. Such increases in direct contact may lead to unfortunate edge effects.

The size of a given population of animal or plant species often varies from year to year, and sometimes catastrophic incidents, such as pollution or extreme weather, bring about drastic changes in populations. Large populations are usually able to grow again when conditions become more favourable. Small populations run a much greater risk of disappearing altogether, and these divided natural habitat types, where the nearest members of the same species are often far away, leave only little chance that the population will be replenished from outside. Moreover, the reduced exchange of genetic material between isolated populations entails a greater risk of loss of genetic diversity, which in turn leads to impaired adaptability to changes in the environment.

Environmentally harmful substances are everywhere in nature

The use of pesticides makes for poorer living conditions for wildlife (flora and fauna) on cultivated land. This is partly due to the direct toxic effects, and partly due to the fact that use of pesticides leads to a shortage of food for species that live off the plants and insects targeted by pesticides.

In addition to this, pesticides can alter the substance cycle of fields, thus causing the workings of soil ecosystems to deteriorate. Areas adjoining cultivated land that has been sprayed with pesticides, including forests and small biotopes, are also affected by such pesticides through driftage. Organic production does not allow pesticide use. This means that organically farmed areas have a richer plant and animal life. There is the added advantage that experience and knowledge about pesticide-free farming from organic farming can be regularly communicated and transposed into conventional farming. Such transferral of cultivation methods will contribute to reducing pesticide use within the conventional farming sector. The last 10-15 years have seen a pronounced drop in the quantities of active substances used in pesticides. Similarly, recent trends show a decline in treatment frequency, from 2.33 in 1999 to 2.0 in 2000.

Besides pesticides, environmentally harmful substances include oil and a number of chemical products that are emitted or discharged into nature. Many of these substances are emitted with wastewater into aquatic areas, as general sewage treatment does not normally target these substances. Various chemical substances are suspected of having effects similar to those of sex hormones. These substances may affect the reproductive ability of humans and animals. One example of this is tributyltine (TBT), which is used in bottom paint for ships. TBT has caused sex changes in whelks and dog whelks, and is found throughout Danish marine waters. One example of an extremely dangerous environmental toxin would be dioxin. This toxin does not degrade in nature, and so gradually becomes concentrated in the food chain.

In 1996, the Danish EPA estimated that approximately 20,000 different chemical substances and approximately 100,000 chemical products are currently being sold in Denmark. Not all chemical substances are harmful to the environment, but both natural and synthetic substances may be so. Such substances may constitute a problem even after active use has ceased, as some substances degrade slowly in nature, or do not degrade at all. Most substances have only been assessed for acute toxicity, and only a small number have been assessed to determine whether they have harmful long-term effects.

Oil spills and leaks are a regular occurrence from both ships and marine installations, and also occur in connection with accidents. Such spills also pose a threat to the biodiversity of the coastal and marine environment.

Impact on species

Impacts on natural and semi-natural habitat types translate into impacts on species. A total of approximately 30,000 species of animals and plants have been registered in Denmark. Of these, a total of 10,600 species, covering 19 groups of plants and animals, are addressed in the 1997 Danish Red List. This list was made in accordance with international standards and constitutes an inventory of plant and animal species that are either in danger of disappearing, have disappeared from a geographical location, or are rare. The Danish Red List includes only those groups of plants and animals whose current and previous distribution in Denmark is sufficiently well documented. The total sum of species in the Danish Red List that appear in one of the two categories of species that are considered to be endangered or in danger of disappearing from Danish nature comes to 3,142, corresponding to almost 30 per cent of the total number of species included.

A number of species from the Danish Red List are, however, experiencing improvements in population size in Danish nature, often due to highly target-specific efforts. Examples of such

species include the otter, the green tree frog, and several species of orchids. The white-tailed eagle, black stork, and eagle owl have all returned to Denmark in recent years. Bans or limitations on hunting have also helped a number of species, such as the mute swan, the cormorant, and the common seal. The population of birds of prey has responded positively to the phase-out of the environmentally harmful substances DDT and PCB. The population of a species such as roe deer is growing rapidly, partly because of the wintergreen fields. A number of watercourses now have self-reproducing populations of trout as a result of watercourse restorations and removal of obstructions (dams, weirs etc.). This has also effected a reduction in the number of trout released into Danish watercourses.

Despite all this, the dominant trend is still clear: the remaining natural areas are generally too few, too small, too far apart and of too poor a quality to serve as habitats for a substantial part of Denmark's indigenous animal and plant life, or to ensure the continued existence of those processes that characterise a varied, well-functioning biological system.

Invasive species spread

Increasing globalisation means that greater numbers of non-indigenous species are introduced to Denmark. This happens deliberately through direct import, e.g. for use in forestry, aquaculture and agriculture, but such imports may also be unintentional, e.g. as imports of alien organisms in the ballast water of ships or in soil from imported plants.

Some of these new species cause no problems in nature. Others, however, are competitive, and so may establish themselves in Danish nature in large numbers, replacing indigenous species. This means that such invasive species can cause significant changes in original natural habitat types and threaten indigenous species.

In many cases, the spread of an invasive species cannot be halted once it is underway. Such invasive species can entail great costs to business communities and Danish society as a whole. Examples of this include parasites affecting salmon and eels, as well as costs associated with nature management necessitated by species such as the giant hogweed and the rugosa rose.

Generally speaking, invasive species must be regarded as a threat to biodiversity. This is also why prevention of the spread of invasive species garners considerable international attention.

Climate changes affect nature

It is estimated that anthropotic (man-made) emissions of greenhouse gases will bring about climate changes within the foreseeable future. This will happen regardless of whether effective international agreements on further reductions in greenhouse-gas emissions are entered into. These climate changes will put additional pressure on ecosystems and valuable elements of Danish natural assets.

The natural part of these climate changes cannot be averted, but efforts *can* be made to reduce their impact on biodiversity. For example, this may be done by having future nature policies ensure greater variation, resilience, volume, and quality in land and marine ecosystems. Ecosystem processes and the adaptability of nature may be promoted by ensuring the presence of more water in Danish landscapes. Similarly, the establishment of a network of wooded areas with indigenous species, good structure and long continuity in forests, hedgerows and small biotopes, etc., will also have a positive effect on the ecosystems.

Extensive efforts to protect nature

The last decade has seen extensive efforts to counteract the deterioration of nature, the environment, and biodiversity. These efforts have been based on the fact that Denmark has a national responsibility to protect nature over a wide front, but also on the fact that we have a global responsibility. The measures taken have comprised general protection of nature and the environment, as well as initiatives aimed at integrating nature issues into the sectors that affect nature.

As regards protection of nature, the 1995 Biodiversity Strategy constitutes a direct follow-up to the 1992 Rio Convention on Biodiversity. The 1992 Danish Protection of Nature Act implemented extended protection of a number of natural habitat types, corresponding to approximately 9 per cent of the total area of Denmark. Comprehensive work has been carried out to designate international nature reserves – land-based and aquatic – as part of the implementation of Community nature protection directives. A total of 200,000 hectares have been listed under conservation orders since 1917. Approximately 45 nature conservation cases are currently being processed comprising approximately 20,000 hectares.

During the period 1989-1998, Danish nature-management authorities have established an additional 14,350 hectares as natural areas, corresponding to approximately 0.3 per cent of the total area of Denmark. These natural areas include lakes, meadows, heaths, dry grassland, forests, and areas for outdoor recreation. Private afforestation has resulted in approximately 20,000 hectares new forest being planted during the same period. Most recently, the substantial windfalls in 1999 have led to the establishment of a windfall scheme to ensure that more durable and varied forests are established to replace the fallen trees.

The objective of the 1987 Aquatic Environment Plan I is to reduce nitrogen emissions by 50 per cent and phosphorus emissions by 80 per cent. In order to ensure that nitrogen emissions from agriculture are also reduced, this Plan has now been supplemented by the 1998 Aquatic Environment Plan II. The main objective of this second Plan is to halve leaching of nitrogen from agriculture by 2003. This will be done through reductions in and better management of the use of fertilisers in agriculture, as well as through a number of other measures such as agri-environmental schemes, establishment of water-meadows, and afforestation.

In addition to this, the 1986 and 1999 Pesticides Action Plans have effected the implementation of a number of regulations as well as increased monitoring of pesticide use in agriculture, in public areas, and in private households. Together with the existing approval scheme, these plans have resulted in a significant reduction in pesticide use – particularly as regards the most environmentally harmful substances.

The objective of the 2001 Ammonia Action Plan is to ensure that a number of different opportunities to reduce ammonia evaporation are put into active use before the end of 2003. As a precondition, it is assumed that the Committee will supplement the Ammonia Action Plan as regards local impacts on particularly vulnerable natural habitat types.

A number of measures taken by various business communities, green organisations, and ordinary citizens have also resulted in positive contributions to nature protection. These contributions include conservation of a number of our existing natural assets within forestry and agriculture,

establishment of ponds, game shelters, hedgerows, supervision of nature and local commitments to preserve natural areas.

This wide range of initiatives has helped stop the decline in Denmark's natural areas and assisted the establishment of new ones. At the same time, however, we must also recognise that the efforts made have not been sufficient to halt a continued process of deterioration of the quality of nature.

Recommendations for future nature policies

The Committee recommends that future efforts (i.e. initiatives taken within the next 10-15 years) concerning biodiversity and nature protection should concentrate on the focus areas outlined below. These focus areas are regarded as being of equal importance:

- Better protection of existing nature.
- More nature – more space and better interconnectedness and coherence.
- A better basis for target-specific nature management.
- Continued strengthening and focusing of sector efforts.
- Better interplay between local and national interests in nature.
- Continuation of international efforts.

All of these focus areas should constitute significant elements in an overall nature policy. As a result, the Committee's specific recommendations on more target-specific and effective use of a number of existing and new measures fall within these equally important areas.

Better protection of existing nature

Long-established natural and semi-natural areas are the most valuable in terms of biodiversity. If such natural and semi-natural areas are destroyed, or if the quality of such nature deteriorates significantly – e.g. due to overgrowing, fertilisation, pollution from airborne nitrogen, pesticide use, intensive farming, or wear from intensive traffic – it is difficult or almost impossible to repair the damage done. This means that the rational thing to do – both in financial terms and in terms of the quality of nature – is to assign the highest priority to conservation of existing natural assets.

Several of the natural and semi-natural habitat types that represent long-term continuity are threatened today. For example, this applies to protected natural habitat types such as raised bogs and uncultivated dry grassland, as well as to natural habitat types that do not enjoy such protection, such as natural forests. There is a need for extended protection that includes protection of continuity, as well as for more target-specific efforts involving nature-friendly farming and management and a reduction in the impact of nutrients, pesticides, etc.

Protection of natural forests

The biodiversity value of forests must be assigned higher priority, and natural forests are particularly important in this regard. Natural forests have long-term continuity in terms of both time and space, and contain original, indigenous species of trees and shrubs. This makes them especially significant for biodiversity. Consequently, the Committee recommends that the Danish natural forests should be registered and permanently safeguarded no later than 2004. In order to ensure comprehensive and objective registration, the Committee also considers it important that forest owners are, as far as possible, informed about how such safeguarding is to be effected before registration commences. This information on intended safeguarding measures should include financial aspects.

Furthermore, the Committee considers it crucial that sylvan natural habitat types and forest flora and fauna falling within EC Directives on nature protection are protected effectively in public and private forests alike. Under the Habitat Directive, active management efforts aimed at achieving a favourable conservation status for the relevant natural habitat types and species must commence no later than 2004.

Coastal nature is given free rein

The coastal areas constitute important natural habitat types while also being attractive areas for dwellings and recreation. This has given rise to many initiatives for protection of Danish coasts over the years. These initiatives have partly been aimed at preventing building/construction, partly at curtailing the free dynamics of coastlines to protect public assets on and along Danish coasts.

The Committee recommends that coastal protection of additional coastlines not currently falling within the scope of such protection should still only be authorised if strong societal interests speak in favour of this. The greater the natural value of a given coastline, the greater the requirements regarding the importance of such societal interests.

The Committee recommends that mapping and planning of coastlines that are valuable in terms of natural assets should form part of the 2005 regional plan revision. Such mapping and planning will serve as a basis for management of these coastal areas. The Committee also finds that improvements should be made in the efforts and coordination of the various authorities that carry out tasks within the coastal zone. In this connection, consideration should be given to expanding the planning competencies of Danish counties to include the near-shore part of Danish territorial waters, allowing integrated and co-ordinated planning for both land and sea within the coastal zone. In the long term, this may be developed into actual integrated management of the coastal zone, as promoted by Denmark within the EU.

Finally, the Committee supports the considerations from the Danish Ministry of Transport regarding a revision of the Danish Coastal Protection Act, partly in order to facilitate State co-funding of projects to improve the quality of coasts and to promote the natural appearance and development of coasts. Such efforts will be carried out as part of the overall collaboration between the Danish Ministry of Transport (the Danish Coastal Authority) and the Danish Ministry of Environment and Energy (the Danish Forest and Nature Agency) in this area.

The dunes are set free

Denmark has a particular international responsibility to preserve dunes and dune heaths. Management of dune landscapes should be carried out in a manner that promotes natural assets. This means that the Committee finds that the existing, restrictive administration of the provisions on dunes laid down in the Danish Protection of Nature Act should be maintained, and that dune management should only be carried out where this is necessary to safeguard significant public assets against sand drifts or to prevent unacceptable nuisance from blown sand. The Committee recommends that the necessary clarifications in the Danish Protection of Nature Act should be carried out.

A number of measures should be taken in connection with practical dune management, including steps to control and counteract wear and tear from public access by regulating or banning such access, use of natural materials to counteract sand drift, bans on planting (except for planting of *ammophila*), bans on use of fertilisers and pesticides, and management and gradual restoration of dune heaths by clearing certain near-shore parts of dune plantations.

Protecting the sea

Preserving marine nature is important to society. In this context, “marine nature” means the shallow-water coastal areas and fiords, bays, straits, and open marine areas. It is also important to protect the marine ecological functions. This includes steps to ensure that the water, seabed, and coastal areas are of a quality that allows natural plant and animal life. The shallow Danish marine areas contain a wealth of international natural assets that Denmark has an obligation to protect. A crucial factor in protection of this nature is a significant reduction in the impacts on nature from e.g. nutrients, environmentally hazardous substances, and fishery. In addition to this, it is important to preserve the genetic diversity of individual species and populations. Such genetic diversity serves as the basis for the ability of species and populations to adapt to changes in the environmental conditions, thus ensuring continued biological development.

The Committee recommends the designation of one or several marine areas as targets of restrictions on usage. Such restrictions must respect the rules on the Danish state’s sovereignty of its territorial waters. These designated areas should be laid out for a five-year trial scheme, during which the area and project should be monitored and assessed with a view to continuation of the trial project and further designations of such areas, if applicable. Such designation must be carried out after specific assessment to identify suitable areas, the expected impact on the marine ecosystem, and the stakeholder interests that will be affected. The designation process must incorporate an assessment of the consequences in terms of socio-economics as well as of local and commercial costs; including an assessment of the opportunities for allowing certain types of non-intrusive fishery. The relevant authorities, users, and research institutions must be included in the designation process.

The Committee assumes that the reduction targets set out in the Aquatic Environment Plans I and II will be met, and that regular assessments are being carried out of the possibilities of and need for further limitations of discharges of nutrients into the aquatic environment in order to achieve good ecological conditions in near-shore waters. The Committee recommends that work continue on the national and international targets already set for the quality (in terms of nature and the environment) of open marine areas. The objective of such work will be to assess the need for further efforts and follow-up in the form of co-operation between authorities, monitoring, etc., in order to achieve good ecological conditions in these marine areas. Such work must, to the extent necessary, be carried out in conjunction with efforts regarding quality targets and aquatic-area plans for coastal waters, as well as with international work within this area. This means that Denmark should continue its efforts within international co-operation, i.e. its work on determining targets and target systems for the ocean. Such work should aim at matching the pace of the timeframe for implementation of the Water Framework Directive.

The Committee also recommends that Denmark should continue to work actively – nationally as well as internationally – to reduce marine pollution from ships, ship-bottom paints, dumping of contaminated materials, and discharges of oil, etc., from platforms. Work should also be carried out to minimise the risk of accidents involving ships.

Protection of reefs and other hard seabeds

Hard seabeds, including reefs, have a special significance to the biodiversity of oceans. This type of seabed features particularly rich growths of benthic (bottom) algae. Reefs and hard seabeds serve a very important function as “pantry” for fish and birds, and thickets of seaweed offer protection for fish and fry. Finally, reefs form the habitat for a number of animals living freely among the stones. In many places, hard seabeds have been changed towards a more uniform structure without any variation in stone size due to decades of fishing with trawling equipment. Similarly, many reefs

were reduced in size and scope up until the mid-1990s, as stones and boulders were removed from the seabed to be used elsewhere (stone dredging). The existing charts and maps of hard seabeds, and the descriptions available of this type of natural habitat, are insufficient to serve as a basis for future marine nature management.

As a type of natural habitat, reefs fall within the scope of the Habitat Directive, and they now enjoy protection against stone dredging. This is because the Danish Raw Materials Act only allows the removal of a limited amount of stones and boulders from specific geographic areas that have been subjected to environmental assessment.

The Committee recommends a continuation of the efforts to map the hard seabeds and reefs, and there are tentative plans to introduce general protection of reefs as a type of natural habitat. The Committee also recommends more detailed assessment of the need and opportunities for restoring a number of specific reef areas that have been destroyed due to stone dredging.

Safeguarding clean lakes and watercourses

The Committee recommends the preparation of a national action plan to safeguard the quality of clean lakes, including the valuable and clear-watered lobelia lakes, as well as of unpolluted, unregulated watercourses, brooks, springs, sources, and founts. This action plan must take as its point of departure the concept of holistic management of these watercourses and lakes, the watercourse systems of which they are part, all significant sources of pollution, and the use of the surrounding banks and shore zones. The most serious threats to clear-water lakes and watercourses include nutrients and pollution from substances with acidifying effects from adjoining areas. Specific management measures may include the designation of field margin strips around the few remaining clear-water lakes and watercourses, agreements on more extensive farming, and the establishment of water-meadows in areas surrounding such lakes and watercourses.

Keeping natural and semi-natural habitats open

Open natural and semi-natural habitats are a special and very important part of Danish nature. This designation denotes a number of different habitat types: dunes, heaths, dry grassland, salt meadows, fresh meadows, and bogs; each featuring their own special fauna and flora. The balance between natural conditions and impact from farming varies greatly; ranging from dunes, where almost no farming has or should take place, to meadows and dry grassland, where there is great need for regular extensive farming. All of these natural habitat types are protected against change in their state and condition under Section 3 of the Danish Protection of Nature Act. Dunes are also protected under Section 8 of the same Act.

Overgrowing due to cessation of grazing, hay harvesting or other types of extensive farming, as well as draining, lowering of water levels, and impacts from nitrogen constitute the most serious threats to biodiversity within the open natural and semi-natural habitats. This means that continued extensive farming of these semi-natural areas is crucial to protect their valuable nature. As the necessary extensive grazing and hay harvesting is often not financially viable for individual farmers, there is a need to take steps to ensure that these methods of farming are also used in future.

A study of nature management within Danish counties, carried out by the Danish Forest and Landscape Research Institute on the basis of information submitted by the counties, indicates that the resources allocated for planning and execution of nature management fall short of requirements. This applies in particular to those natural areas that are not protected or which do not fall within the

scope of agri-environmental agreements. The study shows that protected areas where the counties have the right of management are assigned high priority in general management efforts. This applies correspondingly to state-owned areas where the Danish State is responsible for carrying out management.

There is an insufficient information on the current state and need for management of many natural areas. This lack of knowledge means that it is not possible to make nature-management efforts sufficiently target-specific. All counties carry out nature management, but they do so in varying degrees and in accordance with varying criteria. Several counties have implemented or initiated nature-quality planning. Nationwide nature-quality planning and nature monitoring carried out in accordance with consistent criteria and methods can significantly increase our knowledge of the state and condition of natural areas. Such measures would also create a basis for prioritising and targeting nature management in accordance with national as well as regional targets, including targets regarding the interplay between nature and agricultural cultivation.

Most of the areas under nature management programmes are heaths, as these areas are mostly owned by the State and have been designated for protection. By contrast, only slightly more than half of all salt meadows fall within the scope of similar management programmes, whereas this is true of one-third of the dry grassland and one-quarter of the bogs and fresh meadows. On the basis of information submitted by the Danish counties, the Research Institute estimates that a quarter of all Section 3 areas with public right of management are in need of further management, or are subjected to inappropriate management. Approximately two-thirds of all Section 3 areas without public right of management fall within this group.

The Committee recommends a strengthening of nature-management efforts for areas that are protected under Section 3 of the Danish Protection of Nature Act. This is to be done through target-specific and prioritised efforts in nature-quality planning. The objective of such planning as regards Section 3 areas is to ensure the interplay between nature and agricultural activity, and will constitute part of the implementation of the Natura 2000 Directives. Such implementation will include measures to make the following initiatives more target-specific: voluntary agreements, including the agri-environmental schemes; EU schemes relating to set-aside land, etc.; any environmental regulations or legislation; and measures concerning distribution of land. Furthermore, management of nature must be strengthened at all levels.

In this connection, steps should be taken to incorporate the experience and knowledge of financially effective management of nature gathered by the Division for Land Consolidation in Tønder under the Directorate for Food, Fisheries and Agri Business in collaboration with Danish counties and the Danish Forest and Nature Agency. For example, positive results have been achieved by collecting small grazing areas into larger units. The Committee considers that in general, efforts should target financially sound methods of grazing of natural areas. It also finds that there is a need to carry out further development of models of activity/operation that take into account the varying degrees of sensitivity of the different natural areas, as well as the use of dairy cattle.

As one instrument to ensure grazing of the most important Section 3 areas, a grazing scheme based on experience from the Danish Ministry of Food, Agriculture and Fisheries farm  of the areas in Margrethe Kog may be introduced. Such a grazing scheme must provide a public authority with the opportunity to ensure management of the protected areas. Such management should primarily be carried out by renting grazing rights to farmers or grazing co-operatives.

Similarly, steps should be taken to benefit from the Division for Land Consolidation and the Danish Forest and Nature Agency's experience of carrying out nature projects by means of land distribution and safeguarding the grazing and management necessary in collaboration with land owners and agricultural organisations. It will often be an advantage to join up Section 3 areas wherever possible, forming larger units by means of joint fencing and supervision. In a number of cases, land distribution may also prove advantageous.

In a ruling from June 2001 in a case concerning protection of dry grassland, the Danish Nature Protection Board of Appeal has interpreted Section 3 of the Danish Protection of Nature Act in a manner which limits protection of this type of natural habitat to include, in principle, only actual historic commons - i.e. commons that can be proven to have been used as such since the enclosure movement took effect 200 years ago – and coastal hillsides. This has effected a radical change in the basis hitherto used for management of protection of Danish dry grassland, as most dry grassland – an estimated 60-70 per cent of the total dry grassland area, including a number of the most valuable large dry grassland – is now no longer protected.

The Committee recommends the introduction of permanent safeguards for this very valuable type of natural habitat, so that biological dry grassland is also protected.

The Committee also recommends that an action plan to safeguard raised bogs be prepared.

Fewer nutrients and pesticides in nature

The critical loads for nutrients in nature have been exceeded in many natural areas. This applies in particular to nitrogen and phosphorus, but pesticide use on adjacent agricultural areas can also pose a problem to certain natural areas, e.g. due to driftage.

As a result, the Committee recommends the introduction of a ban on fertilisation of dry grassland, heaths, salt meadows, and bogs that are protected against changes in their current state in accordance with Section 3 of the Danish Protection of Nature Act. If the area forms part of the land-livestock balance area of a given farm, an individual solution must be found. Such a ban should also apply to the use of pesticides in these areas, as well as in areas that fall within the scope of Section 4 of this Act (relating to protection of stone and earth dikes). For Section 3 areas, however, it must be possible to use herbicides at selected points against unwanted vegetation such as thistles and nettles.

In addition to this, the Committee recommends a reduction of direct and indirect contributions of nutrients and pesticides to high-priority, dry natural areas, including semi-natural areas and small biotopes that fall within the scope of Section 3. Similar reductions are also recommended for wet natural areas that have been ranked highly in assessments (bogs, watercourses, lakes, fiords, bays, straits and other marine areas). This may be done through a voluntary designation of field margin strips around the areas specified above. Such border zones must be at least 10 metres wide and be free of cultivation and/or fertiliser and pesticide use. Such designation should be carried out in accordance with a prioritised sequence upon specific assessment of the relevant areas' needs. It should be effected through more target-specific usage of the set-aside scheme and environmentally-friendly agricultural measures.

As follow-up to the work carried out by the Bichel Committee, the Wilhjelm Committee recommends that committee work should be initiated as soon as possible regarding the overall

consequences of reduced pesticide use in private forests, and on a reassessment of the use of rodenticides in forestry. As regards pesticides, such committee efforts are to form the basis for future strategies regarding reduction of pesticide use in forestry in line with the reduction targets set for the other sectors.

Large quantities of phosphorus have accumulated in Danish agricultural soil, and the main contribution to over-fertilisation with phosphorus of fresh water and marine areas now stems from this source. The Committee finds that the solution to this problem must, among other things, be viewed in conjunction with a proposal on a significant increase in the extent of meadow areas near watercourses. This is because the deterioration and degradation of areas near watercourses due to intensive cultivation constitutes a significant source of the increased quantities of phosphorus in lakes and fiords. The Committee recommends that work be carried out to identify and solve phosphorus problems in agriculture. One aspect of this work will involve the production of necessary knowledge to serve as the basis for target-specific, continued efforts directed against diffuse discharges of nutrients, including phosphorus, from agriculture. Such knowledge should be available by the end of the Agreement of the Aquatic Environment Plan II in 2003.

In this context, the Committee recommends that the potential offered by organic agriculture be incorporated - both with a view to a general reduction in overall pesticide use, and in the form of a prioritisation of organic farming in particularly sensitive areas.

Buffer zones around particularly sensitive nature

Based on the critical loads of various natural and semi-natural habitat types, it has been ascertained that there is a need to protect particularly vulnerable natural areas against air pollution with nitrogen as the result of emissions of ammonia. The natural areas in question have critical loads of between 5 and 15 kg nitrogen per hectare per year. The present level of the total, average pollution – comprising local, regional, and international contributions of ammonia nitrogen – comes to slightly less than 15 kg nitrogen per hectare per year. Even if all Danish agricultural production ceased, contributions from other sources in the form of domestic and foreign emissions of nitrogen oxides and foreign emissions of ammonia nitrogen would cause average deposits in Denmark of approximately 7 kg nitrogen per hectare per year.

The local and regional contributions to air pollution from ammonia nitrogen – which combine to comprise slightly less than half the total contributions of airborne nitrogen – stem mainly from ammonia discharges from point sources such as livestock sheds and manure storage plants at animal farms and ammonia emissions from manuring fields.

Local contributions of ammonia nitrogen from a specific point source may be as high as 120 kg nitrogen per hectare per year or more in the immediate vicinity of the relevant point source. Due to the dilution effect, the deposit of nitrogen decreases rapidly in proportion to the distance from the relevant point source. At distances of 100 and 200 m respectively from a given point source, the total nitrogen contributions will have fallen to annual averages per hectare per year of approximately 30 and 20 kg, respectively. At a distance of 300 m, the contribution from the relevant point source will have fallen to a few kg of nitrogen per hectare, and such contributions will usually be less than 1 kg of nitrogen per hectare per year at distances of 4-500 m. These distances and nitrogen contributions are based on the most recent knowledge and model calculations, which incorporate a number of assumptions on e.g. farm size and ammonia dilution in air. They are subject to some uncertainty.

On the basis of nature-quality planning, protection of particularly vulnerable natural habitat types against airborne ammonia should be carried out by establishing buffer zones around the various natural areas. Requirements relating to ammonia emissions from livestock sheds and manure plants will be stipulated for these zones. If the agricultural sector is able to comply with the requirements on impacts by means of technological solutions, etc., farmers will still be able to establish livestock facilities in the relevant areas. As far as manuring is concerned, requirements may be stipulated on the technology used to spread such manure and slurry, e.g. requirements on insertion and use of trailing hoses for established crops.

Special protection should apply to all raised bogs, all lobelia lakes, all – as a point of departure – heaths larger than 10 hectares, and all endangered and low-nutrient dry grassland larger than 2.5 hectares, as well as all endangered heaths, dry grassland, and other particularly vulnerable types of natural habitat such as springs and founts, bogs and other fen areas, brown-water lakes and lakes with low nutrient content in the Natura 2000 sites.

The buffer zones must be delimited and the requirements on ammonia emissions set on the basis of an initial distance of 300 m, to be amended in accordance with specific assessment of the condition and vulnerability of each location, wind conditions, the scabrousness of the terrain, etc. Such assessment must be carried out in accordance with the documented professional data available. When establishing buffer zones, potential new livestock farms and extensions to existing livestock farms in the relevant areas must be assessed in accordance with the requirements set. In this connection, no position has yet been adopted on any problems relating to existing livestock farms within the buffer zones. This issue will be addressed later.

Pollution from airborne ammonia nitrogen is already considered a serious threat to the quality of nature and an obstacle to efforts to maintain a favourable conservation status in particularly valuable natural areas. As a result, the Committee recommends that immediate measures be taken to preserve selected natural habitat types that are particularly vulnerable to ammonia nitrogen.

This has occasioned a proposal to carry out prioritised efforts to protect all raised bogs, all lobelia lakes, all heaths larger than 10 hectares, and high-priority endangered dry grassland larger than 2.5 hectares. These specific sites will be designated within six months, and buffer zones of 300 metres will be laid out. Within these zones, it will not be possible to establish new livestock facilities that increase local ammonia impacts before specific assessment has been carried out to determine the final outline of the buffer zone. Nor will establishment of new facilities be allowed until the requirements on ammonia emissions have been set for the relevant area. Such assessment must be carried out as quickly as possible. It must be carried out as soon as an application for expansion of livestock farms is submitted.

It is presupposed that ongoing work will be carried further in order to continue to reduce ambient contributions to the total average airborne nitrogen pollution from agriculture, transport, energy generation, etc. This work must target international, regional, and local contributions alike. Such efforts include the application of the 2001 Ammonia Action Plan as well as ongoing international collaborative efforts to reduce ammonia losses. It is also assumed that ammonia emissions from livestock sheds and manure storage plants will continue to drop. This issue will be evaluated in 2004, taking into account all sources.

The Committee recommends setting up a working group to address any unresolved issues relating to the establishment of buffer zones, etc.

Environmentally hazardous substances are kept in check

The Committee draws attention to the fact that the Danish government strategy for sustainable development includes a target specifying that by 2020, emissions and discharges of substances that are harmful to health and/or the environment into air, soil, and water may no longer take place. The Committee considers it important to ensure extended assessment, classification, and monitoring of both old and new chemical substances on the basis of their properties and potential environmental impacts. On this basis, there should be an ongoing decision-making process to determine whether a given substance may still be used, whether usage should be limited, whether other substances should replace a substance, or whether use of a given substance should cease altogether. A strategy for assessment and monitoring should be prepared in order to identify substance incidence and effect, making it possible to detect these things as soon as possible. This strategy should include an investigation of the opportunities for using screening.

More nature – more space and better coherence

The extent of Danish areas of nature and semi-natural habitats has been reduced so much that an expansion of this area is in itself a precondition for improving the quality of nature in many places. More space and larger natural areas give rise to nature that is more resilient and adaptable.

In addition to this, better nature quality should be created by ensuring a greater degree of interconnectedness between the various natural areas. This allows plants and animals better chance to spread, and it gives nature freer rein within the natural areas. At the same time, larger and more consistent natural areas provide greater scope for outdoor activities and exploration of nature.

Nature in arable land can be improved through changes in farming practices. This is why the opportunities presented by e.g. organic farming as regards contributions towards reaching the targets set for nature and the environment should be identified with a view to appropriate application of these opportunities.

National natural areas should be designated

The Committee finds that one important element is missing before Denmark's efforts to protect nature will be able to match the work carried out by other countries in terms of continuity in nature and target-specific initiatives. This element is the establishment of large natural areas with special plans for protection, management and development, and with targets, contents and timeframes that exist separately from, and are included as part of, regional planning.

The objective of establishing large-scale natural areas – national natural areas – is to increase the size of natural and semi-natural areas in order to create links and coherence between the natural habitat types as well as to ensure a favourable conservation status for the natural habitat types and species in the area. This will include steps to safeguard continuity. This will also offer nature better opportunities for developing and evolving freely (free dynamics) within the larger areas. This will increase the quality of nature and promote natural adaptability. In these areas, protection of nature must take priority over cultivation. At the same time, the objective of the national natural areas is to improve the general public's opportunity for enjoying outdoor recreation.

The Committee recommends that the Danish State establish a number of national natural areas as part of the 2005 regional plan revision. The Committee wishes to point to the following six areas:

- Heath and dune landscapes in Thy (dunes, dune heaths, dune plantations and lakes).
- “Lille Vildmose” (raised bog, forest, dry grassland).
- Mols Bjerger, Stubbe Sø, and Helgenæs (dry grassland, heaths, plantations, lake, coastlines and coves).
- Gribskov and Esrum Sø (forest, untouched forest, grazing forest, lake).
- The South-Funen Archipelago (salt meadows, coves, shallow marine areas).
- Høje Møn (cliffs, forest, dry grassland, etc.)

The national natural areas should be gradually developed on the basis of the core areas mentioned above. These core areas mainly comprise state-owned natural areas and forests. The South-Funen Archipelago, however, comprises the actual archipelago itself, and the Lille Vildmose area includes the bogs and forests owned by foundations, companies, and the Danish State respectively.

On the basis of the Danish State’s decision to establish these national natural areas, the areas will be designated and delimited in greater detail as part of regional planning. The landowners, local residents, and local authorities concerned will be involved in this process. Preliminary guidelines for the establishment and administration of the areas will be laid down. Designation must be carried out *after* initial assessment of the financial consequences to society and commercial interests and of the regional impact of such designation and the restrictions it entails. For each area, a plan for the protection, management, and development of the area must be prepared. Similarly, an advisory and coordinating committee should be set up for each area. Issues relating to the administration and structure of the areas must also be considered in greater detail as part of the committee work specified below.

Part of the reason why these areas were chosen is their international and national value in terms of protection of nature. Emphasis has also been placed on the fact that they are of considerable importance to outdoor recreation, and that the central parts of these areas are typically owned or administered by the Danish State. The areas will be developed through voluntary incorporation of adjoining areas. Agriculture will be rendered more extensive in these areas, e.g. by means of the agri-environmental schemes, nature restoration and possibly through adjustment of the boundaries of neighbouring properties by the exchange of land, conservation orders, and state purchases of land. For privately owned forest areas, the main tool used will normally be agreements in accordance with the provisions laid down in the Danish Forest Act.

Finally, it is recommended that a national committee be set up under the Danish Forest and Nature Agency. This committee will comprise representatives for the stakeholder organisations and authorities concerned, and will be responsible for preparing the overall principles governing the national natural areas. This will include overall principles on how such areas are to be planned, managed, and developed.

At present, there is no professional basis for establishing national natural areas at sea, but it is recommended that one or more areas should be designated as national natural areas on a trial basis.

Significant growth in Denmark's natural and forest areas

The Committee recommends a significant increase in the extent of semi-natural habitat areas in Denmark during a 10-15 year period. These efforts should be based on nature-quality planning, and the areas are to be designated on the basis of voluntary agreements with their owners. An important point of departure is the great potential for improvements of nature in connection with the restoration of meadows in connection to watercourses in Danish river valleys. The river valleys offer particularly good opportunities for accommodating many different concerns at one and the same time: ecological interconnectedness with watercourses, less need for watercourse maintenance, ecological dispersal corridors, nitrogen and phosphorus retention, and relatively few negative consequences to the agricultural sector. In addition to this, a significant part of all set-aside land can be found in the river valleys, and this land may, on certain preconditions, be transformed into natural areas. The area extent of dry grassland should also be increased. Such increases should primarily take place in connection with existing dry grassland. Furthermore, larger single areas of salt meadows should be enhanced by restoring more salt meadows. Overall, it is recommended that the total area of meadows near watercourses, dry grassland and salt meadows should be increased by 100,000 hectares. This increase is to be effected in interplay with the targets laid down in the Aquatic Environment Plan II. It is estimated that a significant percentage of the 100,000 hectares necessary can be obtained through focused and target-specific use of the set-aside scheme.

The total area of small biotopes should also be increased in the 10-15 years to come. These areas should be established on the basis of voluntary agreements with the owners. The main emphasis should be placed on the restoration of small wetlands, ponds, and watercourses with areas connecting them, as well as on hedgerows to serve as connecting paths for plants and animals (ecological dispersal corridors).

Planning relating to afforestation in general and specifically with respect to its value to biodiversity should be strengthened. The latter objective is to be reached through more target-specific subsidy schemes. It is also recommended that afforestation projects should, by 2004, assign greater priority to biodiversity issues when establishing new forests as well as areas for natural succession and natural areas in these new forests. The objective should be to plant new forest on no more than 80 per cent of the total area included in afforestation projects, allowing the remaining 20 per cent or more to be open areas which the forest can claim for itself, or which can be kept open by means of grazing, etc.

On the basis of the proposed approximately 100,000-hectare increase in the extent of dry grassland, salt meadows, and meadow areas in connection to watercourses, the Committee recommends the inclusion of this proposal in the existing afforestation targets. This will result in comprehensive overall objectives and targets for increasing the extent of forest and natural areas in Denmark.

10 per cent of all forests should be designated for biodiversity purposes

The Committee recommends that for 10 per cent of the existing forest area at any time (currently approximately 40,000 hectares), the primary target in management should be biodiversity. This should include restoration of the natural water balance. The areas designated for this purpose should primarily comprise areas of untouched forest, forest areas characterised by "old" management types and special natural qualities, and areas for free natural succession. The objective is to protect and build up existing natural assets by safeguarding varied habitats and viable populations of native plants and animals.

The 10 per cent target must be reached by 2040. For Danish State forests, this target must be incorporated in management plans within the next five years.

As part of the overall target set for 2040, the Committee recommends the setting of an interim target. This target is to stipulate that by 2012, a total of 25,000 hectares of untouched forest, etc., must be designated. These efforts are to be targeted specifically at the areas designated through the registration of natural forests, with particular focus on the most valuable areas. In 2012, untouched forest must account for at least half of the 25,000 hectares specified.

Assessment of the efforts made must be carried out in 2012 in order to ensure that the overall target for 2040 can be maintained.

The Committee also recommends the implementation of amendments to the Danish Forest Act in order to promote biodiversity. Such amendments may include measures to create better conditions for forests for natural succession, grazing forests, coppice forests, and untouched forests.

Bringing back water to the Danish landscape

The Committee recommends that the restoration of natural water balances in larger parts of the Danish landscape should be an overall objective. The initiatives taken to promote this objective include the Committee proposals for a gradual transition to nature-friendly and sustainable forestry and for designating 10 per cent of the total forest area for management where biodiversity is the primary objective. The proposal on significant increases in the extent of meadow areas interconnected to watercourses will also help to promote restoration of water balances.

These proposals will increase and recreate the interplay between watercourses and the areas surrounding them. The self-purifying effects of watercourses will be put to better use, and the value of river valleys as ecological dispersal corridors will be increased, thus boosting the overall quality of nature. At the same time, planning and management of river valleys as interconnected areas will constitute an important element in the implementation of the Water Framework Directive.

More nature in watercourses

The Committee recommends that steps be taken to improve physical conditions in watercourses. This is important in order to meet the quality targets. In particular, high priority should be assigned to restoring watercourses by promoting natural meandering through changes in maintenance practices. Measures should also be taken to promote the ongoing efforts to remove obstructions (dams, weirs, etc.) and safeguard the natural course of watercourses with free passage for plants and animals, including migrating fish. These efforts must be carried out while bearing in mind the cultural-historical interests associated with watercourses. More attention should also be focused on ensuring water flow in “dead” watercourse stretches.

Promoting the efforts outlined above may be done by allocating a greater proportion of the profits made from fishing licenses to restoration of watercourses, and by changing the priorities of public-sector nature restoration and management. Releases of fish should also be reduced as watercourse quality improves.

The Danish Watercourse Act must be revised before 2004 as a result of the Water Framework Directive. The Committee recommends a revision of the objective and management structure of this Act, allowing it to more accurately reflect the multiple purposes of watercourses. These purposes

include: drainage, the function as ecological dispersal corridors between land-based and marine nature, safeguarding biodiversity, recreation/outdoor activities, teaching, etc.

Steps should be taken to create better opportunities for omitting maintenance or promoting careful maintenance, to promote free meandering, to establish flexible protective borders around watercourses and lakes, and to maintain efforts to reduce impacts from drainage. These efforts may only be carried out insofar as they do not affect drainage which has up until now formed the basis for agricultural cultivation in adjoining areas. They should be viewed within the context of the establishment of water-meadows in accordance with the Aquatic Environment Plan II.

More life in lakes

The development of Danish lakes from the early 1900s to the 1970s is characterised by extensive impacts from nutrients. Lakes that used to contain rich and fertile plant and animal life have experienced marked increases in plant plankton growth, reductions in the number of underwater plants, and a shift from being the habitat of many plant and animal species to containing only very few species that thrive on the high nutrient levels.

The Committee recommends that the overall objective should be clean lakes, and that the variation in lake types should be maintained, ranging from large, deep lakes to small ponds, either naturally rich or poor in nutrients.

As a result, the Committee recommends that general steps should be taken to recreate the wealth and diversity of lake flora and fauna. This is to be done by focusing attention on cultivation methods in the areas surrounding the lakes in order to reduce contributions of nutrients (particularly phosphorus) and xenobiotic substances to lakes. Put-and-take fishing and pollution from duck breeding should also be taken into account. Other important tools to be used include the restoration of meadows and removal of drainage pipes with discharge points in lakes. This may be carried out in connection with establishment of water-meadows under the Aquatic Environment Plan II or nature restoration projects. In lakes where external impact factors have been sufficiently reduced, lake restoration may sometimes be a good way of improving their condition.

The Committee also recommends that more attention be paid to the more than 100,000 small lakes, ponds, etc., dotted around the Danish landscape. These natural habitat types are important habitats for e.g. amphibians and act as shelters to several rare species of plant and animal life. Small lakes should also fall within the scope of quality targets and be managed with a view to preserving biodiversity. This should be done by safeguarding existing high-quality small lakes, and by making an effort to improve the quality of the other small lakes. A set of common guidelines on monitoring small lakes is currently being prepared.

Promoting free dynamics

The Committee recommends that freely dynamic nature – i.e. nature that is allowed to develop and evolve undisturbed within a given area – be included as an element in nature management to a significantly higher degree than is presently the case. Nature-quality planning offers a basis for assessing where it may be expedient to cease cultivation of areas, allowing them to become overgrown and evolve freely.

Free dynamics and free overgrowing should typically be ensured in natural forests, deciduous forests, dunes, watercourses, the sea, wetlands along watercourses and coastlines, in connection

with establishment of national natural areas, etc., and as part of private and state afforestation. As regards dunes, reduced control of sand drifts and phase-out of near-shore parts of dune plantations are significant areas, where the Danish State in particular has a chance to help create greater dynamic. Maintaining free dynamics in grey dunes will also require regular management, e.g. removal of migrating firs, etc.

Better interconnectedness between natural areas

The Committee recommends that the steps taken in connection with the 2005 regional plan revision should include revision, follow-up and additional designations relating to the national network of ecological connecting lines between natural areas. This work should take the following types of natural corridors as its starting point:

- Watercourse systems, lakes, fiords, and bank/shore zones.
- Wet natural habitat types, meadows, bogs, and swamps.
- Dry natural habitat types, dry grassland, and heaths.
- Wooded natural habitat types, forest fringes, deciduous forests, and slope forests.
- Coasts, dunes, dune heaths, salt meadows, and coastal slopes/cliffs.
- Landscape elements with high densities of habitats for a given species, e.g. amphibians, butterflies, or rare flowers. Such elements may include old valuable hedgerows and stone dikes.
- Resting areas, mainly for migrating birds.

Existing connection lines should be preserved and improved, and new ones should be established. The ecological quality of a given corridor should correspond to the requirements set by the biodiversity to be accommodated. Steps should be taken to ensure cohesion and consistency across administrative boundaries. Where feasible, steps should also be taken to establish connections between the various Natura 2000 sites and between these sites and other valuable natural areas. Significant barriers to the spread of species within ecological dispersal corridors must be mapped in order to prioritise fauna passages in the existing network of roads and railway tracks. The planning relating to ecological connecting lines should be viewed in conjunction with the nature-quality planning proposed by the Committee, featuring a ranking of the natural areas to be connected.

The Committee recommends a continuation of the efforts made to establish fauna passages in connection with existing roads and railways. The Committee also recommends amendments to the subsidy scheme for planting hedgerows, allowing this scheme to grant subsidies for preservation and maintenance of certain old hedgerows.

More target-specific nature restoration and conservation of nature

Restoration of nature serves various purposes, including enhancement of biodiversity, creation of better opportunities for outdoor activities, and protection of the cultural-historical assets of our landscape. Usually, efforts are made to accommodate several of these objectives at the same time. This makes sense from a professional point of view, and also serves to counteract area competition.

Future efforts relating to nature restoration should primarily focus on improving valuable existing natural and semi-natural areas with long-term continuity (Section 3 areas), and on expanding and reinforcing connections between existing, valuable areas, e.g. for river valleys, dry grassland, and salt meadows. Following this, high priority should be assigned to improving conditions in the Natura 2000 sites. This will form part of the work carried out to render a number of measures for

protection of nature more target-specific, aiming directly at these areas. Finally, emphasis should be placed on improving the quality of other valuable natural areas, including the national natural areas. The need for restoration of a number of marine natural habitat types should also be identified with a view to determining whether these areas merit greater attention.

Like restoration of nature, conservation can serve to further and promote a number of different objectives, e.g. protection of landscapes, biodiversity, cultural-historical values, recreation, etc. As a result, conservation should remain an important tool in permanent protection of nature.

The Committee recommends the preparation of a new plan for conservation, revising the criteria for instituting conservations and the prioritisation of the objectives targeted by conservation. Where the objective is to promote biodiversity, higher priority should be assigned to conservation that promotes a good conservation status within Natura 2000 sites, and which contributes to safeguarding national natural areas. In future, specific prioritisation of conservations should be carried out in form of rolling planning.

A better basis for target-specific nature management

The basis for nature management should be continually developed by setting quantitative and qualitative targets for nature at national, regional, and local levels. These targets should form part of overall nature-quality planning. The necessary prioritised efforts as well as regular monitoring should follow this planning. Nature management plans should include provisions for subsequent follow-up of the results of such monitoring.

Moreover, steps should be taken to carry out research and develop new tools to render general efforts more effective, thus helping to reach the targets set. Nature management should be improved, both by introducing a number of new measures, such as nature-quality planning and designation of national natural areas, as well by rendering existing measures more target-specific and coordinated. Examples of such existing measures include economic measures, restoration of nature, and legislative updates. International sources of data, etc., should also be employed.

As yet, the data basis available on Danish nature management is insufficient. We do not have enough knowledge on the state and development of Denmark's nature or on the various elements that influence it. As a result, the current nature management efforts are not sufficiently target-specific.

Targeting and prioritisation according to nature quality

The Committee recommends that steps be taken to render protection of nature more target specific, and to rank the efforts made in accordance with the following qualities of nature:

Valuable existing natural and semi-natural areas (Section 3 areas) and marine habitat types, regardless of their location.

2. Other natural and semi-natural areas (Section 3 areas) within Natura 2000 sites, national natural areas, and near-shore waters.
3. Other natural and semi-natural areas (Section 3 areas) outside of Natura 2000 sites and national natural areas and in open waters.
4. New natural and semi-natural areas within Natura 2000 sites and national natural areas (may be assigned higher priority than item 3 areas of poor quality).

5. New natural and semi-natural areas outside Natura 2000 sites and national natural areas that are ecologically linked to other natural areas.

Planning for the quality of nature

The Committee recommends that a decision be made to carry out nature-quality planning in all counties in connection with the 2005 regional plan revision as part of overall nature management. As a basis for this nature-quality planning, the Committee recommends that the Danish Forest and Nature Agency and the Danish counties should cooperate with relevant research institutions and the local authorities to prepare a common system relating to natural areas. This system is to be used to set targets for and assess the value of these natural areas. Preparation of this system should include development of nature-quality planning that supports state, county and local-authority measures with respect to nature and the environment. It should also be possible to apply the targets set within the system and the data collected about the natural areas in monitoring of protected types of natural habitat.

Nature-quality planning will be an excellent tool for assigning priorities to specific nature-management efforts such as management of nature, establishment of ecological dispersal corridors, conservation, restoration of nature, monitoring of nature, public-sector land purchases, designation of Particularly Sensitive Agricultural areas, and agreements on protection and management of nature. Similarly, nature-quality planning will assist administration of Danish legislation relating to protection of nature. This makes it possible to target a significant part of all Danish nature-management work at all levels of authority, aiming specifically at the most valuable natural areas. In addition to this, nature-quality management should assess the potential for transforming cultivated areas into semi-natural areas, e.g. in connection with restoration of interconnected meadows near watercourses, large-scale interconnected dry grassland, etc.

Finally, nature-quality planning can contribute to political dialogue and public debate on the priorities within nature management.

The Committee also recommends that the Danish Forest and Nature Agency should be in charge of carrying out a pilot project on uniform methods for landscape assessment in collaboration with the authorities of a given county. Such collaboration will involve testing the British principles of landscape assessment, as well as incorporation of new Danish data collected by the county authorities of Roskilde and elsewhere. The objective is to arrive at a fully tested method for landscape assessment in Denmark as part of the 2009 regional plan revision.

Monitoring of nature should be developed into a comprehensive programme

The Committee recommends that steps should be taken as soon as possible to develop a single, comprehensive Danish programme for monitoring nature and the environment. This programme must firstly include monitoring of all natural and semi-natural habitat types on land, including forests (terrestrial natural habitat types). These habitat types have been very much neglected in the efforts made so far. Secondly, the programme must incorporate biodiversity issues in monitoring of the aquatic environment (freshwater areas *and* marine areas). The preparation of this programme should draw on results and experience from the monitoring already carried out, as well as on international data, particularly from European sources.

The Danish Environmental Research Institute has overall responsibility for nature monitoring, which is normally carried out by county authorities. A special Agreement Committee has been set

up, comprising representatives of the Danish Environmental Research Institute, the agencies concerned, and the Association of County Councils in Denmark. The objective of this Committee is to coordinate design and implementation of the measures to monitor nature and the environment.

The objective of nature monitoring is to keep tabs on the state of Danish nature, development trends, and the most significant impact factors. The aspects to be monitored include whether the targets specified have been met and whether current development trends are favourable. Indicators, methods, etc., must be determined and tested before an overall programme is implemented. During the design stage, the targets relating to natural and semi-natural habitat types and species should be developed further at the same time as monitoring is carried out for the first time.

Nature monitoring should eventually be extended in scope, allowing it to elucidate the status of species release and immigration in Denmark.

The special monitoring of natural and semi-natural habitat types and species that fall within the scope of international obligations (particularly the Habitat Directive) and the general monitoring programme for the various natural and semi-natural habitat types (including forests) should be coordinated, fully prepared and ready for implementation in 2004, when the present monitoring programme expires.

This means that nature monitoring with respect to many areas can be implemented in 2004. In other areas, however, the data currently available is insufficient. This applies to marine natural habitat types, which have yet to be adequately charted. It also applies to genetic and microbiological biodiversity, where basic method-development work is needed.

The Committee also recommends that general monitoring measures should include monitoring carried out by nature organisations through volunteer work. Such volunteer monitoring should be subject to professional coordination and quality assurance, and the data collected should be stored in national databases, making the information available for use in nature management. Monitoring carried out by the land owners concerned can be of significance in connection with monitoring of e.g. Danish Red List species, but may be of even greater importance to assessment of the effect of agri-environmental agreements, etc. This kind of monitoring, based to a greater extent on contributions from the general public, is important in terms of promoting greater appreciation of nature and nature protection. It may also serve to shed light on aspects of the state and development of nature that would otherwise have remained unrecognised. In addition to this, monitoring should draw on other collections of data and statistics to the widest possible extent.

As regards forests, the Committee recommends that forest monitoring should be developed and initiated in 2004 at the latest. The objective of forest monitoring should be to enhance documentation of the multiple functions of forests, as well as to offer some contribution to total monitoring of nature and the environment across commercial sectors and natural and semi-natural habitat types.

In respect of fishery, the Committee finds that there is a need for a permanent extension of the basis for assessment of the actual catches made. This is to say that in order to assess the actual effect of fishing on fish population, it will be necessary to carry out regular studies of secondary catches and discards which may or cannot be taken ashore for whatever reason, as well as studies of landings in

foreign ports. These studies are to supplement the regularly updated statistics on landings in Danish ports.

More knowledge about nature and nature management

Through its work, the Committee has ascertained that knowledge building carried out hitherto has been insufficient. This is partly due to the fact that specific management measures have not focused enough on the relevant issue, and have not been sufficiently target-specific to secure the necessary build-up of knowledge.

However, the 1990s saw some focus on environmental research through interdisciplinary programmes and the Danish Environmental Research Programme. This means that knowledge, research environments, and interdisciplinary cooperation have also been brought about within a number of areas relating to biodiversity conservation. These programmes have been concluded or will conclude within the near future, and no steps have been taken to continue these efforts.

Denmark has just assumed the role as host of the international Global Biodiversity Information Facility (GBIF), which carries out work to secure Internet access to scientific information on biodiversity. This work should be followed up by national efforts.

On this basis, the Committee recommends that steps be taken to enhance national knowledge building on biodiversity. The Committee considers that this knowledge building, which is to form the basis for the conservation and sustainable use of significant natural/biodiversity resources, should mainly focus on the following:

- Expanding the basic knowledge available on the presence and spread of species, habitats, and natural and semi-natural habitat types; and increasing our understanding of genetic conditions and ecological processes and the interplay of these processes with basic geological conditions. Particularly as regards marine areas, there is a great, basic need to map the extent of natural and semi-natural habitat types and species, their state and the most important threats against them.
- Developing and establishing an overall, comprehensive programme for monitoring nature and the environment, aimed at ensuring collection of data and knowledge on the state of nature, the effects of nature management, and impacts on nature. Particularly high priority should be assigned to the build-up of a terrestrial nature-monitoring programme and development of indicators in order to bring about the necessary data for prioritised and target-specific nature management.
- Knowledge-based nature management. There is a need to enhance research on how existing natural areas are influenced by and can be safeguarded against the most significant environmental impacts to maintain and improve quality. Studies and monitoring should be carried out in connection with major management initiatives, including designation of national natural areas and corresponding marine areas, ecological dispersal corridors and fauna passages, nature-restoration projects, afforestation, various types of nature management, etc. It is important to extend the present level of knowledge on integrated management of biodiversity and ecological processes at landscape level. This includes additional data on how cultural-historical, agricultural, and aesthetic aspects can be incorporated in such management.

- Research cooperation relating to biodiversity and landscape management in order to maintain and develop the competencies developed through the research programmes carried out during the last decade. This may be done by establishing organisational “centres without walls” for biodiversity and landscape management, respectively, and by carrying out further development of existing collaborative measures, such as the Knowledge Centre for Countryside Planning.
- Sustainable utilisation of natural resources, with special focus on research into integration of biodiversity issues within the three primary sectors: agriculture, forestry, and fishing. These measures should include the following: research on how to safeguard biodiversity in forestry and nature-friendly forestry; extensive methods of farming; limitations on emissions of airborne nutrients from agriculture; dispersion models for ammonia; biodiversity protection in conventional and organic agriculture; and development of fishing equipment and selective fishing methods.
- Environmental economics and environmental sociology. Both of these issues are regarded as fundamental to the elucidation and assessment of the significance of nature and the environment to the well-being of the general public. For example, there is a need to promote studies to identify and analyse the general public’s attitudes to, use of and actions relating to nature, landscape, and the sea. This includes promotion of studies of how the public can be involved and become committed to planning and decision-making processes within nature policy-making. The methods used for financial assessment and other methods relating to environmental economic issues should also be developed. This will include measures to determine the costs and benefits involved in measures regarding nature and biodiversity. Finally, there is a need for knowledge on the effects of planning and use of other regulations with respect to nature and the environment, including the interplay between public-sector and private actors within this area.

Careful management of species and genetic resources

The Committee recommends the preparation of guidelines for species where there is a need for holistic management, including e.g. species that fall within the scope of international obligations; species of national responsibility; species that are rare, endangered or are of key ecological significance; and species that cause problems to commercial interests, recreation, or nature management.

Invasive species are non-native species that did not arrive in Denmark naturally, but which are competitive in our environment. This allows them to establish themselves in great numbers, displacing indigenous species. The very highest of priorities should be assigned to measures aimed at counteracting invasive species. A special action plan should be prepared with a view to preventing import of invasive species and combating their proliferation on land as well as within fresh and marine waters.

The existing regulations governing release of plant and animal species should be reviewed with a view to possible amendments. This work should include updates of the existing genetic and ecological recommendations on releases of fish in order to ensure conservation of natural fish populations and genetic diversity. Releases of fish from fish farms should cease within a five-year transitional period, and effective steps must be taken to prevent fish from escaping from fresh-water and marine fish farms. In order to preserve and promote use of native species of trees and shrubs, an

action plan on cultivation of seeds and plants for landscape purposes should be prepared by 2004. Finally, certain subsidy schemes should be changed so that subsidies for planting game shelters and hedgerows focus on indigenous species as native plant material becomes more readily available.

The Committee estimates that there is a need for new guidelines within a number of areas relating to species management. These areas include the release and unintentional introduction of non-native species in Denmark, release of indigenous species, releases for conservation purposes, reintroduction, immigration of new species, re-immigration of species, and conservation of genetic resources. These guidelines should be prepared by 2005 in collaboration with the authorities and commercial interests concerned. A key principle of these guidelines should be that no species may be released or reintroduced in Danish nature without prior assessment of the potential beneficial effects to society of such an action. The impact of the relevant species on nature should also be assessed, and a management plan must be prepared prior to release. It should, however, still be possible to use species that are already being used in agriculture, forestry, and private gardens.

The Danish Forest and Nature Agency should continue to inform and advise the general public as well as other authorities and the business community about the potential problems associated with the introduction of non-native species. Such information should be assigned high priority. These efforts should be supported by an overview of non-native species that may pose a threat to Danish ecosystems, and the Danish Forest and Nature Agency should work to establish international warning systems for invasive species, particularly within the North-European region.

Planning for agricultural land

The Committee considers that there is a need to amend Danish legislation in order to promote concern for landscape and natural and semi-natural areas when determining the location of livestock production and agricultural buildings and facilities in the countryside.

The Committee finds that better coherence should be established between the designation of areas under various schemes, national targets for the protection of nature, and use of subsidies for agriculture. As a result, the Committee recommends that further investigation be carried out of the opportunities for improving the interplay between regional planning within Danish counties, as well as of the designation of Particularly Sensitive Agricultural areas.

It is also recommended that designation of Particularly Sensitive Agricultural areas should be expanded to include more Section 3 areas. Such expansion should, however, be carried out while taking into account the priorities that form the basis for part of the present designation of Particularly Sensitive Agricultural areas. These priorities include ranking of efforts under the Aquatic Environment Plan II.

Continued strengthening and focusing of sector efforts

In recent years, efforts to improve nature within agriculture and fishing have primarily taken the form of incorporation of concern for nature and the environment in fishery and agricultural policies. In many ways, this has been carried out on cooperation with the other EU Member States through development of EU agricultural policies in order to bring about a more multi-functional agricultural sector.

Even so, the integration of concern for nature in agriculture, forestry, and fishery remains insufficient. This integration must be furthered by setting out clear targets and strategies for how

these sectors can continue to be developed to focus more on concerns for nature in their activities. There is also a need to strengthen, focus, and coordinate a number of measures, particularly economic ones, with a view to meeting the targets set relating to nature while taking into account the other targets involved in the various schemes.

Generally speaking, the sectors must reduce their impact on nature in a way that minimises the cost to society of such reduction. In this connection, optimum use should be made of the opportunities offered by organic farming to meet the targets set as regards nature and the environment.

Sustainable fishery and marine aquaculture

The Committee finds that the crisis affecting a number of commercially important fish stocks has clear effects on marine biodiversity. As a result, the Committee recommends that reforms be carried out within Danish fishery policy. These reforms should prioritise efforts to adjust fishing capacity to the resources available, development, and application of sustainable fishing methods, and better performance and inspection of fishery regulations. The reforms should include initiatives to reduce discards, e.g. in the form of a ban, and to limit unintentional secondary catches of marine mammals and birds. In addition to this, structural support to the fishing industry should be designed to support changes towards sustainable fishing, including the necessary reductions in fishing capacity.

The Committee also recommends that reference targets based on the precautionary principle should extend in scope to as many fish stocks as possible and be applied in fishing management. At the same time, reference targets should be developed for the total impact of fishing on the marine environment. Finally, the Committee recommends that support be granted to EU efforts to establish environmental labelling for fish. It also recommends that work be carried out to have this scheme include criteria for sustainable fishing.

The Committee considers it important that steps be taken in connection with any expansions of marine aquaculture and saltwater fish farming in order to ensure that these facilities do not prevent the quality targets set for the relevant marine areas from being met. These facilities should also be located in places where they have no negative impacts on international nature-protection areas or other vulnerable natural areas.

Adjusting forestry to nature-friendly and sustainable management

The Committee recommends that Danish forestry should gradually be readjusted to new management methods. These new management methods should be based on nature-friendly and sustainable principles in order to promote forest resilience, resistance to climate changes, biodiversity, and recreational value. This will involve forestry planning that ensures continuity in forest stands by having all reproduction carried out by means of natural reproduction (self-sowing). Future forest planning should also ensure that the choice of wood species used is based on ecological adaptation to the specific site in question; this will promote the use of native trees and shrubs. It will also serve to minimise or eliminate use of fertilisers, pesticides, etc., to protect key biotopes and other natural habitat types. It will also promote restoration of a natural water balance and the presence of more dead wood. This latter objective will be achieved by accommodating more open areas in Danish forests, as well as more areas of untouched forest. In addition to this, cultural-historical remains and traces in forests should be safeguarded, e.g. by minimising subsoiling in future.

The Committee proposes that the Danish Forest and Nature Agency should, within two years, prepare an action plan for the continued transition to nature-friendly forestry within Danish State forests. Among other things, this action plan must address the following issues: targets and time frames for reorganising forestry in old forests, heath plantations, and dune plantations, site mapping of wooded areas, promotion of the natural water balance and more dead wood in forests, and competency development within the Danish Forestry Commission.

The Committee estimates that the Danish State forests can be reorganised within the span of a wood generation, i.e. a period of 80-100 years, and that nature-friendly operating principles can be implemented for 25 per cent of the total forest areas within the first 10 years.

In private forests, the Committee recommends that a transition to sustainable forestry should be promoted by means of financial incentives, advice, and information. Subsidy schemes aimed at the forestry sector must be holistic at forest and property levels, and must target biodiversity concerns that go beyond the requirements laid down in the Danish Forest Act. It is also recommended to carry out amendments of the Danish Forestry Act in order to promote biodiversity, e.g. by providing better conditions and opportunities relating to forests for natural succession, grazing forests, coppice forests, and untouched forest.

The Committee recommends that the transition to more nature-friendly and sustainable forestry should be followed up by certification schemes. These schemes will create a direct link to the market by specifying production methods and circumstances to consumers.

An additional target is to restore 15,000 hectares of resilient forest to replace the trees that fell in the 1999 storm. The efforts made in this regard include the subsidies granted under the so-called windfall scheme.

More organic farming

In comparison to conventional agriculture, organic agriculture is deemed to have positive impacts on living conditions for plants, animals, and micro-organisms within the organically farmed land. Specifically, this is the result of varied crop rotation, the absence of pesticide use, relatively low levels of fertilisation, and the exclusive use of manure for fertilisation purposes.

The Committee notes the strategy set out in the 1999 Action Plan II from the Organic Food Council, and supports continuation of the current initiatives to promote organic farming within the market framework. This is because organic farming helps to create a good basis for the benefit of natural resources, both within the cultivated land and in adjacent areas.

The Committee also notes that the Danish State is showing the way by converting public-sector agricultural areas to organic farmland within a short timeframe. This will be done to the extent that such areas do not serve special purposes that do not accommodate organic farming.

The Committee recommends that the potential of organic farming relating to the targets set for Danish nature should be mapped, e.g. in connection with the establishment of organic farms within Natura 2000 sites and national natural areas.

Nature plans within agriculture and forestry

The Committee recommends that the ongoing development and testing of nature plans at farm level should, as soon as possible, result in a final concept for such nature plans. The Committee also recommends that an analysis be carried out of the opportunities for establishing coherence between the preparation of nature plans – and the valuable information about individual farms they contain – and subsidy schemes for promotion of nature and biodiversity.

The Committee recommends that more thought be given to methods to safeguard the condition of nature in areas that fall within the scope of nature-friendly and sustainable subsidy schemes. These methods should protect such areas against future changes, e.g. by ensuring that valuable hedgerows are not removed and that semi-natural areas do not become cultivated.

The Committee recommends that landowners and consultants should, to the widest possible extent, be encouraged to coordinate preparation of nature plans for a number of agricultural and forestry properties. Particular emphasis should be placed on establishing financially viable, large-scale operation units with extensive grazing in order to promote management of nature and landscapes. For managing forestry properties, concerns for nature may be included in operation planning.

Continual promotion of concerns for nature in agricultural subsidy schemes

Today, farmers work within a new framework. This new framework has been effected by trends in Danish agricultural policy (most recently laid down in the national strategy for sustainable development), as well as by EU agricultural policies. These new trends involve desires for sustainability, for integration of concerns for nature and the environment in agriculture, and for multifunctional agriculture, including the development of organic farming. As a result, future developments within agriculture will become increasingly “green”.

This trend is an expression of how society is gradually turning away from maximum production in favour of production methods that feature other qualities. Multifunctional agriculture will have a central position in this regard, as this type of production offers more than simply traditional produce: grain, meat, dairy, and so on; it also assists in quality “production” in the form of beautiful landscapes, varied nature with more valuable habitats for wild flora and fauna, clean drinking water and recreational values. Among other things, this entails more focus on biodiversity in agricultural production, aimed at stopping deterioration of agricultural biodiversity by 2010. Indeed, this is the target set in the 6th EU Environmental Action Programme, as corroborated by the European Council Conclusions from Gothenburg, June 2001.

The Committee supports the ongoing Danish efforts to influence EU agricultural policies to promote multifunctional agriculture. These efforts will include concerns for management of nature and landscape as seen in the Danish national strategy for sustainable development.

Thus, the Committee recommends that the existing set-aside and agri-environmental schemes, as well as other measures to promote multifunctional agriculture should focus more specifically on nature, both in terms of geography and content. Specifically, the Committee recommends more focused targeting of the agri-environmental schemes for extensive farming of semi-natural areas that fall within the scope of Section 3 of the Danish Protection of Nature Act. Attention should primarily be focused on Natura 2000 sites, national natural areas, and river valleys. Consequently, these areas should be designated as Particularly Sensitive Agricultural areas.

The Committee has debated the issues of modulation and cross-compliance, but has been unable to reach agreement on recommendations within these areas.

More target-specific subsidy schemes to increase the extent of semi-natural land

The Committee recommends that the proposed approximately 100,000-hectare increase in Danish semi-natural areas (connected to existing natural and semi-natural areas) should as far as possible be effected by making the existing schemes more target-specific. These existing schemes include set-aside, the agri-environmental schemes, etc. The Committee also recommends the following:

- Farmers owning areas that have already been set aside and which are situated within Natura 2000 sites, areas of potential interest for establishing national natural areas, or interconnected meadows/dry grassland in river valleys, may nominate such areas for 20-year agri-environmental agreements or other subsidy schemes for protection of nature *if* the set-aside obligations or subsidies for set-aside are reduced or cease. As part of this, Natura 2000 sites, national natural areas, and river valleys will be designated as Particularly Sensitive Agricultural areas with a view to establishing voluntary agreements, including agri-environmental agreements, to promote extensive farming.
- A number of areas with potential for restoration of semi-natural areas should be designated as Particularly Sensitive Agricultural areas on the basis of county nature-quality planning.
- Closer inspection should be made of the opportunities for developing flexible and voluntary schemes for targeted increases of the extent of semi-natural areas that fall within the scope of Section 3 of the Danish Protection of Nature Act. The primary areas targeted are Natura 2000 sites, national natural areas, and river valleys.
- Supplementing the agri-environmental schemes with a “conversion subsidy” should be considered in cases where there is a need to render production more extensive in order to promote biodiversity.
- The agri-environmental schemes, land consolidation, conservation, and restoration of nature should be developed and adjusted with a view to effective interplay in projects for restoration of semi-natural areas. These projects place great emphasis on the voluntary aspect and active participation from farmers. They aim for area-oriented, holistic solutions where land consolidation involves the provision of replacement land for landowners who give up arable land for restoration of natural and semi-natural areas.

More target-specific subsidy schemes to ensure agricultural activity

In order to ensure agricultural activity at existing and new semi-natural areas, the Committee also recommends the following adjustments to certain subsidy schemes:

- More detailed studies should be made of the opportunities to develop flexible and voluntary schemes with a view to target-specific efforts to ensure agricultural activity at semi-natural areas that fall within the scope of Section 3 of the Danish Protection of Nature Act. The primary areas targeted are Natura 2000 sites, national natural areas, and river valleys.
- The agri-environmental schemes should be adjusted in order to ensure that subsidies are available for cultivation of meadows without fertilisation or pesticide use.
- The agri-environmental schemes for nature will last for long periods (20 years) in order to ensure continuity in extensive farming. Greater consideration should be given to inspection and incentive issues in connection with long-term agreements.

Better interplay between local and national interests in nature

High-quality nature is a welfare asset that should be available to everyone. Establishing and safeguarding high-quality nature requires initiatives at national level, as well as initiatives and efforts to establish common ground at regional and local levels.

Better nature efforts require active participation from all actors and stakeholders – national, regional, and local authorities as well as individual landowners, enterprises, and citizens. Local commitment on nature matters is particularly crucial to the success of any project. It is also vital to achieving more results by virtue of the active participation of several parties. This means that future strategies for protection and management of nature should seek to promote local commitment. This can be done by supporting local initiatives, and by creating incentives for local authorities, individual citizens, and landowners, encouraging them to make greater efforts to the benefit of nature.

An important prerequisite for widespread commitment to protection of nature in local communities is a proper balance between interest in *protecting* nature on the one hand and in *using* nature on the other. Initiatives must be mutually beneficial, creating popular local commitment and development. Similarly, it is important that national interests and international obligations are respected locally if local views are to have real impact at national level. Consequently, there is a need to carry out work on how the outermost local links in the overall chain can be incorporated more in protection efforts. This will involve development of models for better dialogue between local and national stakeholders.

Activating local participation

The Committee considers that dialogue between landowners and other local residents and local, regional, and central authorities must be developed. Such dialogue must be practiced in day-to-day management of nature, as close to the residents as possible. The Committee also finds that active, local commitment and general appreciation of nature are crucial prerequisites for meeting the targets set for nature and environment policies.

As a result, the Committee recommends the development of a strategy detailing how local areas can become more involved in and committed to protection of nature. Such work could draw on the experience already gathered relating to various forms of popular participation, e.g. general hearings, “kitchen-table meetings”, user councils, etc. Use should also be made of the wealth of information brought about by local Agenda 21 work, the LEADER+ project, and demonstration projects under the agri-environmental schemes.

The Committee has taken the position that the importance of protecting nature is now widely recognised. There is, however, no doubt that restrictions will not in themselves help much unless they are widely appreciated. This is why developing dialogue is so important. Similarly, there can be no doubt that protection of nature is more successful when as many stakeholders as possible are committed to the process. Such commitment is strengthened through dialogue and support of local initiatives.

Dialogue about national natural areas

It may be difficult to establish a fruitful local dialogue about the establishment of national natural areas. This is because the decision to establish national natural areas will be a State decision, based on international and national nature-protection interests. If the dialogue is to take place on a realistic

basis, establishment of national natural areas should from the very outset be explained, as something that fulfils a national nature-protection need, much in way that e.g. motorways fulfil a national transport need. This does not, however, diminish the need to involve local residents – and a leaflet or a public meeting is *not* enough. A sufficient basis for debate must be prepared, explaining the intended actions for the area in question, including information on what can realistically be changed. The possible topics for discussion might include the time horizon for establishment of a national natural area, the main principle of the voluntary aspect and the gradual expansion from a core area associated with this principle, demarcation of the area, opportunities for outdoor recreational life, tourism, and the specific content of protection of nature.

From the very outset, it should be made clear that establishing a national natural area will entail restrictions for agriculture in particular. The opportunities for building new housing and for establishing new commercial businesses will also be restricted, and increased numbers of visitors may cause some nuisance. Information should also be disseminated on previous experience from e.g. foreign national parks, where a boost in outdoor recreational life and tourism as well as channelling of subsidies to the area have led to greater economic activity. The area may also become more attractive to its current residents as well as to new residents wishing to live in the country, possibly on a part-time farm with a few heads of cattle, sheep, etc. The debate must be well founded and serious, and must take place over a sufficiently long period to facilitate proper awareness and knowledge of the various consequences.

Involving local authorities

Regardless of who holds legal competence to make the various decisions involved in the establishment of national natural areas, it is now becoming more widely recognised that it is important to involve the relevant local authorities in discussions and dialogue, *and* to support local initiatives. The local authorities are close to the residents, and Danes often view their local authorities as the place to turn to in the event of any problem, or when public debate about an initiative commences. At the same time, local authorities in Denmark act as the environmental authority for agriculture and the majority of all enterprises. This makes them a natural “first stop” for dialogue about issues relating to nature or the environment, and the local authorities are important in this respect due to their ability to influence environmental behaviour within agriculture and the local business community.

In recent years, Danish local authorities have also become involved in development work, environmental campaigns, and other initiatives that have caused their sphere of activity to grow considerably in scope. Examples of such initiatives include Agenda 21 work, urban regeneration projects, recycling, preservation of buildings, afforestation, nature guides, nature schools, and restoration of nature.

The local authorities do, however, also manage a number of “green” areas of activity, e.g. parks, forests, watercourses, roadsides, etc., and their municipal and local planning is of vital importance to nature protection in a wider sense. This is particularly true in connection with urban development planning and recreational areas near cities.

More local-authority involvement in the discussions of a number of the topics addressed in this report will help to further promote awareness and appreciation of these issues. It will also contribute to creating solutions that will meet with more immediate support among local residents.

Promoting education, communication and consultancy about nature

The Committee considers that biology and other natural sciences should occupy a more central position in teaching throughout the school system – from pre-school teaching to upper-secondary teaching to education of new teachers at teacher training colleges. The Committee recommends that nature counselling/nature guides be used to improve matters. These initiatives could, for example, be employed at schools with a view to actively communicating issues relating to nature and its protection – while pupils are actually *in* nature. Steps should also be taken to promote establishment and use of nature schools and nature kindergartens. Work is currently being carried out on using the Internet to make information and knowledge more readily available, e.g. at <http://www.natur.dk/>, <http://www.naturnet.dk/>, and <http://www.skoveniskolen.dk/>.

In order to promote knowledge about nature among farmers, the Committee recommends the introduction of “nature and landscape issues” as compulsory elements of all curricula for new farmers. Also, greater priority should be assigned to courses on biodiversity at farms in connection with the existing rural-district programme on supplementary training. The Committee also recommends that thought be given to introducing courses associated with certain schemes under the rural-district programme. Examples of these schemes include agri-environmental measures, organic farming, the “young farmers” scheme, and the improvement scheme.

In addition to this, the Committee recommends that issues relating to nature and landscape should be designated as a special area within overall consultancy – as organic farming is today.

Continuation of international efforts

In many respects, the Earth is a single, coherent ecosystem, where developments in one place affect conditions elsewhere. As a result, any national action plan on biodiversity and protection of nature must have an international dimension, contributing to making local efforts tie in with international efforts. This is particularly true of small countries, where isolated efforts will often be of limited significance within an international context.

Compliance with the Convention on Biodiversity

Analyses and assessments carried out by the Danish Forest and Nature Agency in connection with the Committee’s work show that the efforts made so far by Denmark in connection with the Convention on Biodiversity do not in themselves meet the targets set in the Convention. As a result, it is necessary to make extra efforts with respect to important nature-protection issues – both for nature’s sake and in order to fulfil the obligations under the Convention. Examples of areas where additional effort is required include protection of species and habitats, monitoring nature, regulation of impact factors, sectoral integration, management of alien species, protection of ecosystems, and conservation of genetic material and gene pools.

Due to time constraints, the Committee has not addressed a number of issues that are relevant to the application of the Convention on Biodiversity, e.g. genetically modified organisms, access to and ownership of genetic resources, domesticated biodiversity, *ex situ* protection, and general information. The Committee considers that these issues should be addressed by the relevant authorities as part of future follow-up to the Convention, allowing them to be included in the action plans themselves whenever possible.

Implementation of the Habitat Directive and Bird Directive

The Committee recommends that future work on implementation of EC Directives relating to protection of nature should be carried out as follows:

- A basis for determining conservation targets should be prepared.
- Targets should be set for the state of nature. This should be done in a process of interplay between county authorities, the Danish Forest and Nature Agency, other relevant authorities, and the general public.
- An assessment of the current conservation status should be carried out on the basis of data from monitoring. This assessment will form the basis for decisions on future efforts.
- Plans for active efforts aimed at reaching the various targets set should be prepared (management plans).
- Conservation-status trends should be monitored.
- Supplementary national assessments and initiatives should be carried out regularly on the basis of conservation-status trends.
- The need for new legal measures aimed at achieving and safeguarding a favourable conservation status should be assessed.

The Committee considers that the proposed nature-quality planning and identification of national targets for the various natural and semi-national habitat types constitute central elements of the implementation of EC nature-protection directives. The Committee recommends that such planning should include an assessment of the need for protecting marine Natura 2000 sites against the effects of fishing. No such assessment has ever been carried out before.

The Committee recommends that all authorities responsible for nature management in Denmark should cooperate to apply for more co-funding from the EU for nature-restoration projects and nature-management efforts aimed at implementing EC nature-protection directives. Such co-funding may be obtained from LIFE-Nature and other subsidy schemes.

Wishes for future EU agricultural policy

The Committee supports the ongoing Danish efforts aimed at greater integration of concerns for nature in EU agricultural policy. In this respect, the Committee makes the following recommendations:

- It should be possible to use set-aside land for grazing with a view to management of nature and landscape;
- It should be possible to establish set-aside areas in 10 m wide border zones along natural and semi-natural areas, including high-priority marine areas;
- Within the framework of the rural-district order, opportunities should be created for using performance-related methods to determine the size of the various subsidies. In this way, it should be possible to make the size of subsidies dependent on performance that promotes multifunctional agriculture as part of overall sustainable development. This will include promotion of biodiversity;
- It should be possible to set up a voluntary agreement scheme based on a single-payment compensation for establishing or restoring semi-natural areas that cannot subsequently be used for cultivation. This agreement scheme should target Natura 2000 sites and national natural areas in particular.

International cooperation on nature should continue

The Committee finds that steps should be taken to create greater cohesion between Denmark's national and international efforts to protect biodiversity.

This should partly be done by making greater efforts to communicate Danish experience to international organisations, and partly by coordinating Danish efforts within the various cooperative bodies that address biodiversity, protection of nature and environmental issues. International cooperation also allows Denmark the chance to obtain valuable knowledge and experience, offering significant contributions towards more effective measures and results.

More than a decade of international cooperation on forests has not yet given rise to a legally binding agreement, e.g. in the form of a forest convention. The Committee recommends that this cooperation should continue with a view to more mutually committed collaboration on forest issues between the countries of the world.

Within an international context, Denmark should continue to work to focus attention on the problems associated with imported and invasive species. This will include efforts to bring about a common EU policy, support for the ongoing initiatives within the scope of the Convention on Biodiversity, CITES, the Bern Convention, IMO, OSPAR, and HELCOM.

Nature, welfare, and economy

The interplay between the natural capital, the economy, and people alive today and in future generations is relevant for political decisions. Economic science, methodologies and prioritising tools can contribute constructively to securing nature and biodiversity as part of sustainable development.

Obviously priorities in the nature-protection sector are inevitable when nature management, just as all other areas, is subject to budget restrictions. In order to ensure the most appropriate basis for decision making in priorities for nature, there should be attempts to prepare economic calculations that ideally, in addition to direct and indirect costs, also contain calculations of direct and indirect benefits from initiatives for nature. In cases where costs or benefits in the nature-protection sector cannot be included in calculations as single figures, i.e. where an economic valuation is not possible, they should be described, and thus included in overall considerations.

The Committee recommends that, as part of decisions on expenditure in the nature-protection sector, a specific basis for decisions should be prepared in order to, as far as possible, enable assessment of the relationship between direct and indirect costs and benefits. The Committee also recommends that application of economic methods, including economic valuation, should be included with other elements in the democratic decision-making process. In this connection, development work is necessary to define terms such as “critical nature capital”, “unique” or “irreplaceable” nature assets with a view to improving the basis for society’s priorities.

Another important part of assigning priorities is the development of methods of regulation to encourage businesses to reduce impacts on nature in a socio-economically appropriate manner. In the longer term the goal is that the impacts of production on nature should be reflected in the price of products. The Committee recommends work to ensure that the structure of the market as part of sustainable development underpins nature protection.

Society has a number of wishes regarding land use. These may be wishes for a beautiful landscape, valuable habitats for wild plants and animals, promoting biodiversity, and increasing recreational assets. It is therefore central to priorities that, in addition to applying the polluter pays principle, they include the scope and means of how society is to pay the producer for services that society desires, but which involve a negative return for the individual producer.

Nature and welfare

The Danish adult population make a total of 75 million recreational visits to the countryside each year. Almost every adult in Denmark goes out to the countryside at least once a year. Outdoor recreation is healthy and enhances the quality of life; one experiences nature and acquires a greater understanding of nature and the culture environment.

There is growing acknowledgement of the economic value of recreation. The monetary value of the positive effect of a trip to the countryside in relation to sickness and stress is unknown, but there is agreement that visits to the countryside and experiencing nature has a significant preventive effect.

Nature makes up an important framework for the average Dane’s outdoor life. Surveys show that, in particular, Danes seek quiet and closeness to nature when they visit the countryside, and many use

nature as a method of reducing stress and recharging their batteries. When people consider moving to the country, surveys show that desires for space, fresh air, closeness to beautiful and interesting nature, as well as peace and quiet are much more important than, for example, paying less for a house. There is also no doubt that the quality of the surroundings and beautiful countryside attracts businesses.

Many of the attractions that satisfy Danes' outdoor needs are also important when tourists choose Denmark for their holidays, and so are important for the Danish economy. Tourism is important for the local economy, especially in thinly populated areas. Surveys show that nature and a clean environment are significant in, for example, Germans' choice of Denmark for their holidays. Many tourists look for nature, beaches, and peace and quiet. Free access to beaches, balanced tourism respecting the requirements of nature, and extensive nature and environmental legislation are amongst the most important arguments from Germans for visits to Denmark. Today, tourism is Denmark's fourth-largest industry, with a turnover of DKK 45 billion in 1999 and value added of DKK 27 billion. However, tourism in Copenhagen comprises the largest proportion of these figures.

The economic framework for nature and environmental policy

The point of departure for the economic analyses is to measure the welfare effects of the activities analysed. The connection between production, nature, and the environment is described so that the activities of the individual producers lead to production of a number of marketable benefits. Production also gives rise to a number of either positive or negative externalities. These non-market externalities are not included in the individual producer's personal financial costs. Therefore, in an economy without public regulation, the optimal personal-financial extent and composition of production will be different from the optimum for a welfare economy. This difference leads to deterioration in welfare.

An example of a positive externality could be a recreational benefit, while a negative externality could be pollution with nutrients. Therefore, in general, if an activity leads to net positive externalities, the extent of the activity will be less than the socio-economic optimum, while the opposite will apply for activities leading to net negative externalities. In nature policy, the point of departure is typically to seek to increase activities leading to positive externalities, e.g. management of salt meadows or afforestation. However, in certain situations the goal will be to reduce negative externalities, e.g. a desire to reduce pollution of vulnerable natural habitat types with nutrients.

With this point of departure, the Committee has commissioned a number of preliminary analyses, partly to identify the costs of different land use changes, and partly to identify relevant policy measures to implement such conversions. Together with the expected nature and environmental benefits from the individual initiatives, the results should be included in the foundation of priorities for recommendations to enhance biodiversity in Denmark. The results should also be included in preparation of an action plan for biodiversity and nature protection.

Priorities that take account of the costs of the individual recommendations are necessary because of limited resources in both nature policy area, and in other societal initiatives. Therefore, priorities for the composition of initiatives within a given economic framework are necessary in order to achieve cost-effective use of resources.

Welfare-economic costs of changes in land use

The Committee has commissioned a number of preliminary analyses from the Danish Environmental Research Institute. The results of the analyses completed can be compared with a general assignment of priorities in nature policy, where each individual initiative, with its associated costs and production of environmental and nature benefits, are included as a possible option.

It should be noted that the derived economic effects and the administrative costs are only included in the analyses to a limited extent. This is because these costs will depend on both the scope and the implementation techniques, and these require a more detailed description of the initiatives.

There will be large variations in both costs and benefits for specific implementation of individual initiatives, but the analyses completed, based on average figures, should give a good indication of the differences between the costs of the initiatives.

With the presentation of the main results from the analyses of costs of extensified land use, there are three possible strategies. These can either be considered independently of each other, or as elements in the priorities of recommendations for nature. The calculations assume that, prior to implementation of the strategies, cereal crops are cultivated on the areas.

The first strategy is to prepare a nature plan at farm level. A nature plan will state the potential for expansion and protection of the nature assets on the farm. Therefore, the effects of the nature plan will depend on the actions following from its preparation. In light of this, the initiative should be considered as a relatively general strategy. The second and third strategies include extensification of farming, or establishing forest respectively, and can be considered in connection with implementation of the nature plan, or independently of the nature plan.

Making farming more extensive involves a number of possibilities, including stopping the intensive agricultural practice, i.e. excluding the areas from the farm and through natural succession allowing them to become natural areas, kept open through annual mowing or establishing suckler cow production and hay harvesting. There are also two possibilities in afforestation; either extensive overgrowing through natural succession, or traditional forest planting. A fourth and relevant possibility could be to establish small biotopes (waterholes, game coverts, hedgerows, and similar). However, there is inadequate material to assess the welfare-economic costs of these measures.

On the basis of this structure of priorities, and if the analyses are supplemented with analyses of costs of afforestation, the welfare-economic costs of the various possibilities can be summarised as in the figure.

The figure shows that there are large differences in the welfare-economic costs of the various initiatives. The lowest costs are in establishing forest through natural succession and extensive hay harvesting, as the only costs for these two examples are lost income from the land due to the cessation of the previous agricultural production. Provided hay harvesting can replace the existing coarse fodder production, the loss of economic rent will be reduced.

Traditional forest planting and establishing natural areas with annual mowing incur more or less the same costs per hectare. It should be noted that economic rent from forestry has been calculated before any EU subsidies. Any funding of afforestation from EU subsidies will reduce the loss of economic rent.

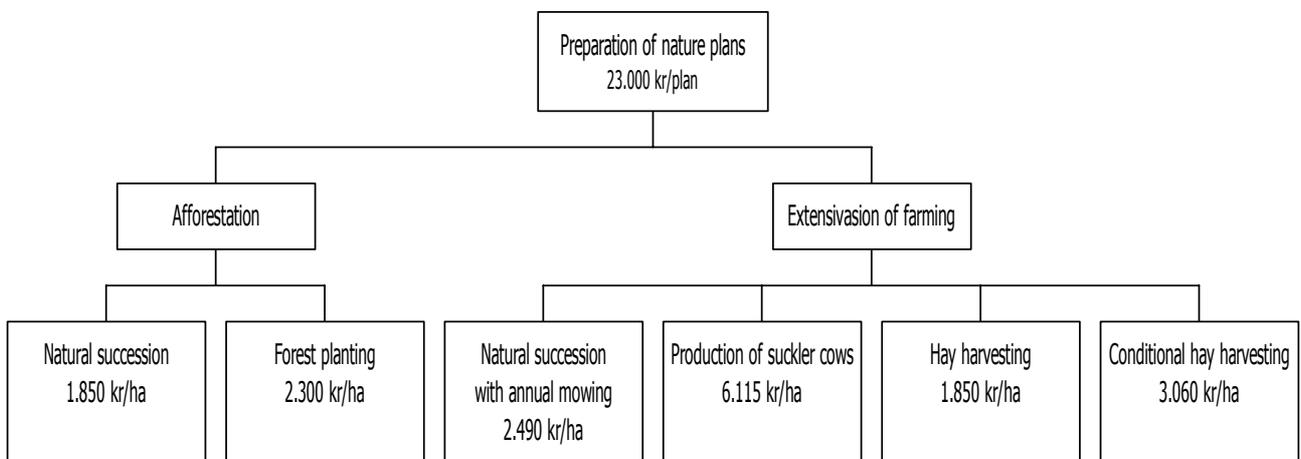


Figure: Overview of the welfare-economic costs of various initiatives for a more extensive land use.

The most expensive initiative is to convert to conditional hay harvesting and suckler cow production, which lead to welfare-economic costs of DKK 3,060 and DKK 6,115 per hectare respectively. This is because these types of agricultural practice have negative economic rent. Conditional hay harvesting assumes a number of nature-based restrictions on times of harvest, and this will reduce the value of the hay harvest. The costings assume that there are changes in the marginal scope in relation to the total agricultural production so that the relative prices are assumed to be unchanged. Costs will be significantly higher if conversion of the area involves, for example, general requirements for reductions in livestock farming.

Policy measures for realising changes in land use

In cooperation with the Danish Environmental Research Institute, the Institute of Local Government Studies, Denmark has completed an environmental-economic analysis of the policy measures in nature policy. This is because, in addition to the costs calculated by comparing the activities before and after implementation of a given initiative, there can be costs significant for the implementation of this initiative arising from the choice of policy measure to realise a given nature policy objective. Thus, the same nature benefits can typically be achieved by several different parties at different costs, and the administrative costs depend on the choice of policy measures. Therefore, a cost effectiveness analysis, i.e. the costs of realising a given nature benefit, is important in order to

exploit the resources in nature policy efficiently, that is, to get the most, and the best possible nature and environment, for the money expended.

For analyses of the cost effectiveness of different policy measures, the nature benefits aimed at by the policy are divided into three categories:

- *Unique* nature benefits that would imply infinite loss to welfare if they were lost and therefore could not be replaced with other nature benefits. For example, these may be raised bogs, lobelia lakes, natural forests, a number of natural habitat types in Natura 2000 sites, a number of Section 3 areas in the form of valuable dry grassland, salt meadows, heaths and bogs both within and outside Natura 2000 sites, as well as old meandering stretches of watercourses and certain old hedgerows in the countryside.
- *Characteristic* nature benefits that are relatively widespread and can be replaced with other nature benefits, provided the natural preconditions are present. For example, these may be a number of less valuable Section 3 areas.
- *General* nature benefits that can normally be replaced with other nature benefits. These may be, for example, nature in agricultural rotation areas, nature in a number of newer hedgerows, and other newer small biotopes in plantations, etc.

Concluding the assessment of policy measures, it can be said that more rigid policy measures, for example conservation or Section 3 protection, will be most appropriate if the nature benefit is unique and requires absolute protection. In contrast, flexible policy measures, for example auctions or subsidies, will be appropriate for characteristic or general nature benefits not requiring absolute protection.

As a starting point, opportunities to introduce flexible policy measures should always be considered when realising all types of nature objectives, including those related to unique nature benefits. An example is the option of outsourcing an operation under precisely defined conditions and thus minimising the costs of preserving a unique nature benefit.

Overall considerations should also include whether application of bottom-up procedures (“kitchen-table models”) can be appropriate, such as in connection with realising a specific project that, within a flexible objective, aims at measures to improve nature. For example, this is relevant in implementing land consolidation or starting up an agreement on nature management for a specific area between a farmer and an authority.

Finally, it should be emphasised that close consideration is necessary of how the different nature benefits are categorised as either, unique, characteristic, and general. The flexibility lost when a nature benefit is categorised as unique instead of characteristic or general can lead to a considerable increase in the costs of regulation. The necessity of a category must be balanced against the costs and therefore cross-disciplinary clarification of the criteria for categorising different nature benefits is crucial in connection with assigning priorities in nature policy.

Benefits from the recommendations

As a result of the recommendations of the Committee, there is potential for a number of benefits. These may primarily be of direct significance for biodiversity, i.e. benefits that lead to improved quality in nature. There may also be secondary benefits.

The primary benefits can be divided into general benefits and effect benefits, where the general benefits are at ecosystem level. For example, general benefits may secure national and/or international unique natural areas, or increase the robustness of such areas to change and impacts, including climate changes. Effect benefits include benefits at species or gene level, e.g. improved opportunity for migration of certain species or groups of species, reduced risks for genetically weakening a population, or more security for species linked to specific habitats.

The secondary benefits can be marketable or non-marketable benefits that can be assigned a monetary market value. This may be, for example, the value of angling or tourism. In contrast, the non-marketable benefits cannot be *directly* assigned a market value. These include the services provided by the ecosystem; the fundamental services provided by nature and biodiversity to society. Examples include the hydrological cycle and ground water resources, developing soil fertility, insects pollinating crops, CO₂ fixation in the sea and forests, etc. Amongst non-marketable benefits are also improved recreational possibilities and research and educational opportunities.

Economic valuation and cost-benefit analyses of projects

Not particularly many analyses of the monetary value of natural areas on land or at sea have been carried out in Denmark. There are a very scarce number of results of economic valuations of nature, especially in Denmark, and methods must be further developed.

However, there are some results from recent years. Assessments via the so-called contingent valuation method have shown that the hypothetical will to pay for access to Mols Bjerge, and thus the utility value, can be set at between DKK 4 and 8 million per year. Using the so-called redomic pricing method, a study has shown that houses in Denmark overlooking a lake are on average DKK 125,000 more expensive than houses without a view. Note that this represents the marginal increase in value. Other studies show that people will offer a significantly higher price for houses located close to forests compared with houses located further away from forests. These types of survey should, however, be interpreted with caution, as the results are primarily apparent in heavily populated areas.

Looking at the economic valuation of larger nature projects, interesting results are also apparent, although the uncertainty associated with methodology means that they should be read with extreme caution. For example, an afforestation project at Vollerup near Kalundborg in the 1990s, where 160 hectares were planted, demonstrated an annual welfare-economic surplus of DKK 1,000 per hectare compared with the previous agricultural operation of the same area. Correspondingly, in the Drastrup project southwest of Aalborg, over 500 hectares were planted and 400 hectares designated for permanent grass. Here, there was an annual welfare-economic surplus of about DKK 4,000 per hectare.

Analyses from the Vollerup and Drastrup projects show, amongst other things, that conversion from intensive agriculture to forestry and extensive agriculture provides society with significant economic benefits in the form of reduced discharges of nitrogen and pesticides into the aquatic environment, CO₂ fixation, and increased recreational values. The analysis of the project at Vollerup also shows that farms, households, and the EU have received economic benefits from the project, while, not surprisingly, the state has suffered expenditure as it funded the afforestation project.

The examples of cost-benefit analyses referred to above illustrate the importance of including all costs and benefits in welfare-economic assessments of nature and environmental projects.

Timescale	Present Value (2000)					
	20 years; DKK mill.			Infinite; DKK mill.		
<i>Interest (discount rate)</i>	3%	5%	7%	3%	5%	7%
Project expenditure: acquisitions, land consolidation, construction works, etc.	143.7	143.0	142.2	143.7	143.0	142.2
State management & management of nature	12.9	13.3	14.0	17.0	14.9	14.7
Loss of ground rent	44.8	36.4	32.3	101.4	63.0	46.1
Cessation of aquaculture	2.2	2.2	2.2	2.2	2.2	2.2
Total costs	203.6	194.9	190.7	264.3	223.1	205.2
Reduced eutrofication from aquaculture	2.8	2.5	2.4	6.1	3.9	3.0
Saved costs of pumping	6.0	5.1	4.5	12.1	7.4	5.4
Improved regularity: structural adjustment of farms and agricultural areas	15.9	14.2	13.0	29.7	19.4	15.2
Reed production (phragmites communis)	4.6	3.6	2.9	10.1	5.0	3.0
Reduced risk of flooding	0.5	0.4	0.4	1.1	0.7	0.5
Reduced leaching of nitrogen	20.3	17.0	14.5	35.8	23.7	18.5
Reduced leaching of phosphorus	20.2	16.9	14.4	43.9	25.8	18.1
Reduced leaching of ochre	18.6	17.7	16.9	40.5	27.0	21.3
Improved hunting	7.0	5.9	5.0	15.3	9.0	6.3
Improved angling	40.9	34.3	29.1	89.0	52.4	36.7
Improved recreational values	55.2	46.3	39.3	120.1	70.7	49.6
Biodiversity; existence value	39.5	33.1	28.1	85.9	50.6	35.5
Total benefits	231.5	197.0	170.5	489.6	295.6	213.1
Cost-benefit result	28	2	-20	225	73	8

As part of the work of the Wilhjelm Committee, the Royal Danish Veterinary and Agricultural University completed a socio-economic cost-benefit analysis of the 2,200-hectare Skjernå project. This project has recreated 20 kilometres of meandering watercourse; restored a 160-hectare lake; created a delta to Ringkøbing Fjord; established cohesion between the watercourse and the riparian areas near it through allowing periodic flooding of 290 hectares of reed swamp; and converted 1,550 hectares of intensively exploited agricultural area to extensive farming.

The objective of the analysis has been to compare the social benefits with the social costs of the project. The analysis therefore covers market and non-market benefits, calculated at market prices.

The value of non-tradable benefits has been calculated using economic valuation surveys and by converting valuation estimates from foreign studies. On the benefits side, the analysis includes the utility value and the existence value of increased biodiversity, the value of improved opportunity for outdoor recreation, and environmental improvements such as retention of nutrients, etc. The costs side covers loss of income from the land through including and converting agricultural land, and capital and operating costs. The results of the study appear in the table above. Note that the figures have been rounded to the nearest DKK million.

The table shows results for different assumptions relating to discount rate (3, 5, and 7 per cent) and time horizon (20 years and infinite). Not surprisingly, the result is very sensitive to the selection of both discount rate and time horizon; low discount rate and infinite time horizon improve the benefits of the project.

At a discount rate of 3 per cent, with an infinite time horizon (which would seem reasonable), and if uncertainty is eliminated, the Skjernå project is good “business” for society with a net present value of more than DKK 200 million. If the discount rate is raised to 7 per cent, the net present value of the project falls to almost zero. However, it is still positive, and the project should therefore be regarded as societally advantageous, even with this profitability requirement.

If the time horizon is restricted to 20 years, a positive net present value is only obtained at discount rates of 3 and 5 per cent. At 7 per cent the benefits of the project are no longer able to cover costs.

However, the result for the 20-year calculation period should be considered as a very cautious estimate, as the stream of environmental and nature benefits should be expected to continue over an infinite time horizon. Some would even say that it will continue with increasing relative values. Therefore, it seems reasonable to assume that the project has a positive value.

While certain utility values can be calculated with reasonable certainty, significant uncertainty is associated with valuations of recreational value, value of biodiversity, and existence value. Furthermore, extensive establishment of many natural areas will lead to falling utility values for new areas.

The results of the project are not least due to the significant expected utility value of outdoor recreation. The figures forming the basis for these estimates arise from the studies mentioned above and the hypothetical will to pay for access to, and thus utility value of, Mols Bjerge.

Technical development of the economic methods

The Committee has noted that application of economic methods, including economic valuation, can provide an important contribution to priorities that, together with other contributions, can be included in the democratic decision process.

The Committee has also noted that direct pricing of biodiversity is extremely difficult. However, it is possible to price elements of biodiversity that may be relevant in connection with actual choices and priorities.

Finally, the Committee has noted that, although much progress has been made with the existing methods of economic valuation, in addition to the proposals mentioned elsewhere in this report, there is a need for further development of methodologies before greater utilisation of benefit transfer. Benefit transfer is the transfer of value estimates of, for example, nature and environmental benefits, from one area already valued to another. Similarly, there is a need to further develop methods to cover the wants of people and their hypothetical will to pay.

Priorities and choice of policy measures

Recommendations have been presented as general recommendations, while more detailed definition of scope and implementation must be carried out on the basis of balancing the benefits against the costs of the recommendations, as well as the resources available.

The Committee has not carried out a comparison of nature interests in relation to other needs, and therefore the Committee has not addressed the issue of the amount of resources that can be made available to implement the recommendations.

The Committee has indicated a number of areas that should be assigned particularly high priority. Priorities of initiatives in the action plan itself should ideally be based on a quantitative assessment of the expected environmental and nature benefits in relation to the costs of realising the individual recommendations. Where this is not possible, the necessary priorities should be based on qualitative assessment of the benefits of the recommendations compared with the costs. The scale, content, and flexibility of implementation of individual recommendations, as well as the choice of policy measures will be central to the benefits, the costs, and thus the priorities in the action plan.

The Committee has pointed to some of the possible policy measures without assigning priorities. The choice of policy measure is important for the efficiency and effectiveness of policies, i.e. certainty regarding realisation of the changes desired, and regarding the costs of implementation. Therefore, the choice of policy measure will also be important for the potential of nature policies in that choice of a cost-effective policy measure, i.e. a policy measure that provides the required benefit for nature with a high degree of certainty and at the lowest possible cost, gives the greatest possible effect using the resources available, including in the long term.

Concluding economic aspects in assigning priorities, the Committee recommends that, as far as possible, specific priorities for implementing the general recommendations are based on an assessment of the benefits in relation to the costs. In order to maximise the effect of policies, policy measures applied should aim at providing the required benefits to nature with the greatest degree of certainty and at the lowest possible cost.

Appendices

1. Glossary and abbreviations
2. Terms of reference
3. Composition of the Wilhjelm Committee

1. Glossary and abbreviations

Agenda 21

A global agenda for sustainable development in the 21st century. “Think globally - act locally” is one of the messages from the 1992 Rio Conference which highlighted the significance of local commitment as a prerequisite for achieving sustainable development and solving the World’s environmental problems. Citizens, grass-root organisations (NGO’s), enterprises, and the local authority cooperate in local Agenda 21 projects.

Active substance

The component in a pesticide that causes the effect required.

Agri-environmental schemes

Agri-environmental measures. An EU programme with national joint-funding that extends subsidies to a number of nature and environmental measures in agriculture through entering into agri-environmental agreements with farmers. Formalised in the Danish Rural Areas Programme

Aquatic Environment Plans

The Aquatic Environment Plan II from 1998 is to ensure that the original objectives of the 1987 Aquatic Environment Plan I on limiting/halving leaching of nitrogen from agriculture by 100,000 tonnes nitrogen per year are achieved by 2003. Aquatic Environment Plan II is based on the fact that the full effect of Aquatic Environment Plan I will ensure a reduction of about 63,000 tonnes of nitrogen from agriculture. Aquatic Environment Plan II deals with initiating the necessary measures to achieve the remaining parts of the goals in Aquatic Environment Plan I to bring reductions up to 100,000 tonnes, i.e. approximately 37,000 tonnes. Aquatic Environment Plan II is based on three principles; general reduction of the application of manure; better exploitation of existing resources and subsidy schemes to promote specific goals for local conservation; and environmentally friendly farming.

Bern Convention

Convention on protection of European wild animals and plants as well as their natural habitats. The Convention on the Conservation of European Wildlife and Natural Habitats from 1979.

Biodiversity

Diversity of all living organisms. See fact box in the report.

Buffer zone

A zone around a particularly vulnerable type of natural or semi-natural habitat where stricter requirements are placed on the size of ammonia emissions from livestock facilities and manure/slurry storage plants, and where there are technical requirements on delivering livestock manure/slurry.

Center without Walls

A binding cooperation between (parts of) several independent research institutions on a particular subject. The Center has its own organisation and financial framework, but no local community. The Center without Walls serves to coordinate and enhance research within special themes.

CITES

The Washington Convention – a global convention from 1973 on trade in endangered plants and animals.

Competitive plants

Plant species that have the ability to exploit fertile locations and rapidly grow large and strong. They out-compete pioneer and other plants.

Convention on Biodiversity

Convention entered into at the UN environmental summit meeting at Rio in 1992.

Critical load

Limit for the size of impacts from, e.g. nitrogen, nature can tolerate without changing its condition. For example, the very hardy vegetation on raised bogs will change to species demanding more fertile conditions when deposits of air-borne pollutants exceed the critical load of the raised bogs. It is now acknowledged that this has happened throughout Denmark.

Cross Compliance

Cross Compliance was introduced by Agenda 2000 into the EU common agricultural policy in 1999. According to these regulations, Member States must apply appropriate environmental measures in connection with the direct support schemes with a view to improving integration of the environment in market schemes.

Danish Red List

The 1997 Danish Red List is a list of extinct, threatened, vulnerable, and rare plant and animal species. The total number of Danish species, of which there is adequate knowledge to carry out such an assessment, is 10,600, or about 1/3 of the known species in Denmark. Of these 10,600 species, 3,142 were included in the Danish Red List in 1997.

Discard

Fish which have been caught, but which are thrown overboard for various reasons.

Domesticated biodiversity

Plants and animals used in agriculture, aquaculture, and forestry that originate from wild species and/or conventional breeding. Does not include genetically modified organisms.

Dry grassland

Open, dry-bottom areas primarily been used for pasture over many years (semi-natural habitat). Grass and herb vegetation is often fertile and varied with many rare species.

Dumping

Dumping material in territorial waters, typically sea-floor material.

Ecological condition

Central concept in the Water Framework Directive. “Good ecological condition” means, e.g. that the biological quality elements for the relevant type of surface water area demonstrate levels that are slightly changed as a result of human activity, but only deviate a little from the normal conditions of this type of surface water without human interference. The physical/chemical parameters should also be allocated values that ensure the ecosystem functions and that biological parameters can be met. Concentrations of pollutants should not exceed the quality requirements stipulated nationally or at Union level. With regard to priority substances, the European Commission is to present proposals for quality requirements for concentrations in surface water, sediment, or biological material.

EEC Bird Protection Directive

Council Directive on Protection of Wild Birds (DIR/79/409/EEC of 2 April 1979).

EEC Habitat Directive

Council Directive on conservation of natural and semi-natural habitat types and wild animals and plants (DIR 92/43/EEC of 21 May 1992).

Emissions of ammonia

Ammonia (NH₃) is a volatile nitrogen compound, amongst other things arising from livestock facilities, manure and slurry storage plants, and from delivering livestock manure/slurry.

Environmental Impact Assessment

EU Directive which states that construction which may have a significant environmental impact can only be established after the procedures in the Directive have been completed, including preparation of an Environmental Impact Assessment, completion of public hearings, etc.

Ex-situ protection

Protection of organisms outside of their original habitats, for example in zoos and gene banks.

Externalities

Consequences of a given economic activity for the surroundings. In nature and environmental issues externalities are most often various types of disadvantages such as pollution of the ground water with pesticides, fish poisoned by heavy metals, or degradation of the ozone layer.

Favourable conservation status

Central term in the EEC Habitat Directive. The conservation status of **a natural or semi-natural habitat type** is “favourable” when: the natural distribution area and the areas covered within this area are stable or spreading; when the special structure and functions necessary for its maintenance in the long term are present and will probably continue to be present in the foreseeable future; and when the conservation status for the species characteristic for the relevant natural or semi-natural habitat type are favourable.

The conservation status for a **species** is “favourable” when: data regarding the development of the stock of the relevant species show that in the long term the species will be able to maintain itself as a viable component of its natural habitats and that the natural distribution area of the species is neither declining nor showing probability of declining within the foreseeable future, and that there

will probably continue to be an adequately large habitat in the long term to preserve the stock of the species.

Forest continuity

Forest growth with or without forest management which, over a longer period, e.g. 100-200 years or longer, has been dominated by the same species of tree, or by naturally reproducing species, and which has not been entirely felled at one time (clear-cut).

Geodiversity

The overall geological foundation for nature, soil strata, the geological profiles of the landscape, geological processes, etc.

Hardy plants

Plant types adapted to nutrient-poor and stable conditions. In fertile environments hardy species are out-competed by competitive species. In unstable environments (e.g. fields), hardy plants are out-competed by pioneer species.

Hay harvest

To harvest grass from a permanent grass area, e.g. meadow, salt meadow, dry grassland, or grass field with a view to hay production.

HELCOM

Baltic Marine Environment Protection Commission, the controlling body for the Convention for the Protection of the Marine Environment of the Baltic Sea Area (including Kattegat).

IMO

UN cooperation body for shipping, International Maritime Organization.

Indicator

Parameter or factor that is measurable and included in monitoring nature. It is usually selected because, in addition to its own value, it expressed something more general about the condition and development of nature. An indicator can be composed of several factors.

International nature protection areas

Areas pointed out by EEC nature protection directives (The Bird Protection Directive and The Habitat Directive) and the Ramsar Convention (see Statutory Order no. 782 of 1 November 1998).

Invasive species

A species that has been imported to an area through human activity and which can establish itself and force out other species.

Key biotope

Structure or element of special significance for plant and animal life. For example, in a forest this may be forest marshes or swamps, open environments, or trees with woodpecker holes.

Kitchen-table meetings / the kitchen table model

A kind of bottom-up planning procedure where employees from public authorities and landowners agree on developments (e.g. nature content) at a property on site, i.e. at the "kitchen table".

LEADER+

EU initiative aiming at testing new ideas based on local initiatives which aim at promoting local cooperation and contributing to enhancing the position of rural areas.

Lobelia lakes

Clear-water lakes, poor in nutrition, and hosting unique flora, including the lobelia. The lakes are internationally unique and have been included under the EEC Habitat Directive.

Marine nature

Nature in salt-water areas, the sea environment.

Meadow

(Fresh) meadow is a plant community influenced by fresh water and extensively exploited for grazing or mowing of natural fen vegetation. The vegetation is open to the light, dominated by grass and herbs, and generally rich in species. Meadows typically lie in river and stream valleys, by lakes and bogs, on reclaimed land, and raised sea floors (often a semi-natural habitat).

Modulation

Term used in the EU common agricultural policy to describe the possibility of Member States to transfer EU funds from, for example, acreage support to environmentally-friendly farming schemes. The proceeds from modulation are ear-marked and can only be used as EU joint financing of expenditure on other measures such as development of rural districts, early retirement for farmers, support to less-favoured areas and areas with environmental restrictions, environmentally-friendly farming, including organic farming, and afforestation. Modulation requires national joint financing.

National nature areas

Large cohesive nature areas designated in accordance with the Committee proposals.

Native/non-native species

Native species that come to Denmark or Danish waters through natural migration. In contrast, non-native species are species that come to Denmark with the help of humans, either deliberately introduced, or unintentionally imported. In forestry, native species are used, but of foreign race.

Natura 2000 sites

Joint European network of nature protection areas including special areas designated in accordance with the EEC nature protection directives (the Habitat and Bird Protection Directives).

Nature-quality planning

Planning of the quality of nature as part of regional planning and as an objective for nature administration and protection initiatives, as proposed by the Committee.

OSPAR

The merged Oslo and Paris Conventions. The convention on protection of the marine environment in the north-east Atlantic.

Pioneer plants

Plants which are the first to appear when the conditions at an area are radically altered.

Polluter pays principle

Principle that the person benefiting from a given activity should also finance minimising the risks connected with the activity and restoration of damage arising from the activity. I.e., this means that enterprises can be financially liable for the pollution they cause.

Precautionary principle

Principle that a lack of clarity of the full scope of a possible environmental threat should not be used as a reason for not combating such a threat.

PSA areas

Particularly Sensitive Agricultural areas. Areas designated for environmental or nature reasons with a view to entering into an agreement under the agri-environmental scheme.

Raised bog

Peat-forming plant community that receives water exclusively from rainfall and therefore is naturally very infertile. Characteristic species are peat moss, heather, cross-leafed heather, crowberry, cranberry, deer's grass, bog asphodel, sundew, etc.

Reference measurement

Measurement for the specific size of a fish stock leading to one or more protection measures in connection with administration of fisheries. Ecological reference measurements are reference measurements prepared on the basis of an eco-system aspect, taking account of more than merely fisheries.

River valley

An entire area which is, or has been, influenced by the course of a watercourse.

Salt meadow

Relatively flat, low-lying, more or less salt water and coastal areas with natural vegetation composed of grasses and herbs that form more or less cohesive turf. The low plant growth is usually a result of agricultural exploitation through grazing or hay harvesting (often a semi-natural habitat).

Section 3 areas

Types of natural and semi-natural habitats protected against change in accordance with Section 3 of the Nature Protection Act

Special Areas of Conservation (SAC)

Areas covered by the EEC Habitat Directive which are designated to preserve the different natural and semi-natural habitat types and specific animal and plant species. Special Areas of Conservation (SAC), together with bird-protection areas, comprise the Natura 2000 network (network of natural areas throughout the EU).

Sustainable development

Development which fulfils the needs of the current generation without endangering the opportunities for future generations to fulfil their needs.

Sustainable forest management

Involves continual growth of trees which rejuvenates itself and selection of primarily domestic species of trees and bushes that adapt to the location, see guidelines prepared by a committee established by the Danish Forest and Nature Agency.

Terrestrial nature

Nature on land. Natural and semi-natural habitat types such as heaths, dry grassland, meadows, salt meadows, bogs, forests, etc.

Treatment frequency

An expression for the average number of times an area will be treated with a normal dosage of pesticide in relation to the amount of pesticide sold.

Trencher ploughing

Method of ploughing used, amongst other things, in connection with tree planting on arable land in order to bring deeper, less fertile, soil layers to the surface. The plough depth is usually 60-80 cm, which means that culture-historic traces may be destroyed.

Untouched forest

Areas of forest set aside from a certain time as non-intervention areas for biodiversity reasons.

Water Framework Directive

The EC Water Framework Directive paves the way for a holistic approach to planning and regulation for water, including wastewater. Administration and regulation of the wastewater sector should take place within a limited water area corresponding to the so-called run-off areas. DIR. 2000/60/EC of 23 October 2000.

2. Terms of Reference – 23 March 2000

for the Wilhjelm Committee regarding preparation of a basis for a national action plan for biodiversity and nature protection.

Objectives

In the 'Nature and Environmental Policy Report 1999', the Danish government approved preparation of a national action plan for biodiversity and nature protection.

“The Government will enhance initiatives to preserve and restore habitats for Danish animals and plants with large, viable populations. Initiatives will also include areas where nature is allowed to develop on its own premises and without significant influence from people . Therefore, the government will prepare a national action plan for nature protection and biodiversity.

It is expected that the action plan will include initiatives to:

- target current initiatives and, amongst other things, develop a cohesive green network of protected natural areas, as well as continue protecting species and genetic diversity.
- ensure that activities in agriculture, forestry and fisheries, and other sectors takes place on a sustainable basis to ensure best possible consideration for biodiversity.
- develop research and monitoring and a basis for sustainable protection and exploitation of nature and biodiversity.
- enhance dialogue, information, and teaching on nature protection and biodiversity.

The government will endeavour to make Denmark a leading country in efforts to safeguard natural and semi-natural habitat types and biodiversity. The action plan may establish further necessary specific targets and time limits for conservation and protection of natural and semi-natural habitat types and biodiversity.”

Preparation of a national action plan for biodiversity and nature protection has three overall objectives:

- to expand the 1995 national strategy for biodiversity by increasing Danish political and practical initiatives in order to comply with and implement Denmark's obligations under the 1992 UN Convention on Biodiversity, the EEC Bird Protection Directive, the EEC Habitat Directive, and other obligations in international nature-protection conventions and agreements.
- to implement a number of OECD recommendations for Danish nature-protection policy issued in 1999 with the OECD assessment of environmental initiatives in Denmark.
- to secure, enhance, and target initiatives for biodiversity and nature protection, including ensuring optimal application of instruments in relation to these initiatives, and sector integration of agriculture, forestry and fisheries, cf. Article 6 of The Amsterdam Treaty on integration of environmental considerations into other policies.

Background

The UN Convention on Biodiversity provides for holistic and combined protection with regard to development. Amongst other things, the Convention commits countries to preparing national strategies, action plans, etc., or to adapting existing strategies and plans to the Convention. Countries must also include biodiversity considerations in relevant sector policies and introduce financial incentives for protection and sustainable exploitation of biodiversity.

The EEC Bird Protection Directive of 1979 aims at protecting wild birds and their habitats in the Community area. Member States must take all necessary measures to secure species in a manner which addresses in particular ecological, scientific, and cultural requirements and which also allows for economic and recreational aspects. Member States must also take all necessary measures to protect, maintain, and restore adequately diverse and extensive habitats for the bird species covered by the Directive.

The EEC Habitat Directive of 1992 aims at helping to secure biodiversity by preserving natural and semi-natural habitat types and wild animals and plants within the Treaty area. Measures to be taken under the Directive aim at maintaining and restoring favourable conservation of natural and semi-natural habitat types and wild animal and plant species of significance to the Community. Measures must take account of economic, social, and cultural needs as well as regional and local distinctions.

Amongst other things, the 1999 OECD assessment of Danish environmental initiatives recommends that Denmark:

- continues to fulfil the goals in the 1995 national strategy for biodiversity,
- draws up a final national action plan for nature protection with quantitative objectives and time limits,
- increases integration of biodiversity considerations into agriculture and fisheries policy.

The task of the Wilhjelm Committee

The task of the Wilhjelm Committee is to prepare a report which will form the basis of the government's action plan on biodiversity and nature protection. This action plan should be completed before the government conference Rio+10 in 2002.

In parallel with the work of the Wilhjelm Committee, preparation of a Danish strategy for plant-genetic resources for food and agriculture and work on agrobiodiversity will take place.

Terms of reference

The Wilhjelm Committee is to issue a brief report to the government stating clearly the goals, resources, and priorities for future initiatives for biodiversity and nature protection.

The Committee is to take stock of the international commitments and national targets and strategies to promote biodiversity and nature protection, as well as action plans affecting these.

The Committee is to assess initiatives in relation to international commitments, and national targets and strategies, and in this connection identify where initiatives can be expanded.

The Committee is to give an account of needs for future initiatives in order to achieve targets, including the need for further enhancement of initiatives for biodiversity and nature protection.

The Committee is to assess the tools applied and need for enhanced coordination of initiatives and new priorities.

On this basis, the Committee is to:

- prepare proposals for the implementation of necessary knowledge development and monitoring,
- prepare proposals to secure, enhance, and target initiatives for biodiversity and nature protection, including optimisation of the application of existing tools and enhancement of integration of these considerations into agriculture, forestry, and fisheries,
- present proposals for any changes in application of existing tools and any new tools,
- present proposals for enhanced coordination of initiatives and new priorities,
- assess the commercial and socio-economic consequences of the proposals.

The recommendations of the Committee are to be prepared taking account of, and with a view to contributing to, the principle of sustainable development, environmentally, economically, and socially.

Time-table

The report of the Wilhjelm Committee is to be completed by mid 2001.

Secretariat

The Wilhjelm Committee is to be served in the secretariat function by the Danish Forest and Nature Agency. The Agency has established a special secretariat for this purpose.

3. Composition of the Wilhelm Committee

Nils Wilhelm, Managing Director
Chairman

Katherine Richardson, Professor
Deputy Chairman

Henrik Høegh, 1. Vice-President
Danish Farmers' Union

Lone Sondrup, Farmer
Danish Farmers' Union

Niels Christian Larsen, Vice-President
Danish Family Farmers' Association

Thomas Færgeman, Head of Department
Danish Society for the Conservation of Nature

Rikke Lundsgaard, Agronomist
Danish Society for the Conservation of Nature

Thomas Harttung
Danish Organisation for Organic Farming

Carsten Krog, Environmental Consultant
Danish Fishermen's Association

Jan Søndergaard, Managing Director
Danish Forest Association

Niels Kanstrup, Biologist
Danish Hunters' Association

Henning Pedersen, Board Member
Danish Association of Anglers

Kirsten Nielsen, Board Member
Danish Outdoor Council

Knud Flensted, Biologist
BirdLife Denmark

Ib Skals, Secretary
Economic Council of the Labour Movement

Michael Brinch Pedersen, Head of Department
World Wildlife Fund

Jytte Heslop, Environment Director
Association of County Councils in Denmark

Iben Koch, Deputy Head of Division
Local Government Denmark

Astrid Ravnsbæk, Head of Division
Ministry of Food, Agriculture and Fisheries

Sten Strömngren, Head of Division
Ministry of Food, Agriculture and Fisheries

Susanne Harder Gabrielsen, Head of Section
Directorate for Food, Fisheries and Agri Business

Dorthe Nøhr Pedersen, Head of Division
Ministry of Transport

Mette Mørkeberg, Head of Section
Ministry of Finance

Lone Neerhøj, Special Consultant
Ministry of Economic Affairs

Susanne Herfelt, Head of Division
Spatial Planning Department

Helle Pilsgaard, Head of Division
Danish Environmental Protection Agency

Hans Henrik Christensen, Director General
Danish Forest and Nature Agency

Tine Kjær Hassager, Special Consultant
Danish Institute for Fisheries Research

Gertrud Jørgensen, Director of Research Department
Danish Forest and Landscape Research Institute

Karen Søgaard, Senior Researcher
Danish Institute of Agricultural Sciences

Hanne Petersen, Director of Research Department
Danish Environmental Research Institute

Peter Vestergaard, Associate Professor
University of Copenhagen

Bent Aaby, Professor
National Museum of Denmark

Jørgen Birk Mortensen, Associate Professor
University of Copenhagen

Peder Agger, Professor
Danish Nature Council (observer)

Secretariat

Danish Forest and Nature Agency:
Henrik Knuth-Winterfeldt, Head of Division
Ingelise Johansen, Senior Assistant
Lone Bjørn, Hortonomist
Henrik Wichman, Head of Section
Tine Nielsen Skafte, Biologist
Jørn Jensen, Agronomist