

# Fourth Country Report to CBD, Denmark, December 2009

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REPORTING PARTY

Contracting Party	Denmark
<b>National Focal Point</b>	
Full name of the institution	Ministry of Environment
Name and title of contact officer	Martin Schneekloth
Mailing address	The Agency for Spatial and Environmental Planning, Nature Division, Haraldsgade53, DK 2100, Copenhagen, Denmark
Telephone	+45-72544857
Fax	+45 39279899
E-mail	masch@blst.dk
<b>Submission</b>	
Signature of officer responsible for submitting national report	The Agency for Spatial and Environmental Planning, Nature Division, Haraldsgade53, DK 2100, Copenhagen, Denmark Mr. Martin Schneekloth
Date of submission	9. december 2009

## Executive summary

The status of biodiversity in Denmark reflects the country's high population density and a long history of intensive commercial exploitation of raw materials, soils, timber, water and stocks of wild species. The vast majority of the country is covered by highly modified urban, silvicultural and arable areas, where construction, cultivation and plantations limit biological diversity. However, there are some natural areas left with high biological diversity. The long protected coastal line, the extensive sea territory and more recent regulations to protect birds and mammals from unsustainable hunting has helped to protect large areas of important habitats and their biological diversity, including large populations of birds.

From a biodiversity perspective, forests hold the largest number of Danish species and also the largest number of threatened species. Forests cover 12% of the Danish terrestrial land area, the vast majority of which is intensively managed logged plantations with relatively few old growth habitats and forest glades for endangered species. However in the last 20 years efforts have been made to secure such habitats, through a Danish national strategy for natural forests, through certification and through a shift towards close to nature forestry practices of all the Danish state forests.

The coastal and marine ecosystems must be considered the most important Danish contribution to European biodiversity, as Denmark holds a major proportion of the areas of dunes, saltmarsh and shallow marine waters, of crucial importance for specialised lichens, plants, fungi and invertebrates, as well as waterbirds, of which Denmark hosts a large globally important share of many flyway populations, e.g. East-Atlantic population of light-bellied brent goose (100%), Svalbard population of pink-footed goose (100%) and the Baltic-Wadden Sea population of common eider (86%).

In conclusion, the best current estimate is that biodiversity is still under heavy pressure. It should be stressed that it is a challenging task to reverse population declines that follow decades of declining habitat area and quality. First, there is a marked delay in the population response to habitat destruction for most species, especially perennial and sedentary species which may survive long after de facto habitat destruction. When habitats are restored or conditions improved, the recovery delay may be even longer, especially for species with poor dispersal ability and highly fragmented populations.

The main threats to Danish biodiversity are identified to be: Cultivation, pesticides, eutrophication, land drainage, overgrowing, high-intensity logging in forests and plantations, former activities to straighten and dam watercourses and commercial fishing.

Denmark has outlined its nature conservation policy objectives in a range of documents, which are in the process of being implemented:

*The National Strategy for Sustainable Development (2002)* sets targets and principles for sustainable development including the objectives of securing a high degree of biodiversity and preserving Denmark's ecosystems;

*The agreement on Green growth (2009)* is a political agreement in the Danish parliament. The purpose of the agreement is to ensure that a high level of environmental, nature and climate protection goes hand in hand with modern and competitive agriculture and food industries. This is an ambitious and long-term plan defining environment and nature policies and the agriculture industry's growth conditions. A total of DKK 13.5 billion is to be invested in Green Growth until 2015, which is about a 50% increase in investments compared to previous initiatives.

The *National Strategy on Natural Forests* (1992-2040) has as overall objective to conserve the biodiversity on the Danish Forests, including the gene resources present in these areas;

The *National Forest Programme* (2002) sets targets for increasing the national forest area and managing the forests in a way that takes the protection of the biological diversity better into account;

The *National Strategy on Biological Diversity* (2004) brings together laws and establishes targets for the conservation of biodiversity;

The *Action plan for Biodiversity and Nature Conservation* (2004-2009) specifies actions to protect nature and biodiversity in accordance with the national Strategy and with EU legislation and the Convention on Biological Diversity;

The *Action Plan for Nature Conservation* (2005) specifies criteria for prioritising nature conservation by site of natural landscape or recreational value, when conservation cannot be done by use of other instruments;

The *National Action plan on Alien Invasive Species* (2009) gives a number of recommendations on actions to be taken. The action plan focuses on prevention, eradication, information and capacity building, research and administration.

Denmark is also in the process for implementing 246 legally binding action plans for designated Natura 2000 areas and River Basin Management Plans for the whole country. The target of the Natura 2000 action plans are to ensure that the species and nature types for which the areas have been designated will achieve a favourable conservation status both locally and nationally. The target of the River Basin Management Plans is to achieve a good ecological status for the surface waters and a good status for the ground water before 2015.

Moreover, Denmark has passed legislation which forbids the authorities to grant permits to plans and activities which can 1) damage breeding and resting places or disturb a range of animal species, 2) destroy individuals in all their life stages of a number of plant species, which figure in annex IV of the EU habitats directive, wherever these animal and plant species might occur.

Denmark has also passed a national park law. So far one national park has been established and 4 more will follow in the coming years.

In the last 20 years Denmark has carried out several large nature restoration projects among others for rivers, meadows, salmonids, coastal heaths and dunes and moors. Denmark has also conserved more areas under national protection orders. In the last 9-10 years app. 24.000 ha of new forests and nature areas has been developed.

Furthermore, Denmark is currently implementing a range of species action plans and a plan for combating invasive alien species.

Biodiversity considerations are being integrated into sectoral and cross-sectoral policies on especially infrastructural development, aquaculture, agriculture, forestry, fisheries, spatial planning, international cooperation and international development assistance.

Denmark has a strategy for the conservation of the genetic diversity of animal and plant resources in agriculture. However, genetic diversity plays a relatively little role in Danish Nature management. Considerations for genetic diversity are taken, for example through ex situ protection of genetic diversity of forest trees. Efforts towards conserving the genetic diversity of the living organisms are furthermore taken through the municipalities planning of corridors and core areas and through the

incorporation of for example fauna passages, corridors and stepping stones in road and railway construction.

In the coming years more national parks and 75.000 ha of new nature areas are planned. The negative effect of pesticides and eutrophication will be reduced, and more species action plans are envisaged to be carried out. More over, Denmark will be bound by a coming EU marine framework directive. Denmark has designated new and enlarging existing marine Natura 2000 areas.

# Chapter I: Overview of Biodiversity Status, Trends and Threats

## Introduction

The status of biodiversity in Denmark reflects the country's high population density and a long history of intensive commercial exploitation of raw materials, soils, timber, water and stocks of wild species. The vast majority of the country is covered by highly modified urban, silvicultural and arable areas, where construction, cultivation and plantations limit biological diversity.

The long protected coastal line, the extensive sea territory and more recent regulations to protect birds and mammals from unsustainable hunting has helped to protect large areas of important habitats and their biological diversity, including large populations of birds.

From a biodiversity perspective, forests hold the largest number of Danish species and also the largest number of threatened species. Forests cover 12% of the Danish terrestrial land area, the vast majority of which is intensively managed logged plantations with relatively few old growth habitats and forest glades for endangered species. However in the last 20 years efforts have been made to secure such habitats, through a Danish national strategy for natural forests, through certification and through a shift towards close to nature forestry practices of all the Danish state forests.

The coastal and marine ecosystems must be considered the most important Danish contribution to European biodiversity, as Denmark holds a major proportion of the areas of dunes, saltmarsh and shallow marine waters, of crucial importance for specialised lichens, plants, fungi and invertebrates, as well as waterbirds, of which Denmark hosts a large globally important share of many flyway populations, e.g. East-Atlantic population of light-bellied brent goose (100%), Svalbard population of pink-footed goose (100%) and the Baltic-Wadden Sea population of common eider (86%).

The rest of chapter one is quoted from the Danish Environmental survey Report 2009 made by the National Environmental Research Institute.

# The agricultural landscape

## Key issues

The population of 22 species of Danish farmland birds fell by 36 per cent between 1990 and 2008. Arable land has become more homogenous and many hedges have disappeared. Fields are on average 7 per cent larger than they were 10 years ago.

## Factors affecting status

The agricultural picture (the arable landscape) is one of cultivated fields, fallow fields, permanent pasture, hedges and agricultural buildings. Cultivated fields comprise 62 per cent of Denmark's land area. Besides producing food crops, these fields are home to many species of plant and animal. Arable land is thus an important feature of the Danish countryside and is highly significant for biodiversity. The main threats to biodiversity in agricultural areas are cultivation, pesticides, pollution by nutrients, land drainage and the clearing of habitats such as hedges and ponds. One of the best-known methods of assessing the condition of the natural environment in arable areas is to use population numbers of birds which are common to the habitat, such as lapwing, partridge and skylark.

## Current status

Monitoring of species on arable land concentrates on birds and certain mammals, whilst information on plants and insects is limited. The population of 22 species of Danish farmland birds fell by 36 per cent between 1990 and 2008. This is a clear indication of diminishing biodiversity on arable fields. Numbers of partridge fell by 54 per cent between 2000 and 2008 and the little owl population fell by 63 per cent between 1998 (approx. 150 pairs) and 2008 (approx. 55 pairs). Numbers of hares have fallen drastically since the 1960s. The official game bag record for hares fell by 31 per cent between 2000 and 2007. It is anticipated that numbers will continue to fall in the coming years, as survival rates for young are at an all-time low<sup>1</sup>. The average size of Danish fields increased by 7 per cent between 1998 and 2008. A survey of hedges in South Jutland indicates an overall fall in acreage of 6.5 per cent between 1994 and 2007. The numbers cannot be directly transferred to the national level but nonetheless indicate an adverse development in the agricultural landscape.

### Read more at:

The Agency for Spatial and Environmental Planning on the subject of biodiversity:

<http://www.blst.dk/2010/>

Agriculture figures:

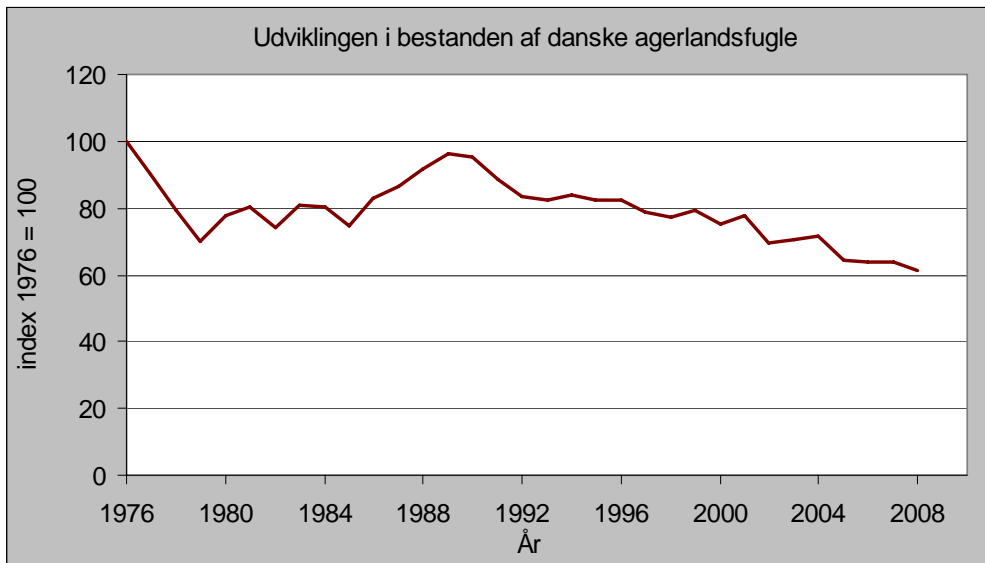
[http://www.landbrug.dk/smcms/Landbrug/Baggrund/Tal\\_om\\_landbruget\\_1/Statistik/Index.htm?ID=6491](http://www.landbrug.dk/smcms/Landbrug/Baggrund/Tal_om_landbruget_1/Statistik/Index.htm?ID=6491)

Ornithological news (The Danish Ornithological Association):

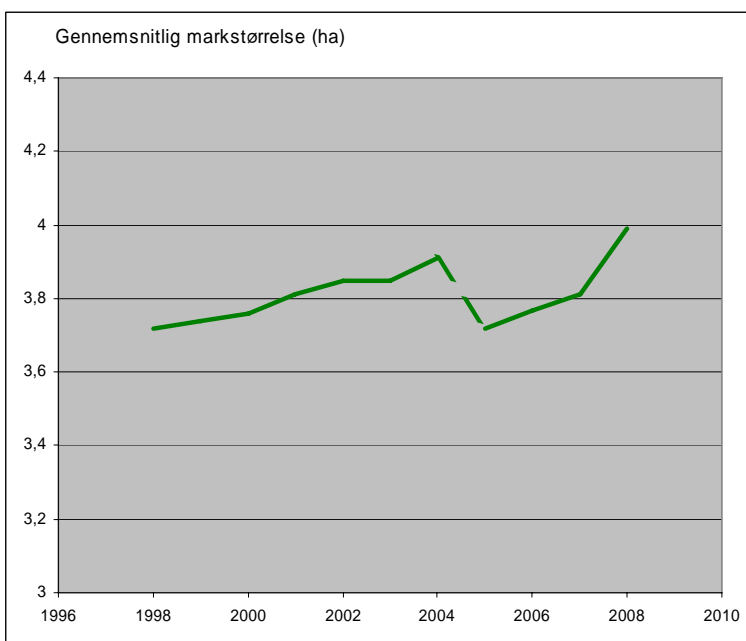
[http://www.dof.dk/sider/index.php?option=com\\_content&task=view&id=209&Itemid=239](http://www.dof.dk/sider/index.php?option=com_content&task=view&id=209&Itemid=239)

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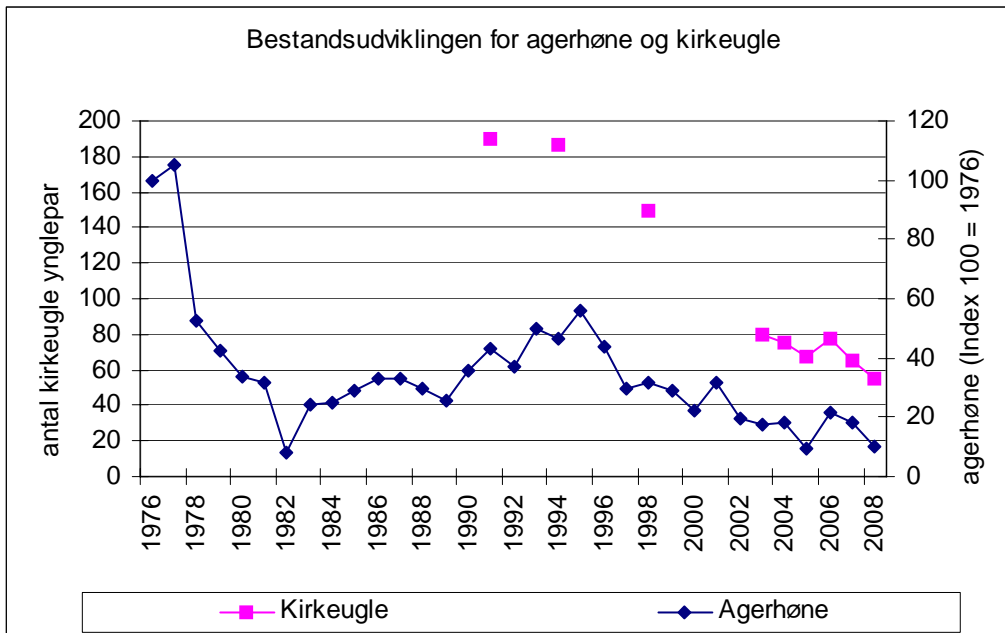
<sup>1</sup> Wincentz Jensen, T. 2009: Identifying causes for the population decline of the brown hare (*Lepus europaeus*) in agricultural landscapes in Denmark. Ph.D. thesis. Danish National Environmental Research Institute, Aarhus University.



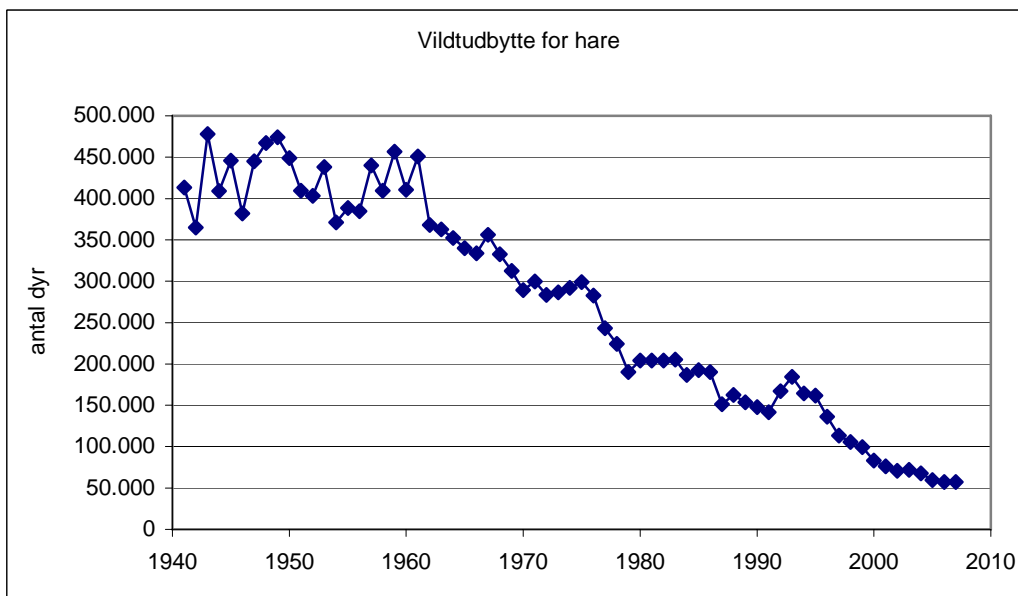
**Figure 1:** The populations of 22 Danish bird species found on arable land (kestrel, partridge, lapwing, common snipe, skylark, swallow, meadow pipit, blue-headed wagtail, white wagtail, whinchat, wheatear, fieldfare, lesser whitethroat, whitethroat, red-backed shrike, rook, crow, tree sparrow, goldfinch, linnets, yellowhammer and corn bunting). Source: Danish Ornithological Association.



**Figure 2:** Average field size in hectares (ha) in Danish agriculture. The marked drop between 2004 and 2005 was due to a change in the grant scheme allowing grants for fields as small as 0.3 ha. This resulted in the recording of such fields. Source: Danish National Environmental Research Institute.



**Figure 3:** Changes in partridge and little owl populations in Denmark. Source: Danish Ornithological Association.



**Figure 4:** Changes in official game bag for hares since 1941. The game bag is an indirect indicator of developments. Source: Danish National Environmental Research Institute.



**Figure 5:** *Hedges in a map section near Billund in Jutland. The map shows the changes that occurred between 1994 and 2007. Overall, 6.5 per cent of hedges were removed (measured by acreage) between 1994 and 2007. Corresponding national figures are not available. Source: Danish National Environmental Research Institute.*

## Open habitats

### Key issues

The area occupied by open habitat types such as commons, heaths, bogs and sand dunes is decreasing.

66 per cent of open habitats have a poor conservation status.

### Factors affecting status

Open habitats are some of the most characteristic of Danish landscapes, including heath, commons, meadow, saltmarsh, sand dunes and bog. Open habitats often need to be grazed or harvested to prevent them reverting to forest. Today, the threat comes from overgrowing and the impact of nutrients. Only limited data is available on national developments in the quality of open habitats and their biodiversity. Environmental monitoring on a national level was established in 2004.

### Current status

Open habitat types are in decline in terms of both area and quality. As a percentage of total Danish acreage, open habitats have fallen from 12.5 per cent in 1965 to 9.2 per cent in 2000 (see also 1.1 Land use). Of the 32 types of open habitat registered in accordance with EU criteria, 21 have a moderate to highly unfavourable conservation status relating to the period 2001-2006, corresponding to 66 per cent<sup>2</sup>. Only 6 per cent have a favourable conservation status. There are moreover seven types of habitat on the EU list of high priority habitats. Of these seven, five have an unfavourable conservation status, whilst the remaining two have uncertain status. The main reason for the unfavourable status of open habitats is overgrowing, nutrient pollution and land drainage<sup>3</sup>.

### Objectives

Current knowledge concerning developments in open habitats, including changes in acreage, indicates that these types of habitat are continuing to diminish. The Nature Conservancy Act of 1992 protects meadows, commons, saltmarsh, meadows and bogs of over 2,500 m<sup>2</sup> (known as 'Section 3 areas'). Currently, open habitats are protected by law against, for example, ploughing and drainage. However open habitat in general is not protected against overgrowing and nutrient pollution. The aim of the government's agreement on Green Growth in 2009 is to ensure a targeted initiative in Natura 2000 sites and to assure the care of approx. 40,000 ha of open habitat outside Natura 2000 sites<sup>4</sup>.

### Read more at:

The Agency for Spatial and Environmental Planning on the subject of biodiversity:

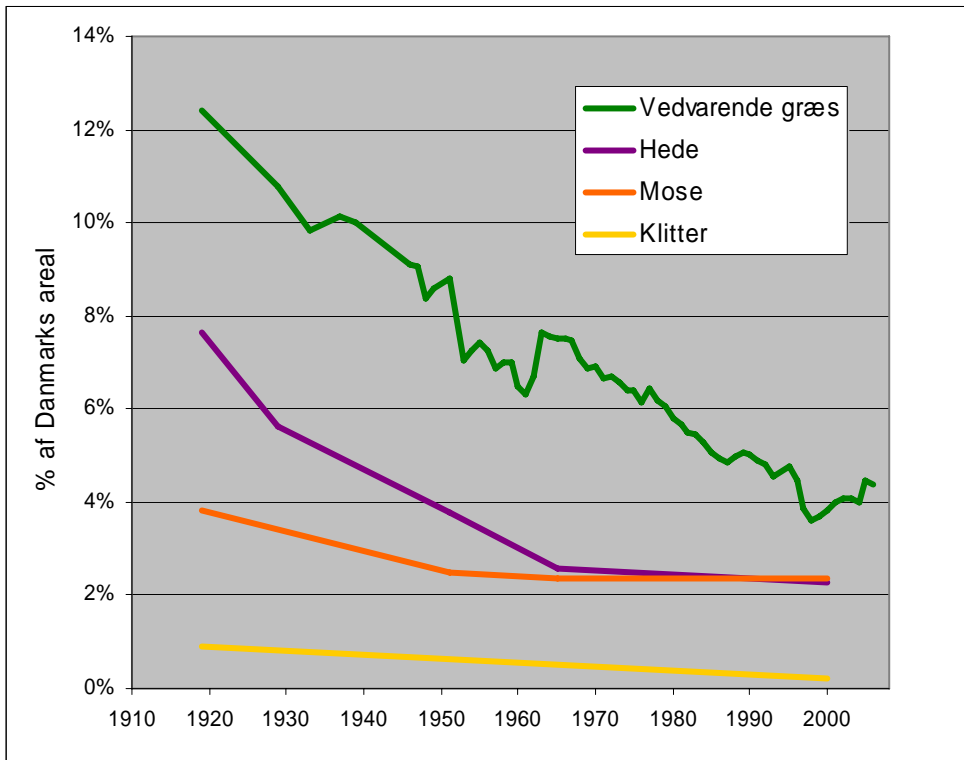
<http://www.blst.dk/2010/>

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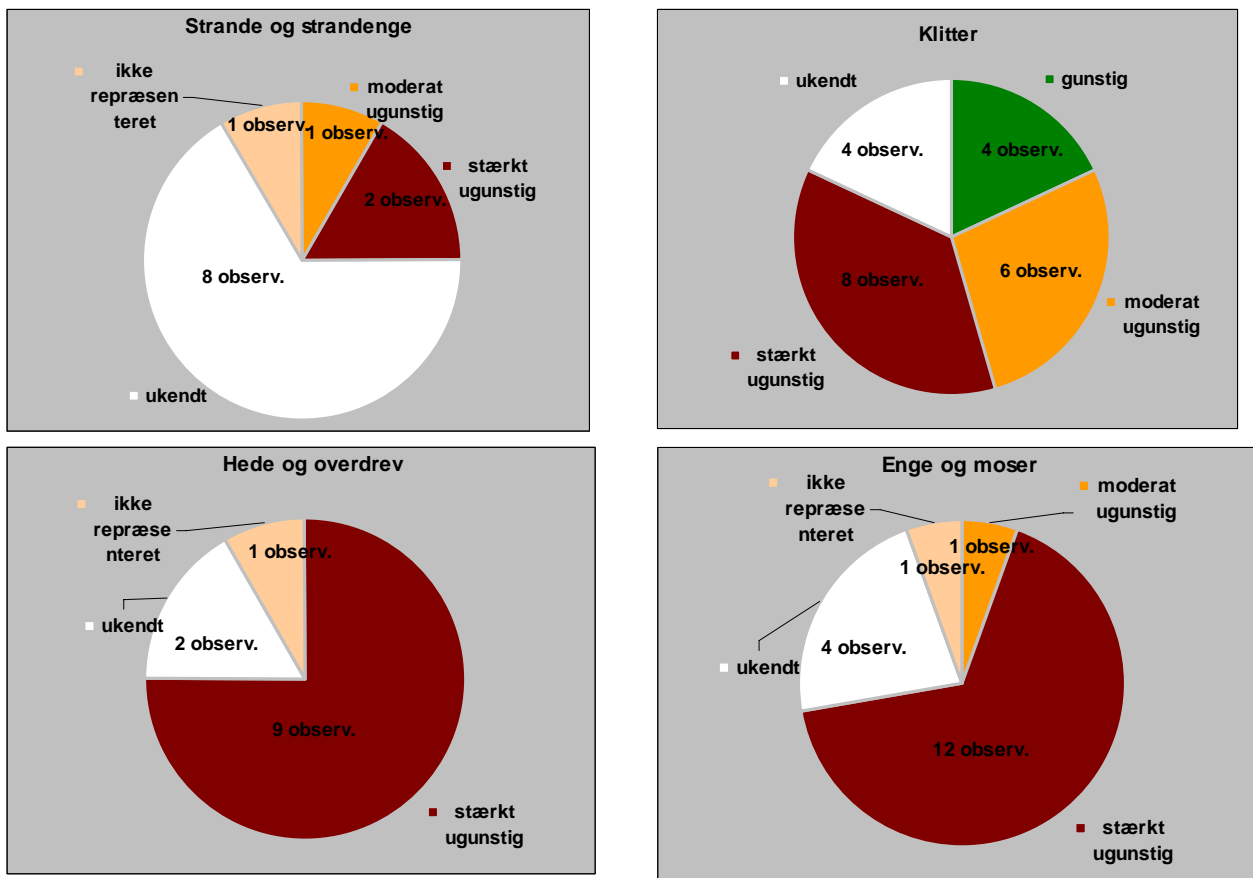
<sup>2</sup> Ejrnæs, R., Nygaard, B., Andersen, P.N., Damgaard, C., Jørgensen, T.B., Nielsen, K.E., Petersen, D.L.J., Skriver, J., Søgaard, B., Teilmann, J., Wind, P. 2008: En status over naturens tilstand i Danmark. (*Status report on Danish nature*) DMUnyt (NERI) magazine 12:3. <http://www.dmu.dk/Udgivelser/DMUNyt/2008/3/naturstatus.htm>

<sup>3</sup> Danish Ministry of the Environment: Denmark's contribution to the EU with regard to Article 17 in the EU Habitats Directive <http://biodiversity.eionet.europa.eu/article17>

<sup>4</sup> Ejrnæs, R., Nygaard, B., Andersen, P.N., Damgaard, C., Jørgensen, T.B., Nielsen, K.E., Petersen, D.L.J., Skriver, J., Søgaard, B., Teilmann, J., Wind, P. 2008: En status over naturens tilstand i Danmark. (*Status report on Danish nature*) DMUnyt (NERI) magazine 12:3. <http://www.dmu.dk/Udgivelser/DMUNyt/2008/3/naturstatus.htm>



**Figure 6:** Developments in open habitat acreage: permanent grass (pasture, common, meadow, saltmarsh, heath, bog and sand dunes). Source: Danish National Environmental Research Institute.



**Figure 7:** The conservation status for the period 2001-2006 for 32 Danish open habitats in accordance with the EU Habitats Directive. Note that the sum of all the 'slices' is more than 32, as Denmark is divided into Atlantic and continental biogeographical zones. The conservation status with regard to habitat types has been compiled for each of the two zones. One habitat therefore counts as two sets of observations. Source: Danish National Environmental Research Institute.

## Forests

### Key issues

The population of 22 species of Danish woodland birds has been stable since 1990. Quality of nature in Danish forests – as measured by the number of old trees, dead wood and undisturbed forest – is low. Six out of 9 types of forest have been labelled as having a favourable conservation status

### Factors affecting status

Large parts of Denmark would still be wooded if man had not influenced the landscape. Danish woods are both deciduous and coniferous with a high proportion devoted to plantation or production forest. There is a lack of knowledge of most woodland species, apart from birds. Some things are known about forest quality in terms of the amount of dead wood, the area of inactive forest and old forestry methods for example. Many species live only in older forest with dead wood, whilst others inhabit clearings.

### Current status

The population of 22 species of native woodland birds such as sparrowhawk, robin, wood warbler and goldcrest increased from around 1980 to 1990 and has subsequently been stable. The volume of dead wood in Danish managed forests is on average 4.7 m<sup>3</sup> per hectare<sup>5</sup>, as opposed to 70m<sup>3</sup> in a natural forest<sup>6</sup>. 73 per cent of forests contain no dead wood. The percentage of trees older than 100 years is 25 per cent for beech, 7 per cent for ash and 0.1 per cent for common spruce. Felling, new plantations and a small percentage of undisturbed forest contribute to a relatively low mean tree age. Undisturbed forest is today estimated to account for 7 per cent of Danish forest, but only 1.6 per cent enjoys direct protection as undisturbed forest<sup>7</sup>. Overall, Danish forests are on the increase due to re-forestation (see 1.1 Land use). A survey for the period 2001-2006 shows that out of 9 forest types in Denmark (as specified in the EU Habitats Directive), six have favourable, one has moderately unfavourable, one has unfavourable and two have unknown conservation status.

### Objectives

The 1992 strategy for natural woodland aimed to devote 40,000 ha to natural woodland, undisturbed forest and traditional cultivation methods by no later than 2040 and at the same time, nature and biodiversity should be instated as primary goals in 10 per cent of forests by 2040. Natural cultivation methods have been introduced in state forests and these have been certified under two schemes since 2007 (FSC and PEFC). The FSC places strict requirements on sustainable forest management, including the rule that a minimum of three trees per hectare must be allowed to die naturally and that self-regeneration only is permitted. Because of the long-term goals in the natural woodland strategy and the recent introduction of forest certification, it is not yet possible to say how much these rules will impact on biodiversity in the forest.

### Read more at:

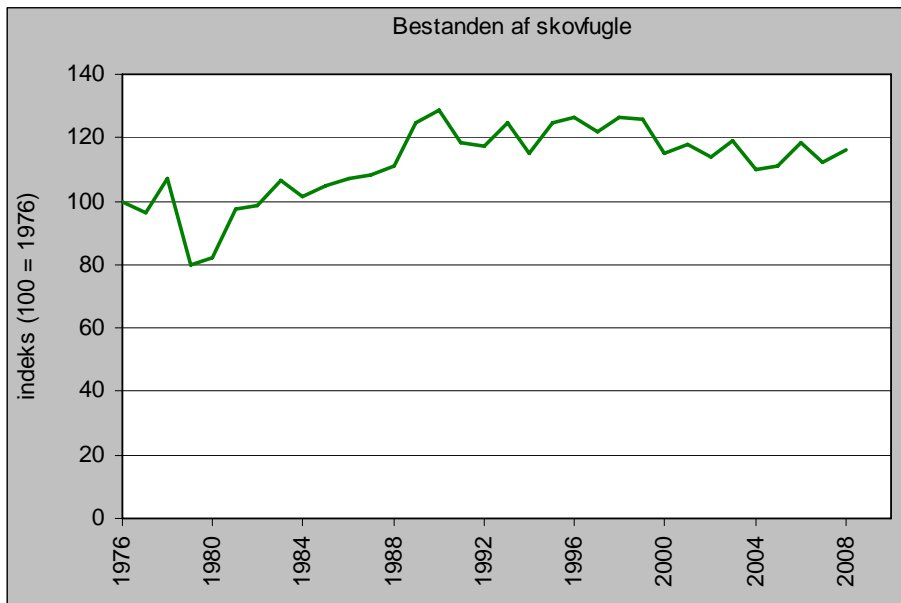
Forest facts: (Forest and Nature Agency): <http://www.skovognatur.dk/Skov/Fakta>  
Forest and Landscape, University of Copenhagen: <http://www.sl.life.ku.dk/Emner/Skov.aspx>

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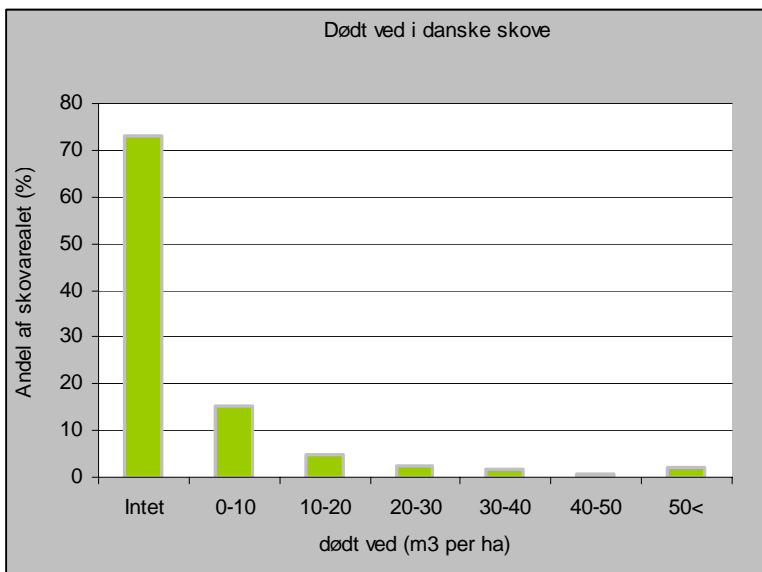
<sup>5</sup> Nord-Larsen, T., Johannsen, V.K., Jørgensen, B.B., Bastrup-Birk, A. 2008: Skove og plantager 2006. Skov & Landskab (*Forest and plantations 2006*. Forest and Landscape Denmark) <http://www.sl.kvl.dk/upload/sp2006.pdf>

<sup>6</sup> Christensen, M., Hahn, K., Mountford, E.P., Odor, P., Standovar, T., Rozenbergar, D., Diaci, J., Wijdeven, S., Meyer, P., Winter, S., Vrska, T. 2005: Dead wood in European beech (*Fagus sylvatica*) forest reserves. *Forest Ecology and Management* 210: 267–282.

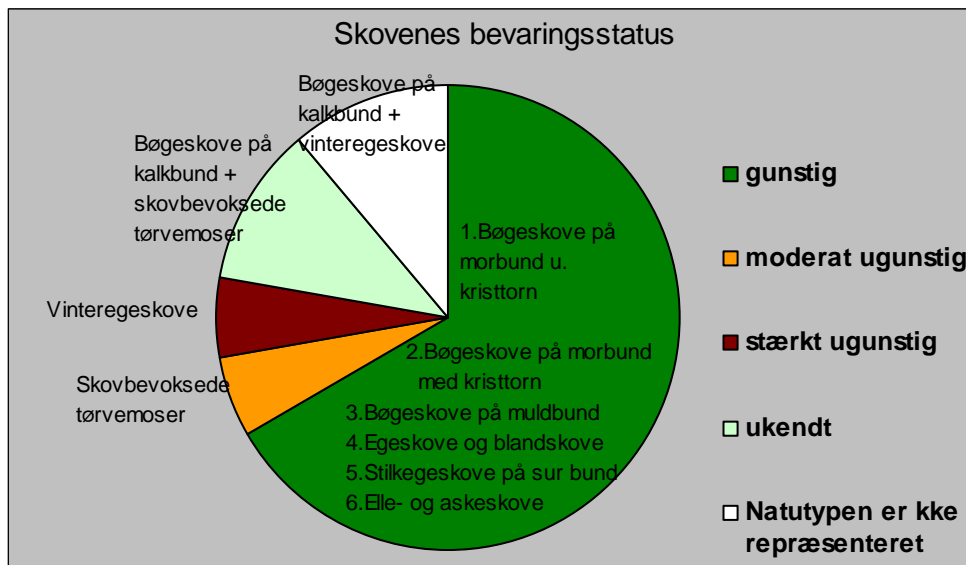
<sup>7</sup> Ejrnæs, R. 2009: Notat til By og Landskabsstyrelsen med udkast til kapitel 1 til 4. landerapporten til CBD-sekretariatet om tilstand, udvikling og trusler for Danmarks biodiversitet: Overview of Biodiversity Status, Trends and Threats in Denmark.



**Figure 8:** The 22 species of woodland bird in Denmark (sparrowhawk, stock pigeon, black woodpecker, great spotted woodpecker, robin, redstart, mistle thrush, garden warbler, wood warbler, chiffchaff, goldcrest, pied flycatcher, marsh titmouse, crested tit, coal tit, nuthatch, tree runner, jay, raven, chaffinch, bullfinch, hawfinch). Source: Danish Ornithological Association.



**Figure 9:** Volume of dead wood in Danish forest in 2006, measured in m<sup>3</sup> of dead wood per ha of forest. In comparison, a natural forest contains over 70m<sup>3</sup> of dead wood per hectare. Source: Forest and Landscape.



**Figure 10:** The conservation status of nine types of forest in accordance with the EU Habitats Directive for the period 2001-2006. The Danish survey of conservation status did not include an assessment of the condition of the volume of dead wood and trees' age. Note that a forest type can have two allocated conservation status results, as Denmark is divided into Atlantic and continental biogeographical zones. The conservation status with regard to forest types has been compiled for each of the two zones. Source: Danish National Environmental Research Institute.

## Lakes and watercourses

### Key issues

The conservation status is unfavourable for all five types of lake listed by the Habitats Directive and for one of two watercourse types.

The incidence of the most sensitive of small animals in watercourses has risen by 23 per cent between 2000 and 2007.

### Factors affecting status

There are around 138,000 lakes (more than 100m<sup>2</sup> in area) and around 69,000 km of watercourses in Denmark. Many Danish lakes and watercourses are endowed with a rich supply of natural flora and fauna. The small animals in watercourses include the caddis fly, mayfly and stonefly. They are also known as freshwater fauna and constitute a good indicator of the natural condition of the watercourse and of biodiversity, as they are very sensitive to physical and chemical changes in their habitat. The main threats to Danish watercourses are maintenance, the discharge of sewage and former practices to straighten and dam watercourses. The main threats to Danish lakes come from the introduction of agricultural nutrients and sewage. Over time, an unknown number of ponds have been drained or reclaimed for agriculture.

### Current status

For the period 2001-2006 the conservation status of five types of Danish lakes and two watercourse types, as covered by the Habitats Directive, was found to be unfavourable for all lake types and moderately unfavourable for one of the watercourse types. The second watercourse type received 'unknown' status. In recent years, however there have been marked improvements in species diversity in watercourses. Incidence of the most sensitive small animals (caddis fly, mayfly and stonefly) increased by 23 per cent in Danish watercourses between 2000 and 2007. Otters, which live in and near watercourses and lakes, have prospered since the 1980s, when the population re-established itself in much of Jutland<sup>8</sup>.

### Objectives

There are indications in watercourses and lakes that loss of biodiversity has halted. The Water Framework Directive sets the objective of achieving good ecological status in watercourses and lakes by 2015, which means that in general, watercourses should have value 5 on the Danish Watercourse Index of Fauna (see 3.2 Water quality in watercourses). Restoration of watercourses has been extensive in recent years and it is expected that there will be positive effects on conditions. The government's Green Growth agreement of 2009 provides for improvement in the physical conditions of selected stretches of watercourses totalling 7,300 km<sup>9</sup>. The Green Growth agreement replaces the Aquatic Environment Plan III with new objectives. Nutrient input from agriculture into the aquatic environment must be reduced by 19,000 tonnes nitrogen and 210 tonnes phosphorus by 2015. At the same time, there is emphasis on improving treatment processes for wastewater being discharged from towns to open countryside. Lakes are especially sensitive with regard to increased levels of nutrients, so that the objectives are expected to have a more marked effect on lakes than on watercourses.

### Read more at:

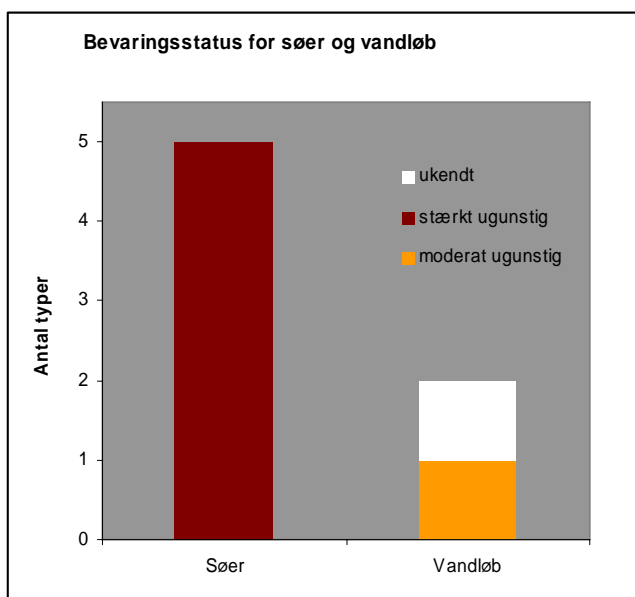
The aquatic environment in Denmark (Agency for Spatial and Environmental Planning):

<http://www.blst.dk/Vandmiljoeet>

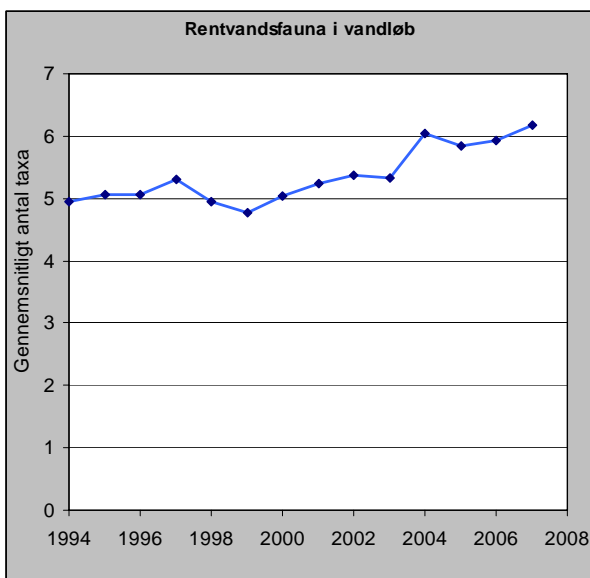
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<sup>8</sup> Søgaard, B., Pihl, S., Wind, P. 2006: NOVANA. Arter (*Species*) 2004-2005. NERI Technical report 582.

<sup>9</sup> Danish Government 2009: Agreement on Green Growth dated 16 June 2009. Danish Government (Venstre and De Konservative [the Danish Liberal Party and the Danish Conservative Party]) and Dansk Folkeparti [the Danish Peoples' Party] <http://www.oem.dk/sw25655.asp>



**Figure 11:** The conservation status for the period 2001-2006 of five types of lake and of two types of watercourse in Denmark listed by the Habitats Directive. Source: Danish National Environmental Research Institute.



**Figure 12:** The average number of sensitive insects (stoneflies, mayflies and caddis flies), the so-called EPT taxa, of 133 watercourse stations between 1994 and 2007. The higher the number, the greater the biodiversity. Source: Danish National Environmental Research Institute.

## Life on the seabed

### Key issues

Diversity of species and populations of seabed organisms in Danish coastal waters has fallen since 2000.

### Factors affecting status

In Denmark, the seabed is generally soft, but reefs are also common. Reefs in particular harbour rich plant life (seaweed forests). Many Danish reefs have however been destroyed in the past by bottom-trawling or the removal of rock for use in jetties, for instance. The main threats to biodiversity in the sea and on the seabed are pollution by nutrients, bottom-trawling and deoxygenation. Long-term effects on the marine environment can be ascertained by examining the composition and diversity of seabed organisms.

### Current status

Diversity of seabed creature types in Danish coastal waters has fallen. Samples from 18 stations in the Kattegat and two straits show that species diversity has fallen from 3.7 points in 1994 and 3.0 points in 2000 to 2.3 in 2007, using the Margalef Index of community diversity. The number of species more than halved between 1994 (almost 14 species per sample) and 2007 (6.5 species per sample). This decline is fairly evenly spread across the various groups of seabed organisms, but when considered in terms of numbers of individuals per m<sup>2</sup> of sand seabed, bristle worms emerge as the group which has declined most severely. Figures for organisms living on and near reefs are not available.

### Objectives

Danish plans for the aquatic environment – which are now incorporated in the 2009 Green Growth agreement – aim to reduce input of nutrients into the sea. This will have a positive effect on the environmental condition of the sea. Monitoring of seabed organisms since 1994 show, that their diversity has halved. This is an indication that biodiversity in the sea is continuing to decline, even though nutrient input has fallen considerably since 1990. The reason for this decline is unknown. Denmark's largest marine nature regeneration project is being conducted near Læsø<sup>10</sup>. A formerly valuable reef is disappearing due to trawl-fishing. Depositing 95,000 tonnes of stone will create a new reef, 7 ha in area, which will provide new habitats for animals and plants. The project is due to be finished in 2012.

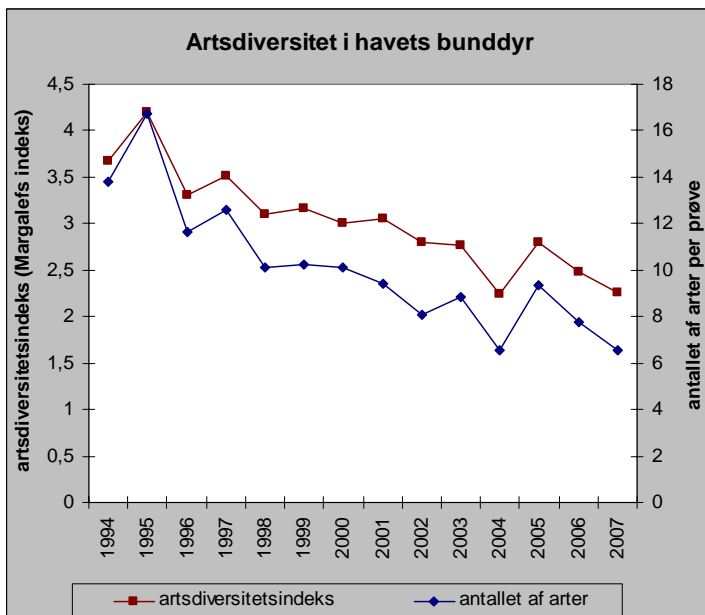
### Read more at:

Book on reefs – 'Stenrev – havets oaser' (*Reefs -oases of the sea*):

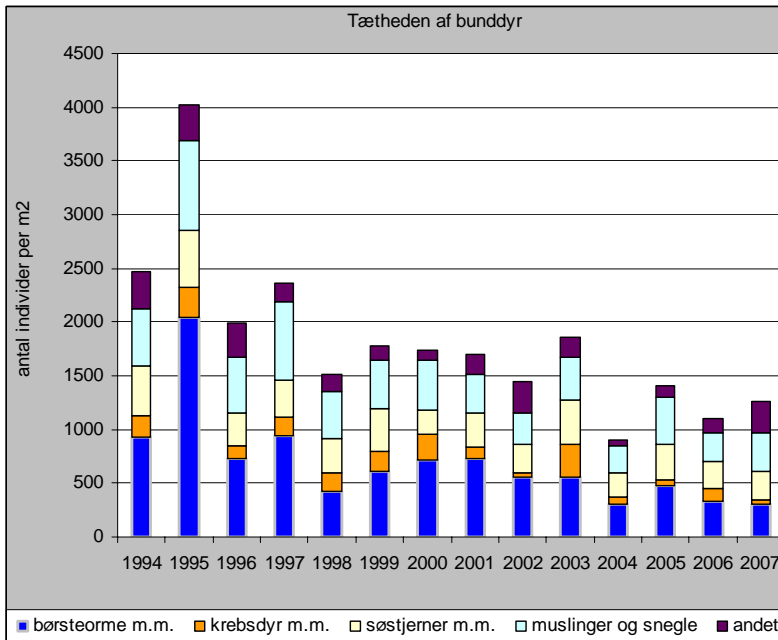
[http://www2.dmu.dk/1\\_viden/2\\_Publikationer/3\\_miljobib/rapporter/MB02.pdf](http://www2.dmu.dk/1_viden/2_Publikationer/3_miljobib/rapporter/MB02.pdf)

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<sup>10</sup> The Forest and Nature Agency 2009: BlueReef - Naturgenopretning af huledannende stenrev i Kattegat. (*Natural generation of stone reefs affording habitats in the Kattegat*) <http://www.blureef.dk>



**Figure 13:** Development of species diversity and number of seabed creature species (including mussels and bristle worms) from 18 stations in the Kattegat and two in other Danish straits. Species diversity is depicted using the Margalef Index. The higher the index figure, the greater the species diversity. Source: Danish National Environmental Research Institute.



**Figure 14:** Developments in sea creature density in animal groups from 22 measuring stations in open coastal water sites. Source: Danish National Environmental Research Institute.

# Threatened species

## Key issues

29 per cent of species under surveillance in Denmark are on the Red List, which means that there is a risk of them disappearing.

Around half of the Red Listed species are in forest areas.

## Factors affecting status

Denmark is home to about 30,000 species of plant, fungus and animal. The aim of placing species on the Red List is to evaluate the risk of them dying out in Denmark. The status of Danish species is thus monitored and species that are threatened, near-threatened or extinct in Denmark are placed on the Red List. It is often these species which are most dependent on living conditions and the condition of the ecosystem. There is a lack of data on the incidence and distribution of many species. Many species' distribution is restricted to Denmark and they can 'naturally' become rare in Denmark due to climatic conditions. These species may be threatened and therefore on the Red List.

## Current status

To date, the status of 5,656 species in Denmark has been assessed. Of these, 1,620 species are Red Listed, corresponding to 29 per cent of species. Of these, 1,620 species are red listed, corresponding to 29 per cent of species<sup>11</sup>. Forests and forest structures are the most important habitats for red listed types, as 52 per cent of habitats are forest structure-related (e.g. dead wood and old trees in clearings). The Pearly Heath butterfly, which lives in sunny locations in oak coppices, was last seen in Denmark in 1995 and is thought to have disappeared. The Pearly Heath shares the same fate as other species linked to forest perimeters and clearings, which are threatened because these habitats are under pressure. The white stork is an example of a species that is close to disappearing. In the mid-19th Century, the population was around 10,000 breeding pairs, but since 2000 one, two or no such pairs per year have been seen.

## Objectives

Of the 5,656 Danish species whose status is known, 29 per cent are red-listed. Almost one third of Danish species under surveillance is thus either threatened or extinct. This suggests that the quality and extent of many Danish habitat types are insufficient to protect the species against the risk of extinction and also that certain species only occur in a few locations in the country, as Denmark is on the edge of their area of distribution.

## Read more at:

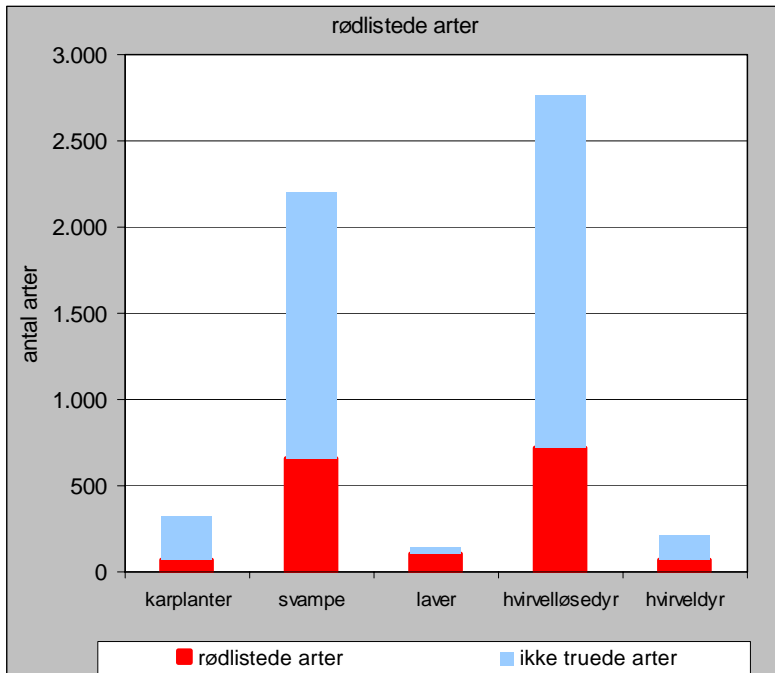
The Danish Red List: <http://redlist.dmu.dk>

Latest update of the Danish Red List (2009):

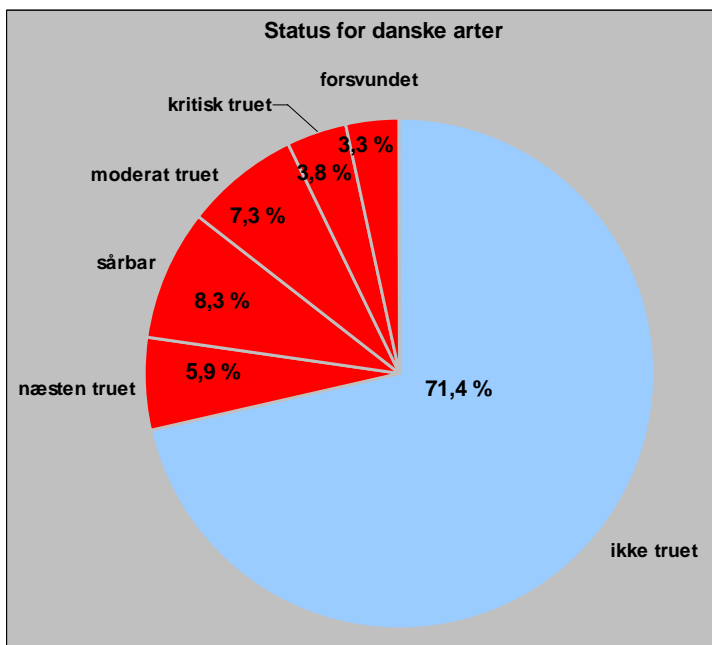
[http://www.dmu.dk/Udgivelser/DMUNyt/2009/2/Roedliste\\_uddyb.htm](http://www.dmu.dk/Udgivelser/DMUNyt/2009/2/Roedliste_uddyb.htm)

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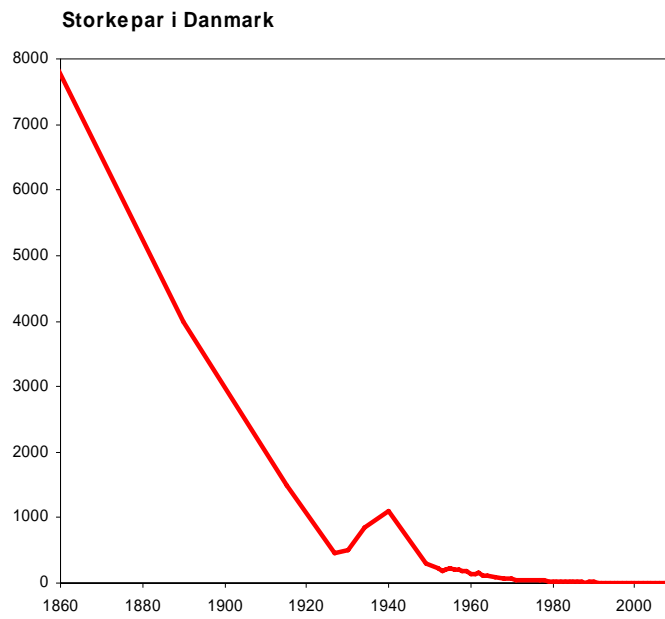
<sup>11</sup> NERI 2009: Opdatering af den danske rødliste. (*Updates to the Danish Red List*)  
[http://www.dmu.dk/Udgivelser/DMUNyt/2009/2/Roedliste\\_uddyb.htm](http://www.dmu.dk/Udgivelser/DMUNyt/2009/2/Roedliste_uddyb.htm)



**Figure 15:** Numbers of red-listed species, (disappeared, critically endangered, endangered, vulnerable and near-threatened) and numbers of non-threatened species by species type. The table comprises 5,656 species. Species for which there is insufficient data are omitted. Source: Danish National Environmental Research Institute.



**Figure 16:** Percentage of species by the various Red List categories. The species were surveyed between 2003 and 2008. The figure covers 5,656 species. Species for which there is insufficient data are omitted. Source: Danish National Environmental Research Institute.



**Figure 17:** *In the mid-19th. century the population of white stork in Denmark peaked at up to around 10,000 breeding pairs. However since 2000 one, two or no such pairs per year have been seen. Source: Danish Ornithological Association and National Environmental Research Institute.*

# Atmospheric deposition of nitrogen

## Key issues

Atmospheric deposition of nitrogen on land and sea has fallen since 1990

The critical load of nitrogen for the most sensitive heaths, commons, raised bogs and 'Lobelia lakes' (after *Lobelia dortmanna*) was exceeded during the entire period from 1990 to 2007.

## Factors affecting status

Danish habitat types are mainly defined by the plant community they contain as well as their physical and chemical characteristics. Nutrients, especially nitrogen (N), are a threat to vulnerable habitats such as heath, bog and common, because the species which live there are driven out when poor soil conditions cease to prevail. Large amounts of nitrogen compounds (NO<sub>x</sub> and NH<sub>3</sub>) are deposited in the atmosphere from livestock, industry and traffic. Most nitrogen compounds are deposited close to their source but the wind can also transport emissions some distance from their source. When nitrogen compounds from the atmosphere are deposited on land or water, this leads to increased nitrogen pollution of the plant community and habitats can eventually disappear as a result of changes in species composition. Nitrogen deposits over many years have led to the overloading of Danish ecosystems with nitrogen.

## Current status

From 1990 to 2007, average nitrogen atmospheric deposition on Danish land and sea areas fell by 32 per cent. In 2007, foreign sources accounted for 69 per cent of nitrogen deposition on Danish land areas and 86 per cent on Danish sea areas. Nitrogen pollution of the most vulnerable habitats has been above the critical level for the habitat for several years<sup>12</sup>. The most sensitive raised bogs and Lobelia lakes (which are very poor in nutrients) have a tolerance limit of 5 kg nitrogen/ha/year and this value was exceeded during the entire period from 1990 to 2007. The tolerance limit of 10 kg nitrogen/ha/year for the most sensitive heaths and chalky commons has also been continually exceeded since 1990.

## Objectives

Denmark has undertaken to reduce atmospheric nitrogen deposition by 55 per cent by 2010 in comparison to 1990 (see 2.1 Discharge of acidifying gasses). The government's Green Growth agreement of 2009 sets more stringent requirements with regard to the discharge of ammonia in order to protect especially sensitive habitats from nitrogen<sup>13</sup>.

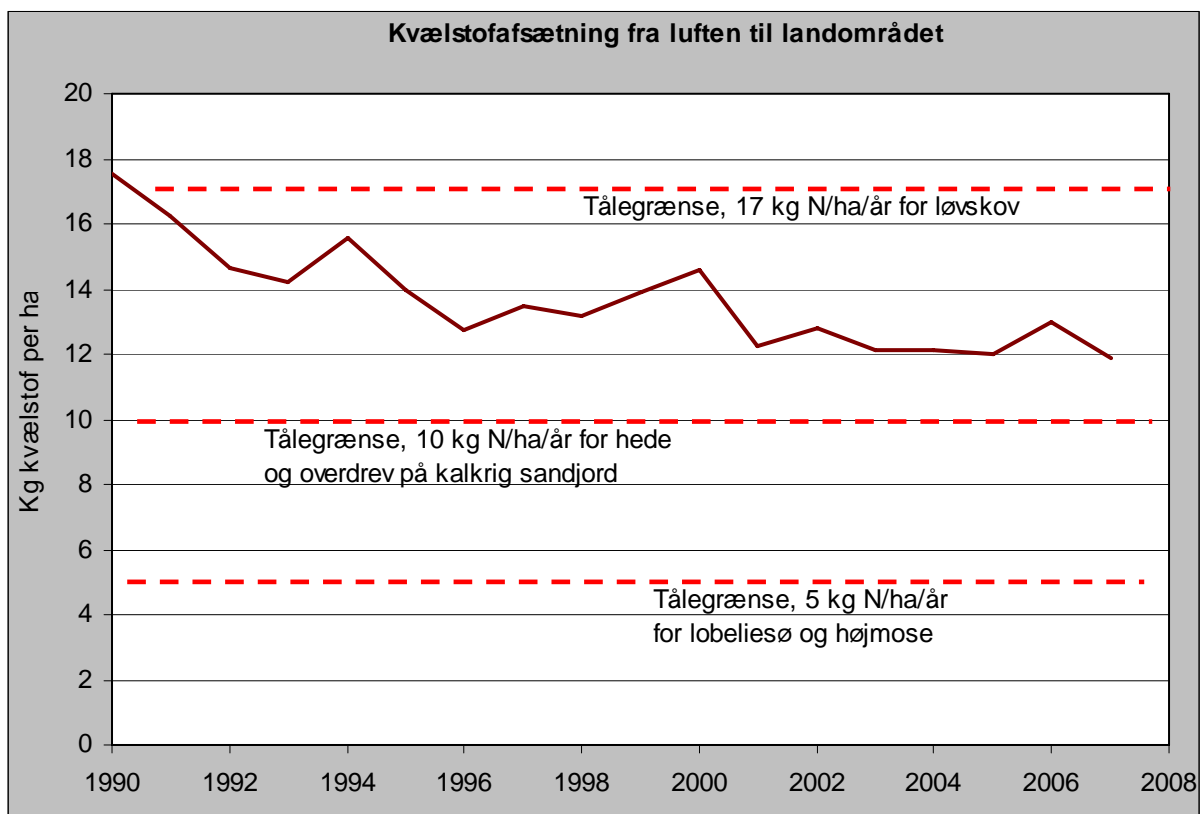
## Read more at:

Book on Airborne nitrogen pollution: <http://www2.dmu.dk/Pub/MB12.pdf>

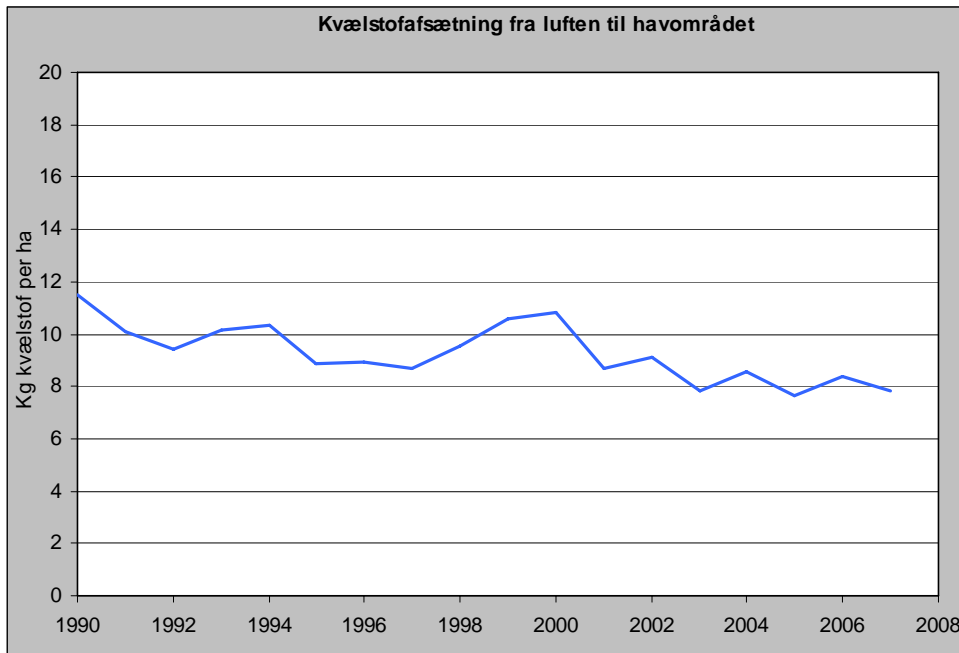
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<sup>12</sup> Ellermann, T., m.fl.2007: Atmosfærisk deposition 2007. (*Atmospheric deposition in 2007*). NOVANA. NERI, University of Aarhus. NERI Technical report 708. <http://www.dmu.dk/Pub/FR708.pdf>

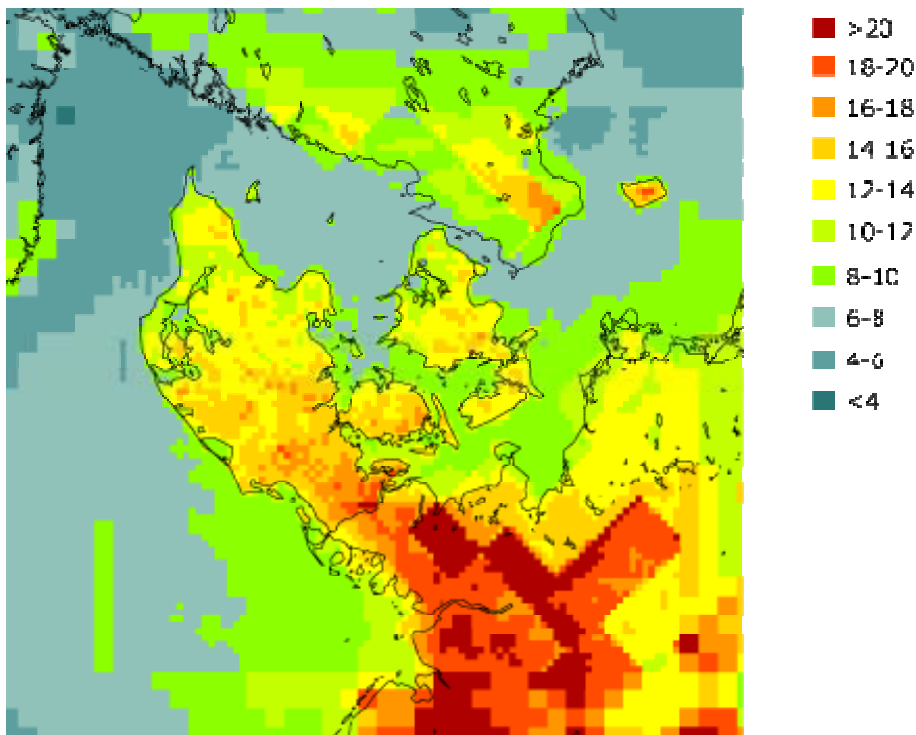
<sup>13</sup> Danish Government 2009: Agreement on Green Growth dated 16 June 2009. Danish Government (Venstre and De Konservative [the Danish Liberal Party and the Danish Conservative Party]) and Dansk Folkeparti [the Danish Peoples' Party] <http://www.oem.dk/sw25655.asp>



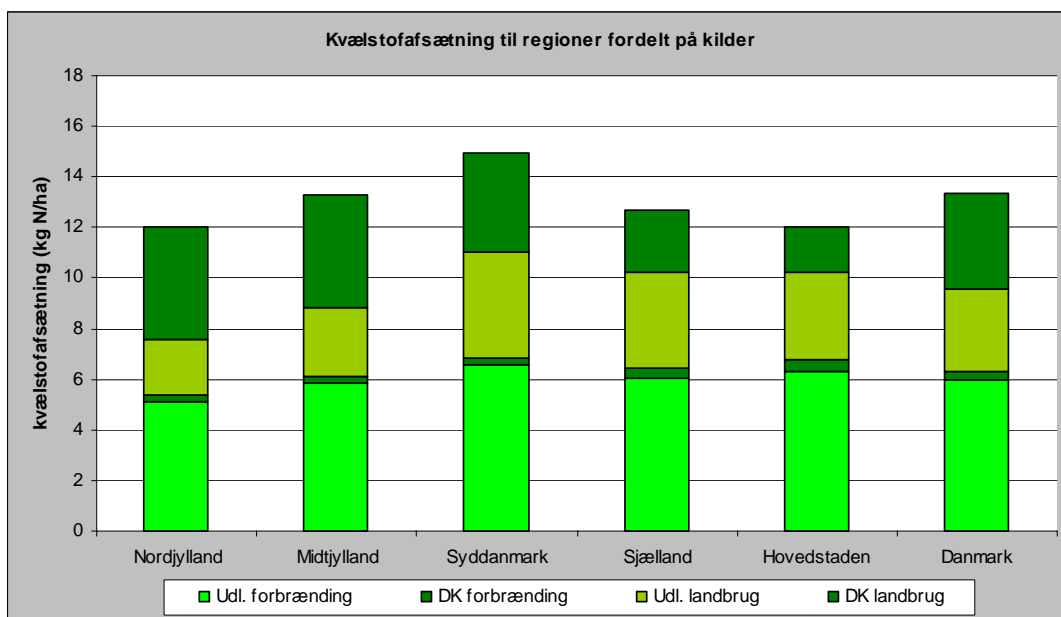
**Figure 18:** Average nitrogen (N) deposition from the atmosphere on Danish land areas. The figure shows critical loads for some of the most sensitive habitats and deciduous forest. For comparison, an ordinary cereal field is fertilized with approx. 150 kg nitrogen per ha per year [http://www2.dmu.dk/Pub/MB12.pdf\(-1141-\)](http://www2.dmu.dk/Pub/MB12.pdf(-1141-)). Source: Danish National Environmental Research Institute and the Forest and Nature Agency.



**Figure 19:** Average nitrogen (N) deposition from the atmosphere on Danish sea areas. Source: Danish National Environmental Research Institute.



**Figure 20:** Atmospheric nitrogen deposition in kg N per ha in 2007. Based on calculation models. Source: Danish National Environmental Research Institute.



**Figure 21:** Average nitrogen deposition on Danish land areas in 2007 by region and source. Source: Danish National Environmental Research Institute.

## Case study: Invasive species

### Key issues

Invasive species represent a threat to biodiversity. Species such as the Spanish slug *Arion lusitanicus* and mink affect indigenous species and ecosystems.

### What are invasive species?

It is sometimes difficult to say which animals and plants are Danish and which are not. Typical non-native species which are widespread in Denmark are partridge, giant hogweed, fallow deer, American mink and pheasant. These species' original natural distribution area is outside Denmark and they are thus classified as non-native. Two of them, the Giant hogweed and the American mink, are categorised as both non-native and invasive species<sup>15</sup>. The definition of an invasive species according to the UN Biodiversity Convention is a non-native species whose introduction and/or spread represent a threat to native flora and fauna.

### From giant hogweed to mink and the lobed comb Jelly

Giant hogweed drives out other plants due to overshadowing. The population of American mink is the result of animals escaping from mink farms and the mink represents a significant threat to local populations of breeding birds and small animals, which it hunts for food. Examples of other invasive species are the Spanish slug *Arion lusitanicus*, the Atlantic jackknife clam, the horse chestnut leaf-miner, the Canada goldenrod, the giant goldenrod and the Japanese rose or roman rose.

Invasive marine species represent one of the most difficult problems. They are almost impossible to combat. The Atlantic lobed comb jelly and pacific oysters are marine invasive species which are instrumental in upsetting the biological balance in Danish coastal waters. The lobed comb jelly is a threat to young fish, fish eggs and animal plankton. Pacific oysters can colonise areas which are home to the Danish common or blue mussel. They can destroy mussel fisheries and at the same time compromise the main diet of bird species which live on blue mussels.

### Recording of invasive species

An estimated 2,656 species in Denmark are not indigenous<sup>16</sup>. Of these, 63 species are invasive and a further 17 species are known as potential invaders, as they occur in neighbouring countries as invasive species or are present in only limited numbers in Denmark, but could become invasive over time.

Invasive species arrive in Denmark for example as garden plants, in ships' ballast water, by direct introduction, by escaping for example from mink farms and by spreading into Denmark from other countries. Climate change can increase incidences of invasive species in Denmark, as species that invade countries south of Denmark will be able to migrate further north as a result of rising temperatures.

### Action plan to halt the progress of invasive species

The Protection of Nature Act states that the release of animals which are not naturally wild in Denmark is prohibited unless it has the approval of the Ministry of the Environment. In 2004, the International Convention for the Control and Management of Ships' Ballast Water was adopted, with

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<sup>15</sup> Danish Ministry of the Environment 2008: Handlingsplan for invasive arter (*Action plan for invasive species*).  
<http://www.skovognatur.dk/DyrOgPlanter/invasivearter/Myndighed/InvasivHandlingsplan.htm>

<sup>16</sup> European Network on Invasive Alien Species (NOBANIS) 2009: Search in Alien Species database.  
<http://www.nobanis.org/Search.asp>

the aim of preventing the spread of organisms from ships' ballast water. The convention has not yet come into force. Denmark is expected to ratify the convention together with the other EU countries.

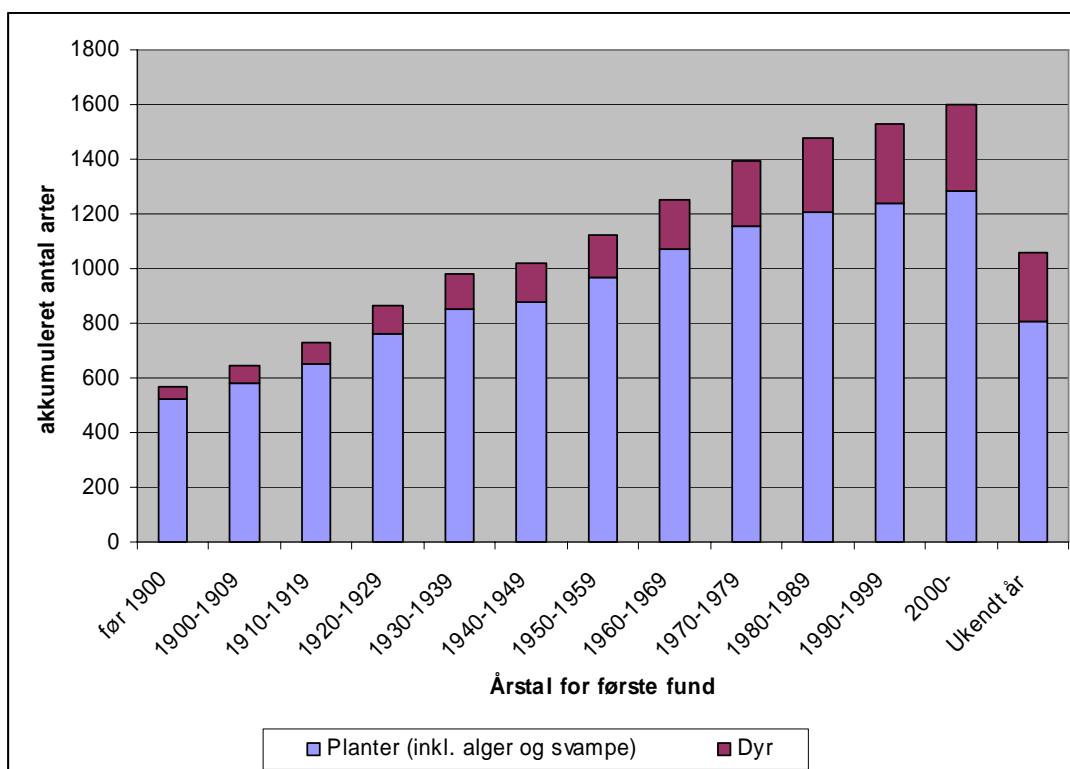
The UN Convention on Biological Diversity provides guidelines for member countries to develop strategies to minimise the spread and effects of invasive species. Denmark's first action plan for invasive species was devised in 2009. This action plan recommendations are centred on prevention, control, information and regulation. The objective of the plan is to prevent or minimise the effects of invasive species on biological diversity, the economy and people's health, through for instance the coordinated implementation of international conventions. It is however extremely difficult to completely stop new invasive species, given modern movements of goods and people. Invasive species that cannot be driven out must be controlled in order to prevent spreading and threatening biologically vulnerable areas.

**Read more at:**

Forest and Nature Agency on invasive species:

<http://www.skovognatur.dk/DyrOgPlanter/invasivearter>

European Network on Invasive Species (NOBANIS): <http://www.nobanis.org>



**Figure 22:** Accumulated figures for introduced species recorded in Danish natural habitats, collated according to the year of the first find. Only a small percentage of introduced species are defined as invasive (see text). Source: NOBANIS.



*The Japanese or Romanas rose is an invasive species from northeast Asia which is driving out indigenous plants in significant numbers along Danish coasts. Photograph: Lise Frederiksen (<http://www2.sns.dk/udgivelser/2004/87-7279-540-9/pdf/87-7279-540-9.pdf>)*

## Chapter 2: Current status of national biodiversity strategies and action plans

### Overview of national biodiversity strategies and action plans

Denmark has outlined its nature conservation policy objectives in a range of documents:

The *National Strategy for Sustainable Development* (2002) sets targets and principles for sustainable development including the objectives of securing a high degree of biodiversity and preserving Denmark's ecosystems;

The Agreement on Green Growth (2009) is a long-term plan defining environment and nature policies and the agriculture industry's growth conditions.

The *National Strategy on Natural Forests* (1992-2040) has as overall objective to conserve the biodiversity on the Danish Forests, including the gene resources present in these areas;

The *National Forest Programme* (2002) sets targets for increasing the national forest area and managing the forests in a way that takes the protection of the biological diversity better into account;

The *National Strategy on Biological Diversity* (2004) brings together laws and establishes targets for the conservation of biodiversity;

The *Action plan for Biodiversity and Nature Conservation* (2004-2009) specifies actions to protect nature and biodiversity in accordance with the national Strategy and with EU legislation and the Convention on Biological Diversity;

The *Action Plan for Nature Conservation* (2005) specifies criteria for prioritising nature conservation by site of natural landscape or recreational value, when conservation cannot be done by use of other instruments;

The *National Action plan on Alien Invasive Species* (2009) gives a number of recommendations on actions to be taken. The action plan focuses on prevention, eradication, information and capacity building, research and administration.

Some of these plans are explained in further detail below.

### Action Plan for Biodiversity and Nature Conservation in Denmark 2004-2009

In 2004, The Danish government approved a national strategy on the conservation and sustainable use of the biodiversity in Denmark. The plan sets out the priorities and proposals for concrete actions in relation to nature conservation and biodiversity.

This Action Plan is the Government's framework plan for Danish initiatives to protect nature and biodiversity in accordance with EU decisions and the Convention on Biological Diversity.

The Action Plan is founded on the principle of investing Danish resources where they will lead to more and better nature. In the years to come, efforts will concentrate on the most important natural areas and activities to which Denmark is especially committed. The Action Plan presents the following priorities for future initiatives:

- Danish NATURA 2000 sites (254 EC habitat areas and 112 EC bird protection areas).
- Existing natural areas outside NATURA 2000 sites.
- New small biotopes and semi-natural areas within habitat and bird protection areas.
- New small biotopes and semi-natural areas outside habitat and bird protection areas.

The action plan places great emphasis on the importance of sector integration. Consideration for the environment must be integrated into all sectors of society in order to achieve sustainable development. The following sectors are especially important: agriculture, fisheries, industry, transport, and education. The management of publicly owned areas is also important.

See more: <http://www.dk-chm.dk/convention/document/1118385958>

In the Action Plan each Ministry describe initiatives to be taken by the ministry in the period.

## **Agreement on Green Growth (2009)**

The government (Venstre and De Konservative [Venstre, the Danish Liberal Party and The Danish Conservative Party]) and Dansk Folkeparti [The Danish Peoples' Party] have signed an agreement on Green Growth. The purpose of the agreement is to ensure that a high level of environmental, nature and climate protection goes hand in hand with modern and competitive agriculture and food industries. This is an ambitious and long-term plan defining environment and nature policies and the agriculture industry's growth conditions.

A total of DKK 13.5 billion is to be invested in Green Growth until 2015, which is about a 50% increase in investments compared to previous initiatives.

These investments will ensure that Denmark meets its environmental obligations fully while strengthening growth and employment.

The Agreement on Green Growth incorporates:

The Environment and Nature Plan Denmark up to 2020. The aim of the plan is to secure not only a better environment and climate, but also more areas of nature of a high quality that are accessible to everyone. The plan not only enables Denmark to meet its obligations under the EU Water Framework Directive and the Natura 2000 Directives but also facilitates follow-up of the Aquatic Environment Plan III and the Pesticide Plan 2004 2009. These investments are conditional on approval by the European Commission.

A strategy for a green agriculture and food industry undergoing growth. A collective and focussed initiative will be implemented in order to create better framework conditions for a self-sustaining agriculture industry that: will develop dependent on market conditions, will protect the environment and nature, and will deliver green energy.

This Agreement implements the Danish Rural Development Programme (RDP) for 2010 - 2013.

The Agreement supports the full repatriation of Rural Development Funds from the EU.

An agreement will be endeavoured with the Parties behind the reconciliation on the Environment Approval Scheme for animal husbandry, cf. Annex 4.

## **Environment and Nature Plan Denmark 2020**

The Parties are agreed on the following goals and initiatives (cf. in addition Annexes 1 and 3):

### *An aquatic environment of high quality*

19,000 tonne reduction in nitrogen discharge to the aquatic environment from 2010 to 2015

210 tonne reduction in discharge of phosphor to the aquatic environment from 2010 to 2015.

Improvement in the physical conditions of selected stretches of watercourses totalling 7,300 km from 2010 to 2015

Re-structuring nitrogen regulation to take into account environmental concerns. Instigation of clarification work to find a workable model based on a system with tradable nitrogen quotas. This clarification work will also compare the advantages and disadvantages of the quota model to alternative methods in order to facilitate determination of any necessary initiatives remaining and selection of the actual model. New nitrogen regulation is potentially anticipated to take effect no later than 1 January 2012. The revenue from trading nitrogen quotas would be transferred to the industry via the land taxes.

Concrete initiatives to reduce the discharge of nitrogen and phosphor to aquatic environments.

These will include dedicated measures such as permanent spraying-free, fertilizer-free and cultivation-free buffer zones and wetlands, as well as general regulation including neutralisation of

nitrogen effect when agricultural land is taken out of production. This initiative will be implemented from 2010. The actual initiatives are described in more detail in Annexes 1 and 3.

An additional initiative will be implemented as part of the River Basin Management Plan targeting storm water overflow and further improvements in treatment processes for waste water from households, industry and sewage works, as well as strengthened protection of groundwater resources.

### *Substantial reduction in the harmful effects of pesticides on human beings, animals and nature*

Introduction of a new indicator for "extent of burden", which not only includes use of pesticides but also the extent of non-sprayed areas. The indicator will be developed to include in the calculation data on the pesticide burden on health and the environment. The new indicator will replace the previous treatment frequency.

The extent of burden shall be reduced to 1.4 by the end of 2013.

The intention is to submit a proposal in the autumn of 2009 for a law on re-structuring of the pesticide tax. This would mean that the least environment- and health-friendly pesticides are subject to the highest tax while the most environment- and health-friendly pesticides are subject to a relatively lower tax. At re-structuring, consideration will be given to specialist and high value crops to counteract that these are discontinued. Any additional revenue from the pesticide tax will be returned to the industry via reduced land taxes.

Several other initiatives will also be implemented, cf. Annex 1.

### *Fewer greenhouse gasses*

Reduction of the agricultural sector's emission of greenhouse gasses by an anticipated 800,000 tonnes of CO<sub>2</sub> annually as a consequence of the energy, nature and environment initiatives proposed in Green Growth.

The opportunities for further reduction of emissions from the agricultural sector using a market-based model (quotas/taxes) will be analysed in more detail. This analysis will be integral to a collective, cross-sectional analysis of possible instruments within the European Climate Action and Renewable Energy package for the entire non-quota area. The analysis will be presented in the autumn of 2009.

The government will present a collective, cost-effective climate strategy for the non-quota area up to 2020 based on this analysis.

### *Improved protection of nature and biodiversity*

The decline in biological diversity shall be stopped.

Several initiatives will be implemented to strengthen the protection of the various types of nature (including drylands), plants and animals in Danish nature, hereunder an initiative for care of nature and management of about 145,000 ha private and public Natura 2000 sites, cf. Annex 1.

### *More nature and better access to nature*

Funding for establishment of a total of 75,000 ha new nature areas until 2015.

The countryside shall be more accessible so that increasing numbers of Danes have the opportunity to use and enjoy it, cf. Annex 1.

A special fund will be established for facilities (e.g. signage, tables, benches, etc.) for historic monuments, and voluntary conservation. An internet portal will be established with advice on restoration and dissemination of information about historic monuments. These initiatives will be evaluated in 2013.

### *Improved planning and monitoring of the environment and nature*

Monitoring the Danish environment and the state of the nature areas will be improved in order to undergird planning of future environment and nature initiatives.

### *Compensation of the industry for mandatory nature and environment obligations*

The industry will, within the framework of the Rural Development Programme, be entitled to compensation for legislated requirements governing spraying, fertiliser and cultivation-free border zones as well as reduced or ceased watercourse maintenance.

**Table 1:** Total public expenses distributed by investment area, DKK million<sup>17</sup>.

Overview of publicly-financed initiatives	2010	2011	2012	2013	2014	2015	Agg
Green Growth in total	2.239	2.501	2.350	2.229	2.062	2.139	13.520
Water Framework Directive nitrogen and phosphor	308	463	212	212	211	211	1.618
Water Framework Directive watercourses	0	130	130	130	130	130	650
Water Framework Directive – non-agricultural initiatives	117	9	9	9	9	9	161
Pesticide initiatives	85	84	83	80	78	75	485
Nature initiatives	589	696	791	853	760	761	4.450
Research and innovation <sup>1</sup>	194	174	174	174	174	174	1.066
The agriculture industry as an energy supplier	163	160	157	20	20	20	541
Environmental approvals, etc. <sup>2</sup>	28	1	1	1	1	1	31
Organic sector:	352	399	432	431	363	439	2.417
Growth in the primary industry and food industry	267	249	224	182	181	181	1.284
RDP in addition to Green Growth	122	123	124	123	123	123	738
Green Growth - reserve	13	13	13	13	13	13	81

## National Forest Programme

In 2002 the Government adopted Denmark's National Forest Programme, which sets out the current political framework for Danish forestry. The key objective for the development of forestry is development towards sustainable forestry in accordance with internationally recognised principles of economic, ecological, and social consideration. The core of the National Forest Programme is the transition to near-nature forestry based on Danish guidelines for sustainable forestry. It sets out 6 overall objectives e.g. that:

- the Danish forest area must increase to 20-25 % within 80-100 years
- 10 percent of the forest area by 2040 must be operated with biodiversity as the primary aim
- The state must maintain and develop state forests for recreational activities etc.

See more: <http://www.skovognatur.dk/Udgivelser/Tidligere/2002/dns.htm>.

<sup>17</sup> The funds' share of growth initiatives has not been included in the total. Additional administrative costs associated with the Rural Development Programme have been included technically under the individual investment areas or initiatives. <sup>1</sup> The intention is to discuss strengthening research and innovation within the environment and food (GDDP) through distribution of the globalisation funds in the autumn of 2009.

To reach the objective of increasing the Danish forest area 20-25% in 2014, forested land must increase at a pace of around 4000-5000 ha/year, which is more than the average level of the last years. Meanwhile, for the past three years the interest in afforestation has been rising and new subsidy scheme has been introduced. It makes it economically more attractive for private landowners to plant new forest. Other subsidy scheme has developed lately that favours protecting valuable nature e.g. old forest containing broad biological diversity.

A major tool in safeguarding the nature and biodiversity in Denmark is the revision of the Danish Forest Act, widening the framework for forestry and the scope for biological diversity, carried out in 2004. In practice this means that forestry in the future more specifically should focus on natural processes and forest succession. Moreover, special account will be taken of obligations under the Habitats and the Birds Directives.

### **Action plan for Close-to-Nature Forestry in Danish State Forests (2005)**

An action plan for the introduction of close-to-nature forestry in the state forests (2005) identifies the use of native or other well-adapted tree species, the retention of permanent forest cover by avoiding large clear-cuttings, the use of natural regeneration, development of diverse forest structures, and single tree management as the key principles for the near nature policy. Furthermore it contains a plan for the conversion of Danish state forest into this type of management.

The exploitation of all state forests (25% of Danish Forest) is now environmentally certified according to national FSC and PEFC standards. This confirms the trend towards emphasising non-timber and environmental values, and the relatively extensive management regime of forests probably also favours many of the endangered plants and animals that live in, or have connections with, forest.

See more: [http://www.skovognatur.dk/Udgivelser/2005/Handlingsplan\\_naturnaer.htm](http://www.skovognatur.dk/Udgivelser/2005/Handlingsplan_naturnaer.htm)

### **National Strategy on Native Forests 1992-2040**

The overall objective of the National Strategy on Native Forests is to conserve the biodiversity on the Danish Forests, including the gene resources present in these areas. The strategy specifically aims at initiatives within the following fields:

- Viable populations of as many species of wildlife, plants and other organisms in forests as possible. The objective must be both to conserve existing populations and to provide possibilities for populations to spread.
- The genetic variation of Danish trees and bushes. Gene resources are protected in order to form a basis for future selection of variants and species for forestry purposes etc. Within this context the strategy will be supplemented by the national strategy for preservation of gene resources.
- Provision of area as a basis for research and monitoring. Untouched forests will allow basic research into ecosystems and studies of dynamics and developments.
- Forestry activities. Future generations must have the opportunity to experience the influence of different forestry activities, ranging from grazing forest, coppice forest, methods which are important in the culture-historical context, to traditional organised forestry.
- The public. Some of the areas, which are reserved for special forest management purposes or as untouched forest, must be selected in order to serve as a resort, which will require a certain minimum size.

### **International targets incorporated into NBSAPs**

Denmark is pursuing the international biodiversity targets such as the European Council in Gothenburg in 2001 and the similar decision of the Nordic Council of Ministers to halt the loss of biodiversity by 2010 within the EU and the North, as well as the global target to significantly reduce the rate of biodiversity loss by 2010.

Furthermore Denmark is pursuing the European targets to achieve a favourable conservation status for the species and habitat types for which the Natura 2000 areas have been designated and the target to achieve a good ecological status for Danish surface waters and a good status for Danish ground water before 2015.

These targets are incorporated into the NBSAPs mentioned above.

## Area based management and regulation

### Habitats and ecosystem protection in general

Denmark has protected more than 11% of its total land area, through:

- A general protection of certain nature types under the Danish Nature Conservation act' §3 and the Forest Act,
- EU's Natura 2000 directives,
- Nature areas conserved under nature conservation orders
- One third of the protected area is in IUCN category I and II.
- The Danish forest area covers app. 534.500 ha, which equals app. 12,4 % of the Danish territory. The majority of the Danish forests are protected as forest through the National Forest Act. These forests cover 481.385 ha which equals around 11% of the Danish land area. However the forests that are protected as forest through the National Forest Act also encompass large areas of open land or inland waters.
- The open-land habitat types are protected through § 3 in the Nature Conservation Act. Almost 50% of the areas have been designated as EU Natura 2000 sites, which gives them double protection.

Natural habitat type	Area (ha)	Denmark's land area (%)	% situated in Natura 2000 habitat sites
Dry grassland	25986	0.6	23.6
Heath land	82013	1.9	49.7
Freshwater meadows	103722	2.4	56.1
Marshes	89919	2.1	32.6
Coastal meadows	43622	1.0	76.4
Dunes (estimated)	30000	0.7	-
Total	375262	8.7	47.2

**Table 2:** Nature types in the open land, protected by §3 in the Nature Conservation Act.

## **Areas protected under the Nature Conservation Act**

### **Protected nature types in the open land**

The Danish Nature Conservation Act protects a range of open land and fresh water nature types, such as dry grassland, Heath land, Freshwater meadows, Marshes, Coastal meadows, dunes, lakes and streams (see Table 2 above).

### **Individual site designation**

The Nature Conservation Act gives the authorities a provision to designate individual sites by conservation order.

The total area protected by individual designation orders is approximately 5 %. The total areal of protection is not known precisely because of many overlaps and existence of many old protections. Individual site designation orders may be adopted pursuant to a number of different purposes as laid down in Protection of Nature Act § 1. Among others to protect nature, with its stock of wild animals and their habitats, as well as its scenic, historical, natural science and educational values and to improve, restore or create areas of significance for wild animals and plants and for landscape and historical interests.

## **Areas protected under the Hunting and Wildlife Management Act**

Nature reserves can be designated under the Hunting and Wildlife Management Act. The purpose of these areas is to protect wildlife for breeding, resting and foraging, especially birds. Currently Denmark has more than 100 such reserves, covering more than 330.000 ha.

Most of these areas are marine (i.e. more than 90%, about 294.000 ha). The rest are found in fresh water (30.000 ha) or on land (7.000 ha).

## **Natura 2000 management plans (2009-2015)**

As part of the Danish implementation of the EU habitats directive and the EU birds directive, Denmark is in the process of making and carrying out 265 action plans for the Danish nature areas included in the EU Natura 2000 network (254 Sites of Community Importance and 113 Special Protection Areas). The network comprises in total 16638 km<sup>2</sup>. Of this 3591 km<sup>2</sup> are on land and 13047 km<sup>2</sup> are in the sea. The Natura 2000 areas on land equal 8,4 % of the terrestrial area of Denmark and the Natura 2000 areas on the sea equal 12,3 % of the marine area of Denmark. The Natura 2000 action plans will ensure, that the conservation status of the species and nature types which the areas are designated for, will as a minimum not decline further during the first planning period, which runs from 2009 to 2015. On the long run, the plans will ensure a favourable conservation status for the species and nature types in the Natura 2000 areas.

## **Ramsar site designations**

Denmark has designated 27 wetlands, primarily large coastal areas like, as Ramsar sites. The Danish Ramsar sites cover an area of app. 7.322 km<sup>2</sup>. These sites are legally managed as Natura 2000 sites, as there is a 100% overlap between the designated Ramsar sites and the designated Natura 2000 areas

## **River Basin Management Plans**

Denmark has a long tradition for water protection, which goes more than 50 years back. Stemming from obligations in the EU Water Framework Directive, Denmark is in process of implementing River Basin Management Plans, which will cover planning for all of the country. These plans will no doubt improve conditions for biodiversity in Danish marine and fresh water ecosystems significantly in the coming years.

## **National park designations (2007)**

The National Park Act was adopted by the Danish Parliament in May 2007. The National Park Act sets up the rules for the establishment and development of Danish national parks. The objective by establishing national parks is to create large coherent nature areas and to protect and improve nature and biodiversity, cultural heritage and public recreation with involvement of the local public. In June 2007 the Danish Government decided to begin the establishment of a network of national parks and to select Thy as the first national park. Thy National Park was later established in August 2008 and in January 2008 four other areas have been selected, e.g. Mols Bjerge, Skjern Å, Vadehavet (Wadden Sea) and Kongernes Nordsjælland. Mols Bjerge will be established in the second half of 2009 and the three others will be established step by step over the next couple of years.

Each national park is established by a designation order which determine the boundary and set up the objective and goals for the development of the park. Each national park is governed by a National Park Board which has a major task to elaborate and implement a National Park plan based on a voluntary approach.

## Nature restoration projects

Denmark has a long tradition for nature restoration. Table 3 below shows the amount of new nature on land that has been established each year since 2001.

Hektares	2001 - 2006	2007	2008	Total	Wet nature	Dry nature
Private reforestation, open areas – subsidised	6.171	2.376	1.094	9.641	400	9.241
Private reforestation subsidised	1.800	300	300	2.400	120	2.280
Public reforestation	480	80	80	640	32	608
Larger nature management initiatives	3.130	495	343	3.968	1.984	1.984
Aquatic Environment	3.600	600	600	4.800	4.800	-
Other – ponds etc.	1.800	300	300	2.400		
<b>Total</b>	<b>16.981</b>	<b>4.151</b>	<b>2.717</b>	<b>23.849</b>	<b>7.418</b>	<b>14.031</b>
* Includes meadows, moors, lakes, coastal meadows and etc. based on an estimation.						
** Includes dry grasslands, heath etc based on an estimation						
*** New nature in this category is an approximation						

**Table 3:** Amount of new nature established in Denmark between 2001 and 2008.

More than half of Denmark's nature is covered by the sea. Boulder reefs rising out of the seabed support a very high biodiversity like for example large sea urchins and leather corals. Denmark is in the process of restoring a degraded reef with the purpose of restoring and maintaining a favourable conservation status of the offshore reef habitat with its associated species. The project area is located at Laesoe Trindel, 12 km north-east of the Island of Laesoe. The project will restore 6,5 ha of marine cavernous boulder reefs and will stabilise 6 ha of the existing reef area or effectively double the area of the habitat. The restoration of the submerged reef structures has been carried out with app. 60.000 m<sup>3</sup> boulders of various sizes each with a weight of app. 1-6 tonnes. The boulders have delivered blasted in a quarry in southern Norway. BlueReef is the first large marine nature restoration project in Denmark as well as the first offshore restoration project receiving 50% co-financing from the European Commission. The project budget is Euro 4.8 million and started the 1st of August 2006 and will finish in the spring of 2012. The BlueReef project has included various elements of assessments prior to the restoration, the restoration activities and a monitoring programme evaluating the success of the restoration effort. It also includes an underwater video and the establishment of an underwater nature trail for divers. Offshore cavernous boulder reefs in shallow waters have a high biodiversity and is now a rare and yet biological important natural habitat for a large variety of species like the European Lobster that live in the cracks and crevices between the large boulders. On a national level cavernous boulder reefs in shallow waters have been an extensively exploited habitat targeted for their high concentration of easy to excavate large boulders suitable for constructing harbour jetties and sea defences. A cautious estimate is that at least 34 km<sup>2</sup> of boulders from predominantly shallow cavernous reefs have been excavated from Danish waters or close to 100% of the area of this habitat, leaving an estimated 5 ha untouched. Laesoe Trindel is a site of European Union community importance and designated as a Natura 2000 Site according to the EU Habitats Directive. The restored site in Kattegat will provide a significant contribution to maintaining the populations of species which are dependent on the cave-forming boulder reef in Danish waters and function as a

crucial steppingstone within a marine corridor linking sites within the Natura 2000 network, as well as being a sanctuary for donor populations.

Besides the establishment of new nature, nature restoration is also taking place in degraded nature areas such as overgrown meadows and dry grasslands, polluted lakes and streams and intensively managed forests. Unfortunately no figures exist on the total amount of this effort.

Forest restoration is for example taking place within the framework of the strategy for natural forests, the Action plan for Close-to-Nature Forestry in Danish State Forests and the National Forest Programme. No figures exist for the actual amount of forest which has been actively restored, as much forest is managed in a less extensive way or left untouched for natural processes to unfold.

Some activities however have been done to actively restore degraded forest systems. This includes efforts to secure more grazing in forests, to close ditches and restore natural water levels, to reforestate logged or cultivated areas.

## **Species management**

### **General species protection**

All indigenous species are protected under the Nature Conservation Act.

Hunting and game management is regulated through the Hunting and Wildlife Management Act.

Indigenous species cannot be hunted unless the state game authorities give special permission for species and conditions. Currently 45 species can be hunted. Illegal hunting is not considered to be a problem in Denmark. The government subsidises game release if various criteria are met.

Hunting in Denmark is only allowed with a hunting permit. To get a permit one must pass a theoretical and practical test. All persons with a hunting permit must report annually the amount of game which has been caught.

### **Management of species under the EU habitats directive**

Substantive protection of a high number of species, including birds, is explicitly addressed by the designation and management of Natura 2000 sites. These include a number of rare and threatened species, all for which the obligation is to achieve favourable conservation status within the sites. Furthermore, a large number of other species living in natural habitats and habitats for species, for which the areas are designated, highly gain from this management and protection.

Denmark is also obliged to protect a range of species listed in annex IV of the Habitats Directive. 39 of these species occur regularly in Denmark. According to the Habitats Directive it is forbidden to destroy or to deteriorate the breeding and resting places of these species. It is also forbidden to disturb these animal species significantly. The plant species in annex IV are protected through a ban on destroying individuals of these species in all their life stages.

Denmark is in the process of amending legislation in order to improve the implementation of these obligations. The government has proposed to further support the strict protection by launching a number of supplementary measures like information of landowners, species action plans and financial support to improvement of habitats of the species.

Moreover Denmark has regulated trade, hunting and collection of a range of species listed in the directives annex V, and for a number of bird species, following from the provisions of the EU nature directives. Furthermore, a large number of species is also from national legislation directly protected from hunting, collection etc.

## **Single species management plans**

Denmark is currently implementing a series of species management plans

It is envisaged that more plans will be carried out in the near future as a means to implement the habitats directive in Denmark.

### **Dormouse (*Muscardinus avellanarius*) action plan (2000)**

The overall objective of the dormouse action plan is to draw attention to the dormouse and its habitat and area of distribution. Together with target the actions to the benefit for the species and to secure its future survival and hopefully increase the size of the dormouse population and distribution. The main tools are monitoring, information and project to make new and improve old dormouse habitats.

### **Corncrake action plan**

A national management plan for Corncrake was launched in 2000, and is now under revision. The main tools are information to farmers, farming subsidies for proper grassland management and identification of the 7 most important Corncrake localities, including special management effort. The Corncrake population has generally been increasing in Denmark since 2000.

### **Action plan on wading birds**

In 2005, a national action plan for threatened meadow birds was initiated. The main focus is to achieve a favourable conservation status for the three most threatened meadow birds of Denmark, Ruff, Black-tailed Godwit and Dunlin. Thus, the 25 most important breeding localities for these three species have been selected for focused action and management. By 2009, a lot has been achieved, also to the benefit of other meadow birds. The Godwit population is now stable or slightly increasing, while the Ruff and the Dunlin are still under severe threat, in spite of strong management efforts.

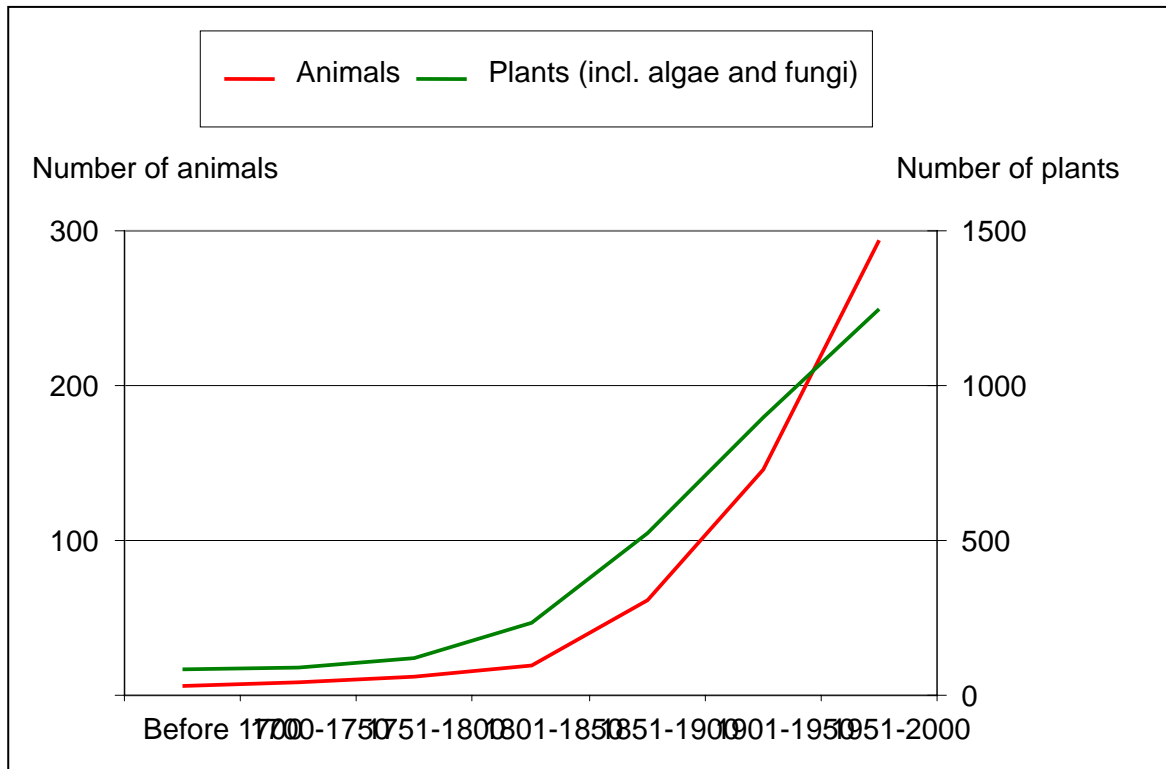
### **Action plan on red kite**

In 2005, an Action Plan for red kite was established. The plan contains elements grouped under three headings:

- Actions to strengthen the protection of the red kite
- Actions to strengthen the knowledge regarding the red kite
- Actions to strengthen information about the red kite vis-à-vis relevant stakeholders.

## **Alien Invasive species management**

The number of alien species being found in Danish nature is rapidly increasing as seen in Figure 23 below. A total of 2635 alien species has been found in Danish nature and more are still coming in.



**Figure 23:** Increase in numbers of invasive alien species of animals and plants, including algae and fungi between 1700 and 2000.

The Action Plan gives a number of recommendations on prevention, eradication, information and capacity building, research and administration. Furthermore the plan contains a black list of invasive species in Denmark, and an observation list of species known to be invasive in other countries in the region.

Denmark is also part of the North and Central European network on alien species (NOBANIS). The network has established a portal where you can find information on all alien species in the 16 participating countries, fact sheets and information on legislation regarding alien species in the countries. For further information see [www.nobanis.org](http://www.nobanis.org)

## Reintroductions

In 1999, Denmark reintroduced European beavers (*Castor fiber*) to Danish water courses. The 18 individuals that were introduced have now multiplied to over 100 individuals and spread to new water systems.

In the autumn of 2009 beavers have been introduced to water courses in the Northern part of Sjaelland.

Denmark is currently contemplating to reintroduce more species which a nationally and locally extinct.

## **Genetic resources management**

### **Natura 2000 plans**

The EU habitats directive does not demand that the EU member states manage the areas explicitly for the conservation of genetic diversity. However, many of the plans include activities which aim at minimizing inbreeding depression and maximising connectivity between isolated habitat patches through a conservation or enhancement of the genetic diversity in the areas.

### **Genetic diversity of forest trees**

Denmark is managing genetic resources of trees and bushes of primarily commercial value to society in general and to forestry. This takes place through a programme that ensures collection of seeds from locally adapted and native Danish forest trees and bushes and a policy of using this plant material in reforestation activities.

### **FAO and Genetic resources (2001)**

In 2001 Denmark ratified the International Treaty on Plant Genetic Resources for Food and Agriculture and in 2007 Denmark ratified the Interlaken Declaration on global action plan for conservation of animal genetic resources.

### **National strategy on gene resources in farm animals and plants (2003)**

Ministry of Food, Agriculture and Fisheries have two strategies for conservation of genetic diversity:

- A strategy for conservation of genetic diversity in farm animals.
- A strategy for conservation of domesticated plants and wild relatives to these plants.

The main target of the strategy is to ensure conservation of plant genetic resources

# Chapter 3: Sectoral and cross-sectoral integration or mainstreaming of biodiversity considerations

## Legal and institutional framework

The following laws create the legal framework for nature and biodiversity conservation in Denmark. The Nature Conservation Act provides Denmark's main legislative framework for nature conservation. It comprises four pillars: general protection for habitats; coastal zone protection; land acquisition and specific regulatory powers for the protection of nature. Natura 2000 and Ramsar sites are established under this act. It protects: natural lakes over 100 m<sup>2</sup>, watercourses that have been designated as protected areas, heaths, bogs, moors, salt marshes, swamps, coastal meadows, humid permanent grassland and uncultivated dry grassland of more than 2500 m<sup>2</sup>. The Forest Act allows for the protection of natural forests in both state forests and privately owned forests. The Planning Act offers protection of the open land and coasts. It is realised through national plans, regional plans, municipality plans and specific local plans within municipalities. These plans may contain provisions for green corridors and afforestation areas. The Hunting and wildlife Management Act regulates the hunting of game species and permits the designation of protected areas for wildlife and birds.

The Environmental Liability Act regulates for the prevention and remediation of environmental damage (or the imminent threat of such damage) to biodiversity, water, protected species and habitats. It introduces a regime of strict liability for the polluter with an obligation to remediate the damage.

The Marine Environment Protection Act allows the Ministry of defence to take action in case of an oil spill that could inversely impact the marine environment, including Natura 2000 and marine reserves. The Fisheries Act aims to protect the marine resources and areas by setting aside spawning in marine species habitats. Under this act, quotas to limit the fishing of fish or shellfish species may be established. The Act on Environment Objectives sets out the framework for protecting water bodies from deterioration and for the planning and future management of international nature protection areas.

Several other laws have an important but indirect impact on nature and biodiversity conservation. These include the Acts on: Environmental Assessment of Plans and Programmes; Operations; Fertilisation; Watercourses; Environment Protection; Rural Development Support; Environment and genetic Engineering.

The Ministry of Environment co-ordinates the implementation of the Action Plan for Biodiversity and Nature Conservation (2004-2009) and is responsible for ensuring compliance with the National Strategy on Biological Diversity. As such, it is responsible for the conservation and restoration of endangered species, including the genetic variation within wild species. The ministry is in charge of the conservation of EU habitat and bird protection areas as well as the development of economic instruments and environmental indicators to support conservation. Through the Forest and Nature Agency and the Agency for Spatial and Environmental Planning the ministry manages important habitats. It is also responsible for international negotiations on nature conservation. The Ministry of Environment is also responsible for administering the subsidies to the forest sector, including those that promote biodiversity in forests. These subsidies include private afforestation, reforestation, close to nature management and green forest planning.

The Ministry of Food, Agriculture and Fisheries is responsible for assuring the sustainable management of marine and freshwater fisheries. Also, via the National Land Fund, the ministry manages certain kinds of nature restoration and afforestation projects and areas with special natural assets. It is responsible for the conservation and sustainable use of farm plant and animal genetic resources.

## **Spatial Planning**

The Planning Act (1992) applies to all of Denmark's land and coastal areas but not its marine area. Since 1971, the public administration has been based on a division of responsibility between the national, regional and municipal levels. At the national level, the Minister of Environment presents after every parliamentary election a national spatial planning report with policy guidelines for national territorial development. This report aims to ensure that the planning synthesises societal interests with respect to land use and contributes to protecting the country's nature and environment. The regions deal mostly with hospitals and have only a marginal role in relation to environmental protection. Municipal planning governs comprehensive municipal planning, detailed local planning and permits for construction and changes in land use in rural zones.

Denmark is divided into urban zones, summer cottage areas and rural zones. Special rules apply to development in rural zones where agriculture is the priority economic activity. Whereas new independent dwellings, urban businesses and institutions require a rural zone permit, new agricultural buildings can be built without a permit. This protects recreational and valuable landscapes, and ensures that agriculture retains good production opportunities.

Special rules for planning are in place for coastal zones. The Danish coasts (including what are now summer cottage areas) have been remarkably protected by a 100-metre protection zone since the 1930s. This zone is enlarged to 300 metres in open coastal areas. In urban areas, the protection zone, from 0 to 300 metres, has to be designated by a special Coastal Protection Committee. A special three-kilometre coastal area planning zone is determined in the Planning Act. The planning zone requires justification by special planning or functional reasons prior to locating buildings and construction works in coastal areas. The aim is to keep them as free as possible of development and installations that do not need to be located near the coast.

Through the Planning Act the municipalities are obliged to include guidelines in their municipal plans for the management of the nature protection interests, including the geographical positions of nature areas of high conservation value, ecological corridors and potential nature areas and ecological corridors.

Moreover, the municipal plans must also include guidelines for designation of reforestation areas, wetlands and the use of streams.

## **Municipal cooperation**

### **Count down 2010 declaration**

On the 25.th of January 2008, the region of Southern Denmark and 16 municipalities in the South of Denmark, signed, as the first municipalities in Denmark, the Countdown 2010-declaration on biodiversity. This means that the region and the municipalities have committed themselves to support the target of halting the loss of biodiversity before 2010.

Region South Denmark has been chosen to be one among 5 European model regions, which are to promote the biodiversity.

Some of the municipalities have so far worked out detailed plans for how the count down 2010 target will be achieved at ground level.

### **Nordic municipal cooperation**

The municipalities of Hedensted, Herning, Holstebro og Kolding are involved in a Nordic co-operation, which exchanges experiences and carry out concrete biodiversity projects. The outcome of the cooperation will be reported before 2010. The project is financed by the Nordic Council of Ministers and consists of 13 municipalities in total.

## **Agriculture, forestry, fishery and aquaculture policies**

### **Agriculture**

In 2008 about 63,4% of the total area of Denmark (i.e 27330 km<sup>2</sup>) is used for agriculture. The primary agricultural sector produced 1.5% of GDP in 2005, and has been on a steady decline since the 1960's. In the 1990's it represented 4.5% of GDP. The adoption of intensive farming increased the average size of holdings from 16 ha in 1965 to about 55 ha in 2005, while the number of holdings decreased from about 200.000 to 46.2700 during the same period.

It also increased the number of livestock (less cattle but more pigs), though the number of livestock units has been almost the same through all the years.

Several Danish policies aim to reduce the environmental impact of agriculture by promoting organic farming, re-establishment of wetlands, environmentally sound farming practices, the controlled use of genetically modified organisms, and the reduced use of pesticides and nutrients. For instance, farmers are encouraged to take wetlands out of agricultural production and re-establish them. Farmers are compensated for the loss of farmland value or offered a corresponding area of farmland elsewhere.

The Danish agreement on Green Growth contains a set of initiatives aimed at the promotion of a market-based organic sector:

Frameworks for a market-based development of the organic sector will be developed so that in 2020 the organic sector will have more than doubled compared to the 2007 level. The organic sector is thus expected to comprise 15% in 2020 compared to 6% in 2007.

Funds to the area-based grants will be increased so that they can support an annual growth in the organic sector up to 18,000 ha. Initiatives to promote sales of organic foods, etc. must be strengthened, cf. Annex 2.

A number of simplifications were introduced at the last revision of the Ecology Act in 2008. Nevertheless, there is a continued need for simplification of the regulations governing the organic sector. Therefore a diversely composed committee will be appointed that is to investigate the possibilities for further simplification and ease of administration within the organic sector. The Parties will discuss the committee's report on simplifications, which will be available at the beginning of 2010.

The registration fee for the organic logo for large scale kitchens will be withdrawn in order to promote use of organic raw materials in the catering industry.

A special starter pool will be established for organic biogas totalling DKK 15 million from 2010 to - 2012, cf. item 2.3.

The initiative will be evaluated in 2013 to assess whether there is a need for additional measures.

## **Forestry**

Denmark is pursuing a policy of doubling the national forest cover in 80-100 years. For the time being, the forest cover increases at a pace of around 2000 ha/year, which is about half of what is needed to achieve the target. A new subsidy scheme which has just been put in place will make it economically more attractive for private landowners to plant new forest. The priority areas for afforestation are those where groundwater needs to be protected as a source of drinking water.

In general the forest management has started to shift towards sustainable management, which is a challenge considering that many forests are very homogenous and look like plantations. An important objective of the National Forest Programme (2002) is to promote a conversion to "close to nature forestry". An action plan for the introduction of close to nature forestry in the state forests (2005) identifies the use of native or other well-adapted tree species, the retention of permanent forest cover by avoiding large clear-cuttings, the use of natural regeneration, development of diverse forest structures, and single tree management as the key principles for the close to nature policy. The exploitation of all state forests (25% of Danish Forest) is now environmentally certified according to national FSC and PEFC standards. This confirms the trend towards emphasising non-timber and environmental values.

## **Fisheries**

The activities of fishing fleet in Denmark account for 0,13 % of the Gross Domestic Product, whereas the entire fisheries sector including aquaculture, fish processing and the wholesale branch accounts for 0,4 %. The number of commercially active vessels in the Danish fleet fell substantially in the period 2005-2007. This is also the case for employment as well as for the total value of landings.

The Common Fisheries Policy in the European Union aims at a progressive implementation of an ecosystem-based approach to fisheries management, which contributes to efficient fishing activities within an economically viable and competitive fisheries industry, while minimising the impact of fishing on marine ecosystems.

The national legislation aims at utilising fishing opportunities while ensuring that Danish quotas are not exceeded. The Fisheries Act covers the protection of fish stocks, regulations on commercial and recreational fisheries, first hand sales and duties. The recreational fishery is regulated by means of restrictions on the amount and kind of gear used. National measures include the release of fish and research by the fees charged for fishing permits.

The Common Fisheries Policy in the European Union shall apply the precautionary approach in taking measures designed to protect and conserve living aquatic resources, to provide for their sustainable exploitation and to minimise the impact of fishing activities on marine ecosystems.

The process to designate additional Natura 2000 sites in Danish marine waters has begun. Some existing marine Natura 2000 sites will be extended and new areas will be designated, especially in the North Sea. When the sites are designated and approved, Natura 2000 management plans will be drawn up and the fisheries in these areas will be regulated as appropriate.

## **Aquaculture**

The regulation on the European Fisheries Fund which was adopted in 2006 will allow numerous possibilities to provide financial support to sustainable development of aquaculture during the period 2007-2013. Council Directive 2006/88/EC on animal health requirements for aquaculture animals provides a new and improved legal framework to address health issues in aquaculture. Regulation No 708/2007 concerns the use of alien and locally absent species in aquaculture, and Regulation No 834/2007 concerns the organic production and labelling of organic product, including organic production in aquaculture.

The demand for more effective technologies to reduce pollutants in effluents and more effective use of extracted water has led to a shift from many small farms to fewer but larger operations. Fish farms are required to obtain water extraction permission and an environmental approval. Fish Farm owners must send the government information about the type and amount of feed and drugs used and the results of the freshwater fish farm's self regulation. Denmark must also perform an environmental assessment of the fish farms in accordance with the EU Habitats and Birds Directive and the Ramsar Convention.

A large number of complaints are registered against fish farms because of concern about their impacts on the local water environment due to the presence of nutrients from leftover food and antibiotics. Nonetheless, waste feed and discharges of phosphorus and nitrogen were halved for fish production between 1989 and 2006 (NERI 2004).

The Danish agreement on Green Growth contains a set of initiatives within aquaculture. A grant pool totalling DKK 100 million will be established from 2010 to 2015 as a supplement to the existing support options in the Fisheries Funds. The pool is dedicated to the most advanced recirculating technologies (FREA - full recirculated aquaculture facilities or model fish farms type 3) and can operate with a higher funding percentage (40%), due to the greater environmental advantages and investment uncertainty associated with this type of facility.

An aquaculture committee will be appointed with the remit to investigate the aquaculture industry's long-term business and environmental conditions.

## **Extraction of raw materials**

Extraction of raw materials in Denmark is regulated through the Raw Materials Act.

At sea extraction can only take place within certain geographically limited areas. These areas have to be biologically assessed before extraction can take place. It is obligatory to make an EIA before extraction can take place in Natura 2000 areas and Ramsar sites. Extraction can only take place if the EIA show, that the extraction will not make it harder to achieve a favourable conservation status for the species and nature types for which the areas have been designated.

Outside marine Natura 2000 areas, EIAs are not obligatory. Whether an EIA will have to be conducted, depends on the amount of extraction, more than 1 mill m<sup>3</sup> pr year or a total of 5 mill m<sup>3</sup> for the hole license result in an EIA. Also the outcome of a screening for possible significant environmental effects may result in an EIA or a changes in the geographically limits of the area. Raw materials which are being extracted are sand and gravel. Around 8 mio. cubic metres are being extracted each year from the sea. Extraction of larger boulders has not taken place since 2002 and it is envisaged to ban extraction of boulders from the marine environment, within the coming years.

On land, the Regional authorities are responsible for making plans for the extraction of raw materials and for defining geographically limited areas in which extraction of raw materials can take place. These plans must be subject to an SEA.

On land the Municipalities are obliged to include considerations for nature protection, when they give permissions for the actual extraction of raw materials. If the extraction takes place in Natura 2000 areas and Ramsar sites, extraction can only take place if the activity doesn't make it harder to achieve a favourable conservation status for the species and nature types for which the areas have been designated.

The authorities must also make sure that no breeding and resting places for animals listed under the habitats directive's annex IV are destroyed and that the listed species are not disturbed.

Furthermore the authorities are obliged to make an environmental rehabilitation plan for the areas where extraction has taken place.

## **Infrastructural development**

### **Railways**

Recently, the Danish Government launched a major plan for infrastructure development. The plan makes the following statements in relation with integration of biodiversity into the transport sector:

The Government will structure the planning process of new, major infrastructure projects in such a way that a preliminary assessment uncovers the traffic effects, economic effects, and impact on nature and environment. This will establish the foundation for the overall assessment of whether to proceed with the projects. If it is decided to proceed with a project, the thorough environmental assessment (EIA) will determine how the project will be carried out- amongst others how to mitigate effects on the environment.

Regarding projects within the existing infrastructure impacts on nature will be reduced if possible. The impacts of existing infrastructure will be reduced by establishing wildlife corridors, bridge paths, wildlife fences, warning signs and reduced speed on locations with large numbers of wildlife.

With regard to the integration of biodiversity into planning of new railways, the main process is the application of environmental impact assessments on projects (EIA's). Further, the European Natura 2000 directives have played a role of integrating biodiversity into railway planning procedures.

As to integration of biodiversity into rail infrastructure management, rail Net Denmark provides the following information:

Rail Net Denmark is removing trees along the railway up to 6 meters from the tracks to allow the engine drivers to see the surroundings and the signals along the tracks.

A positive side effect is that removing trees allows smaller bushes with flowers and berries to sprout up. These open and brighter areas with wild bushes and flowers attract insects, birds and smaller wild animals and also function as habitats and corridors for wildlife along the tracks.

Rail Net Denmark is also controlling invasive plants like giant hogweed, which is spreading and choking other plants along the tracks.

## **Highways**

The Danish Road Directorate (DRD) has the overall responsibility for the planning, construction, operation and maintenance of state roads in Denmark. Local authorities however have the responsibility for roads owned by the municipalities.

As a general rule, the aim of the DRD and the Danish Ministry of Transport is that the mobility and energy consumption in Denmark is sustainable regarding environment and nature.

When DRD is planning a new state road or an extension of an existing state road biodiversity (species protected by the Habitats and Bird Protecting Directives, red listed species, species protected by Danish law, but also species not protected by international or national law having problems with fragmentation) is assessed. This especially applies to roads where an EIA is carried out. Actions to minimize impacts of the road on biodiversity (fauna tunnels etc) are integrated in the project.

Concerning roads in rural areas DRD is obliged to ask the Ministry of Environment for permission to carry out the project (due to the Nature Protection Law) before the beginning of the construction work. Protecting biodiversity is part of the permission.

### *Success stories:*

In Denmark there is an increasing awareness of the importance of monitoring, knowledge and EIA-methods.

### **Monitoring**

In 2007 the DRD financed an investigation and follow-up assessment by the National Environmental Research Institute on placement and effect of fauna passages at the motorways in Northern Jutland (<http://www.dmu.dk/Pub/FR631.pdf>).

In 2005-2008 the DRD financed a Ph.D study on the pollutant transport from highway surfaces caused by rain and the ability of drainage ponds to hold back matter that may contaminate the environment (surface water).

In 2009 the DRD will initiate a monitoring program for five newly build wildlife passages.

### **EIA-methods**

In 2008 DRD and the Ministry of Environment in cooperation initiated a project developing a biological model to calculate biological connectivity of moor frog (*Rana arvalis*) in order to qualify EIAs. The project is supposed to continue for another 3 years. The model will be designed to handle other species than moor frog and other amphibians also.

In 2009 the DRD will initiate a study developing a method to assess impacts on bats.

### **Knowledge**

In 2008 DRD financed a study on great crested newt colonization of human made ponds and ponds adapted by humans.

In 2009 DRD finishes a study on points of conflict between state roads and important nature areas / green corridors. Actions to minimize the conflict and enhance the mobility of animals have been assessed for all points of conflict. Carrying out the proposed improvements will minimize the barrier effect of the state roads. Currently many state roads cross green corridors but do not allow animals to cross the road safe (because of a lack of fauna passages, embankments along streams etc). When extending existing roads conditions are changed to the better.

In 2008 DRD took the initiative to start the project group Wildlife and Traffic within Conference of European Directors of Roads. One of the goals of this project group is to exchange knowledge. Time schedule is 2009-2011.

### Guideline

The DRD in cooperation with national authorities and NGOs have made a guideline on fencing along state roads. One of the goals of the new strategy for fencing is to minimize the barrier effect of roads.

The DRD aims to revise the Danish guideline Fauna and Human Passages in near future.

Actions that need to be taken to enhance implementation of biodiversity:

In order to enhance the integration of biological diversity in planning, construction and operation of state roads in Denmark a great interaction between the action taken on the state roads (eg. fauna passages) and other physical planning of the landscape by local authorities is preferred (e.g. range of rural and urban areas). This interaction helps to protect green corridors crossing state roads.

## Financing and expenditure

Financing for nature and biodiversity protection in Denmark consists of both direct in-kind funding. The main sources of direct funding are public funding (state, counties until end of 2006, municipalities, EU and private funding. The Nature Conservation Act provides funds for acquisition of property to implement major nature restoration projects and state afforestation projects. The act also provides loans or subsidies to municipalities (and provided them to counties until the end of 2006), as well as to organisations and private landowners who wish to tend and restore natural areas and improve the opportunities for recreational activities. In-kind or voluntary funding is generally through management or monitoring activities by the public.

Total government expenditure on nature conservation including county and municipality expenditures was DDK 2528 million in 2005, up from DDK 2118 million in 2000. Total figures after 2005 are not available. However the Counties were closed down by the end of 2006 and an unspecified part of the resources they used on nature protection went to the municipalities and to the state.

While overall public funding has increased for nature protection, contributions from the national government dropped from DDK 1 012 million in 2000 to DDK 968 million in 2005.

In the last ten years, public funds were distributed roughly into 40% for nature conservation, 40% for afforestation and 20% for recreational activities (Enemark 2002). The number of personnel involved in nature conservation and protection was reduced by 20% (from 1271 in 2002 to 1024 in 2006).

	2000	2003	2005
Total national government expenditure	1012	912	968
County expenditure	809	975	1101
Expenditure by municipalities	297	353	458
Total	2118	2240	2528

Management of state-owned areas included.

Source: MoE, National Forest and Nature Agency

**Table 4:** *Public expenditure for nature protection 2000 – 2005 (DDK million).*

Since 1999 Denmark has benefited from EU funding for many projects associated with nature and biodiversity. The EU Common Agricultural Policy (CAP) programmes, and especially the Rural Development Programme, exert a very strong influence on nature by promoting multifunctional agriculture including agri-environmental incentives etc.

Additional, the EU LIFE programme has contributed significant funds for nature conservation projects. In view of the importance of the forest for producing ecological services like the regeneration of ground water government funding of DDK 6,5 million is made available annually for private landowners for consultation purposes and developing plantations. The low rate of reforestation leads one to believe that the incentive programmes could not compete with the return on investments from competing sectors, such as agriculture or industrial livestock production.

No data are available on private funding for nature conservation or protection in Denmark. However three organisations are major actors in nature protection through land purchase and management: the Danish Bird Protection Foundation (with more than 850 ha in 18 bird sanctuaries), The Aage V. Jensen's Foundation (several properties in the country) and the Nordea Foundation (through sponsoring private and state projects). Several other large private foundations exist and contribute to Danish nature conservation and research.

## Fiscal policy

In recent years the Danish Government has worked to integrate biodiversity conservation and sustainable use into a number of major fiscal policy decisions, including most recently in the decisions on investment in infrastructure and on tax reform.

In January 2009 the Government thus decided on a 12-year financial framework for public expenditure in the transport sector until the year 2020. The agreement also lays down the principles for the specific allocation of the financial framework. It is stated as one of the principles that bridges, roads, and railways cannot be allowed to destroy irreplaceable nature.

Furthermore the Government reached an agreement with the Danish Peoples party on a reform of the tax system in March 2009. One feature of the reform is an increase in a range of environmental taxes, including increases in several taxes which are expected to have a beneficial effect on biodiversity conservation. For example, it was decided to raise the rates for the emission of nitrogen, phosphorus and organic material under the waste-water tax. In addition it was decided to raise the taxes for a number of green house gases. In total the reform is expected to raise the level of green taxes by approximately 1.1 billion Euros, including revenue from C02 quota auctions.

There have also been taken steps to integrate biodiversity conservation and sustainable use into the advice the Government receives on its economic policies. The Environmental Economic Council was thus established by law in 2007. The council has 24 members representing unions, employers, NGOs and the Danish Government and is presided over by four independent university professors.

The chairmanship prepares reports for the council which contains analyses on different environmental issues with relevance to the Danish or Global economy.

## **Education**

### **Nature schools and eco bases**

Nature schools and eco bases are facilities placed in nature areas where environmental education can take place. In many instances, the facilities have a specific person in charge of the teaching and the activities on the spot.

The idea is to teach the pupils in all subjects on the spot and to integrate environment and nature considerations in all the subjects.

The nature schools and eco bases are often established in a cooperation between the municipalities and the ministry of environment and serve schools, kindergartens, clubs etc.

The state is involved in 11 eco bases, and 35 nature schools through out the country. Many more exists though and are run solely by the municipalities.

### **Nature Guides**

In 2006, over 950.000 people participated in more than 36.000 events, led by 310 nature guides.

New figures for 2007 and 2008 are not available at the moment, but it is expected that participation has been at an equal or greater level in the years following 2006.

See more (in Danish):

<http://naturvejledernet.skovognatur.dk/Naturvejlederordningen/Beretning/aarsrapport2006.htm>

### **Education material**

The ministry of environment has published a wide range of educational materials for schools. A few initiatives will be high lighted here.

A series of education materials are available under the title, "follow the fox". The material is differentiated to suite the needs of both younger and older pupils and teachers. The ministry of environment is also in a process developing educational material to new subjects as national parks; which is a new concept in Denmark

Every year, a Forest Day is held, with events about forestry and forest biodiversity scattered all over the country. In relation to the Forest Day, a school book about an aspect of forest biodiversity is published and made available to schools. The books are focus on information for pupils in 1. to 3. grade.

See more (in Danish):

[http://www.skovognatur.dk/Ud/Undervisning/Materialer/foelg\\_raeven/Materialer.htm](http://www.skovognatur.dk/Ud/Undervisning/Materialer/foelg_raeven/Materialer.htm)

See more (in Danish):

<http://www.skovognatur.dk/Ud/Undervisning/Materialer/Emma/EmmaOgRaeven.htm>

The Danish ministries of Environment and education have made a 3-year partnership agreement with the Danish Outdoor Council, about promoting an education programme, called Green Flag – green School. The agreement implies that Denmark will be spending DDK 6,6 mio. targeted on education in 500 Danish schools on nature, environment and sustainability. The schools will have to be sustainable and the pupils will be taught about sustainability. The Green Flag School started in 1994 and is part of an international network of so called Eco-Schools, which encompasses millions of pupil in around 28.000 schools in 46 countries from China, Japan, Africa, Europe and USA.

See more (in Danish): [www.groentflag.dk](http://www.groentflag.dk)

## **International co-operation**

### **International agreements**

By 2009, Denmark has ratified almost all international conventions concerning nature and biodiversity, including the Convention on biological Diversity with all three elements (i.e. genes, species and ecosystems) and the protocols on genetically modified organisms and access and benefit sharing.

Denmark has worked towards the objective of halting the loss of biodiversity by 2010 in accordance with the targets set at the Gothenburg EU summit in 2001 and the World Summit on Sustainable Development in Johannesburg In 2002. Denmark is a signatory of the Ramsar, the Washington and the Bonn Conventions, which are implemented through various government programmes.

Denmark is also a party to all the regional agreements that are important to it, including: the Wadden Sea Seal Agreement, the African-Eurasian Waterbirds Agreement, the Agreement on the Conservation of European Bats, and the Agreement of the Conservation of Small Cetaceans of the Baltic and North Sea. Denmark has also signed the UNECE forest initiatives as well as the regional conventions (e.g. Oslo, Helsinki and the Bern and landscape Conventions of the Council of Europe.

In 2004 Denmark ratified the Convention on the Law of the Sea and the Agreement related to implementation of its part XI. Denmark has not ratified the International Convention for the Control and Management of Ship's Ballast water and sediments, but expects to do so in 2011.

### Multilateral assistance

Denmark's international development assistance supports projects that encourage the conservation of nature and biodiversity and are consistent with the Convention on Biological Diversity objectives of substantially reducing the loss of biodiversity by 2010. It has identified priority issues to advance biodiversity and nature conservation: sustainable forest management and combating illegal logging; mutually supportive efforts to combat climate change and preserve biodiversity; integration of biodiversity considerations in climate change mitigation and adaptation; establishment of a global network of protected areas on land and at sea; combating and preventing the introduction of invasive alien species; development of an international regime on access and benefit sharing. In 2005, Danish development assistance totalled DDK 12.6 billion corresponding to 0.81% of GNI. Denmark continues to be among the major contributors of development assistance and has undertaken to grant 0.8% of GNI in development assistance over the coming years.

	2001	2002	2003	2004	2005
Bilateral Aid	745	470	438	1.112	935
Multilateral Aid	1.332	1.418	1.241	1.255	1.260
Total	2.077	1.888	1.679	2.367	2.195

**Table 5:** Danish ODA contributions to implementation of the CBD over the period 2001-2005 (DDK mill.).  
Source: Danida's annual reports 2001-2005

Denmark's multilateral environmental assistance supports efforts made by a number of international fora to promote sustainable development.

Two international events in particular established the agenda for the multilateral cooperation on environment and sustainable development: the Rio conference in 1992 and the Johannesburg summit in 2002.

Continuous efforts to implement and further develop the results from these meetings are, at the international level, primarily made by the EU, UN fora, international organisations and at meetings at conventions and protocols. Denmark participates actively in the global dialogue in these for a. Denmark financially supports developing countries' participation in this process and assists them to implement and comply with the decisions made. The main focus is on central issues covered by international conventions and partnerships such as water, water resources, energy, protection of biodiversity, climate, chemicals and sustainable land management. Important multilateral partners

in environmental assistance over the last decades include GEF, UNEP, IUCN and IIED. Added to these is cooperation with particularly the World Bank, the regional development banks and UNDP concerning integration of environment into the organisations' overall work as well as support to specific activities in the environmental field.

GEF is one of the most important global tools for financing global environmental protection. GEF is financed through assessed contributions. GEF furthermore manages a number of voluntary funds to which Denmark contributes. In total Denmark has provided more than USD 150 million to the GEF since 1991.

The cooperation with UNEP focuses in particular on the organisations' efforts to develop and strengthen global environmental agreements, strengthen the national environmental instruments and develop policies and strategies. Denmark is working to make UNEP's efforts focused and efficient – for example by enhancing the developing countries' capacities to both contribute to, and make use of, global environmental agreements. UNEP is financed through voluntary contributions. The Danish support involves an annual, general contribution supplemented by earmarked funding. The support to IUCN and IIED is aimed amongst others at securing their participation in the international dialogue on policies for nature conservation, poverty/environment and trade/environment. Another priority is helping the organisations to focus their work and to integrate it further into the other efforts for environmental development at country level. Table 6 presents the CBD relevant multilateral assistance for 2005 based on total Danish contributions to those multilateral institutions/programmes whose institutional objectives support the CBD.

<b>Institution / programme</b>	<b>2005</b>
Global Environmental Facility	65,2
World Bank	503,4
African Development Bank	179,0
Asian Development Bank	57,8
Inter-American Development Bank	10,0
UNDP/specific programmes	370,0
UNEP	31,0
UNEP/centre for Water and Environment	4,0
IUCN	20,0
IIED	5,0
IWGIA International Work Group for Indigenous Affairs	14,9
Source: Danidas Annual reports 2001-2005	

**Table 6:** *CBD-relevant support to Multilateral Institutions in 2005 (DDK mill.).*

### **Bilateral assistance**

Denmark's bilateral development assistance currently focuses on 15 developing countries (programme countries) based on long term national strategies on poverty reduction. Sub-Saharan Africa remains the major recipient of Danish bilateral aid. In 2001 bilateral assistance totalled DDK 6,409 million, equivalent to 47,1% of total Danish ODA, while the bilateral aid for 2005 amounted to DDK 7,230 million, or 57,2% of total Danish ODA.

Bilateral assistance is usually concentrated on between two or four sectors in each programme country. Sector programme support makes it possible to focus resources, work and long term initiatives and, in cooperation with the recipient country (including government authorities and civil society), build up knowledge and skills in order to ensure better sustainability of the results.

Ne key bilateral activity in support of the CBD is the environmental support given to countries in Asia, Africa and Latin America. In Asia, the Danish support programme includes Bhutan, Cambodia, Indonesia, Malaysia, Nepal, Thailand and Vietnam. In Africa, the following countries receive environmental support: Egypt, Kenya, Mozambique, South Africa, Tanzania, Zambia and the South African Region. In Latin America, There are environmental support programmes in Bolivia and Nicaragua, in addition to a Central American Regional environmental support programme. Furthermore, as environment is mainstreamed in Danish development assistance, it remains an important element in a number of other programmes, including sector programmes on agriculture, water and sanitation etc. The Danish bilateral assistance to programme countries is in response to the recipient countries' own priorities and is based on individual country strategies that describe the framework for cooperation, including objectives, targets and priorities for each country. In general, these country strategies include priorities that are in line with the CBD.

### Support to key commitments in the CBD

The CBD includes a number of shared commitments for maintaining the worlds' biological diversity. Articles 6-20 of the CBD specify the key obligations of each contracting party. An overview of how Denmark has supported developing countries' efforts to fulfil some of those obligations is given in **Fejl! Henvisningskilde ikke fundet.** below, which links the key commitments in the CBD to CBD to Danish development assistance. All the countries listed have a Danish cooperation agreement in which one or more components support a specific CBD commitment.

CBD articles	Key Commitments	Examples of Danish Environmental support
6, 10 and 11	Developing national biodiversity strategies, plans or programmes. Establish policies which act as incentives for the conservation and sustainable use of biodiversity.	Bhutan, Bolivia, Cambodia, Indonesia, Kenya, Mozambique, Nicaragua, Malaysia and Laos (support to greening of PRSP and mainstreaming of biodiversity into national policies and plans).
7	Identifying and monitoring biodiversity in accordance with Annex 1 of the CBD including monitoring of: Ecosystems and habitats Species and communities Described genomes and genes	Malaysia (university collaboration, mapping of biodiversity) Nicaragua (protected areas, research agreements, national environmental information system) Vietnam (environmental information system, marine protected areas network)
8	Supporting <i>in situ</i> conservation measures encompassing the: Establishment of protected areas, rehabilitation and restoration of degraded ecosystems and promoting the recovery of threatened species Protection of indigenous peoples and their knowledge systems Mitigation of potentially hazardous exotic species and biotechnology products	Bhutan, Malaysia, Nicaragua, Tanzania, Thailand and Vietnam (PA management). Bolivia (PA establishment, national PA systems, natural resources management in indigenous peoples territories, support to demarcation and collective land rights) Cambodia community based natural resources management, integrated coastal areas management) Central America (local level natural resources management) Mozambique (community based natural resources management)
9	Complementing the protection of natural habitats through ex-situ conservation measures	Regional forest seed sector programmes (Cambodia, Laos, Vietnam) Malaysia (captive breeding) Nicaragua (tree seed centre)
12, 17 and	In accordance with the special	Bolivia, Malaysia, South Africa, Tanzania and

18	needs of developing countries, establish programmes for: Scientific and technical education Exchange of information, technical and scientific cooperation to support implementation of the CBD.	Thailand (University collaboration on forest management) Central America (research collaboration) Indochina (University collaboration with Cambodia, Laos and Vietnam)
13	Promote and encourage understanding of the importance of, and the measures required for, the conservation of biological diversity, as well as its propagation through media and in educational programmes.	Bolivia, Cambodia, Nicaragua, South Africa, Thailand and Vietnam (environmental education in schools, public awareness)
14	Introduction of Environmental Impact Assessment (EIA)	Bolivia (EIA support as part of decentralised environmental management, SEA on mining sector) Ghana (SEA on water and sanitation) Indochina (EIA and SEA training and capacity development in Cambodia, Laos and Vietnam) Mozambique (SEA on coastal zone) Nicaragua (EIA support to environment ministry, support to municipalities, transport sector support)

**Table 7:** *Key commitments in the CBD linked to Danish development assistance*

*General measures for conservation and sustainable use (CBD article 6)*

The contracting parties are committed to developing national strategies, plans or programmes that reflect the CBD commitments. The conservation and sustainable use of biodiversity must therefore also be included as a cross-cutting issue within the planning process.

Denmark has contributed with analyses of the best ways to include and develop environmental considerations in the PRSP's (greening of PRSP), both as a cross-cutting issue and in the individual sectors. These analyses have also examined how this development can be supported through institutional and organizational capacity building of the authorities in the countries concerned. This process has been supported in Bhutan, Bolivia, Cambodia, Indonesia, Kenya, Mozambique and Nicaragua. Other countries have been supported in the process to develop and implement a national biodiversity strategy, i.e. the Lao PDR National Biodiversity Strategy and Action Plan.

There has also been given support to developing the national framework for biodiversity conservation. In Nicaragua, support included capacity building and a strengthening of the regulatory and policy framework by developing environmental standards and a national environment plan. Malaysia is supported in order to enhance opportunities for introducing biodiversity conservation and management safeguards into sectoral policy, programme and planning processes.

*Identifying and monitoring biodiversity (CBD article 7)*

Identification and monitoring of biodiversity is especially important in terms of supporting the establishment and appropriate management of protected areas. Danish support to the GEF is important in this regard since GEF finances the consolidation of many national protected area systems. Moreover, many GEF financed projects are site-based and include identification and assessment of biodiversity as well as the design and establishment of biodiversity monitoring schemes.

Some environment programmes, supported by Denmark, have also contributed to identifying areas containing biodiversity of high conservation importance. This has often happened in collaboration with universities and NGOs, as in the Eastern Arc Mountains of

Tanzania where support was provided to identify important areas for biodiversity. The identification of important marine areas has also been supported, as in the Marine Protected Areas Network component in Vietnam, which undertook an inventory and assessment of potential marine protected areas.

The development and establishment of different types of biodiversity monitoring schemes has been supported both inside and outside protected areas. These have ranged from a community-based biodiversity and natural resource use monitoring system in Tanzania to forest cover monitoring using remote sensing and Geographical Information System (GIS) in Nicaragua.

### *In-situ conservation (article 8)*

The CBD emphasizes the importance of supporting in-situ conservation. This line of support includes establishing protected areas and developing guidelines in this regard; biodiversity management inside and outside protected areas, including many types of sustainable Natural resource Management; the promotion of broader habitat and ecosystem protection and rehabilitation; sustainable development I buffer zones around protected areas; preventing the spread of genetically modified organisms (GMOs); resolving conflict over use and conservation; respect for indigenous peoples' territories, culture and intellectual property rights; and legislation on threatened species. The majority of Danish bilateral assistance of relevance to the CBD is, in some way, supporting in-situ conservation. The following is a selection of Danish supported activities in this area:

#### Protected areas establishment and management

Danish support to activities that explicitly promote the objectives of the CBD are often related to the identification, establishment, monitoring and management of protected areas. Among the examples are Nicaragua, where continued support is being provided to the National Protected areas system and to the largest protected area in the country: the Bosawas Biosphere Reserve and the Indio-Maíz Biological Reserve.

In Tanzania, support has been provided for the establishment and management of the 3.250,00 ha Malagarasi-Muyovozi wetland as a Ramsar site. In Vietnam, the focus has been on both terrestrial (Pu Houg PA and U Minh Thuong PA) and marine protected areas (hon Mun Marine Protected Area, Con Dao and Cu lao Cham). Together with the Ministry of Agriculture and Rural Development, World Wildlife Fund (WWF)-Denmark and WWF Indochina have developed a long-term management strategy for the terrestrial PA system.

Protected areas management has been supported in both peninsular Malaysia (Krau Wildlife Reserve, Endau Rompin National Park) and Sabah (conservation area along the Kinabatangan River). In Bhutan there was support to the management of the Bumdeling Wildlife Sanctuary. Co-management of Pas is supported in several places.

#### Invasive species

The introduction of non-native, harmful invasive species can cause severe damage to native biodiversity. Support has been provided – among other examples – to the International Water Hyacinth Programme and its work in Africa to develop an environmentally friendly fungal pesticide that will help bring the water hyacinth under control.

#### Indigenous peoples

To conserve biodiversity it is vital to work with indigenous cultures and the traditional knowledge they possess. Many of the world's biodiversity hotspots and high biodiversity wilderness areas are inhabited by indigenous peoples, and their territories cover a large amount of biologically important land areas in many regions of the world.

A long term support to indigenous peoples organizations and territories in Bolivia has succeeded in demarcation and titling of numerous territories. Technical assistance is provided to sustainable natural resources management including conservation of biodiversity.

In Nicaragua, support has been provided for more than a decade to indigenous communities in the Bosawas Biosphere Reserve to protect their territory and promote a sustainable use of natural resources.

Denmark has furthermore supported two phases of the Consolidation of the Amazon Region (COAMA) programme in the Colombian Amazon. The programme supports the training and capacity building of indigenous organizations with the aim of ensuring their ability to develop their own policies and fulfil the legal and technical- administrative requirements for management of their territories.

The International Work group for Indigenous affairs (IWGIA) is supported through a multi-annual framework agreement. The organization supports indigenous peoples in Latin America, Africa and Asia in their political struggle for recognition and their rights of self-determination. The work of IWGIA includes intellectual property rights, natural resources management, and the conservation and sustainable use of biodiversity.

### **Ex-situ conservation (CBD article 9)**

Ex-situ conservation, whereby plants, animals or genetic material are removed from their original habitat and conserved in special facilities, is in most cases a last resort and the most resource intensive solution for the conservation of critically endangered biodiversity. Examples of ex-situ conservation activities supported by Denmark include support to forest tree seed banks (south eastern Asia and Nicaragua) and to a gaur breeding facility in Malaysia (component of the Krau National Park Project).

### **Sustainable use of natural resources (CBD Article 10)**

According to the CBD conservation and sustainable use of biological resources is to be integrated into national decision-making.

Traditional cultural practices related to the use of biodiversity is encouraged and protected. Support should be given to local activities improving degraded areas.

Governmental and private sectors are encouraged to collaborate on developing methods for sustainable use of biological resources.

Sustainable use of natural resources is vital to long-term improvement of living conditions for disadvantaged population groups and to assure the basis of future production.

Sustainable management of biological diversity is vital for securing food supplies as well as for preserving unspoiled habitats, health, the environment and a stable climate.

Among the natural resources, the forests and the wetlands play a crucial role. While representing in themselves a multifunctional ecosystem characteristic of rural countryside, they not only make a

vital contribution to the preservation of the climate, to the protection of the protection against natural hazards, to tourism etc, but also – in their function as elements of the rural production system – play a huge role in the reduction of poverty.

#### **Box 1: Danish Support to water resources management**

##### **Global water initiatives**

The EU water Initiative (EUWI)  
Global Water Partnership  
The UNEP Collaboration Center on Water and Environment  
The UNEP IWRM programme  
World Water Assessment Programme

##### **Regional Initiatives**

African Water Facility  
Rural Water Supply and Sanitation Initiative (RWSSI)  
Integrated Water Resources Management in the Southern Africa Development Community (SADC)  
Integrated Water Resources Management of the Economic Community of West African States (ECOWAS)  
The Nile Basin Initiative (NBI)  
Mekong River Commission  
Zambezi River Authority

##### **Country Initiatives**

Bangladesh, Benin, Bhutan, Burkina Faso, Ghana, Kenya, Mali, Niger, Sri Lanka, Uganda, Vietnam and Zambia

Sustainable natural resources management is a main priority in Denmark's development cooperation. Activities include the integrated water resources management, integrated coastal zone management, sustainable land management and protection and sustainable use of wetlands and forests. Sustainable water resources management is supported through global, regional and country programmes (see Box 1).

Sustainable forestry is supported in several countries among those Cambodia, Honduras, Nepal, Nicaragua and Thailand. Support includes community forestry and certification. In Tanzania, Denmark has through more than 10 projects provides a substantial support to establishment and consolidation of participatory forest management.

### **Research and training**

Scientific and technical education and training programmes for the identification, conservation and sustainable use of biological diversity are much needed in developing countries. Likewise with research that contributes to conservation and sustainable use. An example of Danish support in this area is the development of an environmental education and research programme at Can Tho University in Vietnam. The objective of this project is to assist the University to develop its capacity to provide environmentally oriented teaching and research to serve the special needs of the Mekong Delta Provinces for natural resources management. Activities like these will often also contribute to the obligations under CBD articles 16-18 "Access and transfer of technology", "Exchange of information" and "Technical and scientific cooperation".

The major modalities of research and training in relation to the CBD are ENRECA<sup>18</sup>, the Danish Council for Development Assistance, research centers and support to research through the environment programmes. On example is an on-going long-term ENRECA programme between Danish Universities and Uganda and Tanzania, which seeks to strengthen local capacity in biodiversity research.

Another long-term collaboration on biodiversity research took place in the period 1999-2003 between the University of Sabah (UMS), Malaysia and Danish universities. Denmark has supported the Asian Institute of Technology (AIT) since 1994. this programme includes research and training in areas such as integrated watershed management and integrated pest management. University collaboration between South Africa and Denmark on sustainable NRM and PFM in Southern Africa took place over the period 2000-2005.

Denmark is host to the global Biodiversity Information Facility (GBIF) and a major donor to the institution. The main task for this centre of knowledge is to register all available biodiversity information in the world. The knowledge is made available to all participating parties.

### **Education and Awareness (Article 13)**

General environmental awareness and understanding of the importance of biodiversity for human well-being is important, as is a general understanding and appreciation of principles on sustainable use. The CBD recommends to the parties to support activities promoting environmental education in schools and general public awareness raising.

Denmark has supported many initiatives in the field of environmental education and awareness raising. Two examples can be highlighted:

Support has been provided for a decade to the Danish NGO Nepenthes, who in partnership with the Nicaraguan Fundacion del Rio develops environmental education for children and young people in the buffer zone of the Indi-Maíz Biological Reserve. Activities include curriculum development, education materials, a nature centre, natural trails, a radio station, agroecological training and school gardens.

The Outdoor Council, a Danish Umbrella organisation for 93 associations related to outdoor life, nature and the environment, is involved in an environmental education programme in Kenya alongside Kenyan Organisation for Environmental Education. The project aims to implement the green School concept in 300 schools and to strengthen environmental education in another 1200.

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<sup>18</sup> Programme for Enhancement of Research Capacity in developing Countries

### **Impact Assessment (CBD Article 14)**

Any proposed projects that are likely to have significant adverse effects on biological diversity should undergo an environmental impact assessment with a view to minimising or avoiding such effects. Denmark is supporting developing countries to ensure that Environmental Impact Assessments (EIA) become a natural part of planning and that capacity is built in terms of implementing EIAs.

The environmental support provided by Denmark include capacity building in EIA methodologies. One example of this practice is the long-term development of Ministerio del Ambiente y los Recursos Naturales Nicaragua (MARENA), Nicaragua. Another example is the regional collaboration on environmental planning and management, the USEPAM programme. This programme has organised a number of EIA courses for local university staff and government officials in Cambodia, Laos and Vietnam.

Strategic Environmental Assessments (SEAs) have been supported in Bolivia (mining sector), Ghana (SEA on Water sanitation), Mozambique (SEA on coastal zone), and Vietnam (SEA on Fisheries sector).

Denmark is also providing training and capacity building in EIA in other types of support such as the transportation sector programmes in Bangladesh, Benin, Ghana, Nicaragua, Tanzania, Uganda and Zambia.

### **Access to genetic resources (CBD article 15)**

Access to genetic resources and equitable benefit sharing are one of the three objectives of CBD. Since the Earth Summit in Rio de Janeiro in 1992 the Parties of the convention have been committed to facilitate access to genetic resources and of sharing benefits arising from their use. In 2002 at the World Summit of Sustainable Development in Johannesburg the governments decided on a mandate to elaborate an international regime on access and benefit sharing of genetic resources. The deadline of the negotiations is CBD COP 10 in 2010. In 2009 at CBD COP 9 in Bonn the Parties decided on a roadmap for the remaining period of the negotiations. This mandate will structure the upcoming negotiations in 2009-2010. This next phase of the negotiations is critical since the actual substance of the regime is to be negotiated. Denmark participates actively in these negotiations – both on EU and international level and supports the development of an international regime on access and benefit sharing.

## **Chapter IV - Conclusions: Progress Towards the 2010 Target and Implementation of the Strategic Plan**

The status of biodiversity in Denmark reflects the country's high population density and a long history of intensive commercial exploitation of raw materials, soils, timber, water and stocks of wild species. The vast majority of the country is covered by highly modified urban, silvicultural and arable areas, where construction, cultivation and plantations limits biological diversity. However, there are some natural areas left with high biological diversity. The long protected coastal line, the extensive sea territory and more recent regulations to protect birds and mammals from unsustainable hunting has helped to protect large areas of important habitats and their biological diversity, including large populations of birds.

From a biodiversity perspective, forests hold the largest number of Danish species and also the largest number of threatened species. Forests cover 12% of the Danish terrestrial land area, the vast majority of which is intensively managed logged plantations with relatively few old growth habitats and forest glades for endangered species. However in the last 20 years some efforts have been made to secure such habitats, through a Danish national strategy for natural forests, through certification and through a shift towards close to nature forestry practices of all the Danish state forests.

The coastal and marine ecosystems must be considered the most important Danish contribution to European biodiversity, as Denmark holds a major proportion of the areas of dunes, saltmarsh and shallow marine waters, of crucial importance for specialised lichens, plants, fungi and invertebrates, as well as waterbirds, of which Denmark hosts a large globally important share of many flyway populations, e.g. East-Atlantic population of light-bellied brent goose (100%), Svalbard population of pink-footed goose (100%) and the Baltic-Wadden Sea population of common eider (86%).

In conclusion, the best current estimate is that biodiversity is still under heavy pressure. It should be stressed that it is a challenging task to reverse population declines that follow decades of declining habitat area and quality. First, there is a marked delay in the population response to habitat destruction for most species, especially perennial and sedentary species which may survive long after de facto habitat destruction. When habitats are restored or conditions improved, the recovery delay may be even longer, especially for species with poor dispersal ability and highly fragmented populations.

The main threats to Danish biodiversity are identified to be: Cultivation, pesticides, eutrophication, land drainage, overgrowing, land drainage, high-intensity logging in forests and plantations, former activities to straighten and dam watercourses and commercial fishing.

In the coming years more national parks and 75.000 ha of new nature areas are planned. The negative effect of pesticides and eutrophication will be reduced, and more species action plans are envisaged to be carried out. More over the Danish government have made a Green Growth agreement in the Danish Parliament in 2009. A total of DKK 13.5 billion is to be invested in Green Growth until 2015, which is about a 50% increase in investments compared to previous initiatives.

## **Appendix 1: Information concerning reporting party and preparation of national report**

The Danish report was prepared by a team of desk officers for biodiversity at the Agency Spatial and Environmental Planning, the Danish Forest and Nature Agency under the Ministry of Environment and at the National Environmental Research Institute under The University of Århus. The preparation included 2 phases of stakeholder involvement:

Contributions were solicited to specific parts of the report from inside the Agency Spatial and Environmental Planning and the Ministry of Environment as well as from other ministries and organizations.

The draft report was commented upon by the initial providers as well as by a broader group of stakeholders through a national hearing. No meetings were held.

The Kingdom of Denmark consists of three parts: Denmark, Greenland and the Faroe Islands with extensive autonomy, also on matters of environment and thus on biodiversity. Therefore three individual reports have been prepared to CBD.

The Kingdom has a common foreign policy, which encompasses several environment and biodiversity matters. Implementation falls separately in the three parts, but close collaboration exists on many issues. Several institutions concern matters from all three parts. This report concerns Denmark.

Denmark is a member of the European Union. For biodiversity this means that all EU directives and regulations, the Biodiversity strategy and its four action plans (Nature Protection and natural resources, Agriculture, Fisheries, Development) are integrated in various ways into the national policies and programmes, including in sectors such as nature protection, forestry, fisheries, hunting and agriculture. For some areas such as protection of sites and areas there are two layers of protection: the wide national site protections and general nature type protection, on top of which is built the EU Habitats and Birds Directive protection. Similarly for species and habitat types.

Biodiversity is increasingly integrated into the general goals of new or renewed national acts and guidelines. However, problems exist in implementation and distribution and passing-on of knowledge and skills as well as with insecure stability in financing and subsidies.

Denmark participates in the European Community biodiversity work programmes in several fora (Malahide process, European Commission groups (Biodiversity Expert Group BEG, WPIEI, European Clearing House Mechanism as development leader) as well as in the forestry, agricultural and fishery groups.

At the pan-European level Denmark participates via the Bern and Aarhus Conventions, the MCPFE process (Ministerial Process for Protection of Forest in Europe) and the EEA anchored SEBI2010 process on streamlining biodiversity indicators and the similar MCPFE indicator process. Denmark is a member of the European Environment Agency (EEA).

Denmark has ratified both the Bonn, CITES and Ramsar Conventions as well as several conventions and agreements for the seas and oceans and their biodiversity. Danish Development Aid programmes have covered a wide variety of issues, including to a limited extent also biodiversity, though mostly indirectly.

Danish NGOs are well organised and active.

Education on biodiversity has no separate high priority in Danish schools. However, the public interest in nature through nature interpreters is very high. The scientific education at universities is generally high. The

term biodiversity as used by the Convention is not well understood, and the public understanding of the basic importance of biodiversity from a holistic socio-economic and protection perspective is still limited.