



Directorate for **Nature Management**

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Emerald Network in Norway

– Final Report from the Pilot Project



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ABSTRACT:

Emerald Network is a network of important sites for conservation of biodiversity in Europe under the Berne Convention. Norway is obligated to participate and to contribute to this network. The first step is to carry out a pilot project where each country reports its specific obligations. Emerald Network can be seen as a parallel network to Natura 2000 under the Habitat and Birds Directives in the European Union. Emerald Network builds upon the same conditions with focus on species and natural habitats.

In this report, the Directorate for Nature Management presents results and recommendations from the Norwegian Pilot Project. The results show that Norway will contribute considerably with important sites for European biodiversity into this network. Protected areas in Norway hold important qualities which are demanded in the Berne Convention, and a majority of the protected areas satisfies the criteria in Emerald Network.

The Pilot Project forms the basis for the second phase, which is the implementation of the Network itself. In this phase, all the sites that meet the criteria should be nominated. Important areas for species and/or natural habitats that are not included in existing protected areas should be considered. In Norway this will be coordinated with the ongoing evaluation of our existing protected areas network.

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1. Introduction

Norway as a member of the Bern Convention has obligated itself to participate in the Emerald Network. The Emerald Network is a Pan-European Network of important sites protecting biodiversity. Here the parties are responsible to protect and designate specific sites – Areas of special conservation interest (ASCIs).

1.1 Pilot Project in Emerald Network

The parties will carry out a pilot project to assess which species and natural habitats according to the resolutions 4/1996 and 6/1998, are relevant for national designations. Based on this assessment, specific sites that meet the criteria should be designated according to the countries level of ambition. The designated sites will eventually be approved by the Standing Committee of the Bern Convention before they formally represent an Emerald Site. For EU member states an approved Natura 2000 Network of sites will automatically fulfil the parties' obligations in the Emerald Network.

1.2 Norwegian Pilot Project - Organisation

The Norwegian Pilot Project has been led by the Norwegian Directorate for Nature Management (DN). DN is a governmental body under the Ministry of the Environment with the main responsibility for nature conservation, biodiversity management and outdoor recreation. Mr. Arild Lindgaard has been Project leader, with support from an expert group within the Agency, consisting of:

- Ms Ellen Arneberg – Protected Areas, GAP-analysis of Protected Areas Network
- Mr. Jørund Braa – Head of the Threatened Species Unit
- Mr. Jan Petter Huberth-Hansen – Ramsar Network in Norway, Polar Areas
- Mr. Terje Klokk – Norwegian Mapping Programme of Biodiversity, Natural Habitats
- Mr. Tore Opdahl – Monitoring Programme on Protected Areas, International reporting
- Mr. Øystein Ålbu – Databases and Expert tools

In addition the project has had considerable contributions from Mr. Svein Båtvik on botany and natural habitats, and Mr. Terje Krogh on GIS and biogeographical maps.

The Norwegian Pilot Project on Emerald Network was started in 2004 when DN was given the task by the Ministry of the Environment. In November 2004 a two days meeting was held in Trondheim as a kick-off for the project, with participants from the Council of Europe, the Ministry and DN.

The main background for choosing an organisational model based on internal capacities at the DN was many years of work with a considerable amount of knowledge, publications and assessments on relevant issues. Emerald Network would benefit from this basis and most of the knowledge needed was available. During the project some gaps in knowledge were identified and it was decided to coordinate this with the newly established Norwegian Biodiversity Information Centre (ADB, established in 2005). ADB has as its main mandate to gather and coordinate all knowledge on biodiversity in Norway and make it available for decision-makers. ADB started its work with the production of a new Norwegian Red List on threatened species and developing a new classification system for natural habitats in Norway. All this activity was highly relevant for the Pilot Project and we used the species assessments from ADB. The new Norwegian Red List was published in December 2006, based on the assessment of 18 500 species. The work on natural habitats is due to be finished in 2008.

Additionally, knowledge and background information from our neighbouring country Sweden relating to their work within Natura 2000 has proven to be most helpful. Norway shares many of the species and natural habitats within Fennoscandia. In the Pilot Project in Norway we have been visiting Sweden (Swedish EPA) and consulted with their experiences and work.

Another important task for the Pilot Project has been to coordinate Emerald Network with other relevant processes in Norway, in particular with our network of protected areas. Several activities and processes have been started and these are connected and will benefit the project and gain synergies through coordination. These activities are found in the new

Programme of Work on Protected Areas under the Convention on Biological Diversity (CBD). In DN the Pilot Project on Emerald Network has been coordinated with GAP analyses and evaluation of the existing protected areas network, the monitoring programme for protected areas, international reporting and the establishment of an ecological knowledge database on protected areas (see Chapter 7).

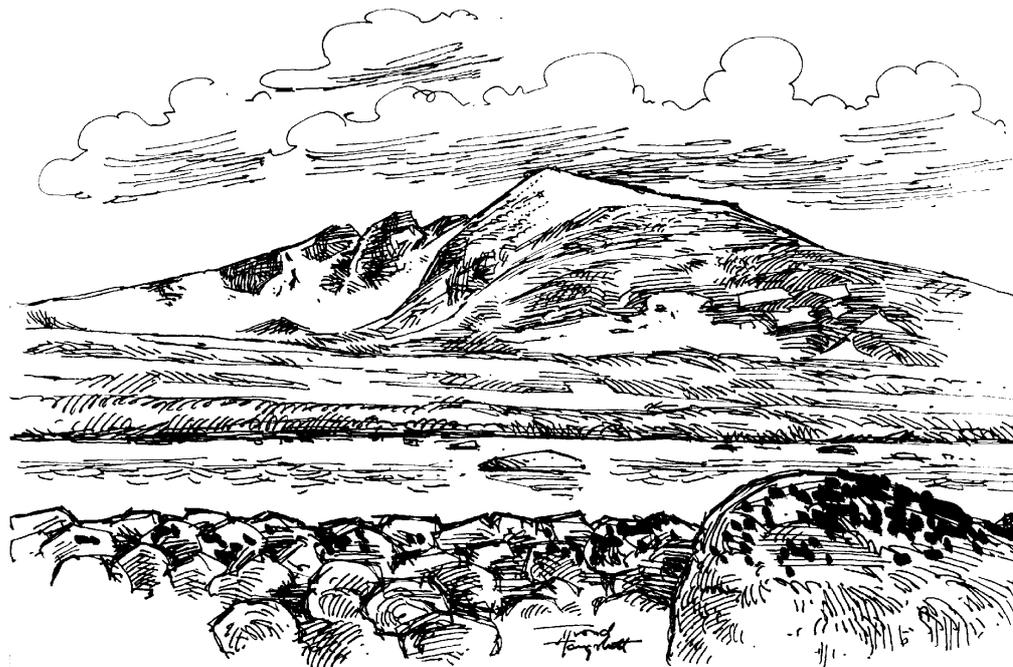
The Pilot Project on Emerald Network in Norway has resulted in several products:

- Project Report in English (this publication)
- Project Report in Norwegian published in May 2007 (DN-Report 2007-1)
- New map on Biogeographical zones in Norway (GIS-layer)
- Database for documenting ecological knowledge in Norwegian protected areas
- Selection of 11 pilot areas to be reported through the Emerald Database
- Starting Phase II of Emerald Network through:
 - Tentative List over candidates for Emerald Network in Norway
 - Recommendation memo from DN to the Ministry of the Environment

1.3 Natura 2000 and the Fennoscandian dimension

When Sweden and Finland entered the EU in 1995, the boreal natural region was introduced into the Habitats Directive, especially the Boreal biogeographical region and the Fennoscandian alpine range. This led to an extension of the Habitats Directive with 18 new Natural habitats and 70 new species. This Nordic exclusive expansion has contributed to a more relevant scientific content into Natura 2000 also for Norway. Because of this the Natura 2000 today includes a much more relevant framework for Norway than the Emerald Network. This is most clearly observed for the Natural habitats. Through the expansion process of the EU in 2004, three additional countries from the Boreal region were included; Estonia, Lithuania and Latvia.

For Norway it is a dilemma that the Habitats Directive and the Natura 2000 is more relevant and updated than Emerald Network. Ideally Emerald Network should be updated according to the development within the EU. This will be in the interest of Norway and will harmonise Emerald Network with Natura 2000. To make this happen, a recommendation must be put forward suggesting a revision of existing resolutions (Res 6/1998 and Res 4/1996). The relations between natural habitats in Emerald Network and Natura 2000 are presented in appendix 2.



2. Background

2.1 Knowledge of Biodiversity in Norway

Emerald Network is based on the knowledge of species and natural habitats in the respective countries. In Norway focus on biodiversity and natural habitats has been increasing during the last 5-10 years through the implementation of the Convention on Biological Diversity (CBD). The implementation has been carried out through a National Strategy (St.meld. no. 58, 1996-97 – Environmental Policy for a Sustainable Development) and a National Action Plan (St.meld. no. 42, 2000-01 – Biodiversity – Sector responsibility and cooperation). Based on these Parliament White Papers a National programme on mapping and monitoring of biodiversity in Norway has been initiated.

The work on identification and mapping of natural habitats became a national priority through the municipal Biodiversity Mapping Programme started in 1999. The Directorate for Nature Management developed a special manual identifying 54 natural habitats of priority (Directorate for Nature Management 1999a). Following this, several other manuals have been developed for biodiversity mapping and natural habitats, like on freshwater biodiversity (Directorate for Nature Management 2000) and on marine biodiversity (Directorate for Nature Management 2001).

Prior to the work on natural habitats there is a long tradition of vegetation mapping in Norway. This work was started in a more systematic way in the 1970's and a lot of work on methods and classification has been carried out by the scientific communities. Today two methods are considered to be the main tools in vegetation mapping; these are Norwegian Vegetation Types (Fremstad 1997) and Guidance in Vegetation Mapping (Rekdal & Larsson 2005). Another important basis for knowledge on vegetation is the publication Threatened Vegetation Types in Norway, published in 2001 (Fremstad & Moen 2001).

The Norwegian work on vegetation ecology and mapping has also contributed to important key knowledge about the varied and complex natural conditions of Norway. The main publication describing this comprehensively is the National Vegetation Atlas of Norway (Moen 1998). This gives an important basis to understand and describe the natural conditions and ecology based on the climatic conditions that exists in Norway. This is also the main source for the development of biogeographical regions in Norway (see chapter 3).

The Forestry sector in Norway has also been working on mapping of biodiversity and natural habitats in the later years. This was first initiated through the NGO

“Siste Sjanse” (= ”Last Chance”) and their mapping of key habitats in forests (Haugset et. al 1996). This approach was further developed through the Ministry of Agriculture and Food, called Registration of Natural Environment in Forests, where the methodology was developed by initiative from the Ministry of Agriculture and Food and led by the Forest Research Institute (Baumann et al. 2001).

In addition to the above mentioned publications and activities, there is a lot of knowledge of biodiversity available through other mapping activities. Examples of this are the Integrated planning of watercourses, different plans for nature protection, vegetation mapping and National Inventory of Cultural Landscape. Several municipal projects related to biodiversity were carried out in the 1990's.

When the Habitats Directive came into force in 1992 and following the expansion of this Directive through the membership of Sweden and Finland in 1995, the work on natural habitats in the Nordic region has increased substantially. A lot of relevant knowledge on the Nordic natural habitats in Natura 2000 (Löfroth 1997, Buchwald & Søgaaard 2000, Swedish Environmental Protection Agency 2004) is also relevant for Norway and has been used in this Pilot Project. Similarly, Nordic work on species included in the Habitats and Birds Directives, where particularly Sweden through the Swedish Species Information Centre, has done much work on the issue of knowledge (Cederberg & Löfroth 2000, Swedish Environmental Protection Agency 2004).

The knowledge of species diversity varies between the different taxonomic groups. For some groups the knowledge is traditionally good, like vascular plants and vertebrates. For others the knowledge is insufficient and less prioritised. This applies to fungi, lichens, mosses and invertebrates. Through the development of the first Red lists in Norway (Størkersen 1992, Directorate for Nature Management 1999b) a larger focus was given to a broader range of species, and accessible knowledge on many taxonomic groups was collected. The focus on biodiversity in the recent years has contributed to increased knowledge on new groups of species e.g. in connection with the mapping of forests, freshwater and semi-cultural landscapes. The new Red List published in December 6th 2006 by the Norwegian Biodiversity Information Centre (Kålås et. al 2006) is based on the best available knowledge on species diversity in Norway.

In the coming years the Norwegian Biodiversity Centre may be the most important channel for biodiversity knowledge in Norway through compiling such knowledge and making it available for all potential users. See also: <http://www.biodiversity.no/default.aspx?m=23>

2.2 Knowledge on Species

In Norway the knowledge on species, their distribution and populations varies between the taxonomic groups. Through the recent years' work on biodiversity in general and the Red List in particular, the knowledge on species has been more systematically collected based on the decision makers' needs and request for data on species. In the following main references used in the Pilot Project according to resolution 6/1998 in Emerald Network are presented.

The knowledge needed for the Pilot Project is the occurrences of the species in Norway, their main distribution and present status. In Phase 2 of Emerald Network more exact knowledge on the specific sites and occurrence in protected areas will be important.

Mosses (Bryophytes)

The scientific communities in the Nordic countries have actively been promoting mosses on the lists of species under the Bern Convention. Through this several Nordic species have been included here. The basis for the consideration of mosses in the Pilot Project is the background information for the Norwegian Red List and the work on Norwegian names for Norwegian mosses (Frisvoll & Blom 1992, Frisvoll et al. 1995 and Flatberg et al. 2006). Other references used are Cederberg & Löfroth (2000), Swedish Environmental Protection Agency (2004) and Nyholm (1974-79). Recently the first volume on mosses in the Swedish series called "Nationalnyckeln" (The Encyclopaedia of the Swedish Flora and Fauna) was published (Hallingbäck et al. 2006).

The University of Oslo has developed a searchable database available on internet, in their Bryophyte Herbarium (<http://www.nhm.uio.no/botanisk/mose/>).



Silene involucrata ssp. *tenella* (previously: *Silene furcata* ssp. *angustiflora*) is critically endangered in Norway. Photo: Svein Båtvik.

Vascular Plants

The knowledge of Norwegian vascular plants is considered to be quite good. This is due to the large number of floristic publications, both Norwegian and Scandinavian. The Lid's Flora is considered to be the main publication within vascular plant floras in Norway. In 2005 the 7th edition was published (Lid & Lid 2005) with updated status for all vascular plants in Norway. Another source of knowledge on Nordic vascular plants is the Swedish publication on Nordic Flora (Mossberg & Stenberg 2003). A separate flora has been published for Svalbard (Rønning 1996). In addition the Swedish publications related to Natura 2000 (Cederberg & Löfroth 2000 and Swedish Environmental Protection Agency 2004) have been used.

Invertebrates

Contrary to other taxonomic groups there are not many comprehensive publications on Norwegian invertebrates. For species related to freshwater ecosystems a comprehensive compilation called "Limnofauna Norvegica" (Aagaard & Dolmen 1996), has been published. For the Freshwater Pearl Mussel (*Margaritifera margaritifera*) a good basis exists through the work on a National Action Plan for the species (Directorate for Nature Management 2006). The background used in the Norwegian Red lists (Directorate for Nature Management 1999b and Kålås et al. 2006) plays a central role here.

For the Lepidoptera species a lot of knowledge is now accessible through a web-based database on the "Lepidoptera of Norway" (<http://www.nhm.uio.no/norlep/english/>), and a Catalogue on all the species in Norway called "Catalogus Lepidopterorum Norvegiae" (Aarvik et al. 2000). The fact sheets from this catalogue have been used as knowledge basis, in addition to the first volume of the Swedish Nationalnyckeln on butterflies (Eliasson et al. 2005).

For the species groups with the least accessible knowledge, cooperation with the Norwegian Biodiversity Information Centre has been established and specific fact sheets are being produced. An example of this is the land snail genus *Vertigo* (Olsen 2006). Apart from this we have used background information from the relevant Swedish publications (Cederberg & Löfroth 2000 and Swedish Environmental Protection Agency 2004) and data from the Red List Database established by the Norwegian Biodiversity Information Centre.

Fishes

The relevant fish species here are only freshwater species of which we in general have a good overview in Norway. The species knowledge is derived from Aagaard & Dolmen (1996) and Pethon (1989). There

is, however, a considerable gap between the knowledge of species of e.g. Lampreys and a species like Salmon (*Salmo salar*), for which we have exceptional amounts of data.

Amphibians

In this context only one species is relevant for Norway; the Great Crested Newt (*Triturus cristatus*). The knowledge basis for this species is compiled through the work on a specific Action Plan for the Great Crested Newt in Norway (Dolmen in press).

Birds

This is a taxonomic group with traditionally good knowledge, regarding distribution as well as current status. Norway has, like many other European countries, published a National Bird Atlas with breeding bird population estimates (Gjershaug et al. 1994). Recently, a Wintering Atlas on Birds in Norway has been published, showing the bird species distribution and status during the winter season (Svorkmo-Lundberg et al. 2006). Important sites for many bird species have been assessed through the international initiative on selecting IBAs (Important Bird Areas) under the auspices of BirdLife International. This work has also been carried out in Norway (Lislevand et al. 2000). In addition a great number of publications on birds relevant for Emerald Network, e.g. Birds and Mammals of Svalbard (Kovacs & Lydersen 2006) exist.

Important sites have for many years been mapped under the auspices of Norwegian Wildlife Authorities. A specific manual and methodology for this work has been developed (Directorate for Nature Management 1996 and 2000) and geographical data have been put into the National Data System "Naturbase" (http://dnweb5.dirnat.no/wmsdn/Default_english.asp). In recent years a national database on Norwegian Breeding Birds has been established through cooperation between the Directorate for Nature Management, the Norwegian Ornithological Society and the Norwegian Institute for Nature Research (<http://www.fugleatlas.no/>).

Mammals

Mammals are also a taxonomic group for which there is relatively good knowledge in Norway. For some species (e.g. Beaver, Wolverine, Wolf, Brown Bear and Grey Seal) data have been collected for many years, while for others the knowledge is more scattered, even if the amount of data has increased in recent years like e.g. the Bats. As for birds specific work on a National Atlas has been started, focusing on distribution and current status, carried out by the Norwegian Zoological Society (Isaksen 2002). Linked to the new Red List (Kålås et al. 2006), some specific fact sheets have been

made on threatened mammal species (e.g. Brown Bear, Arctic Fox, Walrus, Wolverine, Wolf). Such fact sheets on mammal species were also made prior to the previous Red List (Isaksen et al. 1998).

For the large predators (Wolf, Lynx, Wolverine and Brown Bear) specific monitoring systems are in place, connected to the management of these species in Norway. A searchable web-based database, "Rovbase", is available through the Directorate for Nature Management (<http://dnweb5.dirnat.no/rovbase/viewer.htm>). The Arctic Fox (*Alopex lagopus*) is another species with high priority in Mainland Norway through a specific Action Plan (Directorate for Nature Management 2003b).

For Svalbard the relevant species are species for which there is basically good knowledge, like Polar Bear (*Ursus maritimus*), Walrus (*Odobenus rosmarus*), Arctic Fox (*Alopex lagopus*) and Harbour Seal (*Phoca vitulina*). The main reference is Kovacs & Lydersen (2006).

2.3 Knowledge on Natural Habitats

To be able to consider the natural habitats of Emerald Network from resolution 4/1996, the corresponding habitat types from the Norwegian manuals and mapping systems were used (Directorate for Nature Management 1999a and 2001). These manuals describe Norwegian natural habitats of priority to be used in the municipal mapping programme on biodiversity. This programme results in municipal maps on important areas of biodiversity where the State contributes with background data and funding. To carry out the mapping, a specific methodology has been developed through these respective manuals.

The Natural habitats described in the Habitats Directive and Natura 2000 have been compared with Norwegian habitat types and those from Emerald Network. An important reference document here is the assessment of Natura 2000 in Norway by Fremstad (2002).

To be able to compare and interpret the natural habitats in Emerald Network, we have been using EUNIS (<http://eunis.eea.europa.eu/habitats.jsp>) from the European Environmental Agency, European Commission DG Environment (1999) and Halada (2000). Further interpretations made in a Nordic perspective (Denmark and Sweden) have also contributed a lot (Buchwald & Sjøgaard 2000, Löfroth 1997 and Swedish Environmental Protection Agency 2004).

In addition to Norwegian manuals on natural habitats, some publications on vegetation ecology and mapping have been important in the consideration of habitat types (Fremstad 1997, Fremstad & Moen 2001 and Moen 1998).

3. Biogeographical Regions

3.1 Biogeographical Regions in Norway

The Norwegian part of the Pan-European map from 2001 forms the basis for considerations in this Pilot Project. This map and legends have not been considered nor commented from Norway until now. For us it seems that some of the regions have been given borders on a somewhat weak background. The most obvious examples are the Arctic Region which is drawn all the way south to Nord-Trøndelag County, and the Alpine Region not following the lines of elevation in Central Norway. In Norway we will anyway have four different Biogeographical regions: Arctic, Atlantic, Alpine and Boreal. It could also been discussed if Norway would have a part of the Continental Region, but this would be so marginal that it was considered not to be appropriate.

To be able to consider these regions and their borders in Norway, we have used the German European Vegetation Map (Bohn et al. 2000), a specific map on the Biogeographical regions in Norway from the Council of Europe/EEA and the Norwegian National Vegetation Atlas (Moen 1998). These maps have also been used as GIS-layers. The

conclusion is that the Norwegian Vegetation Atlas represents the most updated and comprehensive knowledge on this matter in Norway and will be used as a basis for adjustments. The map of Vegetation Geographical Regions (figure 2) will be used as a main reference.

3.2 Suggested adjustments of Biogeographical Regions for Norway

The suggested adjustments are based upon the Vegetation Geographical Regions of Norway (Moen 1998). In addition adjustments and harmonisation with the already accepted borders of Biogeographical regions in the neighbouring countries, Sweden, Finland and Russia, must be done. There will also be constraint regarding technical limitations related to details, since European maps with large scales will generally be used. The suggested changes are presented in figure 3.

The Norwegian suggestion for adjustments, in addition to the reporting from the Pilot Project on Emerald Network, will be submitted to the Standing Committee in the Bern Convention in 2007.

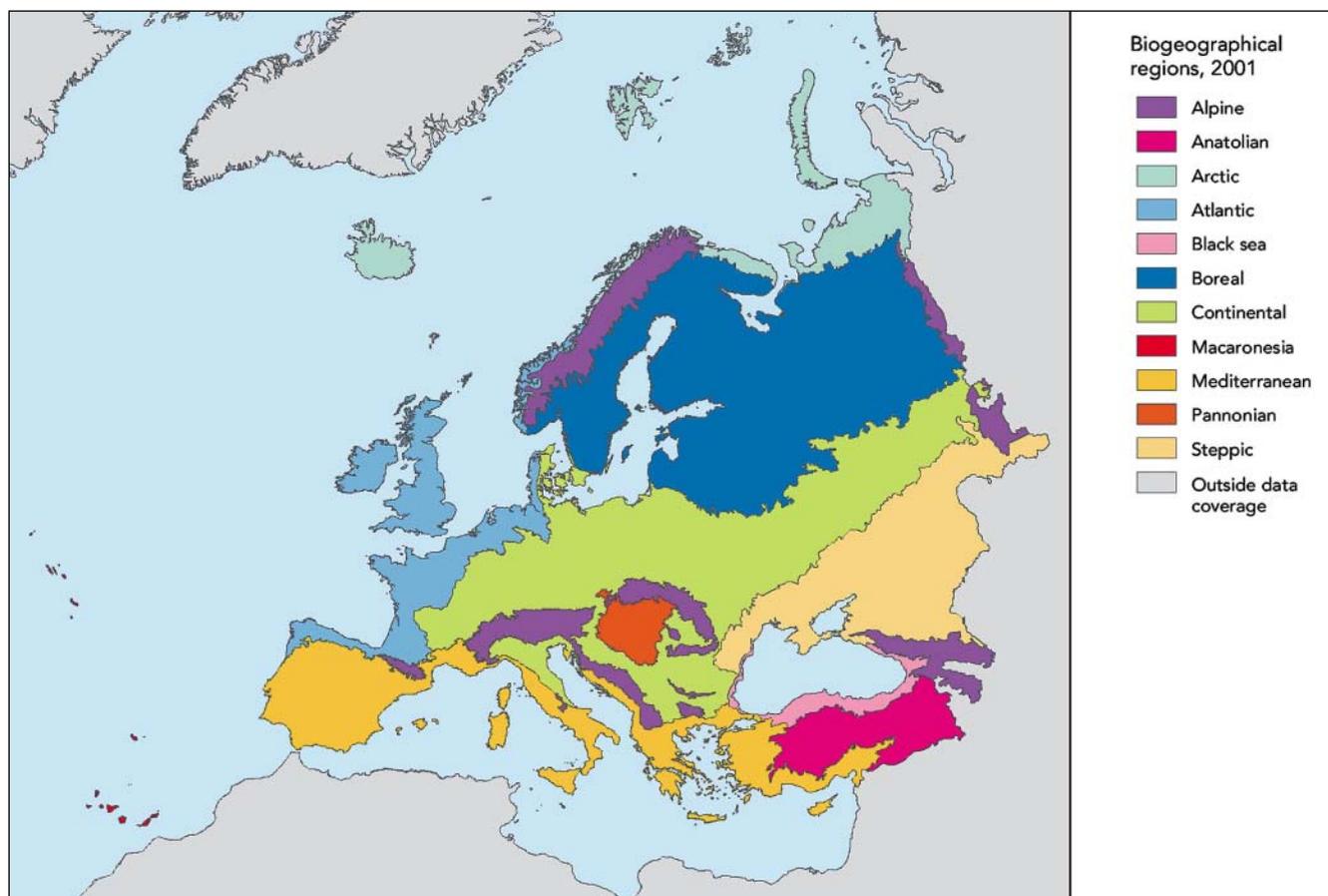


Figure 1. Biogeographical Regions in the Pan-European area, 2001 (Source: EEA).

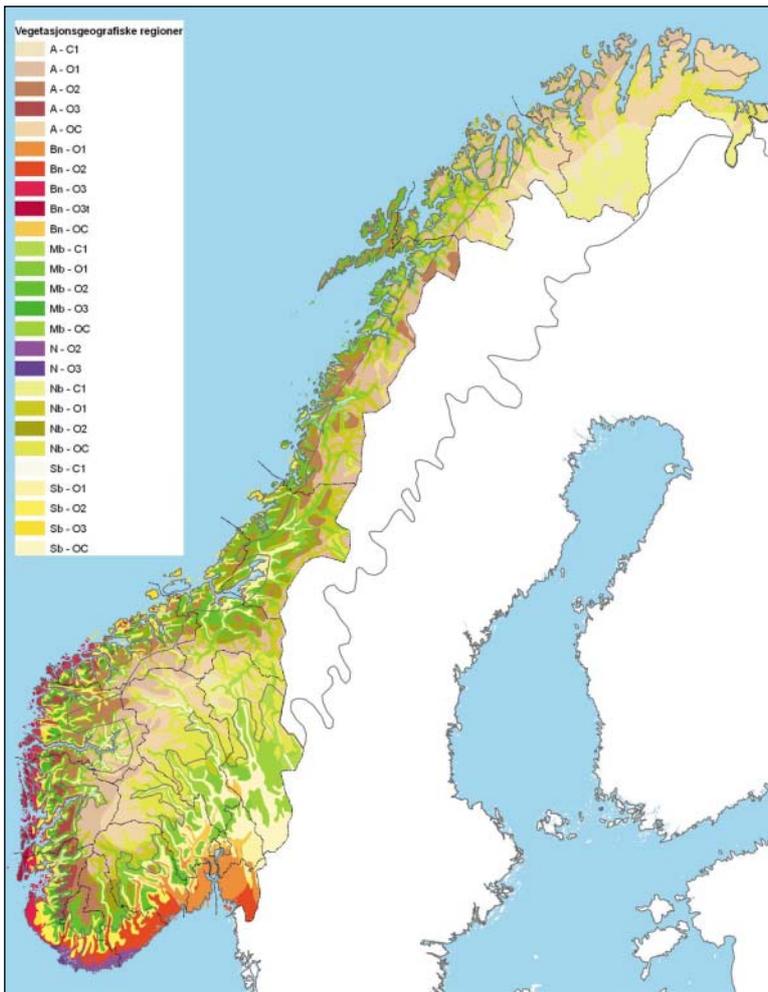


Figure 2. *Vegetation Geographical Regions in Norway after Moen (1998).*

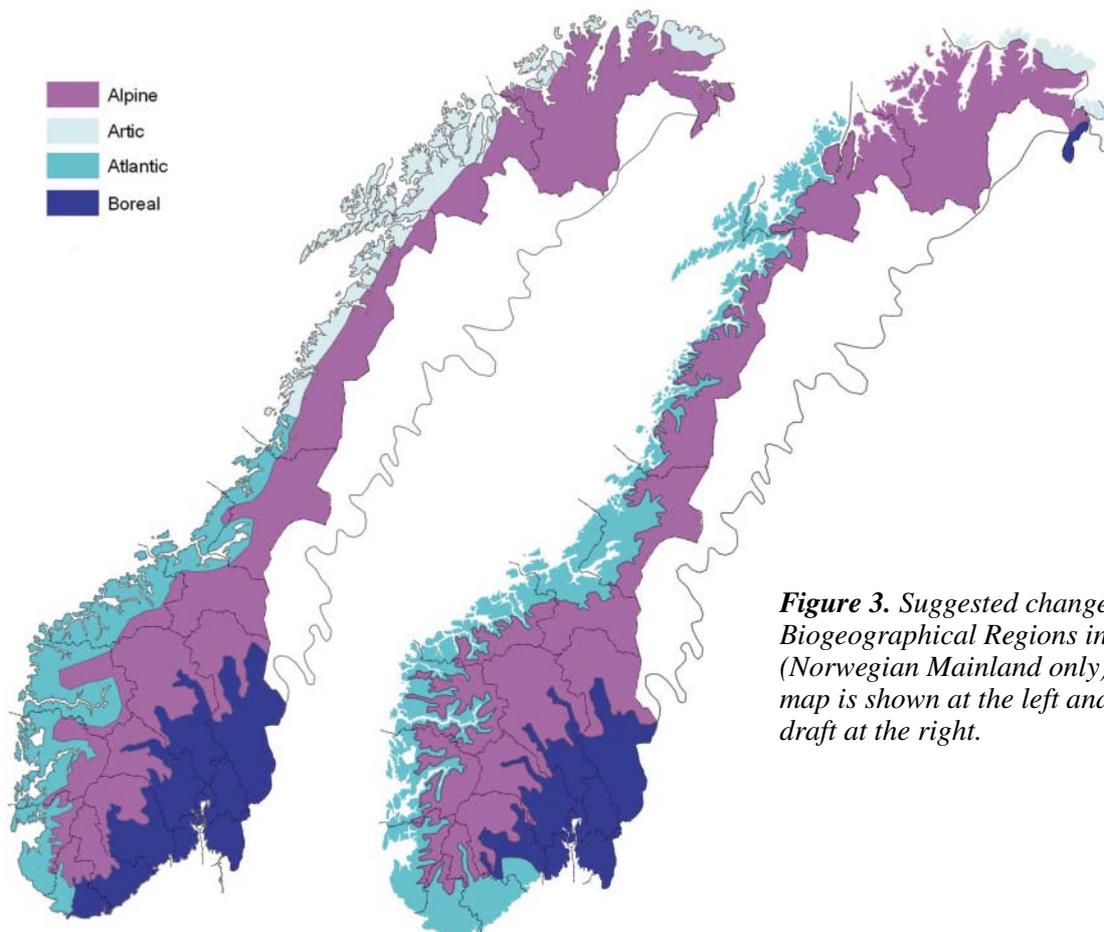


Figure 3. *Suggested changes of the Biogeographical Regions in Norway (Norwegian Mainland only). The basis map is shown at the left and the new draft at the right.*

4. Norwegian Species in Emerald Network

The background knowledge from where the species within the Norwegian territory are considered is described in Chapter 2. Resolution 6/1998 contains 1032 species, with main emphasis on vascular plants and vertebrates (CoE 2003b). In addition a list of species from the Macronesian region contains 134 species. The species in Emerald Network are mainly the same species that form the basis for Natura 2000. The tables in this chapter shows the species' distribution within the adjusted Biogeographical regions in Norway (see Chapter 3), where AL=Alpine Region, AT=Atlantic Region, AR=Arctic Region and B=Boreal Region. Finally the present Red List status as presented in the new Norwegian Red List from 2006 (Kålås et al. 2006) is shown. The categories used are: CR=Critically Endangered, EN=Endangered, VU=Vulnerable, NT=Near Threatened, DD=Data Deficient and LC=Least Concern. For some species there are two categories set because of a separate Red List for Svalbard that may give different status there than in Mainland Norway. For some species considerations regarding subspecies are also included. Species considered as extinct and/or having no regular occurrence in Norway are not included.

4.1 Plants

4.1.1 Mosses (Bryophyta)

Of the 29 species listed in Emerald Network, 11 are relevant for Norway. The species are listed below in Table 1. Norwegian names and assessments are from Frisvoll et al. (1995) and Flatberg et al. (2006). Assessments of Biogeographical regions have also been done with assistance from the Bryophyte Herbarium at the University of Oslo (<http://www.nhm.uio.no/botanisk/mose/>).



The Bryophyte species Buxbaumia viridis is a vulnerable species found in the lowland of Southern Norway. Photo: Kim Abel.

Table 1. Norwegian Bryophyte Species relevant to Emerald Network.

Scientific name	Norwegian name	Biogeographical region	Norwegian Red List 2006
Bryhnia novae-angliae	Oremose	AT, B	
Buxbaumia viridis	Grønsko	AT, B	VU
Cynodontium suecicum	Storskortemose	AL, AT, B	
Dicranum viride	Stammesigd	AT, B	VU
Encalypta mutica	Buttklokkemose	AL, AT	
Herzogiella turfacea	Sigdfauskmose	AT, B	VU
Hygrohypnum montanum	Huldrebekkmose	AT, B	
Meesia longiseta	Stakesvanemose	AL, AT, B	VU
Orthothecium lapponicum	Lappaustmose	AL, AR, AT	EN
Orthotrichum rogeri	Sporebustehette	AT, B (AL?)	
Scapania massalongi (now S. carinthiaca)	Røttevibladmose	AL	EN

Further comments on the species' distribution and status are presented in Annex 1.

Table 2. Norwegian Vascular Plant Species relevant to Emerald Network.

Scientific name	Norwegian name	Biogeographical region	Norwegian Red List 2006
<i>Botrychium simplex</i>	Dvergmarinøkkel	AL, AT, B	CR
<i>Diplazium sibiricum</i>	Russeburkne	AL, B	VU
<i>Luronium natans</i>	Flytegro	B	VU
<i>Arenaria pseudofrigida</i> (<i>A. ciliata</i> ssp. <i>pseudofrigida</i> in res. 6-1998)	Kalkarve	AR	NT/LC*
<i>Arenaria humifusa</i>	Dvergarve	AL, AR	NT/VU*
<i>Moehringia lateriflora</i>	Russearve	AL, AR, B	CR
<i>Silene involucrata</i> ssp. <i>tenella</i> (<i>S. furcata</i> ssp. <i>angustiflora</i> in res. 6-1998)	Småjonsokblom (=finnmarksjonsokblom)	AL	CR
<i>Braya linearis</i>	Rosekarse	AL, AT, (AR?)	
<i>Draba cinerea</i>	Grårublom	AL	EN
<i>Draba cacuminum</i>	Tinderublom	AL	EN/CR**
<i>Carex holostoma</i>	Kluftstarr	AL, AR, B	
<i>Arctagrostis latifolia</i>	Russegras	AL, AR	NT/VU*
<i>Arctophila fulva</i>	Hengegras	AL	CR/LC*
<i>Calamagrostis chalybaea</i>	Nordlandsrørkvein	AL	NT
<i>Cinna latifolia</i>	Huldregras	AL, AT, B	NT
<i>Puccinellia phryganodes</i>	Teppesaltgras	AL, AR	
<i>Trisetum subalpestre</i>	Kveinhavre	AL	CR
<i>Hippuris tetraphylla</i>	Korshesterumpe	AL, AR?	NT
<i>Luzula nivalis</i> (<i>L. arctica</i> in res. 6-1998)	Snøfrytle	AL, AR	NT/LC*
<i>Najas flexilis</i>	Mykt havfruegras	AT, B	EN
<i>Cypripedium calceolus</i>	Marisko	AL, AT, B	NT
<i>Lysiella oligantha</i> (<i>Platanthera obtusata</i> ssp. <i>oligantha</i> in res. 6-1998)	Sibirnatfiol	AL	CR
<i>Papaver radicatum</i> ssp. <i>laestadianum</i> (<i>P. laestadianum</i> in res. 6-1998)	Læstadiusvalmue	AL	VU
<i>Papaver radicatum</i> «ssp. <i>hyperboreum</i> »	«Tromsvalmue»	AL	
<i>Persicaria foliosa</i>	Evjeslirekne	B	EN
<i>Primula nutans</i> ssp. <i>finmarchia</i>	Finnmarksnøkleblom	AL, AR	NT
<i>Primula scandinavica</i>	Fjellnøkleblom	AL, AT, B?	NT
<i>Coptidium lapponicum</i> (<i>Ranunculus lapponicus</i> in res. 6-1998)	Lappsøleie	AL, AR	NT/LC*
<i>Sorbus teodorii</i> (is synonymised under <i>S. meinichii</i> , or is a hybrid: <i>S. aucuparia</i> x <i>hybrida</i>)	Hedlundrogn [Fagerrogn]	AT, B	
<i>Saxifraga hirculus</i>	Myrsildre	AL, AT, AR	EN/LC*
<i>Saxifraga osloensis</i>	Oslosildre	B	NT
<i>Viola rupestris</i> ssp. <i>relicta</i>	Kalkfiol	AL, AT	

* *The Species' Red List status on Svalbard (if this differs from Mainland Norway)*

** *Red List status for a Subspecies (if this differs from the nominate species)*

Further comments on the species' distribution and status are presented in Annex 1.

Table 3. Norwegian Mollusc Species relevant to Emerald Network.

Scientific name	Norwegian name	Biogeographical region	Norwegian Red List 2006
<i>Vertigo angustior</i>	Smal knøttsnegl	AT, B	NT
<i>Vertigo genesii</i>	Kalkkildeknøttsnegl	AL, AT	NT
<i>Vertigo geyeri</i>	Rikmyrknøttsnegl	AL, B	VU
<i>Margaritifera margaritifera</i>	Elvemusling	AT, AL, B, AR?	VU

Further comments on the species' distribution and status are presented in Annex 1.

4.1.2 Vascular Plants

Of the 452 species listed in Emerald Network, 32 are relevant for Norway. The species are listed in Table 2. Norwegian names and assessments are from Lid & Lid (2005) and Elven et al. (2006).



The Scandinavian Primrose (Primula scandinavica) is endemic to Scandinavia and has its centre in Norway. The species occurs in calcareous alpine areas from Rogaland to Troms counties. In Northern Norway it is also found near the coast.

Photo: Arild Lindgaard.

4.2 Invertebrates

Relevant for Norway in this context are species of insects and molluscs. The number of invertebrate species totally in Emerald Network is rather modest compared to the large diversity within these taxonomic groups.

4.2.1 Molluscs

Of the 24 species of molluscs in Emerald Network, four occur in Norway. The species are listed in Table 3. Norwegian names and assessments are from Aagaard & Dolmen (1996) and Olsen (2006).



Vertigo geyeri is a vulnerable species in Norway, strongly attached to moist calcareous areas.

Photo: Karsten Sund, Natural History Museum, University of Oslo.

Table 4. Norwegian Insect Species relevant to Emerald Network.

Scientific name	Norwegian name	Biogeographical region	Norwegian Red List 2006
Leucorrhinia pectoralis	Stor torvlibelle	AT, B	VU
Cucujus cinnaberinus	Sinoberbille	AT, B	VU
Dysticus latissimus	Kjempevannkalv	B	
Graphoderus bilineatus	Vannkalv-art	B	VU
Stephanopachys linearis	Bille-art	B	EN
Stephanopachys substriatus	Bille-art	AL, B	EN
Agriades glandon aquilo	Polarblåvinge	AL, AR	
Clossiana improba (=Boloria improba)	Dvergperlemorvinge	AL	NT
Erebia (medusa) polaris - considered to be a nominate species in Norway	Polarringvinge	AL	
Hesperia comma catena	Kommamyger	AL	

Further comments on the species' distribution and status are presented in Annex 1.

Table 5. Norwegian Fish Species relevant to Emerald Network.

Scientific name	Norwegian name	Biogeographical region	Norwegian Red List 2006
Lampetra fluviatilis	Elveniøye	AT, B	
Lampetra planeri	Bekkeniøye	AT, B	
Petromyzon marinus	Havniøye	AL, AR, AT, B	
Salmo salar	Laks	AL, AR, AT, B	
Aspius aspius	Asp	B	VU
Cottus gobio	Hvitfinnet steinulke	AL, B	NT

Further comments on the species' distribution and status are presented in Annex 1.

Table 6. Norwegian Amphibians relevant to Emerald Network.

Scientific name	Norwegian name	Biogeographical region	Norwegian Redlist 2006
<i>Triturus cristatus</i>	Storsalamander	AT, B	VU

Further comments on the species' distribution and status are presented in Annex 1.

4.2.2 Insects

Of the 54 species of insects in Emerald Network, 10 occur in Norway. The species are listed in Table 4. Norwegian names and assessments are from Aagaard & Dolmen (1996), Aarvik et al. (2000) and Ødegaard et al. (2006). Considerations of distribution have also been done with assistance from the Database on Lepidoptera of Norway (<http://www.nhm.uio.no/norlep/english/>).

4.3 Vertebrates

For Norway, species of Fishes (freshwater and anadromous fishes), Amphibians, Birds and Mammals, are relevant. These are taxonomic groups with relatively good knowledge basis.

4.3.1 Fishes

In Resolution 6/1998 totally 65 species of fish are included. For Norway only six species are relevant. The species are listed in Table 5. Norwegian names and assessments are from Aagaard & Dolmen (1996), Pethon (1989) and Hesthagen et al. (2006). For Salmon (*Salmo salar*) only freshwater sites shall be included. The species Allis shad (*Alosa alosa*) and Twait shad (*Alosa fallax*) are considered not to have sufficient and stable occurrences in Norway to be relevant here, referring to the assessments made by the Norwegian



Salmon (Salmo salar) is one of the fish species where Norway has a particular responsibility.

Photo: Arild Lindgaard.

Biodiversity Information Centre in connection with the Red List work (Kålås et al. 2006).

4.3.2 Amphibians

Totally 27 species of Amphibians are listed in Emerald Network, of which only one species occur in Norway (see Table 6). In addition 30 species of Reptiles are listed, but none of these are found in Norway. Norwegian names and assessments are from Dolmen (2006). Additional assessments are based on the Norwegian Action Plan for the Great Crested Newt (*Triturus cristatus*) (Dolmen in press).

Table 8. Norwegian Mammal Species relevant to Emerald Network

Scientific name	Norwegian name	Biogeographical region	Norwegian Red List 2006
<i>Barbastellus barbastellus</i>	Bredøreflaggermus	B	DD
<i>Castor fiber</i>	Bever	AL, AT, B	
<i>Alopex lagopus</i>	Fjellrev	AL, AR	CR/LC*
<i>Canis lupus</i>	Ulv	AL, B	CR
<i>Ursus arctos</i>	Brunbjørn	AL, AT, B	EN
<i>Ursus maritimus</i>	Isbjørn	AR	VU
<i>Gulo gulo</i>	Jerv	AL, AT, B	EN
<i>Lutra lutra</i>	Oter	AL, AR, AT, B	VU
<i>Felis (Lynx) lynx</i>	Gaupe	AL, AT, B	VU
<i>Odobenus rosmarus</i>	Hvalross	AR	VU
<i>Halichoerus grypus</i>	Havert	AL, AR, AT	NT
<i>Phoca vitulina</i>	Steinkobbe	AL, AR, AT, B	VU
<i>Phocaena phocaena</i>	Nise	AL, AR, AT, B	

* *The Species Red List status on Svalbard (if this differs from Mainland Norway)*

Further comments on the species' distribution and status are presented in Annex 1.

Table 7. Norwegian Bird Species relevant to Emerald Network.

Scientific name	Norwegian name	Biogeographical region	Norwegian Red List 2006
<i>Gavia immer</i>	Islom	AL, AR, AT	
<i>Gavia adamsii</i>	Gulnebbblom	AL, AR, AT	
<i>Gavia arctica</i>	Storlom	AL, AR, AT, B	VU
<i>Gavia stellata</i>	Smålom	AL, AR, AT, B	
<i>Podiceps auritus</i>	Horndykker	AL, AT, B	EN
<i>Hydrobates pelagicus</i>	Havsvale	AR, AT	
<i>Oceanodroma leucorhoa</i>	Stormsvale	AR, AT	NT
<i>Cygnus cygnus</i>	Sangsvane	AL, AT, B	NT
<i>Anser erythropus</i>	Dverggås	AL	CR
<i>Branta leucopsis</i>	Hvitkinngås	AR, AT (B)	
<i>Mergus albellus</i>	Lappfiskand	AL, AT, B	EN
<i>Aquila chrysaetos</i>	Kongeørn	AL, AT, B, AR?	NT
<i>Circus aeruginosus</i>	Sivhauk	AT, B	VU
<i>Circus cyaneus</i>	Myrhauk	AL, AT, B	VU
<i>Haliaeetus albicilla</i>	Havørn	AL, AR, AT, B	
<i>Pernis apivorus</i>	Vepsevåk	AT, B	EN
<i>Pandion haliaetus</i>	Fiskeørn	AL, AT, B	NT
<i>Falco columbarius</i>	Dvergfalk	AL, AR, AT, B	
<i>Falco peregrinus</i>	Vandrefalk	AL, AR, AT, B	NT
<i>Falco rusticolus</i>	Jaktfalk	AL, AR, AT	NT
<i>Bonasa bonasia</i>	Jerpe	AL, AT, B	
<i>Tetrao tetrix</i>	Orrfugl	AL, AT, B	
<i>Tetrao urogallus</i>	Storfugl	AL, AT, B	
<i>Crex crex</i>	Åkerrikse	AT, B (AL?)	CR
<i>Porzana porzana</i>	Myrrikse	AT, B	EN
<i>Grus grus</i>	Trane	AL, AT, B	
<i>Charadrius morinellus</i>	Boltit	AL, AT, B	
<i>Pluvialis apricaria</i>	Heilo	AL, AR, AT, B	LC/EN*
<i>Gallinago media</i>	Dobbeltbekkasin	AL, AT, B	NT
<i>Limosa lapponica</i>	Lappspove	AL, AT	
<i>Philomachus pugnax</i>	Brushane	AL, AR, AT, B	DD
<i>Tringa glareola</i>	Grønnstilk	AL, AR, AT, B	
<i>Phalaropus lobatus</i>	Svømmesnipe	AL, AR, AT, B	LC/VU*
<i>Phalaropus fulicarius</i>	Polarsvømmesnipe	AR	VU
<i>Sterna hirundo</i>	Makrellterne	AL, AR, AT, B	VU
<i>Sterna paradisaea</i>	Rødnebbterne	AL, AR, AT, B	
<i>Pagophila eburnea</i>	Ismåke	AR	EN
<i>Aegolius funereus</i>	Perleugle	AL, AT, B	
<i>Asio flammeus</i>	Jordugle	AL, AT, B	
<i>Bubo bubo</i>	Hubro	AL, AT, B	EN
<i>Glaucidium passerinum</i>	Spurveugle	AL, AT, B	
<i>Nyctea (Bubo) scandiaca</i>	Snøugle	AL, AR	VU
<i>Strix uralensis</i>	Slagugle	B (AL?)	VU
<i>Strix nebulosa</i>	Lappugle	AL, B	VU
<i>Surnia ulula</i>	Haukugle	AL, AT, B	
<i>Caprimulgus europaeus</i>	Nattravn	AT, B	VU
<i>Dendrocopos leucotos</i>	Hvitryggspett	AL, AT, B	NT
<i>Dryocopus martius</i>	Svartspett	AL, AT, B	
<i>Picoides tridactylus</i>	Tretåspett	AL, AT, B	NT
<i>Picus canus</i>	Gråspett	AL, AT, B	NT
<i>Lullula arborea</i>	Trelerke	AT, B	
<i>Lanius collurio</i>	Tornskate	AL, AT, B	VU
<i>Luscinia svecica</i>	Blåstrupe	AL, AT, B	
<i>Sylvia nisoria</i>	Hauksanger	AT, B	CR
<i>Emberiza hortulana</i>	Hortulan	B	CR

* *The Species Red List status on Svalbard (if this differs from mainland Norway)*

Further comments on the species' distribution and status are presented in Annex 1.



Norway has the majority of the world population of White-tailed Sea Eagle (*Haliaeetus albicilla*).
Photo: Terje Kolaas.

4.3.3 Birds

Birds form a large group of species in Emerald Network, partly showing the impact of the already existing Birds Directive in EU. The Birds Directive has also been the basis for the species list in Resolution 6/1998. Norwegian names and assessments are from Gjershaug et al. (1994), and Kålås et al. (2006b) for breeding populations and from Lislevand et al. (2000) for wintering populations. Totally 198 species are listed of which 55 species are considered to have stable populations in Norway. Species considered not to meet this criterion are: Avocet (*Recurvirostra avosetta*), Little Tern (*Sterna albifrons*), Sandwich Tern (*Sterna sandvicensis*), Common Kingfisher (*Alcedo atthis*) and Red-breasted Flycatcher (*Ficedula parva*). The species are listed in Table 7.

4.3.4 Mammals

Totally 53 Mammal species are listed Resolution 6/1998, of which 13 species are relevant for Norway. The species are listed in Table 8. Norwegian names and assessments are from several sources where the main publications are: Isaksen et al. (1998), Kovacs & Lydersen (2006) and Heggberget et al. (2006). Example of a species considered not to have a sufficiently stable occurrence in Norway is the Bottlenose Dolphin (*Tursiops truncatus*).



The Arctic fox (*Alopex lagopus*) have populations both in Svalbard and in the Norwegian high alpine areas. On the Mainland it is one of our most endangered species. Photo: Olav Strand, Norwegian Institute for Nature Research.

5. Norwegian Natural Habitats in Emerald Network

The Natural habitats in Emerald Network are defined by Resolution 4/96 and are based on the Palaearctic Habitat Classification (CoE 2003b). This is a classification system that intends to cover the entire Pan-European area. In later years another classification system, called “EUNIS Habitat Classification” (EUNIS 2004) has been more used by the European Environmental Agency (EEA) (<http://eunis.eea.europa.eu/habitats.jsp>).

The classification system used in Emerald Network is based on a complete coverage and consists of six levels. From this system, in a European perspective, threatened natural habitats have been identified from different levels of hierarchy in the system. This will give habitats with different definitions and limits. The list of threatened natural habitats in Emerald Network does not correspond to the natural habitats in Annex 1 in the Habitats Directive of the EU, even if the same criteria are used to select habitats. Some overlap exists, but the differences are still considerable (see also Chapter 6 and Appendix 2 with a comparison table).

Comparing the habitats of Emerald Network and the Norwegian classification used in the municipal mapping programme of biodiversity (Directorate for Nature Management 1999a and 2001), there is much overlap, but the majority of Emerald Habitats are closer to the “subtypes” in the Norwegian manuals. The “subtypes” in these manuals add up to just over 200 units.

The Norwegian naming of the Emerald Habitats is partly following Fremstad (2002) or are new names translated from the English names in Resolution 4/1996. The reference to Norwegian natural habitats and subtypes includes revisions made in the manuals in 2006. Assessments of distribution in Biogeographical Regions is based on Fremstad (1997 and 2002), Fremstad & Moen (2001), Moen (1998) and Directorate for Nature Management (1999a). For some habitats additional literature on particular species and their distribution is used (e.g. *Zostera* and *Rhynchospora* species). The tables in this chapter show the distribution of the habitats within the biogeographical regions (see Chapter 3), where AL=Alpine Region, AT=Atlantic Region, AR=Arctic Region and B=Boreal Region.

Table 9. Natural Habitats in the Coastal and Halophytic group relevant for Norway.

Code	Name	Corresponding Norwegian Natural Habitats*	Biogeographical Regions
11.22	Sublittoral soft seabeds	“Zostera Meadows and other Submarine Meadows”, “Oyster Beds”, “Larger Scallop Beds”, “Sandbanks of Shells?”	AL, AR, AT, B
11.24	Sublittoral rocky seabeds and kelp forest	“Larger Kelp Forests”	AL, AR, AT, B
11.25	Sublittoral organogenic concretions	“Coral Reefs” and “Maerl Beds”	AT, B, AL?
11.26	Sublittoral cave communities	-	AT
11.27	Soft sediment littoral communities	“Soft Sediment Littoral Areas”, “Estuaries”	AL, AR, AT, B
11.3	Sea-grass meadows	“Zostera Meadows and other Submarine Meadows”	AL, AT, B
11.42	Marine spike-rush beds	“Zostera Meadows and other Submarine Meadows”	AT, B, AL?
12.7	Sea-caves	May be included in “Cave/Mine”	AT
13.2	Estuaries	“Estuaries”	AL, AR, AT, B
14	Mud flats and sand flats	“Soft Sediment Littoral Areas”	AL, AR, AT, B
15.32	Atlantic lower schorre communities	Included in “Salt Meadows and Swamps”	AL, AR, AT, B
15.33	Atlantic upper schorre communities	Included in “Salt Meadows and Swamps”	AL, AR, AT, B
15.34	Atlantic brackish saltmarsh communities	Included in “Salt Meadows and Swamps”	AL, AR, AT, B
16.2	Dunes	“Sand Dunes”	AL, AR, AT
16.3	Humid dune-slacks	Subtype under “Sand Dunes”.	AL, AR, AT
17.3	Sea kale communities	“Stony and Gravel Banks”	AL, AR, AT, B

* Norwegian Habitats from Directorate for Nature Management (1999a and 2001)

Further comments on the Norwegian distribution and comparisons to Natura 2000 are given in Appendix 2.

5.1 Coastal and Halophytic Communities

This group contains habitats from the strict marine to coastal beaches, like sand dunes and salt meadows. Here 29 habitats are defined, where 16 are relevant for Norway. This group of habitats within the Emerald Network system corresponds well with such habitats in Norway and this could be explained by our long coast with comparable conditions in Western Europe. The habitats are shown in Table 9.



Mud flats and sand flats is a common habitat type in Norway, where the largest sites would be important contributions to the Emerald Network.

Photo: Arild Lindgaard.

5.2 Non-marine Waters

This group contains habitats from brackish lagoons to pure freshwater types. The main emphasis is on freshwater communities. Here 24 habitats are defined, where six are relevant for Norway. Several freshwater types have rather specific vegetation communities with a Central European focus. The habitats are shown in Table 10.

5.3 Scrub and Grassland

This group contains open lands mainly with high cultural influence. The main focus on this in Emerald Network is Central European habitat types and Mediterranean habitats. For Norway mainly coastal

Table 10. *Natural Habitats in Non-marine Waters relevant for Norway.*

Code	Engelsk navn	Corresponding Norwegian Natural Habitats*	Biogeographical Regions
21	Coastal lagoons	“Lagoons”	AL, AR, AT, B
22.11	Lime-deficient oligotrophic waterbodies	“Freshwater Mud Banks” could be included	AL, AR, AT, B
22.31	Euro-Siberian perennial amphibious communities	Could be included in several like “Inland Delta”, “Freshwater Shallows and Bays”, “River Lakes, Flood Ponds and Meandering parts of Rivers” and “Eutrophic Lakes”.	AL, AR?, AT, B
22.321	Dwarf spike-rush communities	“Freshwater Mud Banks”	AT, B
22.44	Chandalier algae submerged carpets	Included in “Hard Water Lakes”	AT, B
24.2	River gravel banks	“Large River banks”	AL, AR, AT, B

* *Norwegian Habitats from Directorate for Nature Management (1999a and 2001)*

Further comments on the Norwegian distribution and comparisons to Natura 2000 are given in Appendix 2.

Table 11. *Natural Habitats in Scrub and Grassland relevant for Norway.*

Code	Engelsk navn	Corresponding Norwegian Natural Habitats*	Biogeographical Regions
31.1	European wet heaths	Included in “Coastal Heath”	AT
31.2	European dry heaths	Included in “Coastal Heath”	AT
35.11	Mat-grass swards	May be included in “Hay Meadows” and “Natural Pastures”	AL, AR, AT, B?
37.2	Eutrophic humid grasslands	May be included in “Hay Meadows” and “Natural Pastures”	AL, AR?, AT, B
37.3	Oligotrophic humid grasslands	May be included in “Natural Pastures”	AL, AR?, AT, B

* *Norwegian Habitats from Directorate for Nature Management (1999a and 2001)*

Further comments on the Norwegian distribution and comparisons to Natura 2000 are given in Appendix 2.



River gravel banks is a relevant habitat type where Norway has many large areas along our watercourses. Photo: Arild Lindgaard.

heaths and some meadow types are relevant. Here 31 habitats are defined, where five are relevant for Norway. The habitats are shown in Table 11.

5.4 Forests

This is the most comprehensive group of natural habitats in Emerald Network. As many as 78 habitats are included, but because of the mainly continental focus only seven are relevant for Norway. This is due to the lack of the Boreal dimension within Emerald Network. Here the habitat types included in Natura 2000 reflect the Nordic natural conditions much better. The habitats are shown in Table 12.



Coastal heaths of wet or dry types are important habitats in Emerald Network. Photo: Arild Lindgaard.



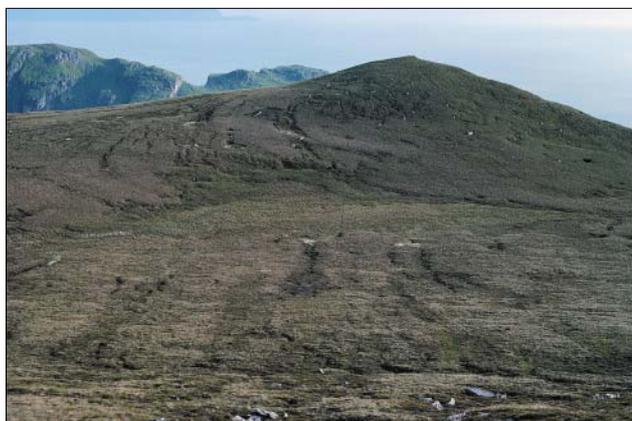
Broad-leaved deciduous forests in ravines and slopes of the Ulmo-Tilietum type are distributed in South-Eastern Norway and along the coast in the Western region up to Nordland County. In Norway the northernmost occurrences of this habitat in Europe exists. Photo: Arild Lindgaard.

5.5 Bogs and Marshes

The habitats of bogs and marshes make an exception in the continental focus in Emerald Network. Here several boreal types relevant for Norway are included. 12 habitats are defined, of which 10 are relevant for Norway. In this group we find the only (!) unique habitat type defined for the Arctic Region; Polygon Mires. There is still some uncertainty if this could be defined in Norway. The habitats are shown in Table 13.

5.6 Inland Rocks, Screes and Sands

This category contains only three habitat types in Emerald Network and only the habitat type “Caves” is relevant for Norway. There is also another category called “Wooded Steppe”, but this one contains no Nordic habitat types. The habitats are shown in Table 14.



Blanket bogs are included in both Emerald Network and Natura 2000. The habitat type is dependent on a moist climate and could only be found in the regions with highest precipitation in Norway. Photo: Asbjørn Moen.

Table 12. Natural Habitats in Forests relevant for Norway

Code	Engelsk navn	Corresponding Norwegian Natural Habitats*	Biogeographical Regions
41.1	Beech forests	Included in “Old-growth Poor Broadleaved Deciduous Forest” and “Rich Broadleaved Deciduous Forest”	AT, B
41.4	Mixed ravine and slope forests	Included in “Rich Broadleaved Deciduous Forest”	AL, AT, B
41.5	Acidophilous oak forests	Included in “Old-growth Poor Broadleaved Deciduous Forest”	AT, B
44.1	Riparian willow formations	Included in “Large River Banks”	AL, AT, B
44.2	Boreo-alpine riparian galleries	Included in “Grey Alder-Bird Cherry Forest” and “Rich Swamp Forest”	AT, B
44.3	Middle European stream ash-alder woods	Could be included in “Rich Swamp Forest”	AT, B
44.A	Birch and conifer mire woods	May be included in “Old-growth Coniferous Forest”, “Intact Lowland and Inland Mire” and “Rich Fens”	AL, AT, B

* Norwegian Habitats from Directorate for Nature Management (1999a and 2001)

Further comments on the Norwegian distribution and comparisons to Natura 2000 are given in Appendix 2.

Table 13. Natural Habitats in Bogs and Marshes relevant for Norway.

Code	Engelsk navn	Corresponding Norwegian Natural Habitats*	Biogeographical Regions
51.1	Near-natural raised bogs	Included in “Intact Lowland and Inland Mires” and “Coastal Mires”	AL, AT, B
52	Blanket bogs	Included in “Coastal Mires”	AL, AT
54.12	Hard water springs	May be included in “Calcareous Alpine Areas”??	AL, AT, B
54.2	Rich fens	“Rich Fens”, may also be included in “Hay and Grazed Fens”	AL, AR, AT, B
54.3	Arcto-alpine riverine swards	“Large River Banks”, partly “Rich Fens”	AL, AR, AT?
54.5	Transition mires	May be included in “Intact Lowland and Inland Mire” and “Coastal Mire”	AL, AR, AT, B
54.6	White beak-sedge and mud bottom communities	May be included in “Intact Lowland and Inland Mire” and “Coastal Mire”	AT, B
54.8	Aapa mires	May be included in “Intact Lowland and Inland Mire”	AL, B (AT?)
54.9	Palsa mires	“Palsa Mire”	AL, AR
54.A	Polygon mires	-	AR

* Norwegian Habitats from Directorate for Nature Management (1999a and 2001)

Further comments on the Norwegian distribution and comparisons to Natura 2000 are given in Appendix 2.

Table 14. Natural Habitats in Inland Rocks, Scree and Sands relevant for Norway.

Code	Engelsk navn	Corresponding Norwegian Natural Habitats*	Biogeographical Regions
65	Caves	“Cave/Mine”	AL, AT, B

* Norwegian Habitats from Directorate for Nature Management (1999a and 2001)

Further comments on the Norwegian distribution and comparisons to Natura 2000 are given in Appendix 2.

6. Natural Habitats in Natura 2000 and Norwegian Specific Habitat types and Species

The term Natural habitats, as used in the Habitats Directive, Natura 2000, Emerald Network and EUNIS, are translated in the Nordic countries by the term “Naturtyper” (Buchwald & Sjøgaard 2000 and Löfroth 1997).

6.1 Natura 2000 related to Emerald Network

The natural habitats in Natura 2000 are defined through Annex 1 of the Habitats Directive of the EU. Through this it is expected from the EU member countries to designate and protect the relevant habitats. Emerald Network is basically using the same principles. Here the habitat types are defined in a Resolution adopted under the Bern Convention (Res. no. 4/1996). For the EU countries the obligations under the Bern Convention and Emerald Network will automatically be met through Natura 2000. See also Chapter 1.3.

The species corresponds between Emerald Network and Natura 2000, and the concept of networks seems to be harmonised. For the Habitat types, however, there are considerable differences. As described in 1.3, the Boreal and Nordic dimensions were introduced through the membership of Sweden and Finland in the EU in 1995. Here also unique Nordic Habitat types were added in Natura 2000. Similar updates of the Emerald Network have not taken place. A more fundamental problem is the fact that many habitat types which describe the same natural elements are defined differently between these networks. This applies both for their description and from what level they are selected in a hierarchical classification system.

Examples of the differences are the “Dunes” which are defined as one habitat type in Emerald Network, but



“Dunes” is an example of a habitat type in Emerald Network that is divided into several types in Natura 2000. Photo: Arild Lindgaard.

for Natura 2000 is divided into five different habitats (2110, 2120, 2130, 2140 and 2170). The opposite relation is to be found in the more general habitat type “Reefs” (1170) in Natura 2000, where several habitat types from Emerald Network could be included. In some cases there is, however, a 1:1 relation between the networks.

A more comprehensive overview of this issue is shown in Appendix 2 where all the Habitat types in Emerald Network are listed in a table showing the connections with Natura 2000 and the Norwegian Habitat types from the Directorate for Nature Management.

6.2 Norwegian Natural Habitat types not covered by Emerald Network

In Norway today natural habitats are mapped mainly based on the Manuals from the Directorate for Nature Management (1999a and 2001), The Ministry of Agriculture and Foods “Registration of Natural Environment in Forests” (Baumann et al. 2001) and through vegetation mapping (Fremstad 1997 and Rekdal & Larsson 2005). The mapping of natural habitats initiated by the environmental authorities and the municipalities relates to a high degree with the conceptual framework and methodology of Emerald Network and Natura 2000. Natural habitats are selected from criteria’s like threatened, rare, value for threatened species and high biological production. The main difference seems to be that the European networks are based on existing comprehensive classification systems. From those systems the habitats have been considered and selected across the hierarchical levels, as threatened in a European perspective. In Norway similar classification systems comprehensively covering Norwegian natural habitats have not been in place. The best approach has been the Norwegian Vegetation classification systems.

In 2005 the Norwegian Biodiversity Information Centre (“Artsdatabanken”) initiated a work on a comprehensive classification system for habitats in Norway called “New Norwegian Natural Habitat Classification” (NNN). This is planned to be completed by 2008, and Norway will have a corresponding basis for consideration of habitats as in Europe today. This system will be compatible with the EUNIS habitat classification system, and will give Norway the opportunity to more actively contribute with the Norwegian dimension and characteristics into the European classification systems on a scientific basis.

The existing classification of natural habitats in Norway which corresponds most directly to Emerald Network and Natura 2000 is the habitats as defined in the manuals no. 13 and 19 from the Directorate for Nature Management (1999a and 2001). Natural habitats considered to be important nationally do not necessarily have a similar status in a European perspective. One example is Calcareous forests, called “Kalkskog” in DN-Manual 13, which is a common forest type in Europe and not given priority in this perspective. The relevant approach will then be to go behind the habitat type to see if there are subtypes of such forests more relevant to be protected. A similar understanding and perspective is the basis for species through the different approach to species in a national Red List and regional or global Red Lists.

In the Pilot Project on Emerald Network in Norway there is an expectation towards a Norwegian contribution to important and unique elements of biodiversity in a European perspective. Important and unique natural habitats in a larger perspective could be a contribution to the Bern Convention and the Emerald Network.

6.3 Norwegian Contributions

The biodiversity of Norway is, as mentioned earlier, not particularly well represented in the lists of Emerald Network. For species the coverage is better than for natural habitats. In Natura 2000 Norwegian habitats are far better represented through the contributions from Sweden and Finland. A way of detecting what’s missing is to consider the habitats in the mapping programmes based on the DN manuals and Natura 2000.

From the DN manuals no. 13 and 19 (Directorate for Nature Management 1999a and 2001), before their revision in 2006, 25 habitat types of totally 70 was not covered by Natura 2000. Most of these are distributed in Europe and their selection and priority are based on a national perspective. From these 25, preliminary five are considered to be special enough in a European context and could be further assessed. These are:

- Waterfall Spray Zones*
- Coastal Spruce Forest
- Coastal Pine Forest**
- Fjords with naturally low oxygen level in the bottom layer
- Particularly deep Fjord Areas

* Waterfall Spray Zones must be considered in relation to their size and oceanic influence to be relevant in this context. This is also the case for **Coastal Pine Forest, where similar habitat types exist in Natura 2000 (e.g. Caledonian forests) in e.g. the United Kingdom. Here specific Norwegian subtypes would be relevant. See Appendix 3 for assessments of all 25 habitat types.

On the subtype level more habitat types could be considered, but we recommend awaiting the work of the Norwegian Biodiversity Information Centre on a new classification system of natural habitats in Norway. On this background we recommend to nominate three natural habitat types which undoubtedly are unique contributions from Norway in this context. In addition Norway should work for a revision of the list of natural habitats in Emerald Network (Res. 4/1996) by the Bern Convention according to Annex 1 in the Habitats Directive and Natura 2000.

For the Arctic region defined habitat types from Svalbard would be an important contribution, since this region has no focus in Emerald Network as today. As mentioned above, a basic work on classification of Norwegian habitats is ongoing, including Arctic habitats. This work will create a scientific basis for the consideration of Arctic habitats under the European Habitat Classification System EUNIS.

6.3.1 Coastal Spruce Forest

The Coastal Spruce Forest is the western taiga’s end against the Atlantic Ocean, and where the spruce forest belt meets the oceanic climate a unique community of species is formed. Typical for this natural habitat is the amount of lichen and moss species where many of these have their only or their most important habitat here. Corresponding habitat types are only found at the eastern coast of Canada and at similar latitudes around the Pacific Ocean (Directorate for Nature Management 1998). The Coastal Spruce Forest is also called the “Boreal Rain Forest”.

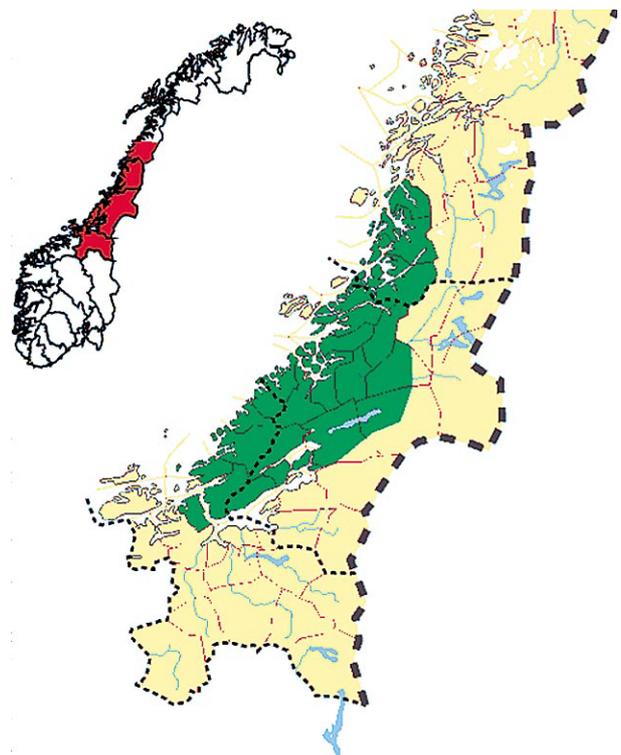


Figure 4. Distribution of Coastal Spruce Forest in Norway.

This forest type only exists in damp environments in the lowland along the coast of Central Norway (see Fig. 4). It has also been an important subject for the plans for establishing protected areas in coniferous forests in the region (Directorate for Nature Management 1998). Here the focus was to protect the larger remaining sites. Like all lowland coniferous forests, these habitats are vulnerable to forestry. Examples of endangered and rare species are the lichen species *Erioderma pedicellatum* (Boreal Felt Lichen) – Globally endangered/CR, *Lobaria hallii* (Hall's Lung Lichen) – VU, *Fuscopannaria ahlneri* – EN, *Pseudocyphellaria crocata* – VU and *Ramalina thrausta* – VU, and further the moss species *Lophozia longiflora* (Reddish Notchwort) and *Anastrophyllum hellerianum* (Heller's Notchwort).

6.3.2 Fjords with Naturally Low Oxygen Level in the Bottom Layer

Fjords are marine habitats characteristic for Norway and unique in a European perspective. The habitat type “Fjords with naturally low oxygen level in the bottom layer” is important because of their special and highly adapted communities of species. The habitat also functions as a historical archive for the biodiversity in the fjords. In this regard it is important to distinguish between fjords with low oxygen level caused by pollution and those that are natural. The main distribution of this natural habitat in Norway is at the Southern and Western coasts, where “Framvaren” in Vest-Agder County is an excellent example of such Fjords (Directorate for Nature Management 2001).

6.3.3 Particularly Deep Fjord Areas

Norwegian Fjords are among the largest and deepest in the World. Deep fjord basins form living conditions for many species and communities with a high degree of specialisation, unlike what is to be found in shallow waters. Species that otherwise belong to the deep ocean are found here, and often populations of oceanic species which have been isolated from other populations over long periods of time. These deep basins are vulnerable to waste dumping and pollution. The habitat type is defined by fjord basins where the depth goes below 500 meters (Directorate for Nature Management 2001).

6.3.4 Species

In the Norwegian Pilot Project no comprehensive assessments of additional species from Norway have been undertaken. Relevant species would have been species that are endemic and considered as threatened. This also includes the Arctic region like Svalbard. In this perspective an assessment of vascular plants with subspecies has been undertaken (Appendix 4). Norwegian endemics with a Red List status (Kålås et al.



The Norwegian Fjords will contribute with unique natural habitats in Emerald Network.
Photo: Arild Lindgaard.

2006) are all good candidates for an extension of the list of species in Emerald Network (Res. 6/1998). For the vascular plants this results in 22 species and subspecies in Norway including Svalbard. Endemics in this regard are species which have their only European distribution in Norway and/or Scandinavia.

Such assessments of species must be continued in cooperation with the Norwegian Biodiversity Information Centre, if there is an ambition for a more comprehensive contribution. Norway could also address such issues through the Expert groups working on species/taxonomic Groups under the Bern Convention.

An example of a species/population of vertebrates, which is not covered by the Emerald Network today, and for which Norway could have argued for an inclusion, is the Norwegian population of the Wild Reindeer (*Rangifer tarandus*). The subspecies Svalbard Reindeer (*Rangifer tarandus platyrhynchus*) is also endemic for Svalbard.



The Svalbard Reindeer (Rangifer tarandus platyrhynchus) and the Wild Reindeer populations of Southern Norway could be unique Norwegian contributions in a European network for biodiversity conservation.
Photo: Arild Lindgaard.

7. Documentation and Data formats for Designated Sites

Designation of sites into Emerald Network shall take place through a specific database with a standard format. This format is identical to the format used in Natura 2000 (EU Commission 1996). The data format expresses also several standards attached to documentation of the sites.

7.1 Norwegian Database for Documentation of Protected Areas

The database software developed for Emerald Network has relatively high threshold of users and is not suitable for everyday work. The Emerald Database will be used in connection with specific designation of sites into the Emerald Network.

In Norway the present storage of data for important areas for biodiversity and for protected areas is done through the “Naturbase” in the Directorate for Nature Management (DN). This is a decision making tool with GIS application and a database with data for the respective map objects. For the protected areas most of the administrative data exists here already and can be used for the Emerald Network. For ecological data on the protected areas, there is no systematic digital storage of this as today.

To cover the needs of data on biodiversity in the protected areas for consideration of designation to the Emerald Network, the database for protected areas needs to be expanded. This need is most relevant also to management of protected areas, evaluation and a gap analysis, and monitoring. Here the data format from Emerald Network provides us with a good international standard for which national needs could be added.

On this background DN has now developed a new database for protected areas where specific data on biodiversity and human impact will be documented (see Figure 5). The challenge is to get all the knowledge of the protected areas, which is considerable, into the standardised database format. This will give a far better knowledge overview and possibilities to assess the designation potential for all Norwegian protected areas, and their value for biodiversity nationally. This database could also be a basis for a coming expansion of the protected areas module in the “Naturbase”.

7.2 Needs for Phase 2 of Emerald Network in Norway

To be able to carry out Phase 2 of Emerald Network with a comprehensive designation of relevant sites, a knowledge overview is needed. In the first phase it would be natural and convenient to start with all the protected areas of Norway. These areas have a protection status and a management regime, which are requested in Emerald Network, and it is also relevant since these areas have been protected in the first place, namely to protect biodiversity.

The first step is to build a knowledge database, as referred to in Chapter 7.1, for all protected areas in Norway, including the national parks and Svalbard. Priority will be given to the most crucial information (most important species and natural habitats related to the purpose of protection) and literature references. There should be no technical limits to the amount of data this database can handle and the data input will depend on available resources and new knowledge.

The first basic level of knowledge of the protected areas must be contributed by DN, based on the central publications related to the protection of areas. Further on this should be added through involvement of the County Governors’ Offices since much of the more recent data and publications are located here. Another step could be to consider other sites not having a formal protection status based on the Act on Nature Conservation.

In 2003 the Norwegian Parliament established a new regime on protecting the most important Salmon populations against impacts like escaped farmed salmon, disease, salmon lice, hydropower development, agricultural activities etc. The watercourses having these populations were given a specific status as “National Salmon Watercourses”. These watercourses will also include a specific protection regime in the nearby fjord basins. The selection of watercourses is done by using criteria like high populations with high productivity, populations with large potential for high productivity, populations of large salmons and populations with unique genetic characters. Such protection regimes will satisfy the criteria for Emerald Network with its focus on protecting a relevant species (see Figure 6). The number of National Salmon Watercourses was in 2006 expanded to include totally 52 watercourses throughout the Country.

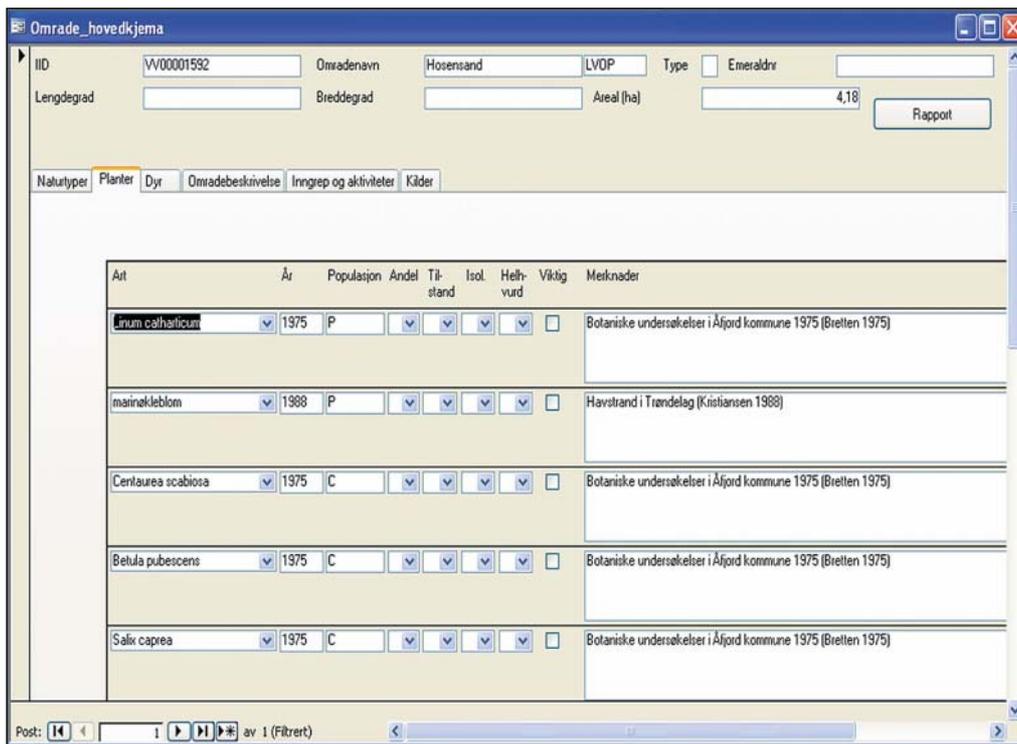


Figure 5. Screen dump from the Protected areas Database.

- ① Enningdalselva
- ② Svennerbassenget
Numedalslågen
- ③ Kysten Jæren - Dalane
Figgjo
Hæelva
Ogna
- ④ Etnefjorden - Ølsfjorden
Etneelva
- ⑤ Sognefjorden
Årøyelva
Vikja
Flåmselva
- ⑥ Dalsfjorden
Gaula
- ⑦ Nordfjord
Stryneelva
Oldenelva
Eidselva
- ⑧ Ørsta fjorden
Ørstaelva
- ⑨ Romsdalsfjorden
Rauma
- ⑩ Sunndalsfjorden
Driva
- ⑪ Halsafjorden
Suma
- ⑫ Trondheimsfjorden
Gaula
Stjørdalselva
Steinkjervassdraget
Figga
- ⑬ Ålfjorden
Stordalselva-Nordalselva
- ⑭ Namsfjorden
Årgårdsvassdraget
Roksdalsvassdraget
- ⑮ Malangen
- ⑯ Måselva
- ⑰ Reisafjorden
Reisaelva
- ⑱ Kvænangen
Kvænangselva
- ⑲ Altafjorden
Altaelva
- ⑳ Repparfjorden
Repparfjordelva
- ㉑ Porsangen
Børselva
Lakselva
Stabburselva
- ㉒ Tanafjorden
Tana
Langfjordvassdraget
- ㉓ Vestre Jakobselv
- ㉔ Komagelva
- ㉕ Neidenfjorden - Bøkfjorden
Neidenelva

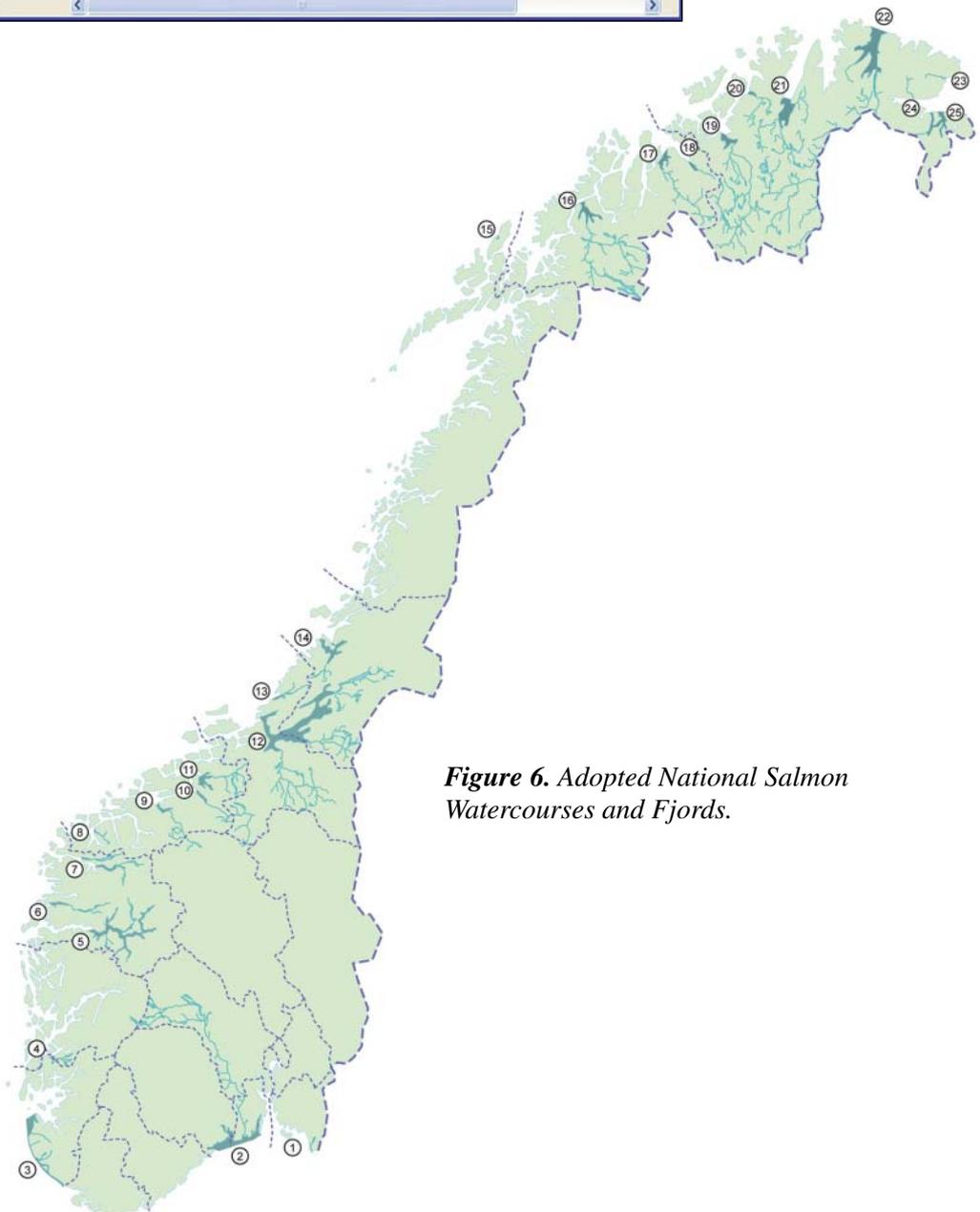


Figure 6. Adopted National Salmon Watercourses and Fjords.

8. Designation of Norwegian Sites to Emerald Network

The intention of Emerald Network is to establish a Pan-European network of important areas for biodiversity. This corresponds to the EU ambitions with their Natura 2000 Network, and Natura 2000 will form the EU's part of Emerald Network. Natura 2000 will give an indication of the level and number of areas to be designated. Sweden has to date designated more than 4000 sites into Natura 2000 and thereby in Emerald Network. Is the same amount expected from Norway?

Norway has to relate to the same species as Sweden in Natura 2000, but fewer natural habitats (see Chapter 6.1). It can neither be taken for granted that all protected areas in Norway will satisfy the criteria in Emerald Network. A first examination of Norway's app. 2200 protected areas (2006) with documentation from data sets in "Naturbase" shows that more than 50% or 1175 areas are current candidates to Emerald Network. Most national parks and larger protected areas are highly relevant, and related to area coverage the relevant candidates total app. 95% of the total amount of protected area (incl. marine areas) on the Norwegian mainland (Svalbard not included). Increased knowledge and compilation of existing knowledge will probably increase the number of potential candidates. Some species and natural habitats will not have a satisfactory coverage within the existing network of protected areas in Norway, and this must be addressed to the ongoing evaluation of the protected areas network.

8.1 Procedure

According to the current resolutions in Emerald Network (Res. 5/1998) made under the Bern Convention, it is the respective Governments of the Parties that nominate sites (ASCIs) into Emerald Network. This is equivalent to other formal international networks of designated sites, like the Ramsar Convention on important wetlands. Here the Directorate for Nature Management (DN) considers designations with assistance from scientific experts and the County Governors.

In Norway a suggested selection of sites will be carried out by DN on the basis of obtained information and assessments. This suggestion will be sent to the Ministry of the Environment for approval and formal nomination to the Council of Europe as the Secretariat of the Bern Convention. Final approval will be made by the Standing Committee under the Bern Convention after an expert review and considerations by the European Environmental Agency (EEA). The final procedures for approval were adopted under the Bern Convention in the meeting of the Standing Committee in 2006.

8.2 Selection of Sites (ASCIs)

The Council of Europe and the Bern Convention recommend the parties to establish committees of experts for the selection of sites to Emerald Network. These experts will consider suggested sites and also be able to suggest sites themselves.

The challenge for all countries that have done their pilot projects is to cover all the different scientific disciplines related to the different taxonomic groups and natural habitats. In Sweden these matters are mainly managed through cooperation between the Swedish Environmental Protection Agency (EPA) and the Swedish Species Information Centre (Artdatabanken), where the Swedish EPA handles the habitats and Artdatabanken the species. In Norway the newly established Norwegian Biodiversity Information Centre (ADB) will have expertise both on natural habitats and species. The expert work in Norway should therefore be developed through cooperation with ADB.

8.3 Tentative List

A designation of sites on a large scale has to be carried out over some time, where a list of relevant candidates from accessible knowledge is set up. This list will be the "Tentative List for Emerald Network in Norway". The list will be based on the knowledge database described in Chapter 7 and will contain names of the site, which species and habitats that are relevant, management status and a ranking of relevance from "highly relevant", "relevant" to "possibly relevant". These categories can change for a site with added or updated knowledge. The list will be managed by the Directorate for Nature Management. Table 15 in Chapter 8.6.12 uses the first version of the Tentative List and shows the present "Highly relevant candidates".

8.4 Svalbard

The nature on Svalbard represents important elements in relation to the arctic dimension in Emerald Network. To be able to include species like the Polar Bear (*Ursus maritimus*) and the Walrus (*Odobenus rosmarus*) into the network, Svalbard will hold some of the most important sites in Europe. Norway could also take a lead in developing classification of natural habitats in the Arctic region through the work carried out by the Norwegian Biodiversity Information Centre (see Chapter 6.2).

Norway has made a formal reservation against including Svalbard into the Bern Convention through our ratification in 1986 (St.prp.12 (1985-86)). This means that formal designation of sites from Svalbard into Emerald Network could not be done unless this is specifically opened for. This might be considered taking into account the general reservation as a whole, or it may be possible to make an amendment where Svalbard is included in the Emerald Network isolated from the rest of the reservations in connection to the Bern Convention.



Norway has an international responsibility to protect the Polar Bear (*Ursus maritimus*) and several other high arctic species. Photo: Morten Ekker.

8.5 Recommendations for Phase 2

These recommendations are directed to the second phase - implementing the Emerald Network in Norway. Norway has a large amount of potential areas satisfying the criteria of the network. It is expected that designated sites is based on a systematic documentation of relevant species and habitats. To enable this, development of knowledge, mainly on the protected areas, must be carried out to be able to analyse and consider candidates for Emerald Network.

Knowledge development and selection of sites should in the longer term be done with assistance from the scientific community. This should be developed through cooperation with the Norwegian Biodiversity Information Centre. Besides this the main recommendations of the Pilot Project could be summarized as follows:

Internationally:

- Contribute more actively with the results and recommendations from the Norwegian Pilot Project in relevant forums under the Bern Convention
- Use the coming results from the Norwegian Biodiversity Information Centre's work on a new classification of habitats for Norway, to develop the

European network to also include unique Norwegian habitat types and the Arctic dimension

- Develop the content of the Biogeographical Region of the Arctic in cooperation with the European Environmental Agency, Iceland and the Russian Federation
- Put forward the Norwegian adjustments to the Pan-European map on Biogeographical Regions through the Standing Committee of the Bern Convention
- Suggest a revision of the list of natural habitats in Emerald Network (Resolution no. 4/1996) to be similar to Annex 1 in the Habitats Directive
- Consider to put forward a suggested inclusion of the Norwegian Wild Reindeer as an amendment to the species list in Emerald Network (Resolution 6/1998)

Nationally:

- All Norwegian protected areas must be documented through a Protected area database based on the standards of Emerald Network and Natura 2000
- Norway should actively designate sites that satisfy the criteria to contribute with Norwegian biodiversity into the European network
- Work out a Tentative List for the relevant candidates from which Norway annually considers designations, with priority given to the sites importance for the relevant species and habitats, level of knowledge and management
- Use the Protected area database as an active tool within the management of protected areas and as a tool to fulfil Norway's obligations under the Programme of Work on Protected areas under the Convention on Biological Diversity (CBD)
- Explore a more formal cooperation with the Norwegian Biodiversity Information Centre on scientific committee considering designation and documentation of sites
- Reconsider Norway's reservations for Svalbard in the Bern Convention in general and for Emerald Network in particular
- Consider designation of all the National Salmon Watercourses into Emerald Network



8.6 Norwegian Pilot Sites

In the Pilot Projects under Emerald Network, the countries are encouraged to designate “Pilot sites”. These are sites which will be a starting point of the designation from the respective country and the implementation of the network. Even if these sites are designated and reported on the specific format from the Council of Europe, they will not achieve a formal status as an Emerald Site before they formally are designated by the Government and are approved by the Standing Committee in the Bern Convention. This designation must then be considered as a test designation where the criteria and the complete format are used on specific sites. The Pilot sites will anyway represent sites that satisfy the criteria of Emerald Network and will be of Norway’s most relevant candidates for this network.

Abbreviations: NP-National Park, LPA-Landscape Protection Area, NR-Nature Reserves, AP-Animal Protection Areas, PP-Plant Protection Area and NM-Natural Monument.

* CPAN means “Circumpolar Protected Areas Network” under the Arctic Council.

8.6.1 Pasvik Protected Areas

Øvre Pasvik National Park and Landscape Protection Area: Sub-Arctic pine forest landscape, western arm of the Siberian Taiga, on the border between eastern and western flora and fauna. The flat landscape consists of ridges and hills, lakes, ponds, bogs, scree and stony terrain.

Pasvik Nature Reserve: Includes the most pristine, remaining part of the Pasvik River’s original watercourse. Great importance as staging area for many species of Anatidae and Waders breeding in the large bogs and forests in the Pasvik Valley.



The upper parts of Pasvik contain a large amount of qualities relevant to Emerald Network. Many species like Smew, Great Grey Owl and Brown Bear, have here their most important areas in Norway.
Photo: Kristine Orset Stene.

Protection status: Øvre Pasvik NP, Øvre Pasvik LPA, Pasvik NR, Gjøkvassneset NR.

Geography: Boreal Region. Sør-Varanger Municipality, Finnmark County. 19.352 Ha.

Relevant Species: Black-throated Diver, Whooper Swan, Smew, Osprey, Merlin, Black Grouse, Capercaillie, Crane, Bar-tailed Godwit, Ruff, Wood Sandpiper, Red-necked Phalarope, Short-eared Owl, Great Grey Owl, Hawk Owl, Three-toed Woodpecker, Blue-throat, Brown Bear and Wolverine.

Relevant Habitats: Riparian willow formations, Boreo-alpine riparian galleries, Birch and conifer mire woods, Different types of mires and bogs.

Other: Ramsar site, CPAN*, Management Plan.

8.6.2 Stabburnesnes

This is a wetland site of international importance as staging site for many migrating species of ducks, geese and waders, and large well-developed salt meadows with arctic plant species and communities. This is the most important staging site for Lesser White-fronted Goose in Northern Europe.

Protection status: Nature Reserve.

Geography: Alpine Region. Porsanger Municipality, Finnmark County. 1.568 Ha.

Relevant Species: Creeping Saltmarsh Grass (*Puccinellia phryganodes*), Fourleaf Mare’s Tail (*Hippuris tetraphylla*), staging site for: Lesser White-fronted Goose, Bar-tailed Godwit, and Ruff (also breeding).

Relevant Habitats: Mud flats and sand flats, Atlantic lower schorre communities, Atlantic upper schorre communities, Atlantic brackish saltmarsh communities.

Other: Ramsar site, CPAN*, Lesser White-fronted Goose Monitoring Programme.



Stabburnesneset Nature Reserve is a large area of saltmarshes of international importance and the most important staging site for the critically endangered Lesser White-fronted Goose in Norway.
Photo: Morten Ekker.



Astujeaggi Nature Reserve has well developed palsa mires in the inner parts of Troms County, which is central in climate monitoring. Photo: Anniken Hofgaard/Norwegian Nature Research Institute.

8.6.3 Astujeaggi

Well developed Palsa mire close to the east end of Altevatt Lake between Gamasjåkka and Leinavatn.

Protection status: Nature Reserve.

Geography: Alpine Region. Bardu Municipality, Troms County. 572 Ha.

Relevant Habitats: Palsa mires.

Other: Selected monitoring site for climate impact on biodiversity.

8.6.4 Børgefjell National Park and Landscape Protection Area

This is a typical wilderness area on the border between Nord-Trøndelag and Nordland Counties, characterised mostly by high alpine areas, rich on lakes and water-courses, and of considerable zoological interest.

Protection status: Børgefjell NP, Austre Tiplingan LPA.

Geography: Alpine Region. Grane and Hattfjelldal Municipalities, Nordland County; Røyrvik and Namsskogan Municipalities, Nord-Trøndelag County. 149.477 Ha.

Relevant Species: Black-throated Diver, Red-throated Diver, Golden Eagle, Osprey, Gyrfalcon, Black Grouse, Capercaillie, Golden Plover, Great Snipe, Red-necked Phalarope, Beaver, Brown Bear, Arctic Fox and Wolverine.

Relevant Habitats: Lime-deficient oligotrophic waterbodies.

Other: Most important site for Arctic Fox in mainland Norway with good data sets, birds of prey and large predators.

8.6.5 Froan Protected Areas

This is a unique archipelago with high variation and low degree of human impact. Important area for coastal



Froan is Norway's most important habitat for Grey Seal, and holds many important qualities relevant for Emerald Network. Photo: Morten Ekker.

seals and seabirds. The most important site for Grey Seal in Norway.

Protection status: Froan NR, Froan LPA, Froan AP.

Geography: Atlantic Region. Frøya Municipality, Sør-Trøndelag County. 85.230 Ha.

Relevant Species: Great Northern Diver (winter), White-tailed Eagle, Common Tern, Arctic Tern, Otter, Grey Seal, Harbour Seal.

Relevant Habitats: Sublittoral rocky seabeds and kelp forest, European wet heaths, European dry heaths.

Other: Ramsar Site, well documented with latest publication by Røv (2006).

8.6.6 Fokstumyra Protected Areas

This is a complex mire area split up by lakes, ponds, streams and dry ridges. Large botanical values and parts of the site consists of rich fens. The site is widely renowned for its rich birdlife.

Protection status: Fokstumyra NR, Fokstugu LPA.

Geography: Alpine Region. Dovre and Lesja Municipalities, Oppland County. 9.742 Ha.



Fokstumyra represents an important alpine wetland area with many qualities. Photo: Arild Lindgaard.

Relevant Species: *Meesia longiseta*, Little Grapefern (*Botrychium simplex*), *Stephanopachys substriatus*, Black-throated Diver, Hen Harrier, Crane, Golden Plover, Ruff, Great Snipe, Wood Sandpiper, Red-necked Phalarope, Short-eared Owl, Bluethroat.

Relevant Habitats: Riparian willow formations, Rich fens.

Other: Ramsar Site, well documented.

8.6.7 Jærstrendene Protected Areas

These areas have unique natural and cultural landscapes, and include Norway's largest and finest sand dune complex, as well as characteristic pebbled beaches.

Protection status: Jærstrendene LPA, Jærstrendene PP, Jærstrendene AP, Jærstrendene NM, Kjørholmane NR, Reime PP.

Geography: Atlantic Region. Hå, Klepp, Sola and Randaberg Municipalities, Rogaland County. 20.457 Ha.

Relevant Species: Wintering site for Great Northern Diver, White-billed Diver, Black-throated Diver, Red-throated Diver, Horned Grebe, and important sites for Grey Seal and Harbour Seal.

Relevant Habitats: Sublittoral rocky seabeds and kelp forest, Mud flats and sand flats, Atlantic brackish salt-marsh communities, Dunes, Humid dune-slacks, Rich fens.

Other: Ramsar Site, well documented, Management Plan, many important coastal habitats.



The largest and finest dune landscapes of Norway are here on Jærstrendene. The site has also other relevant features of habitats and species.

Photo: Torbjørn Moen.

8.6.8 Nordre Øyeren

This is the largest inland delta in Norway.

Protection status: Nordre Øyeren NR, Sørumsneset NR.

Geography: Boreal Region. Fet, Rælingen, Enebakk and Skedsmo Municipalities, Akershus County. 6.369 Ha.

Relevant Species: Asp, Great Crested Newt, Whooper Swan (winter), Smew (winter), Osprey (foraging), Corncrake, Spotted Crake, Ruff (staging), Great Snipe (staging), Common Tern, Arctic Tern, Beaver.

Relevant Habitats: Euro-Siberian perennial amphibious communities, Chandalier algae submerged carpets, River gravel banks, Eutrophic humid grasslands, Boreo-alpine riparian galleries.

Other: Ramsar Site, well documented, Management Plan.

8.6.9 Geitaknottene and Yddal Protected Areas

Geitaknottene hills are unquestionably the richest known area for Great Crested Newt (*Triturus cristatus*) in Norway, probably also in the World. Yddal is one of few remaining large coniferous forests in Western Norway with little impact by human activities.

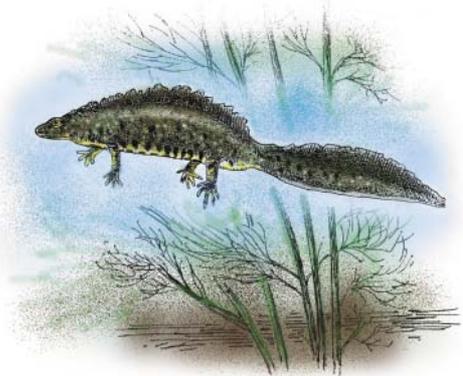
Protection status: Geitaknottene NR, Yddal NR.

Geography: Atlantic Region. Fusa, Kvam and Kvinnherad Municipalities, Hordaland County. 3.376 Ha.

Relevant Species: Great Crested Newt, Black-throated Diver, Golden Eagle, Black Grouse, Capercaillie, White-backed Woodpecker, Grey-headed Woodpecker.

Relevant Habitats: Rich fens.

Other: Norway's and one of the World's most important sites for Great Crested Newt. Many qualities including forest species.





The mountains of Junkerdalen are renowned as one of the classical calcareous alpine areas with a rich alpine flora. Photo: Arild Lindgaard.

8.6.10 Junkerdal with Junkerdalsura

This is a large and relatively pristine natural area conserving biodiversity with ecosystems, species and populations, geological features and cultural heritage. Particularly important is the unique plant life.

Protection status: Junkerdal NP, Junkerdalsura NR.

Geography: Alpine Region. Saltdal and Fauske Municipalities, Nordland County. 69.622 Ha.

Relevant Species: Narrowfruit Braya (*Braya linearis*), *Papaver radicum* “ssp. *hyperboreum*”, Scandinavian Primrose (*Primula scandinavica*), Lady’s Slipper Orchid (*Cypripedium calceolus*), *Viola rupestris* ssp. *relicta*, Arctic Blue (*Agriades glandon aquilo*), Black-throated Diver, Red-throated Diver, Golden Eagle, Gyrfalcon, Wolverine, Lynx.

Relevant Habitats: Rich fens.

Other: Important alpine ecosystem with rich plantlife, well documented, Management plan to be finished soon.

8.6.11 Alta Watercourse (National Salmon Watercourse)

Hardly any other river in Northern Norway has such excellent production conditions, as the Alta River. The river is annually among the five-six rivers with the best salmon catch and is widely renowned for its large salmon population and unique watercourse landscape. The salmon fishing is of great cultural and economic importance for the local community. Fish biology investigations have been carried out in many years and the salmon population is among the best examined in Norway. The fjord outside of the river is a temporary protection zone for salmonids.

Protection status: National Salmon Watercourse (212.Z), parts of the Watercourse is also protected in Protection Plan II for Watercourses against hydropower development (212/2).

Geography: Alpine Region. Alta Municipality, Finnmark County (salmon-carrying part of the river). Entire catchment area: Alta and Kautokeino Municipalities, Finnmark County. Natural salmon-carrying part of the river: 46 km + 15 km of Eiby River (tributary river).

Catchment area: 737.300 Ha.

Relevant Species: Salmon.

Relevant Habitats: River Gravel Banks?

Other: Included in national monitoring programme for salmon watercourses. Management depends on the watercourse regulations. One of Norway’s best known salmon rivers.

8.6.12 Other Potential Candidates

Based on the first draft of the Tentative List all the candidates in Table 15 meet the criteria in Emerald Network well and are highly relevant for the first phase of designations.

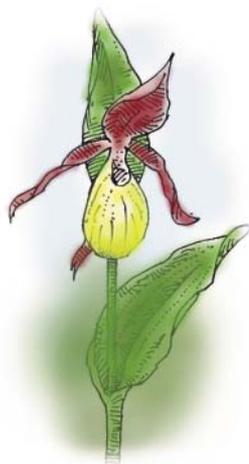


Table 15. The most relevant candidates of Norwegian protected areas to Emerald Network (in addition to the suggested Pilot sites – see previous page).

Name	Protection Status	Municipalities/Counties	Area (Ha)	Biog. region
Store Sametti - Skjelvatnet	NR	Sør-Varanger/ Finnmark	7393	Boreal, Alpine
Neiden- and Munkefjord	NR	Sør-Varanger/ Finnmark	1191	Alpine
Varanger Peninsula with Persfjorden-Syltefjord	NP, LPA, NR	Vardø, Vadsø, Nesseby, Båtsfjord/ Finnmark	208550	Arctic, Alpine
Slettnes	NR	Gamvik/ Finnmark	1230	Arctic
Tanamunningen	NR	Tana/ Finnmark	3409	Alpine
Øvre Anarjokka	NP	Kautokeino, Karasjok/ Finnmark	141430	Alpine
Seiland	NP	Hammerfest, Alta, Kvalsund/ Finnmark	31691	Alpine
Reisa	NP, LPA	Nordreisa/ Troms	88778	Alpine
Lullefjellet	NR	Storfjord/ Troms	565	Alpine
Sørkjosleira	NR	Balsfjord/ Troms	373	Alpine
Målselvtløpet	NR	Målselv, Lenvik/ Troms	1258	Atlantic
Øvre Dividal	NP, LPA	Målselv/ Troms	75791	Alpine
Skogvoll	NR	Andøy/ Nordland	5545	Atlantic
Røstøyan og Nykan	NR, LPA	Røst/ Nordland	7092	Atlantic
Bliksvær	NR, AP	Bodø/ Nordland	14459	Atlantic
Saltfjellet-Svartisen with adjacent Landscape protection areas and Nature preserves	NP, LPA, NR	Bodø, Rana, Rødøy, Meløy, Beiarn, Saltdal/ Nordland	277547	Alpine
Glomådeltaet	LPA, AP	Rana/ Nordland	594	Atlantic
Spjeltfjelldalen	NR	Hemnes/ Nordland	2978	Alpine
Vegaøyan (Lånan/Skjærvær and Hysvær/Søla)	NR, LPA, AP	Vega/ Nordland	20680	Atlantic
Simskarmyra	NR	Grane/ Nordland	509	Alpine
Kvaløy and Rauøy	NR, AP	Vikna/ Nord-Trøndelag	4257	Atlantic
Lierne	NP	Lierne/ Nord-Trøndelag	33300	Alpine
Blåfjella - Skjækerfjella	NP, LPA, NR	Steinkjer, Verdal, Snåsa, Lierne, Grong/ Nord-Trøndelag	206857	Alpine, Atlantic
Øvre Forra	NR	Meråker, Stjørdal, Levanger, Verdal/ Nord-Trøndelag	10254	Alpine
Tautra with Svæet	NR, AP	Frosta/ Nord-Trøndelag	1660	Atlantic
Tekssjøen	NR	Åfjord/ Sør-Trøndelag	2401	Atlantic
Været	LPA, AP	Bjugn/ Sør-Trøndelag	3588	Atlantic
Grandefjæra	NR	Ørland/ Sør-Trøndelag	1582	Atlantic
Kråkvangsvæet	AP	Ørland/ Sør-Trøndelag	1353	Atlantic
Femundsmarka	NP, LPA, NR	Røros, Engerdal/ Sør-Trøndelag, Hedmark	67315	Alpine
Forollhogna with the summer pasture valleys	NP, LPA, NR	Rennebu, Holtålen, Midtre Gauldal, Tolga, Tynset, Os (Hedmark)/ Sør-Trøndelag, Hedmark	151477	Alpine
Høggjølen/Bakkjølen	NR	Meldal/ Sør-Trøndelag	1139	Alpine
Dovrefjell-Sunnalsfjella, Knutshø with adjacent Landscape protection areas	NP, LPA, NR, HP	Dovre, Lesja, Rauma, Nettet, Sunndal, Oppdal, Tynset, Follidal/ Sør-Trøndelag, Møre og Romsdal, Oppland, Hedmark	428249	Alpine, Atlantic
Trollheimen	LPA, NR	Sunndal, Surnadal, Rindal, Oppdal, Rennebu, Meldal/ Sør-Trøndelag, Møre og Romsdal	128822	Alpine, Atlantic
Sandblåst/Gaustadvågen and Knarrashaugmyra	NR	Fræna, Eide/ Møre og Romsdal	266	Atlantic
Vassgårdsvatnet and Einsetvågen/ Nåsvatnet	NR, AP	Eide/ Møre og Romsdal	227	Atlantic
Reinheimen with adjacent Landscape protection areas	NP, LPA, NR, NM	Lesja, Skjåk, Lom, Vågå, Norddal, Rauma/ Møre og Romsdal, Oppland	328690	Alpine, Atlantic

Geiranger-Herdalen	LPA, NR	Norrdal, Stranda/ Møre og Romsdal	50077	Alpine, Atlantic
Harøya Wetland system (Lomstjønnna, Selvikvågen, Malesanden and Lyngholman)	NR, AP	Sandøy/ Møre og Romsdal	1640	Atlantic
Giske	AP	Giske/ Møre og Romsdal	1379	Atlantic
Dekkjene	NR	Selje/ Sogn og Fjordane	457	Atlantic
Movatna and Einevarden	NR	Vågsøy/ Sogn og Fjordane	549	Atlantic
Jotunheimen and Utladalen	NP, LPA, NM	Årdal, Luster, Lom, Vågå, Vang/ Sogn og Fjordane, Oppland	147621	Alpine, Atlantic
Nærøyfjorden with adjacent Nature Preserves (Grånosmyrene, Bleia, Nordheimsdalen)	LPA, NR, NM	Voss, Vik, Aurland, Lærdal/ Sogn og Fjordane, Hordaland	66189	Atlantic, Alpine
Bjoreidalen	NR	Eidfjord/ Hordaland	436	Alpine
Hardangervidda with adjacent Landscape protection areas	NP, LPA, AP	Hol, Nore og Uvdal, Tinn, Vinje, Odda, Ullensvang, Eidfjord, Ulvik/ Hordaland, Telemark, Buskerud	430264	Alpine
Grudevatn	NR, AP	Klepp/ Rogaland	185	Atlantic
Frafjordheiane	LPA, NR	Sirdal, Gjesdal, Forsand/ Rogaland, Vest-Agder	41345	Alpine, Atlantic
Flekkefjord	LPA	Flekkefjord/ Vest-Agder	5427	Atlantic
Listastrendene	LPA, DF, PF, NR	Farsund/ Vest-Agder	1445	Atlantic
Nesheimvann	NR	Farsund/ Vest-Agder	149	Atlantic
Søm-Ruakerkilen and Hasseltangen	NR, LPA, PF, AP	Grimstad/ Aust-Agder	149	Atlantic
Fritzøehus	LPA	Larvik/ Vestfold	163	Boreal
Ilene	NR	Tønsberg/ Vestfold	92	Boreal
Vindflomyrene	NR	Hurdal, Østre Toten/ Akershus, Oppland	344	Boreal
Østmarka	NR	Rælingen, Enebakk, Lørenskog/ Akershus	1782	Boreal
Kongsrudtjern	NR	Fet, Skedsmo/ Akershus	132	Boreal
Søndre Håøya	NR	Frogn/ Akershus	372	Boreal
Søndre Jeløy	LPA, NR	Moss/ Østfold	439	Boreal
Vestre Vansjø	NR	Moss, Rygge/ Østfold	329	Boreal
Kurefjorden	NR	Råde, Rygge/ Østfold	381	Boreal
Eldøya-Sletter	LPA, PF, NR	Råde, Rygge/ Østfold	1324	Boreal
Skinnerflo	NR	Sarpsborg, Fredrikstad, Råde/ Østfold	177	Boreal
Kjennetjern	NR	Fredrikstad/ Østfold	9	Boreal
Goenvad	NR	Fredrikstad/ Østfold	107	Boreal
Øra	NR	Fredrikstad/ Østfold	1551	Boreal
Lundsneset	NR	Halden, Aremark/ Østfold	2237	Boreal
Vestfjella	NR	Halden, Aremark/ Østfold	570	Boreal
Lavsjømyrene-Målikjølen	NR	Hamar, Løten/ Hedmark	2529	Boreal
Åkersvika	NR	Hamar, Stange/ Hedmark	424	Boreal
Brumundsjøen	NR	Hamar, Ringsaker/ Hedmark	820	Boreal
Kvisleflået and Hovdli	NR	Engerdal/ Hedmark	5682	Alpine
Rondane with Grimsdalen, Frydalen and Dørålen	NP, LPA, NR	Stor-Elvdal, Folldal, Dovre, Nord-Fron, Sel, Sør-Fron, Ringebu/ Hedmark, Oppland	116431	Alpine
Dovre	NP, LPA, NR	Folldal, Dovre/ Hedmark, Oppland	30435	Alpine
Falken	NR	Østre Toten/ Oppland	107	Boreal
Dokka Delta	NR	Søndre Land, Nordre Land/ Oppland	375	Boreal
Øyad'n	NR	Vestre Slidre, Vang/ Oppland	274	Alpine
Hynna	NR	Gausdal/ Oppland	1533	Alpine

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Appendices

Appendix I - Norwegian Species in Emerald Network (res.6-1998)

Scientific name	Norwegian name	Norwegian Red List 2006**	Biogeographical region*	Only parts of Europe	Comments
Vascular plants					
<i>Botrychium simplex</i>	Dvergmarinøkkel	CR	AL, AT, B		Has been registered with totally 11 localities in Norway, where six are found in 1990 or later. The recent localities are 3 in Hvaler, Østfold, on near coastal rocks on thin soil, one in Sveio, Hordaland on a tractor road (also rediscovered in 2005), one in Sel, Oppland on an old road, and one in Dovre, Oppland on a dry meadow and/or old road.
<i>Diplazium sibiricum</i>	Russeburkne	VU	AL, B		The species is or has been known from 20 localities (11 locality groups) in stream and river gorges in the Gudbrandsdal valley from Øyer to Sel. It has disappeared from 4 of these, but new findings are registered during the latest years. The species is attached to humid gorge habitats.
<i>Luronium natans</i>	Flytegro	VU	B		Exists in 5 oligotrophic lakes in Oslo (all in Nordmarka), and recently discovered in some ponds near Larvik, Vestfold.
<i>Arenaria pseudofrigida</i> (<i>A. ciliata</i> ssp. <i>pseudofrigida</i> in res. 6-1998)	Kalkarve	NT/LC	AR		Calcareous and dolomite gravel, screes, in open vegetation. Very limited distribution in the Norwegian mainland on Varanger peninsula, Finnmark, mostly limited to Båtsfjord municipality, but with a small population in Vardø (Persfjord). On Svalbard spread in calcareous areas in the fjords on Spitsbergen and Edge Island.
<i>Arenaria humifusa</i>	Dverggarve	NT/VU	AL, AR		Moist grounds on serpentine and on calcareous ground in alpine areas. Known from 17 localities or locality groups spread in 5 different areas in northern Norway: Krutvass area in Hattfjelldal, inner North-Salten in Steigen/Hamarøy, Nordland; Skibotn valley in Storfjord, Troms; in outer Western Finnmark, in Alta/Hasvik, and Nordkapp, Finnmark. Known from 3-4 sites on the western parts of Spitsbergen.
<i>Moehringia lateriflora</i>	Russearve	CR	AL, AR, B		Moist birch forests. Known from Karlebotn in Nesseby (not rediscovered since 1857), and in Sør-Varanger, Finnmark, from Vesle Skogerøya (=Prestøya) in Kirkenes and several populations along the Pasvik River. In addition to the mentioned localities there is a published discovery from Horbma in Tana, but the species has not been rediscovered here.
<i>Silene involucrata</i> ssp. <i>tenella</i> (<i>S. furcata</i> ssp. <i>angustiflora</i> in res. 6-1998)	Småjonsokblom (=finnmarksjonsokblom)	CR	AL		Known from two watercourses, Reisa Watercourse (Troms) and Alta/Kautokeino Watercourse (Finnmark). The species is associated with screes as primary habitats and secondary to river gravel banks. On Svalbard is the nominate subspecies, ssp. <i>furcata</i> , growing in some locations along fjords on the western and northern coasts.
<i>Braya linearis</i>	Rosekarse		AL, AT, (AR?)		Rock and gravel on calcareous grounds. Vågå and Lom, Oppland in the south, and in Northern Norway from Nordland to Finnmark. The species has its European centre in Norway.
<i>Draba cinerea</i>	Grårublom	EN	AL		Calcareous rocks and screes. In Norway known from app. 30 localities in inner parts of Finnmark (Alta, Kautokeino, Porsanger). Around 20 of these were discovered in the 1980s during the surveys before the hydropower regulation of the Alta/Kautokeino Watercourse, and are considered to be lost today.
<i>Draba cacuminum</i>	Tinderublom	EN (CR)	AL		On calcareous mountain tops and gravel patches. The southern subspecies (ssp. <i>cacuminum</i>) has a split distribution in southern Norway in the Finse area (Hordaland/Buskerud), Jotunheimen (Oppland) and Trollheimen/Dovrefjell (Sør-Trøndelag). It is endemic to this area, and totally 21 localities are known. In Nordland, the subspecies <i>angusticarpa</i> is considered to be critically endangered.

Scientific name	Norwegian name	Norwegian Red List 2006**	Biogeographical region*	Only parts of Europe	Comments
<i>Carex holostoma</i>	Kluftstarr		AL, AR, B		Moist rock shelves and grassland in alpine areas. Northern Norway from Ofoten to Eastern Finnmark.
<i>Arctagrostis latifolia</i>	Russegras	NT/VU	AL, AR		Edges of mires and wetlands. Known in Norway in Eastern Finnmark from Lebesby and Tana and along the southern side of Varanger peninsula to Vardø. Known from 7 sites/groups of sites in inner parts of fjords on Spitsbergen, mostly in Sassen and Dickson Land. Here it is associated with moist polygon ground with peat and to compact wetland.
<i>Arctophila fulva</i>	Hengegras	CR/LC	AL, AR		In rivers and lakes. Known from two occurrences in Norway, both along the Kautokeino Watercourse in Finnmark. Distributed in several places on Svalbard, but not common here. It is also known from Bear Island.
<i>Calamagrostis chalybaea</i>	Nordlandsrørkvein	NT	AL		Alpine forests east in Nord-Trøndelag (two known localities in Lierne/Røyrvik) and Nordland (inner parts of Helgeland from Grane and Hattfjelldal north to Rana). App. 25 known sites.
<i>Cinna latifolia</i>	Huldregras	NT	AL, AT, B		Moist dark places in rocky forest slopes. From the central parts of Hedmark and Northern Gudbrandsdal southwest to Akershus, Buskerud and Telemark, inner fjord areas in Hardanger and Sogn, scattered in Central Norway and with a northern limit in Hattfjelldal, Southern Nordland.
<i>Puccinellia phryganodes</i>	Teppesaltgras		AL, AR		Salt marshes on clay and salt meadows in Finnmark (ssp. <i>sibirica</i>). Common all over Svalbard, and Bear Island (ssp. <i>vilfoidea</i>).
<i>Trisetum subalpestre</i>	Kveinhavre	CR	AL		On river banks and rock shelves. It is known to have localities along three watercourses in Northern Norway: Reisa Watercourse in Troms, Alta/Kautokeino Watercourse and along Jakob's River in Finnmark. The species is not documented in Alta/Kautokeino Watercourse after 1983 (hydropower regulation).
<i>Hippuris tetraphylla</i>	Korshesterumpe	NT	AL, AR?		Brackish shores. Known from nine or ten groups of localities in Eastern Finnmark in Porsanger, Nesseby and Sør-Varanger.
<i>Luzula nivalis</i> (L. <i>arctica</i> in res. 6-1998)	Snøfrytle	NT/LC	AL, AR	#	The species is mainly a high arctic species. The Scandinavian alpine occurrences are found in the middle alpine zone and are attached to cold snow patch marshes and polygon surface on base-rich grounds. Dovre, Troms and Finnmark. Very common all over Svalbard.
<i>Najas flexilis</i>	Mykt havfruegras	EN	AT, B		Nutrient-rich freshwaters in Rogaland, Vest-Agder and Buskerud. We have findings from the last 5-10 years in only three lakes in Lista, one lake in Jæren and in Steinsfjorden.
<i>Cyripedium calceolus</i>	Marisko	NT	AL, AT, B		Forests on calcareous grounds. Distributed in many calcareous areas in South-East and Central Norway, and north to Eastern Finnmark.
<i>Liparis loeselii</i>	Fettblad	RE			Rich fens in the Oslo Fjord area. Extinct.
<i>Lysiella oligantha</i> (<i>Platanthera obtusata</i> ssp. <i>oligantha</i> in res. 6-1998)	Sibirhattfiol	CR	AL		Moist calcareous grounds in the mountains. The species has its only European occurrences in Troms-Finnmark and Northern Sweden. It has been known from 8 sites from Målselv, Troms to Porsanger, Finnmark, but in the last 25 years it has been rediscovered in only three of these. At the richest locality (Nordreisa, Troms), there were at least 25 plants in 1988.
<i>Papaver radicum</i> ssp. <i>laestadianum</i> (<i>P. laestadianum</i> in res. 6-1998)	Læstadiusvalmue	VU	AL		High alpine calcareous gravel grounds in inner Troms. Endemic for Norway and Sweden.
<i>Papaver radicum</i> "ssp. <i>hyperboreum</i> "	"Tromsvalmue"		AL		On calcareous gravel grounds and screes from Saltdal, Nordland to Troms. Endemic for Norway and Sweden. It is now considered to be included in the collective subspecies <i>Papaver radicum</i> ssp. <i>radicum</i> .

Scientific name	Norwegian name	Norwegian Red List 2006**	Biogeographical region*	Only parts of Europe	Comments
<i>Persicaria foliosa</i>	Evjeslirekne	EN	B		On shallows and wet places in South-East Norway. Known from app. 15 localities between Våler, Østfold and Nedre Eiker, Buskerud in the South, and Elverum, Hedmark and Sel, Oppland in the North. Six of these localities have been rediscovered in later years while the species most likely has disappeared in the remaining sites and has become rather fragmented. It is annual and associated with trampled zones along lakes and ponds. It seems to be dependent on grazing cattle.
<i>Rheum rhaponticum</i>	Munkerabarbra	RE			The species has had only one known locality in Norway: Onstadberget next to Aurlandsvangen, Aurland, Sogn og Fjordane, where it has been known since 1875. Nordhagen (1973) considers the occurrence to be spontaneous, while Lid & Lid (2005) considers it to be alien and naturalised.
<i>Primula nutans</i> ssp. <i>finmarchia</i>	Finmarksnökkeblom	NT	AL, AR		Associated with brackish salt meadows, grasslands and mires along the lower parts of rivers in North-Eastern Troms and Finnmark.
<i>Primula scandinavica</i>	Fjellnökkeblom	NT	AL, AT, B?	#	Slopes and meadows on calcareous grounds in alpine areas. Endemic in Scandinavia. In Norway it is found from the Rogaland heaths to the middle of Troms. The species has its centre in Norway.
<i>Coptidium lapponicum</i> (<i>Ranunculus lapponicus</i> in res. 6-1998)	Lappsøleie	NT/LC	AL, AR		Wet mossy grounds and mires. In Norway the species has a restricted north-eastern distribution limited to the inner parts of Nordreisa, Troms (not seen since 1936) and Kautokeino, Karasjøk and Sør-Varanger, Finnmark. Widely distributed in Svalbard along the Isfjord, Bellsund and Kongsfjord, and on Edge Island.
<i>Sorbus teodorii</i> (is synonymised under <i>S. meinichii</i> , or is a hybrid: <i>S. aucuparia</i> x <i>hybrida</i>)	Hedlundrogn [Fagerrogn]		AT, B		Dry, calcareous grounds and forest edges. The hybrid is found from the Oslofjord and along the Southern and Western coast to Møre og Romsdal. <i>Sorbus meinichii</i> has approximately the same distribution. In Norway the occurrences of <i>S. meinichii</i> will be focused in this context.
<i>Saxifraga hirculus</i>	Myrsildre	EN/LC	AL, AT, AR		Mires and moist mossy grounds. Mainland Norway has the subspecies <i>hirculus</i> : One isolated locality in Hå, Rogaland, in the north the species has today known localities in Nordreisa, Troms (1) and Kautokeino, Finnmark (7 groups of localities), while it seems to have disappeared in the other known locations in Troms and Finnmark. Widely distributed all over Svalbard, including Bear Island (ssp. <i>compacta</i>).
<i>Saxifraga osloensis</i>	Oslosildre	NT	B		Limited distribution in South-Eastern Norway from Moss, Østfold north to Oslo and Modum, Buskerud, and with two recent discoveries in Kongsvinger and Eidskog, Hedmark. It is associated with base-rich rocks and dry slopes, with a very strong concentration along the axes Oslo-Bærum-Asker. Endemic for Norway and Sweden.
<i>Viola rupestris</i> ssp. <i>relicta</i>	Kalkfiol		AL, AT		Calcareous rocks, ridges and screes, both in the lowlands and in the mountains. Spread from Nordland (Meløy and Bodø) to Finnmark. Otherwise known only from Northern Sweden and Northern Finland.
Mosses (Bryophyta)					
<i>Bryhnia novaeangliae</i>	Oremose		AT, B		On rocks, soil and tree trunks in moist and shady habitats, in forests and by streams. South-Eastern Norway, South and South-Western Norway up to Møre og Romsdal. Found in alder forest in Sweden.
<i>Buxbaumia viridis</i>	Grønnsko	VU	AT, B		On rotten wood or exposed grounds in the lowlands, preferably in spruce forests. Southern Norway.
<i>Cynodontium sueticum</i>	Storskortemose		AL, AT, B		On shady calcareous-poor rocks, often in coniferous forests. Spread through Norway from Agder to Finnmark.
<i>Dicranum viride</i>	Stammesigd	VU	AT, B		Grows on trunks of deciduous trees, particularly Lime and lowland Birch. More rare on rotten wood trunks and on nutrient-poor rocks in deciduous forests. Known from 6-7 sites in South-Eastern Norway and three findings in Western Norway.

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<i>Encalypta mutica</i>	Buttklokkemose		AL, AT, AR		On calcareous soil, often below rock walls. Known from app. 15 sites from Hordaland to Finnmark. Probably on Svalbard.
<i>Herzogiella turfacea</i>	Sigdfauskmose	VU	AT, B		On stumps and roots in shady moist forests. Found in South-Eastern Norway and Trøndelag. Small numbers in Northern Norway.
<i>Hygrohypnum montanum</i>	Huldrebekekemose		AT, B		On wet rocks and sandy soil in or along streams. Known from Akershus, Buskerud, Aust-Agder and Sogn og Fjordane. The species has its European centre in Norway.
<i>Meesia longiseta</i>	Stakesvanemose	VU	AL, AT, AR, B		Found in minerogenic mires and swamps, and on the shores of lakes and ponds. Most common in lower parts. Found in 19 standard monitoring squares from Akershus in the south to Finnmark in the north. There are only two new findings of the species since 1900. Probably on Svalbard.
<i>Orthothecium lapponicum</i>	Lapphøstmose	EN	AL, AR, AT		On moist calcareous rock walls in shady gorges and similar habitats. The species is only known from northern Fennoscandia inclusive Svalbard. App. 10 sites in Northern Sweden, one in North-Western Finland, one in Svalbard (Liefdefjord), and three known sites in Troms/Finnmark. At least one of the two known sites in Stilladalen, Finnmark is affected by the Alta hydropower development, possibly both, and the status of the species here is now uncertain.
<i>Orthotrichum rogeri</i>	Sporebustehette		AT, B (AL?)		Most findings are on Ash, but also on Crab apple, Balsam poplar, Lime and Elder. Known from about thirty sites from Vestfold to Møre og Romsdal. Has its largest European distribution on the Western Coasts of Norway.
<i>Scapania massalongi</i> (now <i>S. carinthiaca</i>)	Røtetvibladmose	EN	AL		On rotten wood along rivers or water falls. Only known occurrences in Oppdal, Sør-Trøndelag.
Molluscs					
<i>Vertigo angustior</i>	Smal knøttsnegl	NT	AT, B		In Norway the species has its habitats in calcareous-rich fens and humid grasslands, or open swamp forests, partly in relatively open to semi-open slopes in broadleaved deciduous forests on screes, and on calcareous dry hills. In Norway the species is found on 9-10 sites in the South-Eastern parts, and one site in Sogn og Fjordane.
<i>Vertigo genesii</i>	Kalkkildknøttsnegl	NT	AL, AT		In Norway the species is associated with open calcareous-rich fens with springs, also in alpine areas. Discovered on 30 sites in the Central and Northern parts of Norway.
<i>Vertigo geyeri</i>	Rikmyrknøttsnegl	VU	AL, B		In Norway the species is mainly found in calcareous-rich areas in South-Eastern Norway (9 sites), and one finding in Finnmark. The species is strongly attached to open calcareous-rich fens, humid grasslands and springs.
<i>Margaritifera margaritifera</i>	Elvemusling	VU	AT, AL, B, AR?		Watercourses all over Norway. Has its centre in South-Eastern Norway and Central Norway. Less common in Troms and Finnmark, and has disappeared from many places in the southernmost parts of Norway.
Arthropods					
<i>Leucorrhinia pectoralis</i>	Stor torvlibelle	VU	AT, B		In the Southern and South-Eastern in Norway (Østfold, Akershus, Hedmark, Aust-Agder). The habitat is medium dystrophic ponds in the lowlands.
<i>Cucujus cinnaberinus</i>	Sinoberbille	VU	AT, B		Old deciduous forests, in particular Aspen forests. In recent years the species is found in old aspen stands in Osloomarka, Lørenskog (Akershus), Drangedal (Telemark) and Froland (Aust-Agder). It is also observed in Vestfold, totally appx. 7 sites.
<i>Dytiscus latissimus</i>	Kjempevannkalv		B		Norway's largest water beetle. Rare. Prefers somewhat larger lakes than the other <i>Dytiscus</i> species. Located in inner parts of South-Eastern Norway.
<i>Graphoderus bilineatus</i>	Vannkalv-art	VU	B		Only findings from South-Eastern Norway: two sites in Østfold and Frysjøen, Hedmark.

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<i>Osmoderma eremita</i> (=O.coriaceum?)	Eremitten	RE			Old broadleaved deciduous forests. Extinct.
<i>Stephanopachys linearis</i>	Hettebille-art	EN	B		Associated with burnt forests. At present only known from a recent finding in Pasvik (Finnmark), but may have been overlooked. Previously known also from Akershus and Hedmark.
<i>Stephanopachys substriatus</i>	Hettebille-art	EN	AL, B		Associated with burnt forests. The species has not been seen in Norway in recent years, except one finding in Fokstummyra, Oppland. It has declined strongly in Sweden, but it is considered that Norway still may have small populations left.
<i>Agriades glandon aquilo</i>	Polarblåvinge		AL, AR		On shale screes in Northern Norway.
<i>Clossiana improba</i> (=Boloria improba)	Dvergperlemorvinge	NT	AL		The species lives on low-growing species of Salix. Habitats are slopes facing west in alpine areas above the tree limit, where the host plants form mats on the gravel. In Norway the species is known from four sites in inner parts of Troms.
<i>Erebia (medusa) polaris</i> - Considered to be a separate species in Norway	Polarringvinge		AL		Widely distributed in Finnmark where it is found on grass meadows and slopes in the lowland.
<i>Hesperia comma catena</i>	Kommasmyster		AL		The subspecies is found in alpine areas and in Troms and Finnmark. Alpine meadows. In the North also along flower-rich stream sides and in birch forest clearances.
Fish					
<i>Lampetra fluviatilis</i>	Elvenøyeye		AT, B	#	Brackish waters and estuaries. Swimming up rivers and streams in the summer. Along the Norwegian coast from the Swedish border in the south and up to Bergen and the inland rivers.
<i>Lampetra planeri</i>	Bekkenøyeye		AT, B	#	Lives in streams and upper parts of rivers. Not above the coniferous forest region. Watercourses from the Swedish border in the south and north to Hardanger, Hordaland.
<i>Petromyzon marinus</i>	Havniøyeye		AL, AR, AT, B	#	Spawns in rivers in spring/summer. Widespread along the entire Norwegian coast and the rivers inwards.
<i>Salmo salar</i>	Laks		AL, AR, AT, B	#	Applies only to freshwater localities. Watercourses throughout Norway. Populations may be threatened. The non-anadromic populations of "Bleke" and "Namsblank" are considered to be critically endangered (CR).
<i>Aspius aspius</i>	Asp	VU	B	#	In rivers with moderate currents and in large lakes. Lower parts of the Glomma Watercourse, limited to Øyeren up to Bingsfossen and lower parts of Leirelva and Nitelva.
<i>Alosa alosa</i>	Maisild			#	Occurs sporadically in Norway. Not relevant here.
<i>Alosa fallax</i>	Stamsild			#	Occurs sporadically in Norway. Not relevant here.
<i>Cottus gobio</i>	Hvitfinnet steinulke	NT	AL, B	#	Lakes and watercourses in Norway: Store Le Watercourse (1490 Ha border watercourse shared with Sweden) and lower parts of the Halden Watercourse, Østfold. On the Norwegian side of the Store Le Watercourse it was discovered in 1968, where it earlier had been established on the Swedish side. The species may also occur in three lesser lakes north of Store Le. In the Halden Watercourse the species only occurs in Femsjøen (1060 Ha) in the lowest parts. The species has recently been introduced to the Tana Watercourse, Finnmark, where it was first verified in the tributans of Utsjoki on the Finnish side of the watercourse in 1979.

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Amphibians					
<i>Triturus cristatus</i>	Storsalamander	VU		#	Stationary water in lakes and ponds with rich plant growth, preferably without fish populations. South-Eastern Norway and spread along the coast up to the Trondheims fjord. Particularly strong populations around the Oslo fjord, outer parts of Hardanger and Central Norway.
Birds					
<i>Gavia immer</i>	Islom		AL, AR, AT		Winters along the Norwegian coast, mainly Northern Norway, Trøndelag and Western Norway. Winter population estimated to 1000-2000 individuals. Has been breeding sporadically on Svalbard and Bear Island, and breeding population is not considered to be relevant here.
<i>Gavia adamsii</i>	Gulnebbloom		AL, AR, AT		Likewise <i>Gavia immer</i> , but in smaller numbers. No breeding known. Winter population estimated to app. 1000 ind.
<i>Gavia arctica</i>	Storlom	VU	AL, AR, AT, B		Normally attached to large oligotrophic lakes, but may also breed near smaller lakes. Scattered breeding through the whole of Norway. Stable in the north, but declining in Western Norway. Norwegian breeding population 5000-10000 pairs.
<i>Gavia stellata</i>	Smålom		AL, AR, AT, B		Likely to breed at the coast of islands and islets with freshwater, in inner parts of Norway in association with small ponds and groups of ponds on larger mires or wet forests. Scattered breeding through most of Norway, but most common to the north. Norwegian breeding population 2000-5000 pairs. Common breeder also in Svalbard (500-1000 pairs). Winters along the Norwegian coast (2000-5000 ind.).
<i>Podiceps auritus</i>	Horndykker	EN	AL, AT, B		Small lakes or parts of lakes with rich, not too tall vegetation. Scattered in inner parts of South-Eastern Norway, most common from Trøndelag and north to Finnmark. Norwegian breeding population 1000-1500 pairs. The main population is found in northern Nordland and Troms. Winters along the Norwegian coast with an estimated winter population on 500-1000 ind. The largest concentrations are along the coastlines of Vest-Agder-Rogaland and Møre-Trøndelag.
<i>Hydrobates pelagicus</i>	Havsvale		AR, AT	#	Breeds in colonies on grass-covered islands at the outer coast, only exceptionally on the mainland. Mainly distributed from Trøndelag to Finnmark, and northern parts of Western Norway. Norwegian breeding population 1000-10000 pairs.
<i>Oceanodroma leucorhoa</i>	Stormsvale	NT	AR, AT	#	Breeds only in colonies on oceanic islands with some distance to the mainland. Known from Sklinna, Værøy, Røst and Hornøya. Only confirmed breeding on Røst, Nordland. Norwegian breeding population 100-1000 pairs.
<i>Cygnus cygnus</i>	Sangsvane	NT	AL, AT, B	#	Breeds mainly in connection with smaller lakes in the forest landscape or in coastal areas in the Salix belt. Largest population in inner parts of Finnmark, otherwise spread down to Hedmark. Norwegian breeding population 200-400 pairs. Larger wintering population with many important sites in Southern Norway (5000-8000 ind.).
<i>Anser erythropus</i>	Dverggås	CR	AL		In previous years a common breeding bird in alpine areas from Nordland to Finnmark. Today restricted to Finnmark where only a few pairs remain. Norwegian population 25-45 pairs. A few important staging sites in Finnmark.
<i>Branta leucopsis</i>	Hvitkinggås		AR, AT (B)		A unique Svalbard population which mainly breeds along the west coast of Spitsbergen. Important spring staging sites at the coast of Helgeland, Nordland. Winter population (Scotland) with 27.000 ind. (2005). An additional Oslofjord population originates from introductions in recent years (70 pairs).
<i>Mergus albellus</i>	Lappfiskand	EN	AL, AT, B		Breeds in hollow trees nearby calm rivers, watercourses and smaller lakes. Only in the eastern parts of Finnmark (10-20 pairs). Winters in small numbers along the Norwegian coast.

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<i>Aquila chrysaetos</i>	Kongeørn	NT	AL, AT, B, AR?		Mainly attached to alpine areas and sub-alpine forests, with centre in Southern Norway, Trøndelag and Nordland. Norwegian breeding population 800-1000 pairs.
<i>Circus aeruginosus</i>	Sivhauk	VU	AT, B		Breeds in connection with wetlands in the lowland with lush vegetation. Known to breed at a few sites in the southern-most of Norway (5-10 pairs).
<i>Circus cyaneus</i>	Myrhauk	VU	AL, AT, B		Breeds in marsh and heath lands with <i>Salix</i> in alpine areas, and in open alpine forests. Mainly in central parts of Southern Norway. Norwegian breeding population 50-250 pairs.
<i>Haliaeetus albicilla</i>	Havørn		AL, AR, AT, B		Breeds along the Norwegian coast from Rogaland and northwards through Finnmark. Some places it breeds inland in connection to larger watercourses. Norway holds the main part of the world population. Norwegian breeding population 1600-1800 pairs.
<i>Pernis apivorus</i>	Vepsevåk	EN	AT, B		Breeds in older coniferous, mixed and deciduous forests, preferably in mosaic landscape. Southern parts of South-Eastern Norway, and Agder. Norwegian breeding population 500-1000 pairs.
<i>Pandion haliaetus</i>	Fiskeørn	NT	AL, AT, B		Breeds by larger forest lakes with tree covered islands and islets. Southern and South-Eastern Norway, inner parts of Trøndelag and Finnmark. Norwegian breeding population 150-200 pairs.
<i>Falco columbarius</i>	Dvergfalk		AL, AR, AT, B	#	The most distributed bird of prey in Norway. The breeding range stretches from coastal to high alpine areas. It demands open hunting areas and is therefore not common in continuous coniferous forests in South-Eastern Norway. Norwegian breeding population 3000-8000 pairs.
<i>Falco peregrinus</i>	Vandrefalk	NT	AL, AR, AT, B		Breeds in steep mountain hills, especially in connection to seabird colonies, wetlands and lakes. Breeds primarily in coastal areas, all over Norway. Norwegian breeding population 350-500 pairs.
<i>Falco rusticolus</i>	Jaktfalk	NT	AL, AR, AT		Breeds mainly in alpine areas, but may also breed along the coast in connection to seabird areas (Troms and Finnmark). Spread through the whole of Norway. Norwegian breeding population 500-700 pairs.
<i>Bonasa bonasia</i>	Jerpe		AL, AT, B		Dense spruce forests with high productivity and rich deciduous elements. Often in wet depressions and swamp forests. Main distribution in South-Eastern Norway and in Trøndelag. Norwegian breeding population 10.000-40.000 pairs.
<i>Tetrao tetrix</i>	Orrfugl		AL, AT, B		Mainly coniferous and mixed forests, but also pure deciduous forests toward alpine and coastal areas. The entire Southern Norway and up to Northern Troms, and Eastern Finnmark. Norwegian breeding population 100.000-200.000 pairs.
<i>Tetrao urogallus</i>	Storfugl		AL, AT, B		Attached to older coniferous mixed forests with larger proportions of Pine. Common throughout Southern Norway, more scattered and local in Northern Norway. Norwegian breeding population 50.000-100.000 pairs.
<i>Crex crex</i>	Åkerrikse	CR	AT, B (AL?)		Lush cultivated habitats, and wet meadows and sedge swamps by sea and freshwater. In South-Eastern Norway and coastal areas to Nordland. Norwegian breeding population 20-40 pairs.
<i>Porzana porzana</i>	Myrrikse	EN	AT, B		Nutrient-rich mires, swamps and small ponds, preferably by freshwater. Status in Norway is uncertain and unstable. Breeding in South-Eastern Norway, Agder-Rogaland, Møre og Romsdal, Trøndelag and Nordland. Norwegian breeding population 30-100 pairs.
<i>Grus grus</i>	Trane		AL, AT, B		Breeds mainly in mires and bogs in forested areas in South-Eastern Norway and in Trøndelag. Small breeding population in Pasvik, Finnmark. Expanding. Norwegian breeding population 500-750 pairs

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<i>Charadrius morinellus</i>	Boltit		AL, AT, B		Breeds in highest numbers in the central alpine range in Southern Norway, south to Setesdalsheiene. In some mountain areas in Nordland, while in Troms and Finnmark also towards the coast. Norwegian breeding population 3.000-15.000 pairs.
<i>Pluvialis apricaria</i>	Heilo	LC/EN	AL, AR, AT, B	#	Breeds mainly in mountains in Southern Norway, but also in heaths in Rogaland and along the coast from Møre northwards. Common in alpine and coastal areas in the entire Northern Norway, and in Finnmark it may breed in clearances in birch forests. Norwegian breeding population 3.000-15.000 pairs. Breeds annually at the Western coast of Spitsbergen with a small population (1-10 pairs).
<i>Gallinago media</i>	Dobbeltbekkasin	NT	AL, AT, B		Have its preferences to rich fens and bedrock with elements of Salix scrub. Breeds in small numbers in wet areas in the Birch and Salix region in the Central and Eastern parts of Southern Norway and Trøndelag, and Nordland. Norwegian breeding population 5.000-10.000 pairs.
<i>Limosa lapponica</i>	Lappspove		AL, AT		Breeds in mires surrounded by open birch forests. Breeds in Norway only in Finnmark with its largest numbers on the Finnmark Plains. Staging sites in spring and autumn migration along the entire coast. Norwegian breeding population 1000-3000 pairs.
<i>Philomachus pugnax</i>	Brushane	DD	AL, AR, AT, B		Most numerous as breeding bird in the Northern parts of Norway, but breeds relatively commonly in the alpine areas in Southern Norway, also with some smaller coastal populations. The breeding habitat in alpine areas is preferably sedge and grass mires in the birch region, in the lowland mires and salt meadows. Population decline of uncertain scale in recent years. Norwegian breeding population 5.000-10.000 pairs.
<i>Tringa glareola</i>	Grønnstilk		AL, AR, AT, B		Widely distributed in the inland, especially the Birch and Salix region, but also in coniferous forests. Attached to mires preferably scarcely forested. Breeds throughout the whole of Norway, but most common in South-Eastern Norway, Eastern parts of Trøndelag and Finnmark. Norwegian breeding population 20.000-40.000 pairs.
<i>Recurvirostra avosetta</i>	Avosett				Only known as a sporadical breeder in Jæren, Rogaland in Norway. Considered not to have a sufficiently stable status to be relevant here.
<i>Phalaropus lobatus</i>	Svømmesnipe	LC/VU	AL, AR, AT, B		Breeds in Norway in the alpine region from Southern Norway to Finnmark. In Northern Norway also by the coast. The most important habitats are small lakes and mire ponds in alpine areas. Norwegian breeding population 20.000-40.000 pairs. Small breeding population at the west coast of Spitsbergen and on Bear Island (10-100 pairs).
<i>Phalaropus fulicarius</i>	Polarsvømmesnipe	VU	AR		Breeds scattered over the entire Svalbard, but in largest numbers on Spitsbergen. Estimated breeding population is 200-1000 pairs. Habitat on lush tundra in mires surrounding small ponds.
<i>Sterna hirundo</i>	Makrellterne	VU	AL, AR, AT, B		Distributed along the entire coast from the Swedish border in the South to Eastern Finnmark. Breeds many places by inland freshwaters. Largest numbers in Southern Norway. Obvious decline in Southern Norway, but probably more stable populations in Northern Norway. Norwegian breeding population 4.000-10.000 pairs.
<i>Sterna paradisaea</i>	Rødnebbterne		AL, AR, AT, B		Breeds along the entire Norwegian coast, most common from Northern Rogaland to Finnmark. Breeds also inland. Norwegian breeding population 4.000-10.000 pairs. Common breeder all over Svalbard (10.000 pairs).
<i>Sterna sandvicensis</i>	Splitterne				Only found breeding in Lista, Vest-Agder and Jæren, Rogaland. It is not considered to be a stable breeding species in Norway and is not relevant here.

Scientific name	Norwegian name	Norwegian Red List 2006**	Biogeographical region*	Only parts of Europe	Comments
<i>Sterna albifrons</i>	Dvergterne				Has been recorded breeding at Store Sletter, Østfold since 1992. It is not considered to be a stable breeding species in Norway and is not relevant here.
<i>Pagophila eburnea</i>	Ismåke	EN	AR		High arctic species which breeds in a few smaller colonies in steep mountains close to the coast or on inland nunataks. Most colonies found in the Eastern parts of Svalbard (200-750 pairs).
<i>Aegolius funereus</i>	Perleugle		AL, AT, B		Breeds in coniferous forests, exceptionally in the birch region. It is found throughout the most of Norway, but is scarce in Western Norway and Finnmark. Norwegian breeding population 2.000-10.000 pairs.
<i>Asio flammeus</i>	Jordugle		AL, AT, B		Breeds over large parts of Norway with exceptions of the most South-Eastern parts and Hordaland. Traditional habitats in Norway are relatively rich fens and mires in alpine coniferous forests, in the Birch region and in lower parts of the Salix region, along with coastal heaths. It seems to have its centre in the central mountain range from Valdres via Dovrefjell to Sylane. Norwegian breeding population 1.000-10.000 pairs.
<i>Bubo bubo</i>	Hubro	EN	AL, AT, B		Scattered distribution throughout the entire Norway, in the cultural landscape and forested areas up to the timber line, from Agder to Troms. Most numerous in coastal areas from Vest-Agder to Nordland. The inland population in South-Eastern Norway seems to have been increasing slowly, while there is reported considerable decline in parts of the coast and in the inlands of the Central and Northern Norway. Norwegian breeding population app.1.000 pairs.
<i>Glaucidium passerinum</i>	Spurveugle		AL, AT, B		Main distribution in South-Eastern Norway and northwards through Nord-Trøndelag. Breeds from the coast and up to the coniferous timber line, more scarcely in Northern Norway. Most dense populations found in mixed forests with large shares of Aspen and other deciduous trees, usually with a mosaic with cultural landscape. Norwegian breeding population 2000-6000 pairs.
<i>Nyctea (Bubo) scandiaca</i>	Snøugle	VU	AL, AR		Appears nomadically and is found breeding on high alpine plains from Southern Norway to Troms and Finnmark. Today most regular in the northernmost counties. Norwegian breeding population 0-10 pairs.
<i>Strix uralensis</i>	Slagugle	VU	B (AL?)		Prefers coniferous forests and lush swamp and mire forests in a mosaic with larger mires. Only in Hedmark, in the bordering areas towards Sweden. Norwegian breeding population 1-12 pairs.
<i>Strix nebulosa</i>	Lappugle	VU	AL, B		Old large-growth forests, alternating with open mires or fields. It is only regular in Pasvik, Finnmark, with single findings in inner Troms and Hedmark. The species is strongly fluctuating and exists in Norway only in small numbers. Norwegian breeding population 0-10 pairs.
<i>Surnia ulula</i>	Haukugle		AL, AT, B		Breeds in the Birch region and alpine coniferous forests all over Norway, most common in Northern Norway and most scarce in Western Norway. Norwegian breeding population 0-10 pairs.
<i>Caprimulgus europaeus</i>	Nattravn	VU	AT, B		Attached to dry open landscapes, often hilly forested landscape with rocks and hillcrests, covered by open shrubby Pine forest. Main distribution from outer parts of Telemark, around the Oslo fjord and through Østfold. More scarce in inner parts of South-Eastern Norway and along the coast to Rogaland. Norwegian breeding population 140-400 pairs.
<i>Alcedo atthis</i>	Isfugl				Unstable and sporadic breeding with some findings in South-Eastern Norway. It is not considered to be a stable breeding species in Norway and is not relevant here.
<i>Dendrocopos leucotos</i>	Hvitryggspett	NT	AL, AT, B		Prefers steep deciduous or mixed forest slopes exposed against south, usually with elements of old Birch, Alder or Aspen. Most common in the Southernmost and Western Norway. Smaller numbers in South-Eastern Norway and from Møre to Trøndelag. Norwegian breeding population 1700-1800 pairs.

Scientific name	Norwegian name	Norwegian Red List 2006**	Biogeographical region*	Only parts of Europe	Comments
<i>Dryocopus martius</i>	Svartspett		AL, AT, B		Main distribution in South-Eastern Norway and southwards to Lindesnes, Vest-Agder. Occurs more scattered in Central Norway. Habitats in coniferous and mixed forests and depends of a certain density of dying and dead trees or stumps. Norwegian breeding population 2000-4000 pairs.
<i>Picoides tridactylus</i>	Tretåspett	NT	AL, AT, B		Breeds relatively scarcely in eastern parts of Southern Norway. Relatively common from Trøndelag and northwards. Typical bird of the coniferous forests which prefers old Spruce forest with dry trees. In alpine areas and in Northern Norway regular in Pine forests and mixed forests of Pine and Birch. Norwegian breeding population 3000-6000 pairs.
<i>Picus canus</i>	Gråspett	NT	AL, AT, B		Deciduous and Pine forests up to the tree limit, usually in more open forests. Its centre is along the Western coast up through Trøndelag. Especially in the coastal pine forests. Norwegian breeding population 2000-4000 pairs.
<i>Lullula arborea</i>	Trelerke		AT, B		Prefers poor open ground with rocks, dry open Pine forests and woodlands with a certain agricultural activity and grazing. Breeds only around the Oslo fjord, most findings in Østfold. Norwegian breeding population 50-200 pairs.
<i>Lanius collurio</i>	Tornskate	VU	AL, AT, B		The distribution in Norway is limited to the South-Eastern Norway, the Agder Counties and Rogaland. Originally attached to herb and shrub rich cultural landscapes like grazing meadows and enclosed pastures. Today it breeds also in clear-cuttings and newly planted forests in coniferous forests. Norwegian breeding population 1000-5000 pairs.
<i>Luscinia svecica</i>	Blåstrupe		AL, AT, B		Typical in alpine Birch forest slopes and Salix shrubs along lower alpine wetlands. Also in forested vegetation with heather as well as moist types. In northern parts of Norway it is not unusual in Salix shrubs at the coast. Norwegian breeding population 500.000-1 mill. pairs.
<i>Sylvia nisoria</i>	Hauksanger	CR	AT, B		It prefers densely grown Rose Hip, Blackthorn and Juniper bushes in pure shrubs near the coast. Outermost parts of the Oslofjord down to Jomfruland, Telemark. Norwegian breeding population 10-20 pairs.
<i>Ficedula parva</i>	Dvergfluesnapper				Verified breeding twice in Norway (Østfold and Hedmark). It is not considered to be a stable breeding species in Norway and is not relevant here.
<i>Emberiza hortulana</i>	Hortulan	CR	B		Traditionally attached to cultural fields with large, open, dry and sun-exposed areas influenced by domestic grazing. It also uses burnt forests. Today it is scattered only in South-Eastern Norway. Norwegian breeding population app. 100 pairs.
Mammals					
<i>Barbastellus barbastellus</i>	Bredøreflaggermus	DD	B		The species occurrence in Norway today is uncertain. Only four verified findings exist, all single individuals. The findings are from the period 1896-1949 and are made in the area from Oslo to Drammen, Buskerud.
<i>Castor fiber</i>	Bever		AL, AT, B	#	In forested landscape in connection with watercourses. The centre of the Norwegian population is found in Agder and South-Eastern Norway. Locally in South-Western Norway, Central Norway and Nordland. The population in Norway is estimated to be at least 50.000 ind.
<i>Alopex lagopus</i>	Fjellrev	CR/LC	AL, AR	#	Occurs scattered in the alpine areas in Northern Norway and Nord-Trøndelag (app. 50 ind.). Small occurrences with an uncertain status in Southern Norway. Common on Svalbard, where it is most numerous in connection to bird colonies and larger reindeer populations.
<i>Canis lupus</i>	Ulv	CR	AL, B	#	Appears in South-Eastern Norway along the Swedish border. In the winter of 2004-05 the registrations were 22-24 wolves in Norway and 24-26 wolves with habitats in both Norway and Sweden.

Scientific name	Norwegian name	Norwegian Red List 2006**	Biogeographical region*	Only parts of Europe	Comments
<i>Ursus arctos</i>	Brunbjørn	EN	AL, AT, B	#	Its present distribution follows alpine forested areas along the borders of Sweden and Finland, from Hedmark to Nordland, and inner Troms and Finnmark. In the period of 1998-2002 the number of adult female bears in Norway was estimated to be 6-12, divided into five separated areas, with the highest numbers (2.6-4.2) in Pasvik.
<i>Ursus maritimus</i>	Isbjørn	VU	AR		Common all over Svalbard. It follows the ice edge and is most common in northern and eastern areas. The population size of Polar bears around Svalbard was in 2004 estimated to app. 3000 (2299-4116) individuals.
<i>Gulo gulo</i>	Jerv	EN	AL, AT, B	#	Associated with high alpine areas and mountain forests. Its present distribution follows the border areas from Sør-Trøndelag to Finnmark, with a centre in Troms. Southernmost regular reproduction area in Dovre-Rondane. The Wolverine population was estimated to a minimum of 330 adult individuals as an average through the period of 2003-2005.
<i>Lutra lutra</i>	Oter	VU	AL, AR, AT, B		Lives both in connection to freshwater, brackish waters and seawater. Most common in coastal areas from the Trondheimsfjord and northwards. More scattered in Western Norway and inner parts of Southern Norway.
<i>Felis (Lynx) lynx</i>	Gaupe	VU	AL, AT, B	#	In small numbers in the coniferous forest areas in Southern Norway (south and east). More common in Trøndelag, Nordland, Troms and parts of Finnmark. The Norwegian Lynx population holds just over 300 individuals.
<i>Odobenus rosmarus</i>	Hvalross	VU	AR		Scattered on Svalbard. During summer most common north of Spitsbergen and Nordaustlandet, by Kvitøya and south of Edgeøya. Migrates in the winter. The most recent population estimate from the early 1990s is at least 2000 individuals and includes Franz Joseph's Land in Russia.
<i>Halichoerus grypus</i>	Havert	NT	AL, AR, AT	#	Coastal seal which lives in the outermost coasts. Distributed from Trøndelag and northwards, also with a population in Rogaland. Surveys in 1994-1998 and 2001-2003 indicate an increase in minimum estimates from 4400 to 5000 individuals.
<i>Phoca vitulina</i>	Steinkobbe	VU/VU	AL, AR, AT, B	#	Common along the entire coast of Norway. Found in the fjords and may also be seen in rivers. Surveys from 1994-1998 and 2003-2005 indicate a decrease in minimum estimate from 7700 to 5800 individuals. A small population has also been established on Svalbard by Prins Karl's Forland. This population is less than 1000 individuals, apparently stable and isolated by geographical distances, and the northernmost population of this species in the world.
<i>Tursiops truncatus</i>	Tumler			#	Rare visitor in Norwegian waters. Mainly outside Western Norway and the Skagerrak coast. No stable occurrence and it is not considered to be relevant here.
<i>Phocaena phocaena</i>	Nise		AL, AR, AT, B	#	Occurs in fjords as well as far out in the ocean along the entire Norwegian coast, north to Bear Island and Svalbard. Numerous. Population estimate is 94.000 individuals in Norwegian waters.

* The four regions which are relevant for Norway are: AL-Alpine, AR-Arctic, AT-Atlantic and B-Boreal.

** For some species there is two Red List categories because of a separate Red list for Svalbard that may give different status here than Mainland Norway. For some species also considerations regarding subspecies are included.

Appendix II - Norwegian Natural Habitats listed in Emerald Network (res.4-1996)

Code	Name	Corresponding Norwegian Natural Habitats*	Biogeographical Regions	Natura 2000 Code	Natura 2000 Type	Comments
Coastal and Halophytic Communities						
11.22	Sublittoral soft seabeds	"Zostera Meadows and other Submarine Meadows", "Oyster Beds", "Larger Scallop Beds", "Sandbanks of Shells?"	AL, AR, AT, B	(1110)	Is included in "Sandbanks which are slightly covered by sea water all the time"	Not used as a mapping unit in Norway, but some of our Norwegian natural habitats could be a part of this. The habitat as defined in the Habitats Directive should be used since this has a more distinct definition. Large parts of the Norwegian coast could be included in the Emerald definition.
11.24	Sublittoral rocky seabeds and kelp forest	"Larger Kelp Forests"	AL, AR, AT, B	(1170, 1180)	Is partly included in "Reefs"	Here the focus is on kelp forests and submarine rock structures created by leaking gases. For our part larger kelp forests would be the most relevant to include in the Emerald network. Distribution all along the Norwegian coast with the largest occurrences outside Central Norway.
11.25	Sublittoral organogenic concretions	"Coral Reefs" and "Maerl Beds"	AT, B, AL?	(1170)	Is partly included in "Reefs"	Different submarine communities are described within this habitat in different marine regions in Europe. It should be considered if this is to be included in the more general type "Reefs" used in Natura 2000. Many known coldwater coral reefs are known in Norwegian waters, some of them have also been protected in the later years.
11.26	Sublittoral cave communities	-	AT	(8330)	Included in "Submerged or partially submerged sea caves"	Not given any particular focus in Norway. It is not included in our national mapping of Natural Habitats. See also Habitat 12.7. In Natura 2000 these are merged into the type "Submerged or partially submerged sea caves" (8330).
11.27	Soft sediment littoral communities	"Soft Sediment Littoral Areas", "Estuaries"	AL, AR, AT, B	(1160, 1140, 1150, 1130)	Included or overlap with "Large shallow inlets and bays", "Mudflats and sandflats not covered by seawater at low tide", "Estuaries" and "Coastal Lagoons".	Defined from algae and invertebrate communities on soft sediments in the tidal zone. See also Habitat 14. It could be included in several habitats in the Natura 2000. Other, more directly related Habitats will be given priority before this one.
11.3	Sea-grass meadows	"Zostera Meadows and other Submarine Meadows"	AL, AT, B	(1140, 1160)	Included in "Mudflats and sandflats not covered by seawater at low tide" and "Large shallow inlets and bays", and others?	This Habitat seems to have a somewhat unclear definition in relation to Habitat 11.22. In its interpretation it might be used on sea-grass meadows where the substrate is not considered (?). In Norway Sea-grass meadows with Zostera marina (11101) and Zostera noltii (11102) will be relevant.
11.42	Marine spike-rush beds	"Zostera Meadows and other Submarine Meadows"	AT, B, AL?	-	-	Specific communities which often will be included in wider defined Habitats like Estuaries, Coastal Lagoons and Large shallow inlets and bays in Natura 2000. In Norway it is included in Sea-grass meadows through the subtype "Ruppia/Potamogeton meadow" (11103). More specifically this corresponds to the vegetation subtype U2h: Needle spike-rush/dwarf spike-rush from Fremstad (1997), which is considered to be an endangered vegetation type in Norway. Scattered distribution along the Norwegian coast.
12.7	Sea-caves	May be included in "Cave/Mine"	AT	8330	Overlaps with "Submerged or partially submerged sea caves"	Discussed under Habitat 11.26. Sea Caves exist in Norway, but haven't been given priority as a specific Habitat. The subtype Coastal Cave (B0502) could probably be used here. Corresponds directly to Submerged or partially submerged sea caves in Natura 2000.

13.2	Estuaries	"Estuaries"	AL, AR, AT, B	1130	Estuaries	Corresponds relatively well between Emerald and Natura 2000 and Habitats in the Norwegian system. The Norwegian Estuaries may in addition include more terrestrial shore vegetation.	
14	Mud flats and sand flats	"Soft Sediment Littoral Areas"	AL, AR, AT, B	1140	Mudflats and sandflats not covered by seawater at low tide	Corresponds directly to Mudflats and sandflats not covered by seawater at low tide (1140) in Natura 2000. Important in the definition is the absence of vascular plants. The same Habitat type is defined in the Norwegian system as well, with a large coverage along the Norwegian coast, particularly in the central and northern parts.	
15.13	Sea-pearlwort communities	-		(1310)	Is included in "Salicornia and other annuals colonizing mud and sand"	This Habitat is considered to be less relevant for Norway as larger areas with specific Sea-pearlwort communities do not occur in our shores. More common in the Baltic Sea.	
15.32	Atlantic lower schorre communities	Included in "Salt Meadows and Swamps"	AL, AR, AT, B	(1330)	Is included in "Atlantic salt meadows".	Salt meadows dominated by species like <i>Puccinellia maritima</i> , <i>Aster tripolium</i> , <i>Salicornia</i> spp., <i>Glaux maritima</i> and <i>Plantago maritima</i> . The Habitat type Atlantic salt meadows in Natura 2000 corresponds well with the Norwegian habitat type Salt meadows. Corresponding Vegetation types from Fremstad (1997) are U3- Saline and brackish foreshore/pan and U4- Lower and middle salt marsh. Atlantic salt meadows are widely distributed along the Norwegian coast.	
15.33	Atlantic upper schorre communities	Included in "Salt Meadows and Swamps"	AL, AR, AT, B	(1330)	Is included in "Atlantic salt meadows".	Brackish meadows with characteristic species like <i>Eleocharis uniglumis</i> and <i>Armeria maritima</i> . See above. Corresponding Vegetation types from Fremstad (1997) are U5- Upper salt marsh and U7- Brackish salt marsh.	
15.34	Atlantic brackish saltmarsh communities	Included in "Salt Meadows and swamps"	AL, AR, AT, B	(1330)	Is included in "Atlantic salt meadows".	Salt meadows with <i>Spergularia marina</i> , <i>Puccinellia capillaris</i> and <i>Potentilla anserina</i> . See above. Corresponding Vegetation types from Fremstad (1997) are Salt marsh subtype U5c- Red fescue-thrift-common bird's-foot-trefoil and U6- Gravelly shore and brackish gravelly/sandy shore.	
16.2	Dunes	"Sand Dunes"	AL, AR, AT	2110, 2120, 2130, 2140, 2170	Includes "Embryonic shifting dunes", "White dunes", "Grey dunes", "Decalcified fixed dunes with <i>Empetrum nigrum</i> ", "Dunes with <i>Salix repens</i> ssp. <i>argentea</i> ".	This habitat type shows the opposite correlation with Natura 2000 as the Salt meadows. Here the Emerald Network has less detailed classification than Natura 2000, and the Emerald Habitat type corresponds to the Norwegian definition. Sand dunes are distributed all along the Norwegian coast up to the Arctic coast, but the sites are scattered.	
16.3	Humid dune-slacks	Subtype under "Sand Dunes".	AL, AR, AT	2190	Humid dune slacks	This habitat shows a good correlation between Emerald and Natura 2000. In the Norwegian system it corresponds with a subtype under "Sand Dunes": Dune slacks (G0303).	
17.3	Sea kale communities	"Stony and Gravel Banks"	AL, AR, AT, B	1220	Perennial vegetation of stony banks	The naming of this habitat type in Emerald is limiting since the definition includes several varieties with also other species than Sea Kale (<i>Crambe maritima</i>). Correlates directly with the habitat type Perennial vegetation of stony banks in Natura 2000. In the Norwegian system it is included in Stony and gravel banks, with a wide distribution along the Norwegian coast.	
Non-marine Waters							
21	Coastal lagoons	"Lagoons"	AL, AR, AT, B	1150	Coastal lagoons	Good correlation with Coastal Lagoons in Natura 2000 and Lagoons in the Norwegian systems. Many good localities along the Norwegian coast, but not common.	
22.11	Lime-deficient oligotrophic waterbodies	"Freshwater Mud Banks" could be included	AL, AR, AT, B	(3110)	Is included in "Oligotrophic waters containing very few minerals of sandy plains".	This is among the most common freshwater types in Norway. It is not given priority in our mapping programmes.	

22.31	Euro-Siberian perennial amphibious communities	Could be included in several like "Inland Delta", "Freshwater Shallows and Bays", "River Lakes, Flood ponds and Meandering parts of Rivers" and "Eutrophic Lakes".	AL, AR?, AT, B	(3110, 3130)	Is included in "Oligotrophic waters containing very few minerals of sandy plains" and "Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëtto-Nanojuncetea".	The habitat type consists of communities of water plants. Natura 2000 focuses on more complete water bodies with such vegetation and classifies accordingly. In Norway such plant communities are common and occur in several freshwater habitat types, and hence are not given priority in mapping programmes.	
22.321	Dwarf spike-rush communities	"Freshwater Mud Banks"	AT, B	-	-	Not directly described in Natura 2000. In the Norwegian habitat system it forms a rich subtype (E0202) of Freshwater Mud Banks, with specific small plants like <i>Limosella aquatica</i> , <i>Peplis portula</i> and <i>Elatine</i> spp. Mostly distributed in the southern parts of Norway.	
22.3233	Wet ground dwarf herb communities	-	-	-	-	Specific communities with very rare and endangered plant species in wetlands. Not considered to be relevant as a Habitat type in Norway.	
22.414	Bladderwort colonies	-	-	(3150)	May be included in "Natural eutrophic lakes with Magnopotamion or Hydrocharition – type vegetation".	The definition refers to specific Bladderwort communities with their main distribution in Eastern Europe. Not considered to be relevant for Norway.	
22.44	Chandallier algae submerged carpets	Included in "Hard Water Lakes"	AT, B	(3140)	Is included in "Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.". .	This habitat type seems to correspond well to Natura 2000 and the Norwegian habitat type Hard Water Lakes, specifically the subtype Chara Lake (E0701). Not common in Norway, mostly in southern parts of Norway and some parts of northern Norway.	
24.2	River gravel banks	"Large River Banks"	AL, AR, AT, B	-	-	Not directly described in Natura 2000, but may probably overlap with Fen-nosandian natural rivers (3210) and particularly with Alpine rivers and their ligneous vegetation with <i>Myricaria germanica</i> (3230), probably also Alpine rivers and the herbaceous vegetation along their banks (3220) and Alpine rivers and their ligneous vegetation with <i>Salix elaeagnos</i> (3240). In the Norwegian habitat system the Emerald type matches directly. Relatively common along the larger Norwegian rivers.	
Scrub and Grassland							
31.1	European wet heaths	Included in "Coastal Heath"	AT	4010	Norwegian heaths are covered by "Northern Atlantic wet heaths with <i>Erica tetralix</i> ".	Corresponds to Natura 2000. In the Norwegian habitat system it corresponds as the wet subtype (D0703) under Coastal Heath. Along the western coast.	
31.2	European dry heaths	Included in "Coastal Heath"	AT	4030	European dry heaths	Corresponds directly to Natura 2000. In the Norwegian Habitat system it corresponds as the dry subtypes (D0701 and D0702) under Coastal Heath. Along the western coasts.	
35.11	Mat-grass swards	May be included in "Hay Meadows" and "Natural Pastures"	AL, AR, AT, B?	(6230)	Included in "Species-rich Nardus grasslands, on silicious substrates in mountain areas".	Mat-grass meadows are common in Norway and are found both in coastal areas and in mountains. This type does not correspond entirely with Natura 2000 which has a more specific description. Relevant subtypes in the Norwegian habitat system are Damp poor grassland (D0101 and D0401) and Mat-grass/sheep's fescue grassland (D0105 and D0405) under respectively Hay Meadows and Natural Pastures.	

37.2	Eutrophic humid grasslands	May be included in "Hay Meadows" and "Natural Pastures"	AL, AR?, AT, B	(6450)	"Northern boreal alluvial meadows" may be included.	This habitat does not correspond well to Natura 2000. Seems to correspond better to subtypes in the Norwegian habitat system, under Hay Meadows and Natural Pastures, respectively. Matches Vegetation type G12-Damp, medium nutrient-rich grassland in Fremstad (1997). Relatively common in Norway?
37.3	Oligotrophic humid grasslands	May be included in "Natural Pastures"	AL, AR?, AT, B	(6410)	Includes "Molinia meadows on calcareous, peaty or clayey-silt-laden soils".	Common Habitat type in Norway (Fremstad 1997: G1 and G2). In Norway mapping priority is given to managed natural pastures where this habitat type corresponds to the subtypes Damp poor grassland (D0401) and Purple moor-grass grassland (D0402). Treated more specifically within Natura 2000.
Forests						
41.1	Beech forests	Included in "Old-growth Poor Broadleaved Deciduous Forest" and "Rich Broadleaved Deciduous Forest"	AT, B	9110, 9120	Relevant Beech types in Norway are "Luzulo-Fagetum beech forests" and "Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrub layer".	Divided into two habitat types in Natura 2000. In the Norwegian Habitat system these two types correlates to two different subtypes in the habitats Old-growth poor broadleaved deciduous forest; Beech-type (F0202) and Rich broadleaved deciduous forest; Low-herb Beech-type (F0102). Very limited and southern distribution in Norway. Norway holds the northernmost Beech forests in the world.
41.4	Mixed ravine and slope forests	Included in "Rich Broadleaved Deciduous Forest"	AL, AT, B	9180	Tilio-Acerion forests of slopes, screes and ravines	Direct correlation with Natura 2000. In the Norwegian habitat system, it corresponds to the subtype Elm-Lime forest (F0105) under Rich broadleaved deciduous forest. Corresponds to Vegetation type D4 in Fremstad (1997). Mainly in southern Norway up to northern Norway along the coast where the northern limits of these forest types are to be found.
41.5	Acidophilous oak forests	Included in "Old-growth Poor Broadleaved Deciduous Forest"	AT, B	(9190)	Includes "Old acidophilous oak woods with Quercus robur on sandy plains".	In Natura 2000 "Old acidophilous oak woods with Quercus robur on sandy plains" is not defined to Norway. Poor oak forests grow in Norway in more steep terrain on moraine soil, but with similar communities of species. In Emerald this habitat type is more general and includes the Norwegian subtype of Oak forest (F0201) under the habitat type Old poor broadleaved deciduous forest. Limited to the southernmost parts of Norway.
44.1	Riparian willow formations	Included in "Large River Banks"	AL, AT, B	(91E0, 3230, 3240)	May partly be included in "Alluvial forests with Alnus glutinosa and Fraxinus excelsior" and in shrub vegetation along rivers.	This habitat type with its definition in Emerald does not fit in as a forest type. It corresponds, in the Norwegian habitat system, to the subtype Riverbank Shrub (E0403) under Larger River banks. The reason why it's not compatible with habitat types in Natura 2000, may be due to the inclusion of the water body into the definition. Among the described subtypes there is a Myricaria germanica-Hippophaë rhamnoides-type and a Salix alba-fragilis-type, see also the Vegetation type Q3 in Fremstad (1997).
44.2	Boreo-alpine riparian galleries	Included in "Grey Alder-Bird Cherry Forest" and "Rich Swamp Forest"	AT, B	91E0	Includes "Alluvial forests with Alnus glutinosa and Fraxinus excelsior"	In Norway this will mainly concern Grey alder-Bird cherry forests in connection to flooded areas along watercourses, which corresponds to the Norwegian habitat subtype Alluvial forest (F0501). In addition Alder-Beach forest along water-courses could be included (subtype F0602 under Rich Swamp forest). The Emerald type would completely be a part of Alluvial forests with Alnus glutinosa and Fraxinus excelsior in Natura 2000. Along larger rivers all over Norway.
44.3	Middle European stream ash-alder woods	Could be included in "Rich Swamp Forest"	AT, B	91E0	Includes "Alluvial forests with Alnus glutinosa and Fraxinus excelsior"	Southern alluvial forests with high temperature-demanding vegetation (in Norwegian context). The species inventory fits our high temperature-demanding deciduous spring forests, which have a very limited distribution and is considered to be an endangered vegetation type in Norway. Included as a subtype (F0604) in the Norwegian habitat system. The Emerald type would completely be a part of Alluvial forests with Alnus glutinosa and Fraxinus excelsior in Natura 2000.

44.A	Birch and conifer mire woods	May be included in "Old-growth Coniferous Forest", "Intact Lowland and Inland Mire" and "Rich Fens"	AL, AT, B	91D0	Includes "Bog woodland".	Widely defined forest/woodland type which includes both forested bog and poor swamp forests with Birch, Spruce or Pine. Relevant Vegetation types (Fremstad 1997) in Norway would be Poor swamp woodland (E1), Wooded ombrotrophic bog (J1) and Wooded poor fen (K1), probably also Purple moor-grass woodland (A7c). In the Norwegian habitat system this type could be included as a subtype in connection to Old-growth coniferous forest and/or Intact lowland mires. Under Rich fens there is a specific subtype called Rich forested/scrub covered fen (A0501). Beyond this the habitat type is so common in Norway that it's not given priority in any mapping. In Natura 2000 this will mainly overlap with Bog woodland.
Bogs and Marshes						
51.1	Near-natural raised bogs	Included in "Intact Lowland and Inland Mires" and "Coastal Mires"	AL, AT, B	7110	Active raised bogs	Corresponds directly to Active raised bogs in Natura 2000 and the subtypes Well-developed raised bog (A0701) and Atlantic raised bog (A0802) in the Norwegian habitat system. The habitat type is mainly distributed in South-Eastern Norway, along the Western coast and in Central Norway.
52	Blanket bogs	Included in "Coastal Mires"	AL, AT	7130	Blanket bogs	Corresponds directly to Blanket bogs in Natura 2000 and the subtype Well-developed blanket bog (A0801) in the Norwegian habitat system. The habitat type is mainly distributed along the Western coast of Norway.
54.12	Hard water springs	May be included in "Calcareous Alpine Areas"??	AL, AT, B	7220	Petrifying springs with tufa formation (Cratoneurion)	Corresponds directly to Petrifying springs with tufa formation in Natura 2000. In the definition of this type, it is referred to the subtype "Boreo-alpine calcareous springs" with characterising species like tufa mosses (Palustritella), Juncus triglumis, Cratoneuron filicinum, Scopidium revolvens, Scopidium cossonii and Bryum pseudotriquetrum. In the Norwegian habitat system it is focused on Lowland springs and the habitat type is not corresponding. May be covered to some degree by the type Calcareous alpine areas. In Norway this habitat type is mostly distributed in alpine areas and corresponds mainly with the vegetation type Rich spring; subtype Palustritella spring (N2b) in Fremstad (1997).
54.2	Rich fens	"Rich Fens", may also be included in "Hay and Grazed Fens"	AL, AR, AT, B	7230	Alkaline fens	Corresponds directly with Alkaline fens in Natura 2000 and Rich fens in the Norwegian habitat system. In addition richer subtypes of Hay and Grazed fens would be relevant from the Norwegian system. Widely distributed in Norway with largest areas in the Alpine region.
54.3	Arcto-alpine riverine swards	"Large River Banks", partly "Rich Fens"	AL, AR, AT?	(7240)	May include richer types of "Alpine pioneer formations of the Caricion bicoloris-atrofuscae".	Some correlation with the Natura 2000 type Alpine pioneer formations of the Caricion bicoloris-atrofuscae. In Norwegian Vegetation types this type may overlap to some degree with Extremely rich lawn fen (M3) and Rich spring (N2), but the main overlap would be towards Herb and grass-rich alluvial vegetation, especially the alpine subtypes (Q2b and f). In relation to the Norwegian habitat system, Larger River Banks would be most relevant, especially the subtype Herb and Grass Vegetated Banks (E0402). Distributed along alpine rivers with largest areas in Northern Norway.
54.5	Transition mires	May be included in "Intact lowland and inland mire" and "Coastal mire"	AL, AR, AT, B	7140	Transition mires and quaking bogs	Mires formed by an overgrowing phase of ponds, and transforms from minerotrophic to ombrotrophic. Corresponds to "Transition mires and quaking bogs" in Natura 2000. Not used as a specific mapping category in the Norwegian habitat systems. In the Boreal region this habitat type is used for minerotrophic mires which do not form any part of a mire complex, and transition zones between open water and mineral soil. Several vegetation types may be included, most likely different types of carpet/mud bottom fens, in particular intermediate types, and to some degree tall-sedge fens (L4) in Fremstad (1997). May also include Sedge swamps like O3b. Distributed throughout Norway where mire complexes exist.

54.6	White beak-sedge and mud bottom communities	May be included in "Intact Lowland and Inland Mire" and "Coastal Mire"	AT, B	7150	Depressions on peat substrates of the Rhynchosporion	Corresponds directly to the type Depressions on peat substrates of the Rhynchosporion in Natura 2000. Narrowly defined habitat type which is considered to be rare in Central Europe, but not in Norway. This type includes mud bottom communities in many mire complexes making it unsuitable to define as a separate unit. It should therefore be used as an extra dimension in relation to other types of mires. In Norway White beak-sedge (<i>Rhynchospora alba</i>) is most common close to the coast in the Southern and Central parts.
54.8	Aapa mires	May be included in "Intact Lowland and Inland Mire"	AL, B (AT?)	7310	Aapa mires	Corresponds directly to the Aapa mires in Natura 2000. Aapa mires are complexes of mires characterised by string fens and/or sloping fens in the Boreal zones. It is not particularly used as a habitat type in Norway, and it is considered to be relatively common. Mostly in the Alpine and the Boreal regions.
54.9	Palsa mires	"Palsa Mire"	AL, AR	7320	Palsa mires	Corresponds directly to Palsa mires in Natura 2000 and in the Norwegian habitat system. This type demands specific climatic conditions and is only to be found in the northernmost parts of Norway and in eastern parts of the mountain range in Southern Norway.
54.A	Polygon mires	-	AR	-	-	This habitat type is not included in Natura 2000 since it is linked to the Arctic region. This type may occur on Svalbard.
Inland Rocks, Screes and Sands						
65	Caves	"Cave/Mine"	AL, AT, B	8310	Caves not open to the public	Corresponds directly to Natura 2000. Does also correspond to the habitat type Cave/Mine in the Norwegian habitat system, where the focus is on the types functioning as habitat for specific species like Bats and different species of invertebrates.

* Norwegian Habitat types based on the DN Manuals 13 and 19 (Directorate for Nature Management 2006 and 2007)

Appendix III - Norwegian Natural Habitats not directly covered by the Habitats Directive/Natura 2000 and Emerald Network

Habitat type**	Specific for Norway*	Comments
Intact Lowland and Inland Mires	-	Wide and general type relating to size and human impact. Not used as an approach in the European systems.
Woodland Border Scrub	-	Includes several subtypes. Most of these may be included in <i>Juniperus communis</i> formations on heaths or calcareous grasslands (5130) in Natura 2000, compared to what has been nominated from Sweden and Denmark.
Hayed Fens	+/-	Not a specific type within Semi-natural grassland or Bogs, Mires and Fens. May be considered in e.g. Alkaline Fens (7230) and Northern boreal alluvial meadows (6450).
Species-rich Road Embankments	-	Compensation habitat with a focus on herb-rich vegetation which is being cut. Not focused in Natura 2000 or Emerald.
Small Semi-natural Habitats	-	Remaning habitats in an Agricultural landscape. No corresponding approach in Natura 2000 or Emerald. Several different habitat types could however form parts of this.
Large Old Trees	-	No corresponding approach.
Park Landscapes	-	No corresponding approach.
Replacement Habitats	-	No corresponding approach. In many cases a species approach through the networks could be more adequate.
Disturbed Sites	-	No corresponding approach.
Waterfall Spray Zones	+	No corresponding habitats. Waterfalls of Norwegian sizes in oceanic environment could be unique in a European perspective.
Important Courses of Brooks	-	No corresponding approach. Mat probably be included as a River type (3240).
Ponds	-	Natural ponds and small lakes will mainly be included in Natural dystrophic lakes and ponds (3160). Farmland ponds are not considered as a priority habitat in the networks. A species approach would probably be most relevant here.
Calcareous Woodland	+/-	Seems to fall between other habitats. Many of the relevant habitat types are region specific (e.g. Baltic, Caledonian, Central European). Norway's Boreal Calcareous Woodlands with e.g. orchids are not considered specifically.
Stream Crevices	+/-	No corresponding habitats. Could be a part of Fennoscandian herb-rich forests with <i>Picea abies</i> (9050) or Western Taiga (9010). Norway also holds unique habitats of Stream Crevices in Gudbrandsdalen with characteristic plant communities.
Coastal Spruce Forest	+	Unique Natural habitat for Norway internationally. Habitat specific communities of species. Could be characterized as a subtype under Western taiga (9010), but should be separated as a solitary habitat type.
Coastal Pine Forest	+	Similar Forest types exist in Natura 2000, but they are region specific e.g. Caledonian Forests only linked to the United Kingdom. Norwegian Coastal Pine Forests with their subtypes contain species like Bell heather (<i>Erica cinerea</i>), Ivy (<i>Hedera helix</i>), Holly (<i>Ilex aquifolium</i>) and Hazel (<i>Corylus avellana</i>). In addition the Ultrabasic Pine Forests in Møre are not covered by the networks.
Shallow Currents and Strong Tidal Currents	+/-	The Tidal Currents form marine habitats rich in species. Not used in the networks at this stage.
Larger Kelp Forests	+/-	Purely marine habitats which are not much developed in Natura 2000, but they may form a part of Reefs (1170). In Emerald it is covered by Sublittoral rocky seabeds and kelp forest (11.24).
Fjords with Naturally Low Oxygen Level in the Bottom Layer	+	Probably unique for Norway within Europe with our Fjord systems.
Particularly Deep Fjord Areas	+	Probably unique for Norway within Europe with our Fjord systems.
Tidepools	-	Not a specific habitat in the networks, but may be considered within Reefs, as this habitat type is also defined to areas exposed during low tide, but consist of marine communities.
Ice Margin Deposits	+/-?	No corresponding approach.
Oyster Habitats and Larger Scallop Habitats	-	No corresponding approach, but may form parts of more general Seabed habitat types.
Key Sites for Populations of Particular Interest	-	Species based with main focus on marine fish populations. Marine species are not substantially covered by the networks at present.

In addition specific habitat types within the Arctic region will occur: Svalbard, Bear Island and Jan Mayen. These need to be explained specifically.

* Consideration of how unique the Habitats are in a European context (Emerald and Natura 2000):

- + Unique Norwegian habitat according to present lists
- Non-specific Norwegian habitat, distributed generally in Europe
- +/- TMain occurrence in Norway, less distributed in Europe and/or subtypes that may be unique for Norway

** Norwegian Habitat types based on the DN Manuals 13 and 19 (Directorate for Nature Management)

Appendix IV - Norwegian Red List species and subspecies of Vascular Plants that are endemic or limited to Norway in a Pan-European perspective, and will be relevant as new Norwegian additions to Emerald Network

Scientific names	Norwegian names	Red List Status (2006)	Distribution (Municipalities)
<i>Alchemilla semidivisa</i>	Sunnmørsmarikåpe	VU	Stranda, Norddal, Sykkylven (Møre and Romsdal County)
<i>Artemisia norvegica</i>	Norsk malurt	VU	Hjelmeland, Jondal, Follidal, Sunndal, Surnadal, Rindal, Oppdal, Rennebu. Otherwise on two mountains in Scotland and from Northern Ural.
<i>Carex scirpoidea</i>	Grønlandsstarr	VU	Saltdal, Gildeskål, Ballangen. Otherwise in Northern North America, Greenland and Northeast Asia.
<i>Carex stylosa</i>	Griffelstarr	VU	Nordreisa (only collected once in 1934 and not rediscovered). Otherwise on Greenland, in Arctic North America and around the Bering Strait.
<i>Oxytropis deflexa</i> ssp. <i>norvegica</i>	Masimjelt	EN	Two sites in Kautokeino. (The nominate subspecies grows in Central and Northeast Asia, other subspecies occur in North America).
<i>Poa lindebergii</i>	Knutshørapp	VU	Tynset, Follidal, Oppdal
<i>Potentilla hookeriana</i> ssp. <i>chamissonis</i>	Fløgmure	NT	Vågå, Dovre and from Målselv, Storfjord and Lyngen up to Sør-Varanger, Vadsø and Berlevåg. Scattered in Fiord areas on Spitsbergen. Otherwise only in North America and Greenland.
<i>Puccinellia finmarchica</i>	Finnmarkssaltgras	VU	Only known from Neiden – Munkelv in Sør-Varanger.
<i>Sorbus lancifolia</i>	Smalasal	EN	Sogndal and Solund north to Luster and Gulen; Alstahaug and Nesna
<i>Sorbus neglecta</i>	Nordlandsasal	EN	Three populations in Bindal
<i>Sorbus subarranensis</i>	Småasal	NT	From Tokke and Kragerø to Luster and Selje. (Closely related species in the United Kingdom)
<i>Sorbus subpinnata</i>	Grenmarasal	NT	From Lyngdal to Tokke and Nedre Eiker
<i>Sorbus subsimilis</i>	Sørlandsasal	NT	From Lindesnes to Hå, Vindafjord and Karmøy, non-verified findings in Moss, Tvedestrand, Kvinnherad, Os, Hyllestad and Flora
<i>Stellaria hebecalyx</i>	Pomorstjerneblom	CR	Vardø and Sør-Varanger. Otherwise known only from Northern Russia and Ural.
<i>Taraxacum dovrense</i>	Dovreløvetann	NT	Vågå, Lom, Dovre, Lesja and Oppdal
<i>Relevant Red List Species from Svalbard</i>			
<i>Carex lidii</i>	Lidstarr	NT	Scattered in Fiord areas on Spitsbergen and on Edge Island. Only known from Svalbard
<i>Carex marina</i> ssp. <i>pseudolagopina</i>	Buttstarr	VU	Inner parts of Isfjorden, Liefdefjorden. Only on Svalbard and Greenland
<i>Minuartia rossii</i>	Putearve	NT	Relatively common on Svalbard. Otherwise known only from Greenland, Arctic North America and Northeast Asia.
<i>Potentilla insularis</i>	Svalbardmure	NT	Fjord areas on Spitsbergen. Closely related taxa in North America and Greenland.
<i>Puccinellia angustata</i> ssp. <i>palibinii</i>	Kildesaltgras	NT	One site at the Bockfjord on Spitsbergen, otherwise known only from Franz Joseph's Land and Novaja Zemlja
<i>Puccinellia phryganodes</i> ssp. <i>neoarctica</i>	Amerikateppesaltgras	DD	Spitsbergen. Otherwise only from Greenland and Arctic Canada
<i>XPuccinippsia vacillans</i>	Svalbardgras	NT	Scattered on Svalbard. Otherwise known from Novaja Zemlja, Greenland and Northern Canada

Directorate for Nature Management

The Directorate for Nature Management (DN) is the national Agency for Nature conservation, Wildlife management and Outdoor recreation in Norway. DN was established in 1985, as an Agency under the Norwegian Ministry of the Environment.

Authority to manage natural resources is given through a variety of laws and regulations. Apart from its legally specified tasks, DN also has a responsibility to identify, prevent and solve environmental problems through collaboration with, and the provision of advice and information to other authorities and groups of public.



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