The Barents Sea - A sea of opportunities…

…and threats

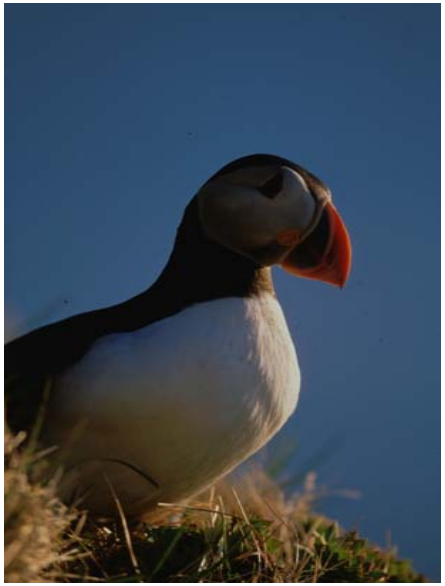
Petroleum activities and fragile nature

A WWF-Norway report. EXECUTIVE SUMMARY

The Barents Sea – A sea of opportunities

The Barents Sea contains one of Europe's last large, clean and relatively undisturbed marine ecosystems. The extremely high primary production of the Barents sea supports a rich biological diversity including some of the world's most numerous colonies of seabirds such as puffin and guillemot, rich seafloor-communities with kelp-forests numerous deep water coral reefs and a unique variety of marine mammals such as walrus, bowhead whales and polar bears.

With the notable exception of intensive commercial fisheries, the Barents Sea is still relatively undamaged by human activities. This area still has a potential for protecting its natural values for the future and to keep and develop sustainable industries based on its natural resources. A clean and well-managed ecosystem is a basic requirement for all future livelihoods along the coast of the Barents Sea.



Puffin
Photo: Lars H. Krempig

Now, the unique values of the Barents Sea are threatened by a new, and potentially extremely damaging activity: Oil and gas development. Harsh climatic conditions and short and simple food webs make this marine ecosystem particularly sensitive to impacts such as pollution from chemicals and oil. A large oil spill would cause dramatic consequences to the wildlife in this area, such as seabirds, mammals and fish-stocks

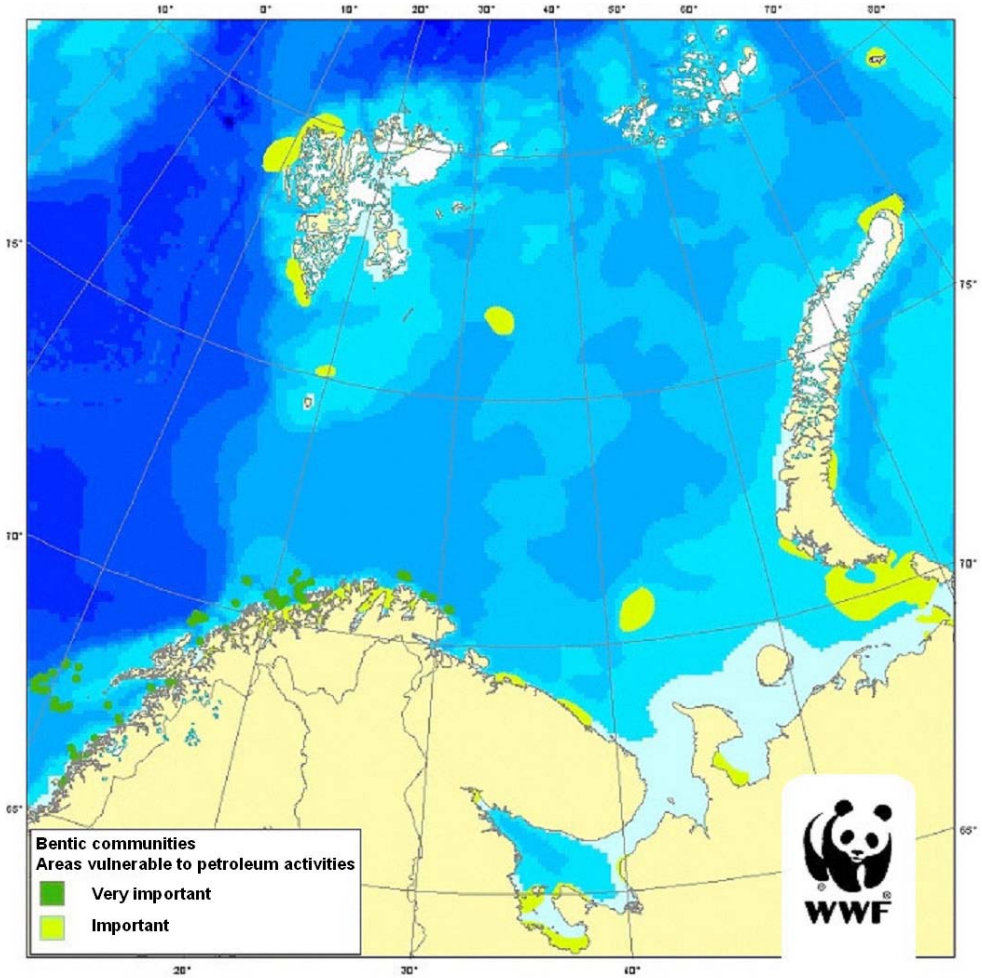
Norwegian-Arctic cod
Photo: Rudolf Svendsen

So far, there is no petroleum-exploration in the Norwegian Barents Sea. One gas field is under development and some oil fields have been found. The petroleum industry is eager to get access to these fossil resources. Before any new petroleum development is allowed in this fragile arctic ecosystem, it is extremely important to practise the "conservation first"-principle. Areas containing natural resources that are most valuable and sensitive to negative effects of oil and gas-operations must be set aside as petroleum-free zones to protect their biodiversity and productivity for the future.

This report presents the distribution of these most valuable and sensitive natural resources in the Barents Sea.

Life on the sea floor – Benthos

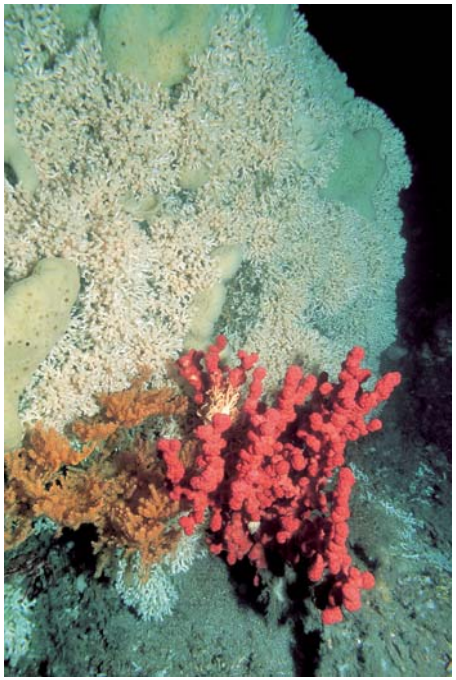
Of all arctic seas, the Barents Sea sustains the highest sea floor biodiversity communities, including the world's largest deep-water coral reef, huge mussel banks and large coastal kelp forests.



Several hundred cold-water coral reefs are found in the Barents Sea. These reefs represent very important spawning and nursing areas for many fish species including important commercial fish species such as redfish, ling and tusk. More than 750 other species have been recorded in these coral areas.

The areas of kelp forests on the coast of Norway and the Kola Peninsula cover thousand of acres. This "marine forest" forms the basis of a rich and diverse wildlife also supplying food and shelter for many fish species, including cod.

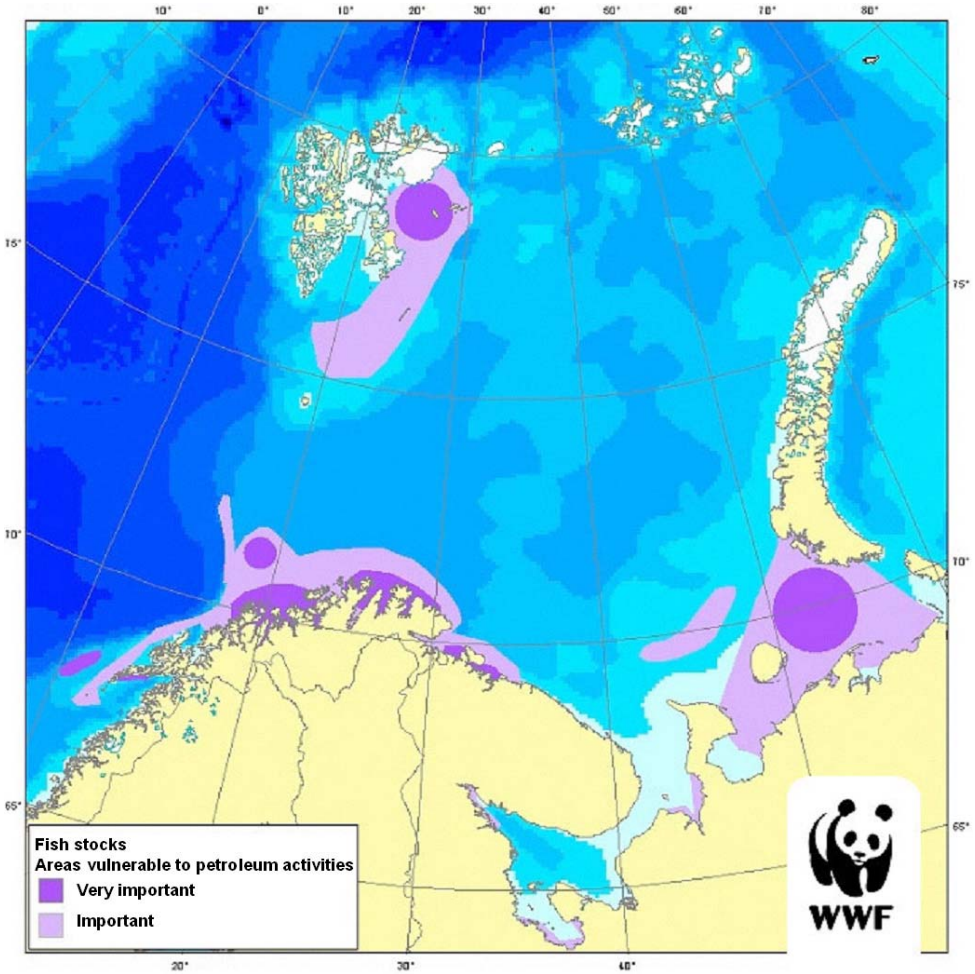
Coral reefs and other seafloor communities are vulnerable to industrial activities. Installations for drilling and production of oil and gas can lead to physical destruction of the bottom communities. However, the major threat comes from discharges of oil, drill cuttings and drilling muds. Many organisms living on the seafloor filtrate nutrients from the seawater, and they will catch pollutants even in low sea water concentrations. Toxic substances will accumulate in the organisms and be transported to the next part of the food web.



Deep-water coral reef
Photo: Erling Svendsen

Life in the seawater – Fish

There is around 150 different fish species in the Barents Sea. Among these are some of the worlds biggest fish stocks, including the Norwegian-Arctic cod, capelin, haddock, saithe and Norwegian spring-spawning herring.



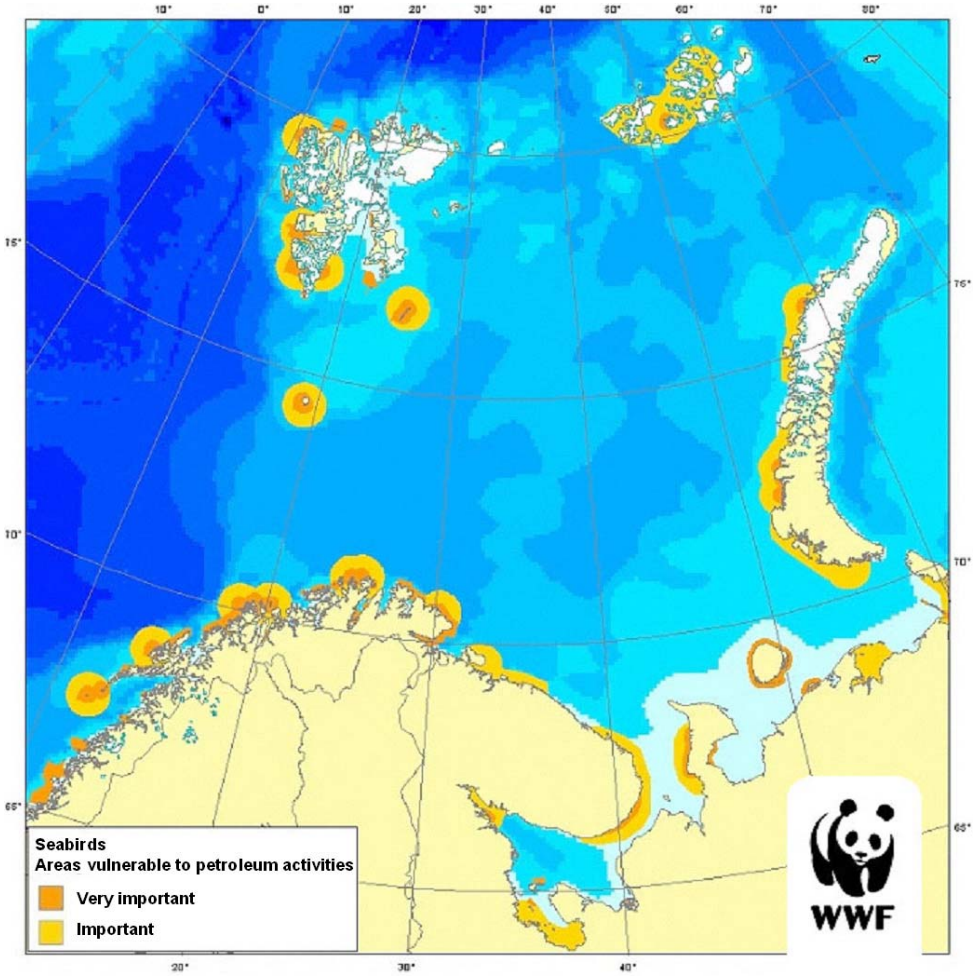
Egg and larvae of cod and herring drift with the currents along the Norwegian coast up to nursing areas in the Barents Sea. Capelin spawns along Norways northernmost coast and is a keystone species in this arctic foodweb, as prey for fish, seabirds and marine mammals.

Fish eggs and larvae are particularly vulnerable to toxic chemicals found in oil. Small amounts of oil in seawater has been proven lethal to cod larvae. Furthermore, chemical substances found in so called “produced water” (water extracted along with oil and gas from the reservoirs) has been shown to affect the reproductive capacity of cod. A common trait of several Barents Sea fish stocks, including capelin, cod and herring, is that huge concentrations of egg and larvae are often found in relatively small areas (see map). An oil spill affecting these areas could have severe impacts for the fish and the wider ecosystem.

Polar cod
Photo: Erling Svendsen

Life in the air and along the coast – Seabirds

The Barents Sea supports some of the world's largest seabird colonies. Annually, between 13 and 15 million aggregate in nesting cliffs along the Barents Sea coast. Many of these seabird colonies are considered as internationally important. The seabird species include Puffin, Common guillemot, Little auk, Razorbill and Black guillemot.



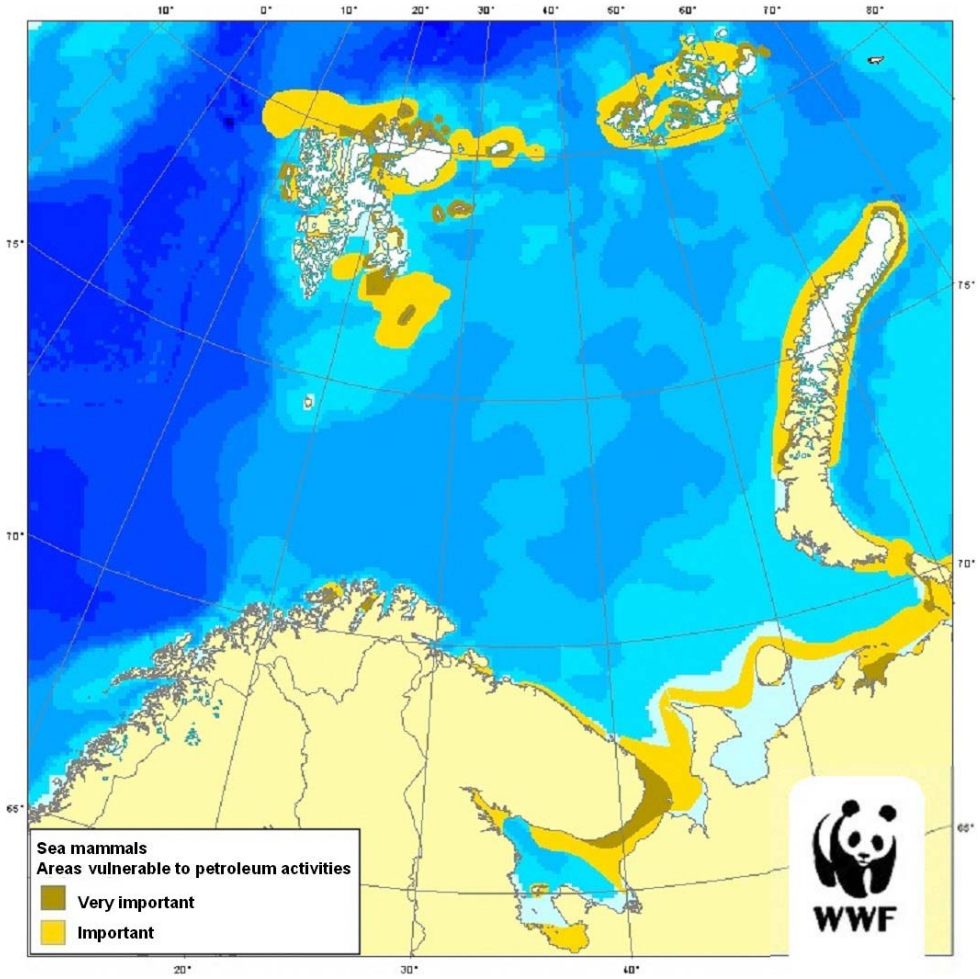
.During the nesting season, parent birds use the sea areas within a 100 kilometer radiusas as their main feeding grounds. If oil is present on the sea surface near seabird colonies, it is therefore likely to affect a large number of breeding birds.

Auk birds and other typical seabirds like diving ducks, will often suffer greatly from oil spills as the oil sticks to their feathers and thereby causes the birds to freeze to death. Also swallowing of oil can cause death by poisoning. Even small oil spills can cause harm. In 1979 between 10 and 20 thousand Brünnich's guillemot were killed after a minor oil spill from a boat in the Varanger-fjord.

Common Guillemot
Photo: John Stenersen

Life on the ice and in the sea – Marine mammals

There are several species of marine mammals in the Barents Sea, namely twelve whale species, five dolphins, six seals plus Walrus. In addition, both otter and polar bears depend entirely on the marine environment.



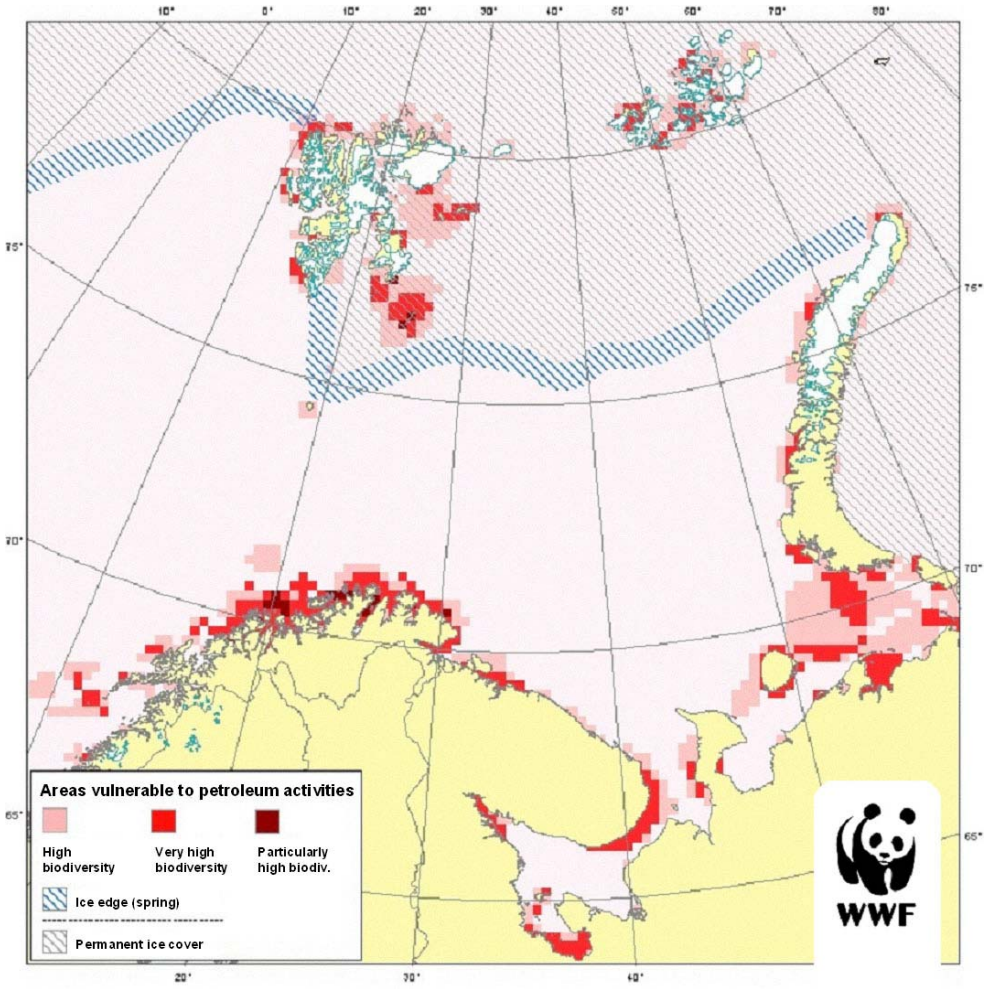
The dominating species in the Barents Sea is the harp seal, living in open waters and spending winter on the ice. Walrus, ringed seal and bearded seal are found in the waters around Svalbard, Novaja Zemlya and Franz Josef's Land, while common harbour seal and grey seal live along the coast of Finnmark. Whale species found include beluga whale, narwhale and the extremely rare bowhead whale.

Marine mammals that swallow oil risks detrimental effects on vital organs, and otters and polar bears impacted by oil in their fur can freeze to death.

Walrus
Photo: © WWF Fritz Pölking

Particulary sensitive and vulnerable areas

By combining the previous theme maps, we can identify where in the Barents Sea we find the highest concentrations of vulnerable biological values. This map is the result of strict priorities from WWF, and shows the areas that are absolutely critical to protect from the threats posed by oil and gas activitities.



Production and transport of oil at sea will always include a risk for oil spills and discharges. The Barents Sea has a harsh climate and long winter period with no, or very little daylight, which increases the possibility for accidents and makes cleaning and rescue work even harder.

The natural values of the Barents Sea must therefore be protected by the establishment of petroleum-free zones – before any new oil & gas activities are allowed in this unique area.

WWF believes this is the only way to ensure that the Barents Sea remains among the worlds cleanest and most productive seas also in the future. Apart from safeguarding the areas biodiversity, this will benefit the fisheries aquaculture an tourism industries that depend on the natural qualities of this arctic ecosystem.

Dead Guillemot on the beach near La Coruña. 'Prestige' oil spill, Galicia, Spain.

Two cases: The Goliath field and the Nordland VI-block

If an oil spill occurs, oil slicks will spread on the sea surface. The distribution of the slicks will depend on the wind and ocean currents. The illustration on this page shows the likelihood that oil will reach a certain spot following spills at two different oil-fields in the Barents Sea. These illustrations have been developed by the oil industry itself.

Nordland VI (left figure) is an area considered to be promising for finding oil and gas reserves. The oil and gas industry is lobbying hard to get this area opened for further exploration drilling.

Goliath (right figure) is the first commercially attractive oil-field discovered in the Norwegian part of the Barents Sea. The field is owned by Agip, Statoil, Enterprise oil and ConocoPhillips. It is expected that the companies will seek to develop the field in the near future.

When combined with WWF's map, it becomes apparent that oil spill in these areas has a great potential to impact on some of the most vulnerable biodiversity of the Barents Sea. The Norwegian Pollution Control Authority (SFT) has proposed that the Nordland VI-block should become a "petroleum-free area" due to its importance for fish and seabirds. SFT has also indicated that due to the Goliath-field's proximity to the coast, it would be virtually impossible to provide effective oil-spill contingency.