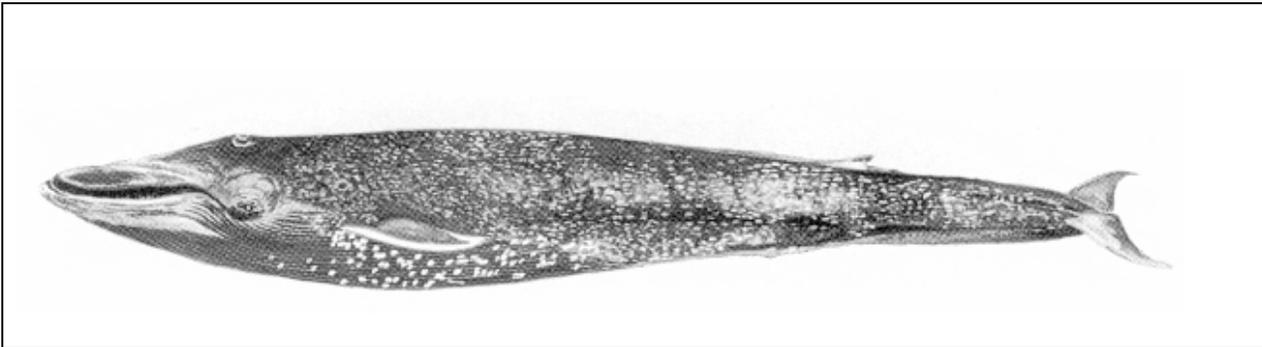## Nomination

Balaenoptera musculus, Blue whale

Geographical extent

OSPAR Region; All
Biogeographic zones: 1-20
Region & Biogeographic zones specified for decline and/or threat: as above

The blue whale is found in all major oceans of the world. There are considered to be two stocks in the North Atlantic and it is the east Atlantic stock that occurs in the OSPAR Maritime Area. The migration patterns of this stock are poorly known. Some blue whales are known to winter off the Azores and Cape Verde Islands. In spring blue whales migrate to the productive feeding grounds around Iceland, in the Barents Sea and around Spitzbergen.

Application of the Texel-Faial criteria

B.musculus was nominated for inclusion in a joint submission by three Contracting Parties citing sensitivity, keystone role and decline with information also provided on threat.

Decline

The blue whale has been severely depleted throughout its range. Whaling during the late 1800s and early 1900s targeted stocks in the North Atlantic and the North Pacific and then moved to other areas leading to a drastic reduction of the population throughout the world. The North Atlantic stock is estimated to have been made up of around 3,500 whales in Northern Norway and 10,000 in the Denmark Strait (FAO, 1978; Yochem & Leatherwood, 1985). Large scale sightings surveys in the North Atlantic in 1987 and 1989 gave estimates of the population around Iceland as 442 and 878 respectively with very few observations in other parts of the survey area (i.e. off Norway, Greenland, the Faeroes and Spain). Gunnlaugsson

& Sigurjónsson, 1990; Sigurjónsson & Víkingsson 1997).

There are no agreed figures for the population of the blue whale in the northern hemisphere at the present time. The IWC only makes an estimate for blue whales in the southern hemisphere and Randall *et al.*, (2002) have recently suggested that there are perhaps a few hundred to a thousand Blue Whales remaining in the North Atlantic.

Keystone species

The blue whale is a baleen whale that feeds almost exclusively on a few species of euphausiids and copepods in highly productive polar waters. There is evidence to suggest they also feed on shallow banks in the Azores before resuming migratory movements and where they probably have a significant impact on plankton numbers, consuming around 2-4 tonnes of food a day.

Sensitivity

Like other cetaceans the blue whale has a low reproductive rate and late age of maturity. This means that recovery of depleted populations will take many decades rather than years. Cetaceans use sound to provide information about the physical environment, to communicate between individuals and for the detection of potential prey. Baleen whales, such as the blue whale emit low frequency sound that can travel hundreds of kilometres. This makes them sensitive to acoustic disturbance from military activities such as naval sonars (particularly low frequency acoustics), as well as other sources such as seismic exploration. The whales will be particularly vulnerable if the zone of influence coincides with migration and breeding areas. In the case of the blue whale this would include the edge of the continental shelf that may be an important migration route for this species (Evans, 2000).

Threat

The blue whale was the preferred target of modern whalers because of its size and, once they could be taken and processed on factory ships, they were hunted in all the world's oceans. Catches peaked in 1930-31 when nearly 30,000 were taken worldwide. It has also been estimated that over 280,000 blue whales (including pygmy blues) were taken between 1924-5 and 1970-71, mostly in the Southern Hemisphere (Chapman (1974) in Klinowska 1991). Commercial whaling was therefore the overriding threat to this species until it was banned in 1964. Current threats come from acoustic disturbance and habitat degradation. Depletion of food resources is an issue in the Antarctic where krill are harvested. This is not the case in the Arctic however there are also other influences on krill abundance and therefore it is not clear if this is a threat to blue whales in the Arctic. Boat collisions also pose some threat to the whales during their spring and autumn migrations.

Relevant additional considerations

Sufficiency of data

Data are available on the numbers of whales taken during the period when they were subject to commercial exploitation. Since then sightings data have been collected to determine population size and trends. Given the current rarity of the species, with the exception of a few areas, the population density is too thin to enable any recovery to be detected from surveys except over a very long period (Klinowska, 1991).

Changes in relation to natural variability

The large numbers of blue whales that were taken by commercial whalers will have masked any changes caused by natural variability. With such a small number remaining, natural variability may however become a major contributory factor in any further decline.

Expert judgement

There is overwhelming evidence of the severe decline in blue whale numbers as a result of past commercial whaling activity. Current threats are known but there is uncertainty about precise trends in the North East Atlantic stock. The IWC gives no estimate of population size for blue whales in the Northern Hemisphere at the present time.

ICES Evaluation

The species occurs in all regions of the OSPAR area, but in Region II is peripheral to the range of the species. The ICES Advisory Committee on Ecosystems (ICES, 2003) concluded that there is good evidence of decline but there is no evidence of a direct threat currently although indirect threats such as pollutant effects may be present.

Threat and link to human activities

Cross-reference to checklist of human activities in OSPAR MPA Guidelines

Relevant human activity: Shipping & navigation; military activity; fishing, hunting, harvesting; research. *Category of effect of human activity:* Physical – Noise disturbance. Biological – removal of target species, removal of non-target species, physical damage to species.

Commercial whaling was undoubtedly the cause of the decline in blue whale numbers in the last century and therefore there was a clear link between the threat to this species and human activities. Today the threats that may lead to further decline or failure to recover are more indirect unless whaling resumes. They include marine pollution, poor water quality, acoustic disturbance, and collisions with vessels.

Management considerations

The population was severely depleted before it was given protection by the IWC in 1964 and, while it is too rare to be the main target species of any fishery it is vulnerable to illegal whaling. OSPAR does not deal with whaling issues directly but can communicate an opinion on it to the IWC and members of the North Atlantic Marine Mammal Commission (NAMMCO). Management measures need to be geared towards enabling the recovery of the population and, apart from direct protection this could include actions to minimise acoustic disturbance.

The IUCN have classified the Blue Whale as an endangered species (IUCN, 2002).

Further information
Nominated by:
Iceland, Portugal and UK

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