

**PROPOSAL FOR INCLUSION OF SPECIES ON THE APPENDICES OF THE  
CONVENTION ON THE CONSERVATION OF MIGRATORY SPECIES OF WILD  
ANIMALS**

**A. PROPOSAL:** inclusion of *Balaenoptera borealis* on Appendix I and II.

**A. PROPONENT:** Government of Australia

**B. SUPPORTING STATEMENT**

**1 Taxon**

<b>1.1 Class</b>	Mammalia
<b>1.2 Order</b>	Cetacea
<b>1.3 Family</b>	Balaenopteridae
<b>1.4 Genus and species</b>	<i>Balaenoptera borealis</i> (Lesson, 1828)
<b>1.5 Common names</b>	English: Sei Whale, Coalfish Whale, Pollack Whale, Rudolph's Rorqual Spanish: Ballena Sei, Ballena Boba, Rorcual Boreal, Rorcual de Rudolphi, Rorcual Norteno French: Rorqual Sei, Baleinoptere de Rudolphi, Rorqual Boreal, Rorqual de Rudolphi

**2 Biological data**

*B. borealis* is a slender rorqual whale with a prominent falcate dorsal fin, a slightly arched rostrum with a single prominent ridge and a slightly downturned tip. The dark back is often mottled and scarred, while the bottom is lighter.

*B. borealis* live to an estimated maximum of 60-70 years. The species exhibits a degree of sexual dimorphism. In the Northern Hemisphere, male *B. borealis* grow to a recorded maximum of 17.1m in length, while the larger females may reach 18.6m. Males reach sexual maturity at 12.7-12.9m; females at 13.1-13.7m. In the Southern Hemisphere, males have been recorded to a maximum of 17.7m and females 21m. Males reach sexual maturity at 13.0-13.9m; females at 13.6-14.5m (Horwood, 1987; Gambell, 1985; Leatherwood and Reeves, 1983). Maximum weight is about 30 tons (Jefferson, Leatherwood and Webber, 1993).

There are unresolved problems in estimating the ages of *B. borealis*. Females appear to ovulate for the first time at five to six years of age. Breeding takes place in late autumn to early winter, and gestation lasts 10.5 to 12.5 months. Mothers then lactate for five to nine months, by which time their weaning calves are 8 to 9m long (Horwood, 1987; Gambell, 1985; Leatherwood and Reeves, 1983).

*B. borealis* usually travel in small groups, of two to five individuals. Larger aggregations sometimes occur on feeding grounds. Little is known about how this species communicates, although low-frequency pulses are common.

*B. borealis* feed primarily on plankton or minute crustaceans, which are taken through hundreds of baleen plates by swallowing or surface-skimming, in waters of about 5-15°C (Horwood, 1987).

Like other cetaceans, *B. borealis* are "K strategists," in that they are large, long-lived and slow to mature, they have fewer, larger offspring and a high parental investment in young, and have evolved in an environment with little (temporal and stochastic) variation. As an Order, cetacean populations are thus not equipped to cope with and rebound from:

- sudden declines in population numbers, as has happened over the past two centuries because of unsustainable hunting; or
- detrimental environmental impacts on habitat due to anthropogenic factors from pollution, climate change, increased fishing effort, shipping traffic etc. as is currently the case.

## 2.1 Distribution

*B. borealis* is a deep-water species, found in the temperate and oceanic waters of the Atlantic, Indian and Pacific Oceans, and in the Mediterranean and the Black Sea. The past and present distribution of this species is difficult to document, because of the irregularity of its movements, and the difficulty of distinguishing sightings and specimens from Bryde's whale, *B. edeni*.

### *North Pacific*

In summer, *B. borealis* can be found from California to the Gulf of Alaska in the east, across the Bering Sea and down to the coast of Japan and the Korean peninsula in the west. However, there is some doubt about the southern part of the summer range, because of past confusion with *B. edeni*. There have been few confirmed records south of 30°S in summer. Catch and sightings records indicate concentrations in some areas, although the general distribution is continuous across the entire ocean. In winter the main area of abundance is further south, around 20°N (Horwood, 1987; Gambell, 1985; Leatherwood and Reeves, 1983).

### *North Atlantic*

In the North Atlantic, *B. borealis* inhabit the coasts of New England, Labrador, East Iceland, the British Isles and Norway to the Arctic Ocean. Once common – and commonly hunted – off northern Norway, the species has not been found there in recent years. Breeding groups spend winter at low latitudes, perhaps as far south as Florida, Mexico, Spain, Portugal and northwest Africa. They have also been reported from the western Mediterranean Sea. The southern limits of distribution are unclear, because of confusion with *B. edeni* (Horwood, 1987; Gambell, 1985; Leatherwood and Reeves, 1983).

### *Southern Hemisphere*

*B. borealis* occur in the South Pacific, South Atlantic and Indian Oceans. Breeding groups spend winter north of about 40°S. The summer feeding range is broader, from about 30° southward. The Antarctic Convergence appears to act as a barrier to all but the larger animals, which are the only individuals capable of crossing it to feed further south (Horwood, 1987; Gambell, 1985; Leatherwood and Reeves, 1983).

## 2.2 Population

Present population estimates are the subject of ongoing controversy. The IUCN concluded that, although estimates abound, they “are derived from methods which have since been found to be problematic” (IUCN, 1991: 386).

Various attempts by the Scientific Committee of the International Whaling Commission (IWC) to estimate *B. borealis* populations were subject to debates over the reliability of their modelling and assumptions. Until the 1970s, catch records of *B. borealis* did not distinguish this species from Bryde's whale, *B. edeni*. Hence, it was very difficult to separate the statistics of past operations, in order to derive population estimates and/or catch quotas. The IWC is not currently prepared to give an abundance estimate, citing a lack of detailed assessment and statistical certainty.

While genetic studies show the existence of different populations in the Northern and Southern Hemispheres, separate populations have not been identified within ocean basins. However, for management purposes, populations have been separated on the basis of different migrations and biological characteristics (Horwood, 2002). In the Southern Hemisphere six populations are assumed, in the North Pacific two or three populations have been proposed, and in the North Atlantic as many as eight populations have been suggested but only three are considered for management purposes (Horwood, 2002).

### *North Atlantic*

No estimates exist for the original populations in this area, which includes Nova Scotia, the Iceland-Denmark Strait and the Eastern North Atlantic. However, modern whaling operations recorded takes of about 13,300 whales of this species from the North Atlantic (Jonsgard, 1977). Dedicated surveys have revealed only small numbers of this species in what were once important whaling grounds, leading to the assumption that these populations were seriously depleted and have not recovered to any significant extent.

Norwegian surveys of the northeastern Atlantic in 1987-89 found only one individual (Christensen, Haug and Oien, 1990). Faeroese surveys, which covered the waters around the Faeroes and the northern and western British Isles, saw none in 1987 and only one in 1989 (Joyce, Deportes and Bloch, 1990). This is important negative abundance information, because whalers targeted *B. borealis* in both these areas until the 1950s (Jonsgard, 1977). In 1989, an Icelandic survey of the central North Atlantic north of 50° found nearly 200 feeding *B. borealis* (Sigurjonsson, Gunnlaugsson, Ensor, Newcomer and Vikingsson, 1990). Gordon and Steiner (1990) sighted five of this species in the Azores in 1989, but believed this to be atypical.

### *North Pacific*

The question of stock identities within the North Pacific is unresolved. Preliminary IWC assessments, based on Catch Per Unit Effort data (which is now considered to be liable to under-represent declines in whale stocks), indicated that whaling operations reduced the population in the North Pacific from about 63,000 in 1963 to 13,000 in 1974 (IWC, 1989).

### *Antarctic Stocks*

A 1979 IWC assessments suggested a pre-1930 adult population of about 100,000, which by 1979 had been reduced to about 24,000. This estimate is likely to understate the pre-exploitation population and be over-optimistic in its latter figure (Mizroch, 1980; IUCN, 1991).

## **2.3 Habitat**

*B. borealis* is a deep water species, with critical breeding and calving habitat in various temperate and sub-tropical waters. Calving occurs in the lower latitudes of the species' range (Jefferson, et al, 1993), and calves are weaned within 7 months after they have migrated to colder waters with their mothers (Horwood, 2002).

The critical summer feeding habitat of the species is in the subarctic and subantarctic.

The trophic habitat is indicated by recorded dives to a depth of 300m.

## **2.4 Migrations**

*B. borealis* undertake long annual migrations between subtropical and subarctic and subantarctic seas. In each Hemisphere, the species makes a generalised movement towards higher latitudes to feed in their respective summers, and a corresponding movement in winter towards temperate equatorial waters to breed.

The critical migratory paths are more difficult to define than for some other whale species, as their movements are less regular and predictable, although migrating animals tend to follow shelf contours and plankton gatherings. Pregnant females migrate towards the poles and their feeding grounds earlier than other age and sex classes (Horwood, 1987; Gambell, 1985; Leatherwood and Reeves, 1983).

# **3 Threat data**

## **3.1 Direct threats to the populations**

The International Convention for the Regulation of Whaling allows Parties to issue permits unilaterally, to kill whales for scientific research.

Into the 1980s, Iceland continued to hunt whales, under Special Permit. Until 1986 the IWC set a *B. borealis* quota for Iceland of 100 whales per year. After the moratorium on commercial whaling came into effect, this catch was reduced to 10-40 per year for scientific research.

Shore-based fisheries in Japan took *B. borealis* from about the 17th century, but the main exploitation did not begin until modern whaling methods were developed in the late 19th century.

In the North Atlantic, substantial catches of several hundred per year were made off northern Norway in the 1880s and 1890s, and off the UK and Ireland from 1905 to 1920. Catches off western Norway were in the low hundreds each year from about 1920 to 1940, and some tens per year until the late 1950s. Sporadic catches occurred off Canada from the 1900s, and reached the low hundreds in the late 1960s and early 1970s. Sporadic catches were also made off the Faeroe islands, Iberia and elsewhere, while Icelandic catches became more regular from the 1950s (IUCN, 1991).

In the eastern North Pacific, pelagic operations from the USSR and Japan took a peak of up to several thousand animals a year between 1964 and 1974. Modern whaling land stations began in Canada and Alaska in 1905. These targeted *B. borealis* from the 1960s, with the Canadian stations taking several hundred animals each year, and the USA some tens of animals per year up to the 1970s. Russia introduced modern whaling in the western North Pacific from the 1860s, and pelagic operations began in 1903. Catches off Kamchatka peaked in the 1960s, when around a thousand animals a year were being taken. Modern whaling began in Japan in 1898, and figures 1910 show takes of several hundred a year from 1910, rising to around a thousand a year in the 1950s and 1960s (IUCN, 1991).

*B. borealis* became an important component of the Southern Hemisphere catch when the stocks of the other large whales (especially Blue and Fin Whales) had been depleted by the 1950s. Pelagic operations took 10-15,000 animals per year at their peak, and land stations made substantial catches at South Georgia and South Africa, with others recorded from stations in Peru, Australia, New Zealand, Chile and Brazil. There is now evidence to suggest that the former Soviet Union under-reported catches of Antarctic Sei Whales to the IWC in 1963-64 (Centre for Russian Environmental Policy, 1995).

*B. borealis* may drown through entanglement in discarded fishing gear.

While the Sei whale's offshore distribution makes it less vulnerable to disturbance from whale watching enthusiasts, unregulated whale watching may place stress on *B. borealis* individuals and groups. This is a rapidly growing industry that range states need to regulate, because at certain proximities and intensities, operators and tourists will interfere with critical breeding and socialising behaviour (Gordon, Moscrop, Carlson, Ingram, Leaper, Matthews and Young, 1998).

*B. borealis* is also susceptible to pollution. The increasing volume of marine debris, particularly buoyant and synthetic items such as plastic, may threaten this species through the possibility of entanglement and ingestion. Substantial volumes of rubbish discarded by humans have been found in the stomachs of stranded whales (Laist, Coe and O'Hara, 1999). Further, oil spills and the dumping of industrial wastes into waterways and the sea lead to bio-accumulation of toxic substances in the body tissues of the top predators, making such events dangerous to great whales in general (Cannella & Kitchener 1992; IWC, 2000).

Chemical pollution, in particular the persistent organic pollutants including PCBs, DDTs, PCDDs, HCB dieldrin, endrin, mirex, PCDs, PBs, PEDEs, polycyclic aromatic hydrocarbons and phenols as well as metals and their organic forms methyl-mercury and organotins are of concern for marine mammals in the marine environment. Many of these pollutants can cause immune suppression, making them more susceptible to prey depletion, habitat modification, environmental changes (including global warming or ozone depletion) or disease. Synergistic and cumulative effects must be

considered in the assessment of any risk to individual species or populations. (Reijnders & Aguilar, 2002), Currently marine mammals in mid-latitudes (industrialised and intense agriculture use) of Europe, North America and Japan have the highest loads. However levels of organochlorines are declining in the mid latitudes and are predicted that in the near to midterm future the polar regions will become the major sinks for these contaminants. (Reijnders & Aguilar, 2002). Of the 2 million tonnes of PCBs that have been produced world wide, only 1% has reached the oceans at this stage. Around 30% has been accumulated in dump sites and the sediments of lakes, estuaries and coastal zones and future dispersal into the marine environment cannot be controlled (35% are still in use) The open ocean water serves as the final reservoir and sink for the worlds PCB production. (Reijnders 1996).

Levels of PCB and DDT have been detected in *B. bonaerensis* and appear to vary depending on geography and diet, with adult migrating to less polluted areas. (Reijnders & Aguilar, 2002)

### **3.2 Habitat destruction**

At the 50<sup>th</sup> meeting of the IWC, the Scientific Committee identified “environmental change” as the looming threat to whale populations and their critical habitats. This meeting discussed the impact of climate change, chemical pollution, physical and biological habitat degradation, effects of fisheries, ozone depletion and UV-B radiation, Arctic issues, disease and mortality events and the impact of noise and resolved an ongoing work program for continued investigation (IWC, 1998).

### **3.3 Indirect threats**

Global environmental change is an indirect threat to *B. borealis*. Springer (1998) concluded that fluctuations in marine mammal populations in the North Pacific are entirely related to climate variations and change. One of the more important impacts of a changing climate on marine mammals is changes to the abundance of and access to prey. This has a particularly detrimental impact on marine mammals that feed from the top of the food chain, such as whales (IPCC, 2001).

Further, global warming appears to be related to reductions in sea ice: one study concludes that the Antarctic sea-ice receded by 2.8 degrees latitude (168 nautical miles) between 1958 and 1972 (de la Mare, 1997). This would have interfered with the feeding patterns of adult males, as well as altering the seasonal distributions, geographic ranges, migration patterns, nutritional status, reproduction success, and ultimately the abundance of marine mammals (Tynan and DeMaster, 1997).

### **3.4 Threats connected especially with migrations**

While migrating between feeding and breeding grounds, *B. borealis* are susceptible to shipping strikes. The increase in oceanic traffic increases the likelihood of collision with large vessels on shipping lanes in critical *B. borealis* habitat beyond the edge of continental shelves.

Underwater noise pollution is often a direct threat to migrating cetaceans, given their reliance on sound for navigation through their highly developed echolocation systems. *B. borealis* are particularly sensitive to low and moderate frequency sounds, from approximately 12Hz to 8kHz (Richardson, Greene, Malme and Thomson, 1995). It is difficult to identify conditions under which *B. borealis* is particularly sensitive, given the varying acoustic transmission conditions from shallow water to deep, and relative to the animal's position within a water column. However, a number of anthropogenic sound sources are known to produce underwater acoustics within the frequency range of *B. borealis*, and potentially within migratory routes.

For example, seismic operations may disturb the movements and natural activities of the species through the production of continuous, high-level, low-frequency (below 1kHz) sound (Würsig and Richardson, 2002). Most Baleen whales continue normal activity up to 150db re 1  $\mu$ Pa, but, as these levels are some 50+ dB above typical ambient noise levels,

lower received levels may have subtle effects on surfacing and respiration (Richardson, et al, 1995).

Military activities that produce significant underwater sound pressure may also potentially interrupt whales' movements and natural activities, including critical migratory, feeding and breeding patterns. These sounds include those associated with underwater detonations of explosives, and the penetration of active sonar (Richardson, et al, 1995).

### **3.5 National and international utilisation**

There is currently no demand for *B. borealis* products that cannot be met by alternatives. The main objective of commercial whaling was formerly oil, but the later Icelandic efforts concentrated on meat for human consumption, mainly in Japan (Horwood, 1987; Gambell, 1985).

## **4 Protection status and needs**

In 1996, the IUCN listed the status of *B. borealis* as Endangered – ENA1abd:

Facing a very high risk of extinction in the wild in the near future, due to a population reduction. The Cetacean Specialist Group made this judgement on the basis of a) direct observation, b) an index of abundance appropriate for the taxon, and d) actual or potential levels of exploitation (IUCN, 2000).

### **4.1 National protection status**

National legislation protecting the *B. borealis* is mainly derived from international agreements.

### **4.2 International protection status**

Articles 65 and 120 of the United Nations Convention on the Law of the Sea (UNCLOS) accord a special status to marine mammals, and specifically allow for more strict protection of marine mammals by coastal Parties or international organisations. Also in relation to cetaceans, Articles 65 and 120 oblige coastal Parties to work through appropriate international organisations for their conservation, management and study.

*B. borealis* is protected from commercial whaling by the IWC, through its general moratorium on commercial whaling. Given uncertain stock analyses, the moratorium imposed a zero catch limit on every whale stock, effective from 1985/86. This limit is subject to annual review by the IWC. The IWC also protects whales, including *B. borealis*, through the declaration of sanctuaries, to provide freedom from disturbance for migrating and breeding great whales that were once hunted to the brink of extinction. The IWC established the Indian Ocean Sanctuary in 1979, and the Southern Ocean Sanctuary in 1994. These sanctuaries are important zones of protection for whales.

International trade in *B. borealis* products has been controlled since 1986 by the listing of the species in CITES Appendix I. However, Japan, Norway, USSR and Austria entered reservations against this, and for them the previous listing on Appendix II applies.

In general terms, the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR) relates to whale protection. CCAMLR applies to the Antarctic Convergence, a natural oceanographic boundary formed where the circulation of cold waters of the Antarctic ocean meets the warmer waters to the north. Although whales are not specifically referred to in the CCAMLR, its objective is the conservation of Antarctic marine living resources.

The Jakarta Mandate is an agreement implementing the Convention on Biological Diversity, 1992, in the marine environment. The Jakarta Mandate encourages a precautionary approach to resource management and promotes the adoption of ecosystem management principles. It also recognises that wide adoption and implementation of integrated marine and coastal area management are necessary for effective conservation and sustainable use of marine and coastal biological diversity.

### 4.3 Additional protection needs

As noted above, the IUCN lists *B. borealis* as endangered. The global population of the species was greatly reduced by past whaling, and there is no evidence to suggest that population numbers have recovered to pre-whaling levels (IUCN, 1991). Additionally, the species is subject to a number of ongoing threats. Because the species is a “K strategist,” it is likely that it will take even longer to recover from any further impacts.

The main vehicle for the protection and conservation of *B. borealis* is the International Convention for the Regulation of Whaling (ICRW) which establishes the moratorium on commercial whaling, and two regional whale sanctuaries (the Indian Ocean Sanctuary and the Southern Ocean Sanctuary).

In the event of a resumption of commercial whaling, the efficacy of the Convention on International Trade in Endangered Species of Wild Fauna (CITES) as a protection measure for *B. borealis* would also be compromised. This is because Iceland entered a reservation against the listing of *B. borealis*, while Japan and Norway entered reservations against the listing of certain populations of *B. borealis*; thus these States are not bound by the Convention. Further, some of these Parties have regularly proposed the downlisting of great whales from Appendix I to Appendix II of CITES.

Under UNCLOS, Parties have an obligation to protect the marine environment within their exclusive economic zones and on the high seas in cases where they have jurisdiction. However, effective conservation for migratory species of cetaceans requires a consistent and coordinated approach to the development and application of conservation measures throughout the full range of a species' habitats, regardless of which jurisdictions they fall within. This includes important feeding, mating and calving sites and the migration routes between them.

Inclusion of *B. borealis* on Appendix I and II of the Convention on the Conservation of Migratory Species of Wild Animals allows non-parties to the Convention to provide protection for the species, and participate in regional agreements ratified under the auspices of the Convention. This makes the protection measures more accessible than under other international agreements. *B. borealis* would also benefit from such cooperative research and conservation actions. A listing under the CMS would also complement the current protection provided by the ICRW and CITES.

## 5 Range states

Putative countries of origin include all those with sea coasts. Other countries may also have conservation responsibilities through international trade or the registration of shipping.

The IUCN (2000) lists the following countries as range states:

Argentina, Australia, Canada, Chile, Cuba, Falkland Islands/ Malvinas, Iceland, India, Indonesia, Japan, Kenya, Democratic People's Republic of Korea, Republic of Korea, Malaysia, Mexico, Mozambique, Norway, Poland, Russian Federation, Réunion, South Africa, Spain, Suriname, Taiwan – province of China, United Republic of Tanzania, Thailand, United Kingdom, United States, Uruguay.

Of these, the following are Parties to the CMS:

Argentina, Australia, Chile, India, Kenya, Norway, Poland, South Africa, Spain, United Republic of Tanzania, United Kingdom, Uruguay.

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