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

A. **PROPOSAL**: addition of the remaining populations of *Orcinus orca* to CMS Appendix II (the Northeast Pacific and Eastern North Atlantic populations were listed by decision of the 3rd Conference of Parties to the Convention on the Conservation of Migratory Species of Wild Animals in 1991)

B. **PROPONENT**: Government of Australia

## C. SUPPORTING STATEMENT

**1. Taxon**

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| **1.1** | **Class** | Mammalia |
| **1.2** | **Order** | Cetacea |
| **1.3** | **Family** | *Delphinidae* |
| **1.4** | **Genus and species** | *Orcinus orca* complex (Linnaeus 1758) |
| **1.5** | **Common names** | English: killer whale, orca |
| | | Russia: kosatka |
| | | France: épaulard, orque |
| | | Portugal: orca |
| | | Spain: orca |
| | | Norway: spekkhogger |
| | | Japan: Shachi, sakamata |
| | | Korea: innuata |

### 2 Biological Data

Information presented here is taken from Dahlheim & Heyning (1999) unless otherwise noted.

*Orcinus orca* are the largest of the delphinids. They are also the most strikingly pigmented cetaceans in the world and can be identified at the individual and population level. *O. orca* have a black body with distinctive white markings. The white region extends from the tip of the lower jaw towards the flippers, where it constricts medially and then widens slightly as it ends caudal of the urogenital region. A lateral white flank patch that connects to the ventral white patch on each side of the whale gives the ventral patch a trident-like design. The ventral side of the fluke is also white or a light gray and may be bordered in black. A conspicuous white patch is located slightly above and behind the eye. A variable gray or white saddle is usually present behind the dorsal fin. The shape of the saddle varies among individuals, pods and from one side of an individual to the other (Baird and Stacey, 1988). The saddle patch is indistinct in young individuals, becoming more obvious as the individual matures.

Body size, flipper size and height of the dorsal fin are sexually dimorphic. Females attain a body length of up to 7.7 meters, while males reach 9.0 meters. In adult males, the dorsal fin is erect and may be from 1.0 to 1.8 meters tall, whereas the dorsal fins of females are less than 0.7 meters and distinctly falcated, i.e., they curve to a point.

The head is somewhat rounded with a slight demarcation of a beak. The relatively large ovate flippers are positioned about one-fourth of the distance from the snout to the flukes. The flipper shape and size contrasts sharply with the small sickle-shaped flippers of most delphinids. Flipper length may attain 20% of the body length in males and 11-13% of the body length in females. Although few animals have

been weighed, weights of 3810 kg for a 6.7 m female and 5568 kg for a 6.75 m male have been obtained.

Like other cetaceans, *O. orcas* are 'K strategists' in that they are large, long-lived, slow to mature, have fewer, larger offspring, 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; 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.

**2.2 Population**

It is not yet possible to give a global population estimate for *O. orca*, nor is it meaningful to derive such a figure, if *O. orca* constitute a complex of highly distinctive and unique populations, forms or subspecies.

The Conservation of Small Cetaceans Report prepared for the CMS Secretariat suggests at least six separate populations are possible for the southern hemisphere, including a dwarf form (CMS 1991). A priority for conservation is to determine the boundaries and population sizes of the distinct populations, forms or subspecies throughout the world, including Antarctica, and to conduct a thorough overhaul of the present monospecific taxonomy of the *O. orca* as suggested by Dahlheim & Heyning (1999).

**2.3 Habitat**

*O. orca* habitat is primarily determined by their prey distribution. In the case of Antarctic mammal eaters, heavy sea-ice appears to present no barrier as it appears it does for Arctic *O. orca*. Nonetheless shallower seas and estuarine areas (southern North Sea, Mediterranean, Gulf of Mexico) appear to be depauperate in *O. orca*. To what extent this is a result of poor prey abundance, habitat degradation or excessively warm waters is unknown.

Special features like "rubbing" beaches are also a habitat requirement. There are no known special habitat requirements for birthing and nursing. Southern residents seem to prefer high relief sea-floor areas perhaps related to the preferred movement of salmon (Heimlich-Boran, 1988).

**2.4 Migrations**

Perrin (2001) has stated that *"… the cetacean agreements developed under CMS to date have not stipulated that the cetacean species included be known to be migratory in the sense of the CMS definition …The assumption is that all or most of them will eventually be proven to be migratory, wholly or in part."* This assumption is also reflected in Annex I to the United Nations Convention on the Law of the Sea where seven families of cetaceans are listed as highly migratory, including the family *Delphinidae*.

The case for *O.orca* as a globally spread migratory species complex is building. It is known that *O. orca* movements, including long distance movements, which are sometimes termed migrations, are strongly influenced by the distribution, movements and life history cycles of their preferred prey. Unlike baleen whales and some other large cetaceans, *O. orca* has less distinct and less well-characterised seasonal migration patterns. In most populations studied, however, it is clear that seasonal movements or migration takes place. In many cases much of this migration takes place on the high seas. Evidence suggests that individuals occupy very large ranges and the proportion of time spent in different parts of their ranges may vary seasonally (Baird 2000). Individuals have been documented to move over very large areas, one of the widest movements documented being a number of individuals seen both in central California and south eastern Alaska, a linear distance of 2660km (Baird 2000).

It seems that some Antarctic *O. orca* may associate with pack ice in winter (Gill & Thiele, 1997), and seasonal movements in the Antarctic, Arctic, subantarctic and subarctic are necessary to some extent as they are forced to move with the ice. Soviet research has concluded that *O. orca* are found throughout the southern hemisphere and, although their distribution is not uniform, migrate from higher latitude warmer waters (up to 60 degrees) in winter to as far as the ice edge for the Antarctic summer (Mikhalev, Ivanshin, Sarusin and Zelenaya, 1981). Mikhalev et al (1981) alternatively identified six populations, classified by their winter distribution as western American, eastern American, western African, eastern African, western Australian and eastern Australian. There is circumstantial evidence that Antarctic populations migrate vast distances, over many thousands of miles, both north-south and east-west following their two major prey groups (Mikhalev et al, 1981). At least one western north Atlantic population migrates seasonally between US and Canadian waters, while Norwegian residents migrate north and south (and east and west to some extent) following herring. Brazilian *O. orca* and southern Indian Ocean populations are also known to be seasonal migrants, moving down as far as the sub-Antarctic Islands.

Much closer study of *O. orca* movements using individual identification is needed to resolve the multiple uncertainties of which distinct population is being observed, and what is each population's distinct range. It is certain, however that most populations cross international boundaries at some point in their wide-ranging travels and that the species complex qualifies as a migratory species.

## 3. Threats

It appears, with the exception of the Antarctic orca population, *O. orca* are distributed into small distinct populations around the coastal and shelf waters of the globe. Many of these populations occur along heavily populated coastlines and are subjected to interaction with fisheries and hunting, prey depletion by fisheries, ship strikes, fishing gear entanglement, noise pollution and oil spills. As top to near-top predators depending on dietary specialisation, they are subject to bioaccumulating organic pollutants as discussed below.

### 3.1 Direct threats to the populations

Intentional killings by fishermen and marine mammal hunters have been widespread. The 1994-1996 Action Plan for the Conservation of Cetacean states that *O. orca* have been the subject of hunts in Greenland, Indonesia, Japan and the Lesser Antilles. (Reeves and Leatherwood 1994).

Commercial whalers have taken many *O. orca* - particularly in Norway (~2500), Japan (~1500) and the former Soviet Union (~2000) of which 1,644 were killed by Russian whalers in the Antarctic and 300 in the former Soviet Union (Dahlheim & Heyning, 1999). With the ban imposed by the International Whaling Commission (IWC) on factory ship whaling of species, including *O. orca* [1], this threat has diminished, although *O. orca* have been hunted recently in Greenland[2] (2002) and St Vincent and the Grenadines (2001)[3]. *O. orca* may still be hunted in Indonesia (Barnes 1991) and are known to be taken as bycatch in gillnets in some parts of the Indian Ocean (Leatherwood, McDonald, Prematunga, Girton, Ilangakoon, and McBreaty, 1991) and probably elsewhere (Reeves & Leatherwood, 1994).

The death rate during captures for live trade has been high in the past. During a 1967 capture from the southern resident K pod three animals died during capture and five were taken into captivity. The same pod was once again targeted in 1970 and at least four animals (including 3 calves) drowned in nets

[1] Paragraph 10(d) of the Schedule to the International Convention for the Regulation of Whaling
[2] Statement of Ivalo Egede, Head of Information Department, Secretariat to the Cabinet, Greenland Home Rule Government, P.O.Box 1015, 3900 Nuuk, Greenland, March 18, 2002
[3] Caribweek News April 26th, 2001

during capture and eight animals were taken into captivity (Hoyt 1990, Hoyt 1992). There are unconfirmed reports that a more recent capture in 1997 off near Taiji, Wakayama prefecture, Japan, resulted in five animals being captured and transported to three different Japanese facilities. Two animals, a male and a female, died within four months of being captured, and the surviving *O. orca* have all suffered health problems. Since 1997, the captivity industry has sought to capture *O. orca* off Argentina, Norway and Eastern Russia without success.

Unregulated whale watching also places stress on *O. orcas* individuals, pods and populations. 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).

*O. orca* habitats in populated coastlines are invariably polluted to varying degrees with persistent organic pollutants (POPs), heavy metals, sediments and nutrients, particularly for industrialised countries. The extent to which fecundity and survival has been impaired by POPs and heavy metals is unknown, but much circumstantial evidence suggests that pollutants are a significant threat to existence for many populations. *O. orca* that eat mammals accumulate extreme body burdens of organochlorines many times the levels at which reproductive impairment has been observed in pinnipeds (Calambokidis & Baird, 1994; Jarman, Norstrom, Muir, Rosenberg, Simon and Baird, 1996; Law, Allchin, Jones, Jepson, Baker and Spurrier, 1997a; Ono, Kannan, Wakimoto, and Tatsukawa, 1987; Ross, Ellis, Ikonomou, Barrett-Lennard, Addison, 2000; Watanabe, Tanabe, Miyazaki, Petrov-Evgeny, Jarman, 1999; Ylitalo, Matkin, Buzitis, Krahn, Jones, Rowles, and Stein, 2001). Populations that have a close proximity to industrial sources within their intracoastal habitat appear to have higher body burdens of PCBs (Ross *et al*., 2000). Higher body burden of PCBs is also associated with higher stranding rates in striped dolphins in the Mediterranean (Marsili *et al*., 1997; Marsili & Focardi, 1997). Simmonds & Mayer (1997) discuss the presumed synergistic effect of starvation on POP mobilisation, immune dysfunction and disease outbreaks.

In major oil-producing areas, oil spills are a serious threat to existence for *O. orca* populations. *O. orca* spend a large portion of time at or near the surface. Oil can poison *O. orca* directly or contaminate the food web upon which they rely. The Exxon Valdez oil spill, Alaska, provides a well documented account of oil spills killing and impairing *O. orca*.

### 3.2 Habitat degradation

At the 50$^{th}$ 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 *O. orca*. 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, 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 associated with migration**
While moving or migrating, *O. orca* are exposed to ship strikes and fishing gear entanglements. The increase in oceanic shipping, inshore boat traffic and fishing activities increases the likelihood of collision with whales. Whales that have to pass through narrow straits and sounds in the course of migration have less room to manoeuvre and escape from loud noise, fishing gear, vessels and pollutant discharges. Ocean oil transport poses a significant risk of oil spill mortality for *O. orca*.

Underwater noise pollution is often a direct threat to migrating cetaceans, given their reliance on sound for navigation through their highly developed echolocation systems. *O. orcas* are particularly sensitive to moderate and high frequency sounds, from approximately 1 - 20 kHz (Richardson, Greene, Malme and Thomson, 1995). It is difficult to identify conditions under which *O. orcas* 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 *O. orcas*, and potentially within migratory routes.

Most seismic exploration occurs at frequencies below the frequencies of the calls and optimum hearing of odontocetes, hence *O, orcas* may be rather insensitive to these sound pulses (Richardson, et al, 1995). However, overall received levels of airgun pulses often exceed 130 dB re 1 ?Pa, and may be potentially audible to odontocetes (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**
Whale watching of *O. orca* is now on offer in such diverse locations as Iceland, the Shetland Islands (UK), Norway, Australia, New Zealand, Canada, USA, Argentina, and in the Antarctic. Around Vancouver Island alone, in US and Canadian waters, approximately 400,000 people a year watch *O. orca* from boats or shore-based parks, spending $75 million USD in total revenues (Hoyt 2001). However, whilst public awareness of the negatives associated with captivity has undoubtedly been achieved through education (and many ex-capture locations such as BC, WA State, Iceland and Argentina have now banned further captures), there are still countries and facilities seeking to secure new *O. orca* for public display (Hoyt 1992).

Oil formerly taken from *O. orca* is of inferior quality, low yield and is now completely substituted by other superior products. It has been reported that meat is used sporadically by hunters in Greenland, who hunted *O. orca* most recently in early 2002

No other products of importance are provided by these animals in any country.

**4. Protection Status And Needs**
The IUCN has not listed *O. orca* as Endangered or Vulnerable.

**4.1 National protection**
National legislation protecting *O. orca* in many countries is derived from international agreements.

Australia's legislation protects *O. orca* (EPBC, 1999) and their habitat and prevents any taking or interference without a permit. Australia strictly regulates whale watching. Argentine law established in

1998 (Ley Nacional 25.052) prohibits the hunting or capture of *O. orca* using nets or intentional stranding methods along the Argentine coastline and EEZ. The United States offers some protection to all marine mammals under the Marine Mammal Protection Act (MMPA, 1972, plus later amendments) and prohibits take without a permit. Canada considers the southern resident population as endangered (Baird, 1999). Canada also regulates whale watching and taking of other marine mammals with permit issuance. A petition currently before the United States National Marine Fisheries Service (NMFS) would list the southern resident population as endangered (Centre for Biological Diversity, 2001).

**4.2 International protection**

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.

Two *O. orca* populations are currently listed in Appendix. II of CMS– listed as *Orcinus orca* eastern North Atlantic population and *Orcinus orca* eastern North Pacific population.

The International Whaling Commission prohibits the killing of *O. orca* by factory ships, and some parties argue that its Moratorium on commercial whaling (Para 10(e) Schedule to the International Convention on the Regulation of Whaling), agreed in 1982, covers all cetaceans, including *O. orca*. Other Contracting Governments disagree that the IWC has legal competence for the management of small cetaceans and the issue remains unresolved. The IWC also protects whales, including *O. orcas*, through the declaration of sanctuaries, to provide freedom from disturbance for migrating and breeding 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, but they are subject to periodic review.

In general terms, the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR) provides 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 discussed above, *O. orca* is certainly divided into an unknown number of highly distinct and possibly unique species or subspecies, distinct forms and endogamous populations. Most of these subdivisions of this taxonomically heterogenous complex have yet to be characterised.

It is conventionally accepted that 500 individuals of a species or population represents the minimum critical number to maintain genetic diversity with a reasonable size gene pool. Although some species would certainly have higher or lower desirable minimums, it is significant to consider that most known populations of *O. orca* number fewer than 500.

Known distinct populations in the northeastern Pacific, considered a world stronghold for the species, each number fewer than 300, and each is at high risk of extinction due to habitat degradation, take and

stochastic demographic and environmental processes. Loss of any of these populations would be a significant gap in the global range of the *O. orca* complex.

At least two populations, the southern residents and the AT1 pod are critically endangered by IUCN criteria, with numbers of mature animals below 50.

As already seen, *O. orca* have been taken by commercial whalers in the past, however, IWC has no current or planned regime to regulate whaling of odontoceti. Therefore resumption of commercial whaling poses a threat to *O. orca*.

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. In the case of top to near-top predators such as *O. orca* this also includes security of prey resources, such as marine mammals or prey fishes.

Inclusion of the entire *O. orca* complex of as yet largely unresolved species, subspecies, forms and populations in Appendix II of the Convention on the Conservation of Migratory Species of Wild Animals would provide a framework by which to coordinate actions that could be adopted by range states to improve the conservation of the species.

**5.0 Range States**

The *O. orca* is a cosmopolitan, coastal and oceanic animal, and therefore is of conservation concern to almost every country with a sea coast and every country registering shipping.

The IUCN (2000) lists the following countries as range states:
Argentina, Australia, Belgium, Brazil, Canada, Chile, China, Colombia, Costa Rica, Eritrea, Falkland Islands/ Malvinas, French Polynesia, Greenland, India, Indonesia, Ireland, Japan, Kenya, Democratic People's Republic of Korea, Republic of Korea, Liberia, Mexico, Mozambique, Myanmar, Netherlands, New Zealand, Norway, Panama, Portugal, Saint Helena, South Africa, Spain, Sri Lanka, Suriname, United Republic of Tanzania, Thailand, United Kingdom, United States, Uruguay, Venezuela.

Of these, the following are Parties to the CMS:
Argentina, Australia, Belgium, Chile, India, Ireland, Kenya, Netherlands, New Zealand, Norway, Panama, Saint Helena (UK), South Africa, Spain, Sri Lanka, United Republic of Tanzania, United Kingdom, Uruguay.

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