

The Status of the Pygmy Sperm Whale, *Kogia breviceps*, in Canada*

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The general biology, world-wide status and management of the Pygmy Sperm Whale, *Kogia breviceps*, with special reference to its status in Canadian waters, is reviewed. Pygmy Sperm Whales appear to be uncommon in Canadian waters; there are several unconfirmed sighting records off British Columbia and only four stranding records off the Canadian east coast. Little is known about its biology or world-wide status, and although it is taken in small numbers both directly and incidentally in fisheries, no serious threats to its status are apparent. No COSEWIC designation is required regarding its status in Canadian waters.

Le présent rapport résume la biologie générale, le statut international et la gestion du Cachalot Pygmée, *Kogia breviceps*, et s'attache plus particulièrement à son statut dans les eaux canadiennes. Le Cachalot Pygmée semble être une espèce inhabituelle dans les eaux canadiennes; il existe plusieurs mentions visuelles de cachalots au large de la Colombie-Britannique, mais aucune n'a été confirmée. En outre, on ne dispose que de quatre mentions de spécimens échoués le long de la côte est du Canada. On ne connaît que peu de détails au sujet de sa biologie ou de son statut international. Bien que le Cachalot Pygmée soit capturé en petit nombre, que ce soit directement ou comme prise fortuite par les pêcheurs, il ne semble y avoir aucune menace grave à son statut. Son statut dans les eaux canadiennes ne nécessite donc aucune désignation par le CSEMDC.

Key Words: Pygmy Sperm Whale, Cachalot Pygmée, *Kogia breviceps*, Canada, North Atlantic, British Columbia, status, Cetacea.

Little is known about the Pygmy Sperm Whale, *Kogia breviceps* (de Blainville, 1838) [Figure 1]. We summarize here the current state of knowledge of the species, with special reference to its status and management in Canadian waters. There are two species within the genus *Kogia*: *Kogia breviceps*, and the Dwarf Sperm Whale, *Kogia simus*. Before 1966, however, most authors recognized one species, *Kogia breviceps*, within the genus (Yamada 1954; Handley 1966), resulting in considerable confusion as to which species is actually referred to in early publications. This taxonomic uncertainty can be attributed to the similarity of the two species and the scarcity of specimens. Both taxa are small (less than 3.8 m), have a small, underslung shark-like mouth which is set well back from the tip of the snout. They are dark bluish-gray dorsally and shade from a lighter gray laterally to a dull white or pink on the belly (Leatherwood and Reeves 1983; Nagorsen 1985). Both have a bulbous head and, like the other member of the Family Physeteridae, the Sperm Whale (*Physeter macrocephalus*), they have a spermaceti organ (Handley 1966). The tail stock is elongated and laterally compressed, and the flukes are notched and concave along the rear margin. Stranded specimens of both species are occasionally confused with sharks, due to the shark-like mouth and the presence of a lightly pigmented bracket-shaped mark on each side of the head between the eye and flipper, sometimes referred to as "false gills" (Figure 1).

The two species can be discriminated by a variety of external and cranial characters (see Table 1). Many authors note that they can be distinguished by the position of the dorsal fin on the back, set well posterior to the midpoint of the back for the Pygmy Sperm Whale and with the anterior insertion of the fin near the midpoint of the back for the Dwarf Sperm Whale, but Ross (1979) cautioned against using this character in isolation, as there is considerable individual variation in both species. Pygmy Sperm Whales reach a greater length than Dwarf Sperm Whales, but the maximum length attained by *Kogia breviceps* is unclear. Caldwell et al. (1971) reported an individual of 4.25 m, but Ross (1979) suggested that the length may have been estimated, rather than measured. According to Ross (1979) the

*Reviewed and Approved by COSEWIC 14 April 1994, report accepted no status designation required.

next-largest recorded specimen was 3.5 m in length. Leatherwood et al. (1988) noted that Pygmy Sperm Whales may grow to a maximum length of at least 3.7 m, and Eliason and Houck (1986) reported an animal 3.82 m in length from the records of the Smithsonian Institution. The taxonomic position of the genus *Kogia* within the Odontoceti is unclear (e.g., see Rice and Wolman 1990).

Distribution

The Pygmy Sperm Whale is found virtually world-wide in tropical and warm-temperate seas. In the western Pacific it has been reported from Japan in the north to New Zealand and Australia in the south (Omura and Takahashi 1981; Baker 1983; Brabyn 1991), and in the eastern Pacific from Washington State in the north to Peru and Chile in the south (Allen 1941; Scheffer and Slipp 1948; Hubbs 1951; Brownell 1969; Waerebeek et al. 1987). Pike and Giovando (1963) stated that Pygmy Sperm Whales were known to occur in the offshore waters of British Columbia, but we could find no documented records from the Canadian west coast. Four unconfirmed sighting reports are listed as *Kogia breviceps* from the British Columbia coast (Baird unpublished data), but positive confirmation awaits photographs or a specimen. Three records are confirmed from the adjacent waters of Washington State (Scheffer and Slipp 1948; Everitt et al. 1979; Osborne et al. 1988) and it is likely that this species will eventually be documented in B.C. *Kogia simus* has been recorded in British Columbia (Nagorsen and Stewart 1983).

In the western Atlantic, Pygmy Sperm Whales have been recorded from Canada southward along the United States east coast, throughout the Gulf of Mexico, and as far south as Brazil, Uruguay and Argentina (Piers 1923; Allen 1941; Gunter et al. 1955; Carvalho 1967; Hysmith et al. 1976; Geise and Borobia 1987). Four stranding records have been reported on the Canadian east coast (Figure 2; Table 2). Three of these were from Canadian waters, and one from the French Island of Miquelon (Piers 1923; Sergeant et al. 1970; Nelson et al. 1991). These are the most northern records in the western Atlantic. In the eastern Atlantic this species has been recorded

from Ireland, the Netherlands and France south to South Africa (Allen 1941; Fraser 1974; Maul and Sergeant 1977; Teixeira 1979; Ross 1984). Pygmy Sperm Whales are found in the Indian Ocean (Leatherwood and Reeves 1989; Chantrapornsy et al. 1991) but do not appear to have been recorded in the Mediterranean Sea (Baccetti et al. 1991).

Protection

International

The Pygmy Sperm Whale is listed under Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora 1973 (CITES) (see Birnie 1982). Such a listing allows for the regulation of international trade between members and non-members of the convention by requiring export permits from the country of origin. However, there appears to be no current international trade in Pygmy Sperm Whale products. The International Whaling Commission (IWC) regulates the taking of whales in accordance with the current Schedule provisions, but whether this Commission's mandate covers the Pygmy Sperm Whale is unclear, as members of the Commission are divided as to whether "whale" refers to all cetaceans, or to only some species (Klinowska 1987, 1991).

National

Canada: Until they were repealed in 1993, the Cetacean Protection Regulations of the Fisheries Act of Canada of 1867 protected all cetacean species from "hunting". "Hunting" was defined as "to chase, shoot at, harpoon, take, kill, attempt to take or kill, or to harass cetaceans in any manner", and could only be undertaken under licence. Aboriginal "hunting" however could be undertaken without licences. The Cetacean Protection Regulations were replaced with the Marine Mammal Regulations of the Fisheries Act in early 1993. These regulations appear to provide no more or no less protection, by stating only that "no person should disturb a marine mammal except when ... under the authority of these Regulations". No provisions exist for regulation of incidental catches in fishing operations. Canada is not currently a member of the International Whaling Commission, having withdrawn in 1982 (IWC 1982).

TABLE 1. Distinguishable characteristics of *Kogia breviceps* and *Kogia simus* (Ross 1979; Leatherwood et al. 1988).

Characters	<i>Kogia breviceps</i>	<i>Kogia simus</i>
Maximum length ¹	3.8 m	2.7 m
Throat creases	absent	usually present
Dorsal fin height	usually less than 5% total body length	usually greater than 5% total body length
Dorsal fin position ¹	posterior to mid point of back	near midpoint of back
Relative snout length	longer	shorter
Teeth in upper jaw	absent	up to 3 pairs
Teeth in lower jaw	10–16 pairs	8–13 pairs

¹See text for further details.



FIGURE 1. Pygmy Sperm Whale. Illustration by Dawn Nelson.

United States: All cetaceans are protected through the Marine Mammal Protection Act of 1972, as well as through the Packwood-Magnuson Amendment of the Fisheries and Conservation Act and the Pelly Amendment of the Fisherman's Protective Act.

Population Size(s) and Trends

In the recent IUCN Cetacean Red Data Book, Klinowska (1991) noted that there is insufficient information to accurately classify the world status of this species. No information is available on population sizes or trends, nor on stock identity. In fact, very few sightings of either species of *Kogia* have ever been reported, and knowledge of both species comes largely from stranded animals. In some areas, Pygmy Sperm Whales are among the most frequently recorded stranded species. For example, Odell (1991) noted that they are the second most frequent to strand in the southeastern United States; off the Hawaiian Islands the Pygmy Sperm Whale is the fourth most frequently stranded species (Nitta 1991). In his analysis of strandings in New Zealand, Brabyn (1991) noted that although they do not represent the largest number of individuals (as mass strandings are infrequent), Pygmy Sperm Whales are the most frequently recorded species. Many authors have interpreted these frequent strandings as evidence that this species is fairly common. Recent numerous aerial sightings of *Kogia* (not discriminated to species) in the northern Gulf of Mexico seem to support this supposition (Jefferson et al. 1992).

Only four strandings have been reported off the Canadian east coast and it appears that Pygmy

Sperm Whales become more common in the south, with a greater number of records reported off the northeast U.S. coast (Early and McKenzie 1991).

Habitat

Pygmy Sperm Whales generally inhabit offshore waters in warm temperate and tropical areas. Brabyn (1991) suggested that the Mahia Peninsula area of the north island of New Zealand is a calving area for this species, based on a high proportion of mother/calf strandings. However, information on the habitat type is not presented. Klages et al. (1989) noted that both species in the genus feed on prey typical of the continental slope, although *Kogia simus* feeds more inshore than *Kogia breviceps*.

General Biology

Reproduction

Very little is known about the reproductive biology of this species. Most estimates of reproductive parameters are based on the examination of a small number of stranded animals, and should be considered preliminary. Ross (1979) suggested that mating and calving occur from autumn through spring, and noted that while there was insufficient data to accurately estimate gestation, two alternative methods suggest a duration between seven and 11 months. Individuals have been recorded as being simultaneously pregnant and accompanied by a calf, indicating that some females may breed annually (Ross 1979; Price et al. 1984; Eliason and Houck 1986). Ross (1979) reported that length at birth averages about 1.2 m, sexual maturity is attained at about 2.7 to 2.8

TABLE 2. Records of *Kogia breviceps* from the Canadian east coast. All records are of single animals, found dead. No confirmed records from the Canadian west coast have been reported.

Date	Location	Source
17 January 1920	Halifax Harbour, Nova Scotia	Piers 1923 ¹
29 January 1969	Sable Island, Nova Scotia	Sergeant et al. 1970
8 October 1990	Isle de Miquelon	Nelson et al. 1991
8 December 1992	Saint John, New Brunswick	McAlpine and Murison, in preparation

¹Katona et al. (1983) report a dead animal found under the ice in Halifax Harbour, Nova Scotia, in the winter of 1970, but this appears to be a misprint, referring to the animal found under similar circumstances in 1920.

m for females and 2.7 to 3.0 m for males, and physical maturity is reached at lengths of 3.0 to 3.3 m for both sexes. The sex ratio of stranded animals varies. Brabyn (1991) found that of 79 Pygmy Sperm Whales that stranded in New Zealand, there were more than twice as many females as males. Off South Africa, the sex ratio of 16 adult and sub-adult animals was 1:1, while the sex ratio for 15 fetuses and calves was heavily biased towards males (12 males: three females) [Ross 1979]. Such disparate figures likely arise from the small sample sizes, and clearly more information is needed.

Ross (1979, 1984) and Eliason and Houck (1986) discussed sectioning teeth for age determination, but no information is available to calibrate the deposition rate of layers. Ross (1984) noted that one sexually mature female which stranded with a calf had only 3.5 growth layers in the dentine. Assuming that one layer is deposited annually, this would imply the female was only about two years old when she first conceived (Ross 1984). No information on longevity is available.

Movements

Strandings off South Africa and the U.S. southeast coast occur throughout the year, possibly suggesting a lack of seasonal movements (Ross 1979; Leatherwood and Reeves 1983). Off South Australia however, Kemper and Ling's (1991) analysis of stranding records indicates the presence of Pygmy Sperm Whales only during April through October. In the eastern North Pacific the majority of records are concentrated during the fall and winter (Eliason and Houck 1986), and along the coast of Europe, Fraser (1974) suggested that this species follows the North Atlantic current extension of the Gulf Stream in search of food. There is also evidence for a possible seasonal movement of *Kogia breviceps* near the west coast of New Caledonia, as strandings there occur mainly between June and December (Sylvestre 1988).

Behaviour

Behavioural observations are based on a few sightings at sea and on instances where individuals have been kept in captivity after stranding alive (e.g., see Sylvestre 1983). Pygmy Sperm Whales are seen singly or in groups of up to about six individuals (Allen 1941; Vidal et al. 1987; Leatherwood et al. 1988), and do not appear to regularly associate with other species of cetaceans or with seabirds (Au and Pitman 1988). Surface behaviour is typically undemonstrative; individuals typically rise slowly to the surface, produce an inconspicuous blow, and dive without showing the flukes. They are occasionally observed lying still at the water's surface with the top of the head and back exposed. Allen (1941) noted that animals at the surface appeared to be very easy to approach closely, even after being har-

pooned. However, as with several other species of cetaceans, Pygmy Sperm Whales may release a cloud of reddish brown feces into the water when startled (Leatherwood et al. 1988). The function of this behaviour is unclear, although Scott and Cordaro (1987) observed a Dwarf Sperm Whale mother and calf pair exhibiting this behaviour while trapped inside a tuna purse-seine net, and then apparently hiding within the cloud when approached by dolphins which were also trapped.

Pygmy Sperm Whales appear to feed primarily on cephalopods, as well as crustaceans and fish. Cephalopods recorded from stomach contents of this species include *Abralia* sp., *Abraliopsis* sp., *Ancistrocheirus* sp., *Galiteuthis* sp., *Histioteuthis* sp., *Loligo vulgaris*, *Lycoteuthis diadema*, *Moroteuthis* sp., *Octopoteuthis cyeletron*, *Ommastrephes* sp., *Onychoteuthis boreali-japonicus*, *Phasmatopsis* sp., *Pygropsis* sp., *Pyroteuthis* sp., *Sepioteuthis australis*, *Taningia* sp., *Taonius pavo*, *Todarodes* sp., *Tuethowenia pellucida*, and *Vampyroteuthis* sp. (Hale 1947; Raun et al. 1970; Ross 1979; Eliason and Houck 1986; Klages et al. 1989). Crustaceans recovered include *Aristaeomorpha foliacea*, *Carcinides maenas*, *Gnathophausia ingens*, *Goneplax angulata*, *Hymenodora* sp., *Pandalopsis* sp., *Pandalus* sp., *Pasiphaea pacifica*, and *Penaeus californiensis* (Allen 1941; Hale 1947; Scheffer and Slipp 1948; Raun et al. 1970; Ross 1979; Vidal et al. 1987). Fish recorded include *Lampanyctus* sp., *Maurollicus muelleri*, *Photichthys argenteus*, *Pyrosoma* sp., *Rexea solandri*, *Scopelopsis multipunctatus*, and *Symbolophorus* sp. (Ross 1979, 1984). Raun et al. (1970) also noted the seaweed *Sargassum* from the stomach of a stranded animal, but suggest that this may have been ingested accidentally. An isotope analysis of muscle tissue from a stranded animal off Miquelon suggested that the animal had been feeding at the same trophic level as Sperm Whales; i.e., it had probably been feeding on squid in offshore waters (Nelson et al. 1991). This species likely uses echolocation to find prey, as echolocation-type clicks have been recorded from live-stranded animals (Caldwell and Caldwell 1991).

Limiting Factors

Data on natural mortality are scarce. There are no reported observations of Killer Whales (*Orcinus orca*) attacking Pygmy Sperm Whales (Jefferson et al. 1991), but the species has been recorded from the stomach contents of Killer Whales from both the Caribbean and the Indian Ocean (Perrin 1982). Long (1991) noted an apparent attack by a White Shark (*Carcharodon carcharias*) on a Pygmy Sperm Whale off California. Information on other causes of natural mortality is sparse. Virtually all recorded strandings of this species are of single animals or of cow/calf pairs. In New Zealand, Robson (1984)

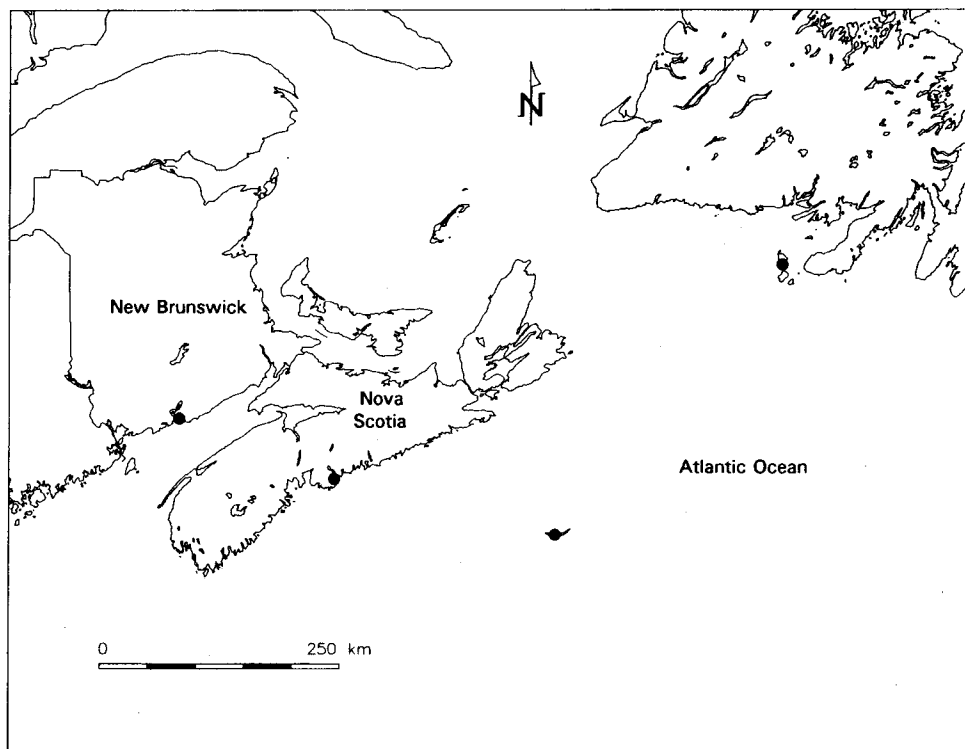


FIGURE 2. Records of *Kogia breviceps* off the Canadian east coast. See Table 2 for details of records.

reported one case of three dead individuals found together on a beach, in association with seven stranded False Killer Whales (*Pseudorca crassidens*), and Brabyn (1991) described a stranding of four individuals. Robson (1984) attributed many of the single strandings of this species to heavy infestations of parasites in the head and inner ear. Parasites recorded from this species include the cestode *Phyllobothrium delphini*, and the nematodes *Anisakis physeteris*, *Anisakis typica*, *Anisakis simplex*, *Phocanema kogiae*, *Stenurus* sp., *Terranova* sp., and possibly *Crassicauda* sp. (Zam et al. 1971; Ross 1979; Vidal et al. 1987). Buck (1984) noted the presence of the bacteria *Enterobacter agglomerans*, *Enterobacter cloacae*, *Pseudomonas cepacia*, *Pseudomonas maltophilia*, *Bacillus*, *Flavobacterium*, and the yeasts *Rhodotorula pallida*, *Rhodotorula rubra*, *Torulopsis*, and *Aureobasidium*, but the role of such pathogens in natural mortality is unknown. Severe vascular disease, including thrombus formation, has been noted in one animal (Roberts et al. 1964, cited in Sweeney and Ridgway 1975).

There appear to be no known major threats (past or present) to this species (Klinowska 1991). Small numbers of Pygmy Sperm Whales have been taken in fisheries, both directly and incidentally. In previ-

ous years, *Kogia* have been taken by shore-based whaling operations off Japan, but it is unclear if both species were included (Yamada 1954). Edmondson (1948) noted one animal which was speared, and another accidentally hooked and landed while fishing with a hand line off Hawaii. Van Waerebeek et al. (1987) found a specimen in a dump in Peru where the remains of fish and dolphins taken deliberately for human consumption were discarded. One animal was illegally killed in Australia in 1989 (Australia 1991). Whalers in the Timor Sea, Indonesia, have hunted *Kogia* (Weber 1923), although there is no evidence that they have been taken in recent years (Barnes 1991). *Kogia*, probably including *Kogia breviceps*, have been and probably still are taken occasionally in the Lesser Antilles (Caldwell and Caldwell 1975; Reeves 1988). Vidal et al. (1990) noted that Pygmy Sperm Whales were recorded caught in gillnet fisheries in Mexican or Central American waters, but presented no details on exact locations or numbers. This species is taken in directed fisheries and incidentally in gillnet and seine fisheries in the Philippines (Aragones et al. 1991; Dolar et al. 1991). Animals have also been caught incidentally in gillnets in the central North Pacific and off Sri Lanka (Omura et al. 1984; Leatherwood and

Reeves 1989). Ingestion of foreign objects (Jones 1984; Ross 1979, 1984) and boat collisions (Sylvestre 1988) may occasionally result in mortality. Little has been reported on levels of environmental contaminants in this species (Cockcroft et al. 1991).

Evaluation

Based on existing information the Pygmy Sperm Whale appears to be only a rare visitor to Canadian waters. No serious threats to its status in Canadian waters are apparent. As such, no COSEWIC status designation is required.

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Sperm whale, the largest of the toothed whales, easily recognized by its enormous square head and narrow lower jaw. It is dark blue-gray or brownish, with white patches on the belly. It is thickset and has small paddlelike flippers and a series of rounded humps on its back. The pygmy and dwarf sperm whales (*Kogia breviceps* and *K. sima*) are the only other members of the family *Physeteridae*. These little-known dolphinlike whales are gray above and white below, and they are quite small—about 2.5 to 4 metres (8 to 13 feet) long. They are distributed worldwide in offshore waters from equatorial to temperate regions and have no commercial value. The family *Physeteridae* diverged from the rest of the toothed whales (suborder *Odontoceti*) very early. The stomach contents of 27 pygmy sperm whales, *Kogia breviceps*, stranded on New Zealand beaches between 1991 and 2003 are reported. These individuals comprise 16 males, 10 females, and one for which... A comparison of the diet of *K. breviceps* is made with that of the sperm whale, *Physeter macrocephalus* from New Zealand waters, and with the diet of *Kogia* known elsewhere. Keywords. Pygmy sperm whale *Kogia* Diet Cephalopods Strandings Fisheries. This is a preview of subscription content, log in to check access. Notes. Dwarf (*Kogia sima*) and pygmy (*K. breviceps*) sperm whales occur in pelagic waters around southern Africa. Here we report the first record of *K. sima* from Namibia and provide information on the basic morphometrics and diet of that record and of two recent strandings of *K. breviceps*. All known records ($N = 29$) of *K. breviceps* from Namibia are also collated. Baird, R.W., Nelson, D., Lien, J. and Nagorsen, D.W. (1996) The status of the pygmy sperm whale, *Kogia breviceps*, in Canada. *Canadian Field Naturalist* 110/3, 525–532. Baird, R.W. (2005) Sightings of dwarf (*Kogia sima*) and pygmy (*K. breviceps*) sperm whales from the main Hawaiian Islands. *Pacific Science* 59, 461–466.