Kogia spp. – Pygmy and Dwarf Sperm Whales

Kogia breviceps

Regional Red List status (2016)	
Kogia breviceps	**Data Deficient*†**
Kogia sima	**Data Deficient*†**
National Red List status (2004)	
K. breviceps	Least Concern
K. sima	Least Concern
Reasons for change	Non-genuine change
Global Red List status	
K. breviceps (2012)	Data Deficient
K. sima (2012)	Data Deficient
TOPS listing (NEMBA) (2007)	None
CITES listing (2003)	Appendix II
Endemic	No

*Watch-list Data †Watch-list Threat

Kogia spp. have been documented basking on the surface of the ocean (Yamada 1954), and although they can often be easily approached, if distressed they excrete extensive clouds of dark reddish-brown faeces, in order to conceal themselves from the perceived threat (Caldwell & Caldwell 1989).

Taxonomy

Kogia breviceps (Blainville 1838)

Kogia sima (Owen 1866)

ANIMALIA - CHORDATA - MAMMALIA - CETARTIODACTYLA - PHYSETERIDAE - *Kogia*

Common names: *Kogia breviceps*: Pygmy Sperm Whale, Lesser Cachalot, Lesser Sperm Whale (English), Dwergpotvis (Afrikaans). *Kogia sima*: Dwarf Sperm Whale, Owen's Pygmy Sperm Whale (English), Miniatuurpotvis (Afrikaans)

Taxonomic status: Species

Taxonomic notes: Before 1966, only one species of *Kogia* was described, *K. breviceps* (the Pygmy Sperm Whale), however succeeding studies (Handley 1966; Chivers et al. 2005) documented the distinctions between this species, and the Dwarf Sperm Whale (*K. sima*). Additionally, recent morphological and mitochondrial DNA evidence found unexpectedly that there may be two monophyletic groups of *K. sima*, an Indo-Pacific group and an Atlantic group (Chivers et al. 2005). As suggested by Chivers et al. (2005), until supporting evidence confirms the status of two genetically isolated species within the *K. sima* taxon, we recognise this as one species. Previously, *K. simus* was used to describe the Dwarf Sperm Whale, however this was considered grammatically incorrect, and was later altered to *K. sima* (Rice 1998). Currently, no subspecies of *K. breviceps* have been identified (Skinner & Chimimba 2005).

Assessment Rationale

Kogia breviceps and *K. sima* are naturally uncommon and there are no regional estimates of population size or trends. However, as they are deep-diving species (up to 800 m), the effects of marine noise pollution should be monitored (although thus far no strandings have been linked to this threat), and we urge more research into the severity of this threat within South African waters. Additionally, plastic pollution should be recognised as an increasing emerging threat, as both species are known to fatally ingest plastic bags mistaken for squid. While their offshore distributions do not overlap with many major threats in the assessment region, their natural scarcity and presumed low population numbers (especially *K. breviceps*) make them vulnerable to minor threats, which may be increasing in severity in the assessment region. Thus, in line with the global assessments, we list both species as Data Deficient and urge more systematic monitoring and analysis to determine population sizes and trends within the assessment region.

Regional population effects: Pygmy and Dwarf Sperm Whales occur extensively across pelagic waters of tropical and temperate regions, and although their movement patterns are largely unknown, no barriers to dispersal have been recognised, thus rescue effects are considered possible.

Distribution

Both Pygmy Sperm Whales and Dwarf Sperm Whales are widely distributed and inhabit deep tropical, subtropical and temperate waters throughout all oceans (McAlpine 2002). However, the Pygmy Sperm Whale seems to occur more commonly in cooler temperate regions in comparison to the Dwarf Pygmy Whale, which seemingly prefers warmer waters (Caldwell & Caldwell 1989). The distributional ranges of *Kogia* spp. are poorly known, and most records originate from strandings or occasionally as individuals captured in small fisheries, rather than live sightings at sea (Nagorsen 1985; Caldwell & Caldwell 1989; McAlpine 2002). This may, however, be attributed to

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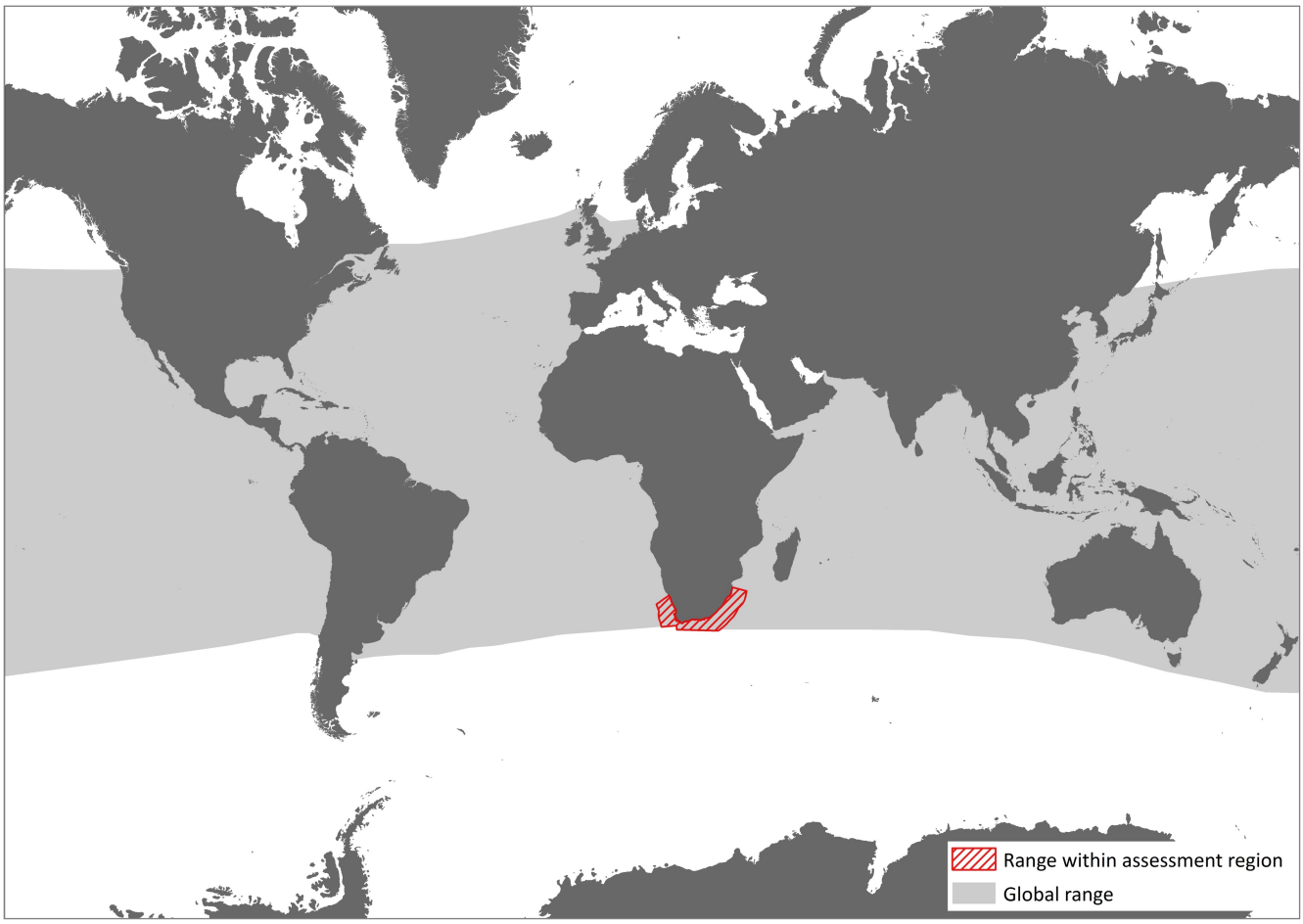

Figure 1. Distribution range for Pygmy Sperm Whale (*Kogia breviceps*) within the assessment region (IUCN 2012a)

their cryptic nature and affiliation for pelagic regions, rather than low population abundances. The Pygmy Sperm Whale is thought to predominantly reside in pelagic regions, beyond the continental shelf edge (Ross 1979). Ballance & Pitman (1998) recorded a number of sightings of Dwarf Pygmy Whales in extremely deep waters (over 3,000 m) in the western Indian equatorial zone.

Within the assessment region, stranding records of Pygmy Sperm Whales suggest that this species occurs from 22°S on South Africa's west coast to 29°50'S on the east coast (Findlay et al. 1992). Prior to 1977, Ross (1979) documented strandings of 42 Dwarf Sperm Whales along South Africa's coastline from Saldanha Bay to East London. These and additional records suggest that this species is restricted to South Africa's southern coast between 17.8°E and 28°E (Ross 1979; Findlay et al. 1992), and an outlying record from KwaZulu-Natal is thought to be attributed to unusual environmental conditions (Ross et al. 1985). The lack of records northwards from Saldanha Bay and along the east coast of South Africa suggests that Dwarf Sperm Whales may prefer the mixed-water conditions, where the Benguela and Agulhas Currents mix (Ross 1984). There appears to be no seasonal variation in the occurrence of either Dwarf or Pygmy Sperm Whales within the assessment region (Skinner & Chimimba 2005), and their movement patterns are largely unknown.

Population

Abundance estimates of these species are often underestimates due to their offshore habitats, long and deep-diving behaviour and inconspicuous nature at the surface (Barlow 1999). For example, Dwarf Sperm Whales lie very low in the water when on the surface and can only be seen when wind speeds are between 0 and 2 on the Beaufort scale. Additionally, Pygmy and Dwarf Sperm Whales are often confused during sightings, which further complicates any population assessments. Although no global population estimates are available for either species, the stranding frequency of *K. breviceps* in regions such as South Africa and the southeastern United States suggests they may be more common than sightings records would imply (Taylor et al. 2008a). Similarly, although no regional population estimates exist for *K. breviceps* in the southern hemisphere, there appears to be substantial gene flow between stocks (S. Plön pers. comm.). These species are primarily known from stranding records, which are declining across the region. However, because the cause of strandings are largely unknown, it is unclear how this trend is reflective of the population. There have been no recent sighting records of either species within the South African exclusive economic zone (EEZ).

The 3-generation period of the species is calculated as 36 years (Taylor et al. 2007), and, globally, a 30% reduction over three generations cannot be ruled out (Taylor et al. 2008a, 2008b).

Current population trend: Unknown

Continuing decline in mature individuals: Unknown

Number of mature individuals in population: Unknown

Number of mature individuals in largest subpopulation: Unknown

Figure 2. Distribution range for Dwarf Sperm Whale (*Kogia sima*) within the assessment region (IUCN 2012b)

Number of subpopulations: Unknown

Severely fragmented: No

Habitats and Ecology

Pygmy Sperm Whales inhabit deep waters over the continental shelf and slope (Ross 1979; S. Plön pers. comm.). Although some studies document some division between *K. breviceps* and *K. sima* in their preference for water depth, Mullin et al. (1994) using aerial observations noted that in the Gulf of Mexico, both species occurred in waters between 400–600 m deep. These depths constituted the upper regions of the continental slope, which exhibited high concentrations of zooplankton (Baumgartner et al. 2001). Both species appear to feed over the deeper continental shelf and slope (Ross 1979; S. Plön pers. obs.).

Ross (1979) reported that Pygmy Sperm Whales may occur individually or in small groups of up to six, whereas Dwarf Sperm Whales occur in socially-structured schools of up to ten individuals. Although they are capable of rapid bursts in speed, Pygmy Sperm Whales typically swim at about 5.5 km / h (Mörzer Bruyns 1971). While not commonly sighted at sea, Katona et al. (1983) reported that *K. breviceps* are easy to approach, as they often float on the surface of the water with much of their body exposed, contrasting with the Dwarf Sperm Whales, which lie very low in the water (Leatherwood & Reeves 1983).

The stomach contents of stranded Pygmy Whales contained the remains of deep-water cephalopods, suggesting that this species feeds at depths of up to 900 m (S. Plön pers. obs.). Similarly, the stomach contents of Dwarf Pygmy Whales insinuate that this species routinely dives to about 600 m to feed, possibly even deeper, and is mostly found over the continental shelf (Ross 1979; S. Plön pers. obs.). The majority of the diet of *Kogia* spp. consists of cephalopods, but they may also consume other prey, for example deep-sea fishes and shrimps (McAlpine et al. 1997; dos Santos & Haimovici 2001; S. Plön pers. comm.). Ross (1979) documented that in South African waters, Pygmy and Dwarf Sperm Whales consumed at least 67 and 38 different prey species, respectively, and Pygmy Sperm Whales are likely to feed in deeper waters compared to Dwarf Sperm Whales.

Although little is known about the reproductive biology of *Kogia* spp., and no seasonality can be inferred, female and male *K. breviceps* from South Africa are estimated to reach sexual maturity at 2.7–2.8 m and 2.7–3.0 m, respectively, while both sexes of *K. sima* reach sexual maturity at 2.1–2.2 m (Ross 1984). Pygmy Sperm Whale calves are born at an approximate length of 1.2 m and, surprisingly, an extremely high proportion (80%) of calves and foetuses were found to be male (Ross 1979).

Ecosystem and cultural services: Marine mammals integrate and reflect ecological variation across large spatial and long temporal scales, and therefore they are prime sentinels of marine ecosystem change (Moore 2008).

Use and Trade

Although these species are hunted at low levels in some parts of their range, there is no trade or use of these

species within the assessment region. In other parts of the world, such as the Philippines, *Kogia* spp. are hunted for bait to be used in fisheries or meat for human consumption (Leatherwood et al. 1992; Anonymous 1996). Additionally, where they are caught accidentally in fisheries, such as gillnets, they may also be utilised for human consumption (Klinowska 1991; Muñoz-Hincapié et al. 1998).

Threats

Although no major threats have been recognised for *Kogia* spp. within the assessment region, and the threats listed below are not likely to cause drastic population reduction on their own, they may result in slow, significant declines in the future, especially if the threats synergise.

Kogia spp. were not historically hunted commercially, but are currently hunted on a small-scale in regions such as Japan, Taiwan, Sri Lanka, Indonesia and the Lesser Antilles (Jefferson et al. 1993), and there are reports of sporadic accidental bycatch of Pygmy Sperm Whales in gillnet, longline and purse seine fisheries across the northern hemisphere (Jefferson et al. 1993; Barlow et al. 1997; Perez et al. 2001; Garrison 2007). Similarly, Dwarf Sperm Whales are also occasionally caught as bycatch in many areas of its range (including southern Brazil; Zerbini & Kotas 1998). No direct or indirect catches of these species have been reported from South African waters, and Baird et al. (1996) suggests that direct and indirect catches of the Pygmy Sperm Whale are not expected to severely impact their population stability.

The ingestion of plastic bags (which the animals possibly mistake for squid) is common among squid-eating cetaceans, and has been documented for *K. breviceps* (for example, Scott et al. 2001; Stamper et al. 2006), and is considered to be relatively common among these species. Plastic pollution in the stomachs of cetaceans frequently hinders natural digestion of food resources, leading to gut-blockage, starvation, strandings and death (Caldwell & Caldwell 1989; Laist et al. 1999; S. Plön pers. obs.). There is no direct evidence for *K. sima* being affected by either plastic ingestion or noise pollution. However, since they have a large niche overlap (S. Plön unpubl. data) with *K. breviceps*, they are likely to be as affected as *K. breviceps*.

As deep-diving species (similar to beaked whales), Dwarf and Pygmy Sperm Whales are presumably vulnerable to anthropogenic noise pollution, for example those produced by seismic surveys and sonar generated during naval operations (Cox et al. 2006; Wang & Yang 2006; Yang et al. 2008). A number of recent stranding events, which included *Kogia* spp. have been documented in Taiwan (Wang & Yang 2006; Yang et al. 2008), the Gulf of Mexico and off the east coast of Florida (Waring et al. 2006). Although, anthropogenic noise pollution is a possible cause of these stranding incidents, due to spatial and temporal associations, this assumption has not been confirmed (Hohn et al. 2006; Wang & Yang 2006; Yang et al. 2008). Marine noise pollution is thought to be intensifying within South African waters (Koper & Plön 2012).

The impact of global climate change, and the associated effects of increased water temperature and CO_2 concentration on *Kogia* spp. is largely unknown, however, is likely to have cascading effects on the movements and feeding ecology of these species (Learmonth et al. 2006).

Current habitat trend: Declining in quality due to marine pollution and climate change.

Conservation

Both *K. breviceps* and *K. sima* are listed in Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). In the absence of further data, no specific conservation measures can be

Table 1. Threats to *Kogia* spp. ranked in order of severity with corresponding evidence (based on IUCN threat categories, with regional context)

Rank	Threat description	Evidence in the scientific literature	Data quality	Scale of study	Current trend
1	*9.4 Garbage & Solid Waste*: plastic bag ingestion. Current stresses *2.1 Species Mortality* and *2.2 Species Disturbance*.	Tarpley & Marwitz 1993	Empirical	Local	Increasing. Documented mortalities from plastic ingestion.
		Laist et al. 1999	Empirical	Local	
		Scott et al. 2001	Empirical	Local	
		Stamper et al. 2006	Empirical	Local	
2	*9.6.3 Noise Pollution*: marine noise pollution through seismic surveys and navy sonar operations. Current stresses *2.1 Species Mortality* and *2.2 Species Disturbance*.	Yang et al. 2008	Empirical	Regional	Increasing. An 'unusual' increase in cetacean strandings, which included both *Kogia* spp. was recorded in Taiwan in 2005. Although the direct cause is inconclusive, high-intensity sonar is considered a likely cause.
3	*5.4.4 Fishing & Harvesting Aquatic Resources*: entanglement in gillnet or purse seine fisheries. Current stresses *2.1 Species Mortality* and *2.2 Species Disturbance*.	-	Anecdotal	-	Increasing
4	*11.1 Habitat Shifting & Alteration*: climate change may exacerbate shifts in prey base. Current stress *2.3.8 Indirect Species Effects*: effects on food resources	Learmouth et al. 2006	Review	Global	Increasing

recommended for these species within the assessment region at present. Continued research is necessary into the impact of and interactions between threats, such as plastic and noise pollution, climate change and incidental bycatches in pelagic fisheries. Management plans should be developed as such data become available.

Recommendations for managers and practitioners:

- The interaction between *Kogia* spp. and gillnet, purse seine and longline fisheries requires ongoing monitoring, and regular records of bycatch should be collected by fishing operations.

Research priorities:

- Population size, distribution and trends of these species in South African waters.
- Investigations into threats to these species, such as the impacts and severity of marine pollution (both plastics and noise) on populations.

Encouraged citizen actions:

- Use information dispensed by the South African Sustainable Seafood Initiative to make good choices when buying fish in shops and restaurants, e.g. wwfsa.mobi, FishMS 0794998795.
- Save electricity and fuel to mitigate CO_2 emissions and hence, the rate of climate change.
- Sightings data from pelagic commercial tourism operators may be valuable.
- Report any strandings to the relevant local authorities.

Data Sources and Quality

Table 2. Information and interpretation qualifiers for the *Kogia* spp. assessment

Data sources	Field study (strandings – unpublished), indirect information (literature, expert knowledge)
Data quality (max)	Inferred
Data quality (min)	Suspected
Uncertainty resolution	Expert consensus
Risk tolerance	Precautionary

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Details of the methods used to make this assessment can be found in *Mammal Red List 2016: Introduction and Methodology.*