Stenella spp. – Pantropical Spotted, Striped and Spinner Dolphins

Regional Red List status (2016)	
Stenella attenuata	**Least Concern**
Stenella coeruleoalba	**Least Concern**
Stenella longirostris	**Least Concern**
National Red List status (2004)	
Stenella attenuata	Data Deficient
Stenella coeruleoalba	Least Concern
Stenella longirostri	Data Deficient
Reasons for change	Change
Stenella attenuata	Non-genuine change: New information
Stenella coeruleoalba	No change
Stenella longirostri	Non-genuine change: New information
Global Red List status	
Stenella attenuata (2012)	Least Concern
Stenella coeruleoalba (2008)	Least Concern
Stenella longirostri (2012)	Data Deficient
TOPS listing (NEMBA) (2007)	None
CITES listing (2003)	Appendix II
Endemic	No

The *Stenella* genus consists of five dolphin species ranging across the globe in warm tropical, subtropical and temperate regions (LeDuc et al. 1999); three of these species are located within the waters of South Africa.

ANIMALIA - CHORDATA - MAMMALIA - CETARTIODACTYLA - DELPHINIDAE - *Stenella*

Synonyms: *Stenella graffmani* (Lönnberg 1934); *Stenella capensis* (Gray 1865) (*S. attenuata*); *Stenella euphrosyne* (Gray 1846) (*S. coeruleoalba*)

Common names: *Stenella attenuata*: Pantropical Spotted Dolphin, Bridled Dolphin, Narrow-snouted Dolphin, Spotted Dolphin, Spotted Porpoise, Spotter, Sharp-beaked Dolphin, Slender-beaked Dolphin, Slender Dolphin, Cape Dolphin, White-spotted Dolphin (English), Gevlekte Dolfyn (Afrikaans). *S. coeruleoalba*: Striped Dolphin, Blue-white Dolphin, Euphrosyne Dolphin, Gray's Dolphin, Gray's Porpoise, Long-snouted Dolphin, Streaker, Streaker Porpoise, White-belly Porpoise (English), Streepdolfyn (Afrikaans). *S. longirostris*: Spinner Dolphin, Gray's Spinner Dolphin, Long-beaked Dolphin, Long-snouted Dolphin, Long-snouted Spinner Dolphin, Small-headed Dolphin, Spinner, Spinner Porpoise, Spinning Dolphin, Spinning Porpoise (English), Toldolfyn (Afrikaans)

Taxonomic status: Species

Taxonomic notes: The *Stenella* genus includes three paraphyletic (LeDuc et al. 1999) groups of small to medium-sized dolphins: 1) the spotted dolphins, which comprises of two species, *S. attenuata* (a pantropical species) and *S. frontalis* (an endemic Atlantic species); 2) the Striped Dolphin, including the single species, *S. coeruleoalba*; and 3) the spinner dolphins, which consists of *S. longirostris*, and *S. clymene* (a tropical Atlantic species). Three of these species are located in South African waters: *S. attenuata*, *S. coeruleoalba* and *S. longirostris*. Two subspecies of *S. attenuata* have been identified, *S. a. attenuata*, which occurs throughout tropical oceanic regions (including the assessment region), and *S. a. graffmani*, which is restricted to coastal regions of the eastern tropical Pacific (Perrin et al. 2002). Although a range of striped dolphins have been described previously, current evidence suggests that only one valid species exists (Fraser & Noble 1970; Mitchell 1970) and no subspecies have been recognised (Archer & Perrin 1999). Perrin et al. (2002) recognized four subspecies of *S. longirostris*, of which *S. l. longirostris* (Gray's Spinner) occurs within the assessment region. There is also a smaller, dwarf type Spinner Dolphin in the region of the South Africa–Mozambique border and Madagascar, but no specimens have been collected. Overall, the taxonomy of the *Stenella* genus remains somewhat controversial, due to an insufficient record of historical specimens on which to base the limits of variation in many areas (Skinner & Chimimba 2005).

Taxonomy

Stenella attenuata (Gray 1846)

Stenella coeruleoalba (Meyen 1833)

*Stenella longirostris (*Gray 1828)

Assessment Rationale

Stenella species have not been well studied in the assessment region and population size and trend estimates are unavailable. However, periodic but regular strandings suggest that there is no major population decline of these species. Additionally, Pantropical Spotted

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Figure 1. Distribution range for Pantropical Spotted Dolphin (*Stenella attenuata*) within the assessment region (IUCN 2012a)

and Spinner Dolphins are considered to be abundant in the Indian Ocean. Although general pelagic threats may apply and annual takes of *Stenella* species occur in regions outside of the assessment region, no major threats were identified for these species; thus they are not considered conservation priorities. However, the potential emerging threat of a drift-net fishery requires monitoring. The listing as Least Concern is retained for *S. attenuata*, *S. coeruleoalba* and *S. longirostris*.

Regional population effects: No barriers to dispersal of these species have been identified, thus rescue effects are possible.

Distribution

Generally, *Stenella* species occur in tropical and subtropical waters, but the extent of their range is poorly known in many regions (Moreno et al. 2005).

The Pantropical Spotted Dolphin ranges extensively across all oceans from approximately 40°N to 40°S, although it is considerably more plentiful within the lower-latitude regions of its distribution. It occurs in tropical and warm temperate waters. In the assessment region, strandings have been recorded along the KwaZulu-Natal coast in the region of St Lucia from 28°24'S to 29°50'S. Additionally, sightings from the Durban whaling ground have been documented in waters between 200 m and 2,000 m deep, as far south as 32–33°S (Findlay et al. 1992). Additionally, this species has been documented in the southwest Indian Ocean (20°43'S–35°30'S) in summer (Gambell et al. 1975). Although, this species appears to be primarily restricted to South Africa's east coast, exceptions have been documented as strandings near Gansbaai (34°40'S; 19°30'E), Yzerfontein (33°15'S; 18°07'E) and Varkvlei (32°46.5'S; 18°06'E) in the Western Cape (Findlay 1989). These exceptions may indicate that this species occurs offshore of South Africa's west coast, or may represent individual strays from the east coast population, as supported by the absence of additional sightings records from the west coast.

The Striped Dolphin has a broad distribution from tropical and warm temperate regions of the Atlantic, Indian and Pacific Oceans, extending from about 50°N to 40°S. However, extralimital records from the Prince Edward Islands have also been documented. Within the assessment region, its distribution is considered to range in waters deeper than 500 m, from Kosi Bay to Cape Agulhas; although, strandings have been recorded from Mozambique (Tofo Beach: 23°50'S; Ross 1984) to the Western Cape (Yzerfontein). The distribution pattern may be confounded warm-water incursions; when warm-water eddies of the Agulhas Current intrude into cold water and then dissipate, Striped Dolphins that were in that warm water may be unable to survive in cold water and strand further west (e.g. Yzerfontein) than their actual distribution.

The Spinner Dolphin occurs throughout tropical and subtropical zones of the northern and southern hemisphere, where the broad limits of their range extend from approximately 40°N to 40°S. *Stenella l. longirostris* primarily inhabits waters around the oceanic islands of the tropical Atlantic and Indian Oceans, as well as the western and central Pacific, eastwards to about 145°W (Rice 1998). In the assessment region, it occurs on the east coast from Kosi Bay southwards possibly to 34°S, and is found in coastal and continental shelf zones.

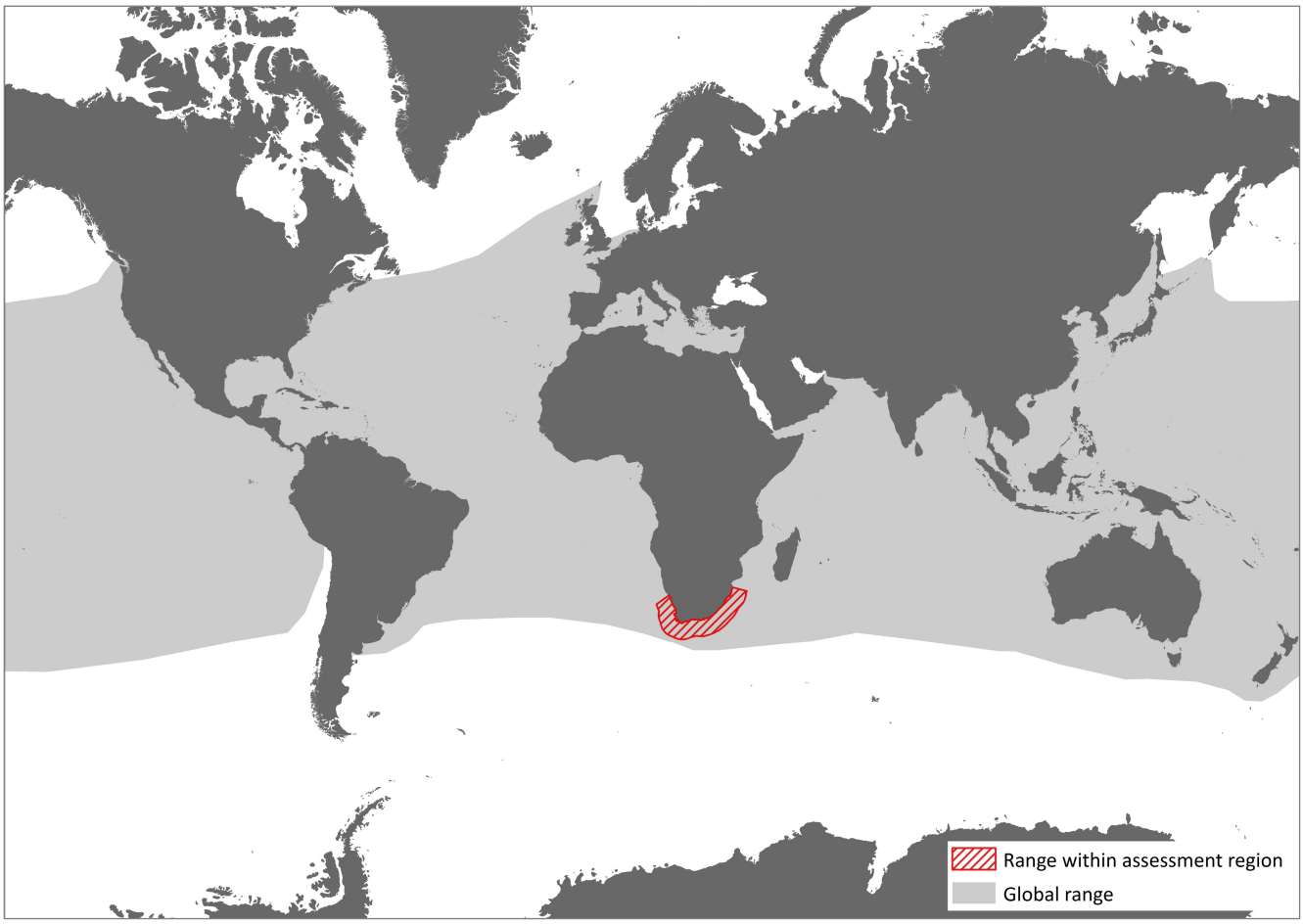

Figure 2. Distribution range for Striped Dolphin (*Stenella coeruleoalba*) within the assessment region (IUCN 2012b)

Figure 3. Distribution range for Spinner Dolphin (*Stenella longitostris*) within the assessment region (IUCN 2012c)

Population

No estimates of abundance are available for *Stenella* species within the assessment region. Regular stranding data of Pantropical Spotted Dolphins suggests that there is no population decline: overall there have been 35 records of strandings or bycatch in KwaZulu-Natal since the 1980s. This is unlikely to be an isolated population as the species travels large distances and may interact with groups from Mozambique and the Mozambique Channel, where several thousands have been sighted. A detailed analysis of Striped Dolphin standing records are still pending; however, no change in temporal or geographic trends in the frequency of strandings is expected. No population research has been conducted on Spinner Dolphins within the assessment region and it is known only from strandings and incidental sightings. Spinner Dolphins are wide-ranging, occurring both in deep pelagic waters far from the coast, as well as around islands and banks. The population is very unlikely to be isolated and long distance movement is high probable. Additionally, movement between Mozambique and South Africa is expected.

Model based estimates of generation time for the Pantropical Spotted Dolphin and Spinner Dolphin have been recorded at 23.1 years and 13.7 years, respectively (Taylor et al. 2007). For the Striped Dolphin generation time calculated on sexual maturity is 8–9 years, longevity was calculated at 42 years and a calving interval of 2–3 years was recorded (Kroese 1993).

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

Number of subpopulations: Unknown

Severely fragmented: No

Habitats and Ecology

Stenella species are relatively small dolphins, often inhabiting coastal and offshore tropical and subtropical waters, with distributions that overlap in many portions of their range (Moreno et al. 2005).

Spotted Dolphins inhabit tropical, equatorial and occasionally warm temperate regions, and although much is known about this species in the Pacific and Atlantic Oceans, there is a paucity of information from the Indian Ocean. Off the KwaZulu-Natal coastline, group size ranged from 20 to ~ 300 individuals, with an average of about 100 (Ross 1984), and from 25 to 200 in the southwest Indian Ocean (Gambell et al. 1975). Sightings of individuals caught in purse-seine nets suggest that schools are subdivided into smaller groups of female-calf pairs, mature males, or juveniles (Skinner & Chimimba 2005). In the eastern Pacific, *S. attenuata* have been recorded in association with *S. longirostris* (Hohn & Scott 1983). In the western Atlantic, *S. attenuata* occur in waters beyond the continental shelf in depths of more than 850 m (Moreno et al. 2005).

The stomach contents from three South African *S. attenuata* specimens contained squid beaks (mostly *Oregoniateuthis* spp.) and the remains of fish (mainly lanternfish, *Symbolophorus* spp.) (Ross 1984). Similarly, Sekiguchi et al. (1992) identified ten species of cephalopods (primarily *Sthenoteuthis* spp., *Chiroteuthis* spp. and *Todaropsis eblanae*) and six species of fish from Spotted Dolphin stomachs along South Africa's coast. In the eastern Pacific Spotted Dolphins consumed both epipelagic species, such as flying fish (*Oxyporhampus* spp.), and mesopelagic species, for example *Benthosema* spp. (Fitch & Brownell 1968).

The Pantropical Spotted Dolphin reaches lengths of about 2 m, and adults weigh approximately 114 kg. Spotted Dolphins are born without spots, acquiring them as they grow, until they are entirely covered with overlapping markings. Although, there is some evidence of seasonality in mating and calving in some regions (for example, off Japan: Kasuya et al. 1974, and in the eastern Pacific: Barlow 1984), this is not the case for all other regions. They experience gestation and lactation periods of 11–12 months (Kasuya et al. 1974; Perrin et al. 1976) and 20–24 months (Kasuya 1985; Myrick et al. 1986), respectively, and sexual maturity is reached at body lengths of approximately 1.82 m in females and 1.94 m in males (Skinner & Chimimba 2005).

Stenella coeruleoalba prefer pelagic warm temperate and tropical zones, only roaming close to the shore where deep waters approach the coast (Van Waerebeek et al. 1999). In South African waters, this species is primarily oceanic, preferring deep waters (> 1,000 m) beyond the continental shelf, and is commonly associated with the warm Agulhas Current (Ross 1984). Group size of schools off South Africa ranged from 4–5 individuals to "several hundred" (Ross 1984), with an average of 74.5 (Findlay 1989). Gambell et al. (1975) recorded groups of between 20 and 500 individuals in the southwest Indian Ocean, averaging at 122.6.

The diet of *S. coeruleoalba* comprises principally of small pelagic and benthopelagic fish species, including laternfish, cod and squid (Wurtz & Marrale 1993; Hassani et al. 1997; Archer 2002). The stomach contents of 15 South African stranded individuals revealed diets consisting mostly of cephalopods and Myctophid fish, specifically the lanternfish, and Hygophum (Ross 1984). Sekiguchi et al. (1992) found the remains of 11 species of cephalopods (especially *Loligo vulgaris reynaudii* and *Sthenoteuthis* spp.) and six fish species (mostly hake *Merluccius* spp., Atlantic Horse Mackerel *Trachurus trachurus capensis,* and Myctophids) in the stomachs of 11 individuals.

Kroese (1993) found that Striped Dolphin calves are born at body lengths of about 1.0 m (although males are somewhat larger than females), following a gestation period of 13.4 months. The lactation period lasts approximately 16.5 months, and generally a period of 2–3 years occurs between calving (Miyazaki 1984; Kroese 1993). Ross (1984) recorded that female South African Striped Dolphins reached sexual maturity at 2.1 m, and males at 2.1–2.2 m. Maximum lifespan of this species in southern African waters was estimated at 47 years for males and 42 years for females (Kroese 1993).

Spinner Dolphins occur throughout tropical waters and warm temperate regions, often within inshore waters or around islands and banks; although in the eastern Tropical Pacific they are frequently seen in deep pelagic regions several hundred kilometres from the coast. Spinner Dolphins in the western Atlantic have been observed in tropical waters over the continental shelf and slope, in waters ranging from 170 m to 2,700 m deep.

While little local information is available for this species, in Hawaii Spinner Dolphins travel in groups of up to a few hundred. The characteristic spinning behaviour exhibited by this species is most likely attributed to communication (Norris et al. 1985), but an alternative hypothesis is that this behaviour aids in the removal of ecoparasites or commensals (Perrin & Gilpatrick 1994). The first of a series of descending leaps can reach a height of 3 m (Norris et al. 1985; Perrin & Gilpatrick 1994). Most Spinner Dolphins feed predominantly at night, on small (< 20 cm) midwater fish of many different families (including Myctophids), squids, and sergestid shrimps (Perrin et al. 1973; Dolar et al. 2003). Spinner Dolphins are suggested to hunt at greater depths and at different times of the day, compared to Pantropical Spotted Dolphins. There is currently no data attributed to the diet of Spinner Dolphins from South African waters.

A newborn calf from the waters off KwaZulu-Natal was 0.83 m in length (Ross 1984), although in the eastern Pacific average length at birth was recorded at 0.77 m (Skinner & Chimimba 2005). Seasonality in reproduction of Spinner Dolphins appears to vary depending on habitat and distribution (Barlow 1984). Both males and females reach sexual maturity at lengths of 1.6–1.7 m, usually at an age of 6–9 years in males and 4–7 years in females, although again, there is some variation between populations (Perrin & Henderson 1984). Approximate calving interval is three years.

Ecosystem and cultural services: Bycatch mitigation measures to reduce Spotted Dolphin (and Spinner Dolphin) entanglement in fishing gear in the Pacific led to the phrase “Dolphin friendly tuna”.

Use and Trade

There is no trade of these species within South Africa, although in certain regions *Stenella* spp. are hunted for food and as bait for fisheries.

Threats

The offshore distribution of *Stenella* species within the region suggests that industrial activity is not a major threat, additionally MacLeod (2009) predicted that due to the tropical distribution of *S. attenuata* and *S. longirostris*, it is unlikely that these species would be negatively influenced by the effects of climate change. However, although it is largely undocumented, due to their diet and distribution, localized threats to these species include accidental bycatch and competition for prey resources associated with pelagic fisheries.

Although within the assessment region there appears to be no major overlap between this species and major fishing operations, the Pantropical Spotted Dolphin in the eastern Pacific is severely threatened by tuna-seine fisheries. In fact, in 1972 approximately 270,000 Spotted Dolphins were incidentally killed due to accidental bycatch (Perrin et al. 1982). Gear modifications, which enabled dolphins to escape more easily aided in the decline of bycatch, though mortalities of 55,000–60,000 individuals in 1987 (Hall & Boyer 1989) and 15,000–16,000 individuals in 1992 (Hall & Lennert 1997) were recorded. Additionally, elsewhere in the world (such as off Japan), this species is directly targeted in drive fisheries; a catch of 4,184 individuals was recorded in 1978 (Miyazaki 1983).

Similar to other *Stenella* species, accidental bycatch in pelagic fishing gear has been identified as a threat to Striped Dolphins in other regions (Hammond et al. 2008). Net fisheries in the western Indian Ocean (including drift net fisheries south of Madagascar) may prove to be an emerging, undocumented threat to this species, specifically within pelagic trawls or purse-seine fisheries. As an extension to the assessment by Cockcroft and Krohn (1994), an up-to-date assessment of the potentially dangerous pelagic fisheries off the coasts of Africa may be necessary. Striped Dolphins have also been intermittently recorded entangled in shark nets off the coast off KwaZulu-Natal, but this is unlikely to have any major effect on abundance (Cockcroft 1990).

Since the 19th century, Striped Dolphins have been directly exploited in Japanese waters, in fact, at least 10,000 individuals were caught each year between 1942 and 1953, and approximately 14,000 were taken annually between the late 1950s and early 1960s (Kasuya & Miyazaki 1982). Catches declined during the 1980s and 1990s, and between 1989 and 1993, the average annual catch was 1,028 individuals (Perrin et al. 1994).

Spinner Dolphins have been recorded as bycatch in purse-seine, trawl and gillnet fisheries throughout their range (Donahue & Edwards 1996). Although the rate of bycatch is largely unrecorded, as the most abundant dolphin within the Indian Ocean, entanglement incidences of Spinner Dolphins is likely to be substantial in this region. Artisanal set nets off Mozambique have been identified as a specific threat to Spinner Dolphins. In the eastern Tropical Pacific mortality as a result of entanglement in purse-seine fisheries was estimates at 130,000 individuals in 1971 (Perrin et al. 1982), but more recently (1995) this rate of mortality declined to 1,100 animals (Hall & Lennert 1997).

Current habitat trend: Declining, due to increasing competition with pelagic fisheries for prey resources.

Table 1. Threats to the *Stenella* 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	*5.4.4 Unintentional effects*: entanglement in pelagic fisheries, and shark nets off the KwaZulu-Natal coast. Current stresses *2.1 Species Mortality* and *2.2 Species Disturbance.*	Reeves et al. 2013	Empirical	International	Unknown
2	*5.4.4 Unintentional effects*: competition with pelagic fisheries. Current stress *2.3.8 Other*: indirect Species Effects: on food resources.	DeMaster et al. 2001	Indirect	International	Increasing

Table 2. Conservation interventions for the *Stenella* spp. ranked in order of effectiveness with corresponding evidence (based on IUCN action categories, with regional context)

Rank	Intervention description	Evidence in the scientific literature	Data quality	Scale of evidence	Demonstrated impact	Current conservation projects
1	*5.4 Compliance & Enforcement*: bycatch assessments in pelagic fisheries	-	Anecdotal	-	-	-
2	*2.1 Site/Area Management*: reducing bycatch from shark nets by the removal of nets completely, decreasing net length and/or modification of fishing gear	-	Anecdotal	-	-	-

Conservation

No species-specific conservation initiatives have been identified for *Stenella* species within the assessment region, although *S. attenuata*, *S. coeruleoalba* and *S. longirostris* are all listed in Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), and are protected by national legislation under the Marine Living Resources Act (No. 18 of 1998).

Ship-based sighting surveys are recommended for the assessment region in order to determine general abundance, seasonality and distribution of *Stenella* species, and the pelagic zone of the temperate Agulhas Current should be specifically targeted. Additionally, investigations into the severity of threats and possible mitigation measures (including the use of alternative fishing gear technologies) associated with pelagic trawl, gillnet and purse-seine fisheries are required for these species. In response to the negative effects associated with fisheries bycatch of other dolphin species, Buscaino et al. (2009) suggest a collaborative response towards sustainable exploitation of oceanic resources, a decrease in the intensity of marine extraction and the establishment of protected areas.

Recommendations for managers and practitioners:

- Accurate bycatch assessments in the pelagic trawl, gillnet and purse-seine fisheries.
- Enforce regulations associated with deep water fisheries, including bycatch mitigation efforts.
- Sightings data should be recorded during systematic monitoring of other marine species.

Research priorities:

- Basic life history parameters, population size, structure and trends within the assessment region.
- Bycatch assessments in pelagic fisheries, including a specific reassessment of the western Indian Ocean fisheries.
- Taxonomic resolution of the *Stenella* genus.
- Distribution and the identification of core concentration regions of these species within South African waters.

Encouraged citizen actions:

- Use information dispensed by the South African Sustainable Seafood Initiative (SASSI) to make good choices when buying fish in shops and restaurants, e.g. wwfsa.mobi, FishMS 0794998795.
- Report sightings on virtual museum platforms (for example, iSpot and MammalMAP) to help with mapping geographical distribution.
- Report any stranding reports to the relevant local authorities.

Data Sources and Quality

Table 3. Information and interpretation qualifiers for the *Stella* 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	Evidentiary

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