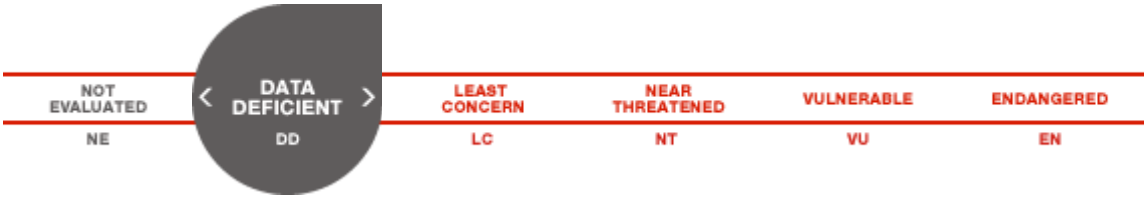
Sotalia guianensis



View Printer Friendly

Taxonomy [top]

Kingdom	Phylum	Class	Order	Family
ANIMALIA	CHORDATA	MAMMALIA	CETARTIODACTYLA	DELPHINIDAE

Scientific Name: Sotalia guianensis

Species Authority: (Van Bénéden, 1864)

Common Name/s:

English–Guiana Dolphin

Taxonomic Notes: It has been recommended that the riverine and marine forms of *Sotalia* be split into two species, *S. fluviatilis* in the Amazon and *S. guianensis* in marine and estuarine waters off eastern South and Central America and Caribbean. The evidence for separate species is based on genetic (Cunha *et al.* 2005; Caballero *et al.* 2007, 2008) and significant geometrical differences in skull shape and size (Monteiro-Filho *et al.* 2002, Fettuccia *et al.* 2009) and is currently widely accepted. Marked differences in the skull had been previously described by Borobia (1989), but a robust conclusion to support the splitting of the two forms into different species could not be reached, among other reasons due to the lack of samples from the transitional zone.

Two taxonomic issues, however, remain unclear for *Sotalia*. The first is the uncertainty on taxonomic status and range of *Sotalia* in the Orinoco River. There are frequent records of *Sotalia* dolphins at Ciudad Bolívar, some 300 km upstream. They are suspected to correspond to *S. guianensis* (da Silva and Best 1996, Meade and Koehnken 1991, Flores and da Silva 2009). It is believed that *Sotalia* dolphins cannot traverse the rapids at the Casiquiare channel, which connects the Orinoco and Amazon River basins (da Silva and Best 1996). This barrier has existed since the uplift of the Mérida Cordillera (10 million years ago - Mya; Lundberg *et al.* 1998), which predates the split between *Sotalia* species (Cunha *et al.* 2005, Caballero *et al.* 2007, 2008). Thus, *Sotalia* dolphins in the Middle Orinoco are likely to be an isolated population of *S. guianensis* (Cunha *et al.* 2010). The second issue is related to the taxonomic status of *Sotalia* dolphins from the southern freshwater portion of Maracaibo Lake. Those individuals are morphologically different from the marine *Sotalia* that inhabit the northern portion of the Lake, adjacent to the Gulf of Venezuela. Dolphins from southern Maracaibo are smaller than marine *Sotalia* and about the same size as *S. fluviatilis* (Casinos *et al.* 1981, da Silva and Best 1996, León 2005). However, there is no connection between Maracaibo Lake and the present day known range of riverine *Sotalia*, and it has been isolated from the Amazon basin for the last 8-10 Mya (Hoorn *et al.* 1995 and Días de Gamero 1996, cited in Cunha *et al.* 2010). The morphological distinctiveness of the southern Maracaibo Lake population could result from phenotypic plasticity, unlike the difference between *S. guianensis* and *S. fluviatilis*. However it may also indicate a lack of gene flow with the marine

Sotalia from the mouth of the lake and the Gulf of Venezuela. Indeed, Caballero *et al.* (2006) observed some exclusive haplotypes in samples from the lake, but they did not attribute the variation to specific differentiation.

Assessment Information [top]

Red List Category & Criteria: Data Deficient ver 3.1
Year Published: 2012
Assessor/s: Secchi, E.
Reviewer/s: Reeves, R. & Perrin, W.F.
Contributor/s:
Justification:

Although Guiana Dolphins are certainly affected by several threat factors including bycatch in fisheries, deliberate capture for bait, pollution and habitat deterioration, no formal assessment to evaluate the risks of population decline has been performed. Despite progress on population structure, relevant information for assessment under IUCN's criteria is incomplete for any of the proposed management units. Such assessment cannot be performed before population (management unit)-specific abundance, non-natural mortality rates and other relevant parameters are estimated. Due to a lack of adequate data on these parameters, *Sotalia guianensis* status cannot as yet be assessed under any of the criteria and it is listed as Data Deficient.

History: 2010 – Data Deficient

Geographic Range [top]

Range Description: The Guiana Dolphin (*sensu* Flores and da Silva 2009) is found mostly in shallow waters near shore and in estuaries along the Atlantic coast of northwestern South America, from Florianópolis, Santa Catarina State, southern Brazil (27º35'S), northwards into the Caribbean Sea and along the coast of Central America to the mouth of the Layasiksa River, the west side of Waunta Lagoon (13°40'N), northeastern Nicaragua (Carr and Bonde 2000) and possibly Honduras (15°58'N, 79°54'W) (Flores and da Silva 2009). In the Orinoco River, there are frequent records of *Sotalia* dolphins at Ciudad Bolívar, some 300 km upstream, which are suspected to correspond to *S. guianensis* (da Silva and Best 1996, Meade and Koehnken 1991, Flores and da Silva 2009). Boher *et al.* (1995) reported a sighting in the middle Orinoco, 800 km inland. Although there are disputed reports of *Sotalia* dolphins in the upper Orinoco, and even in the Apure River (Hershkovitz 1963, Borobia *et al.* 1991, but see Boher *et al.* 1995), there are no confirmed records from the upper Orinoco and Apure Rivers, or in the lower reaches of most of the major Orinoco tributaries, in a compilation of sightings over the period from 1983 to 1990 (Meade and Koehnken 1991). It is assumed that *Sotalia* dolphins cannot traverse the rapids at the Casiquiare Channel, which connects the Orinoco and Amazon River basins (da Silva and Best 1996).

The map shows where the species may occur based on oceanography. The species has not been recorded for all the states within the hypothetical range as shown on the map. States for which confirmed records of the species exist are included in the list of native range states. States within the hypothetical range but for which no confirmed records exist are included in the Presence Uncertain list.

Countries: Native:
Brazil; Colombia; Costa Rica; French Guiana; Guyana; Honduras; Nicaragua; Panama; Suriname; Trinidad and Tobago; Venezuela

FAO Marine Fishing Areas: Native:
Atlantic – southwest; Atlantic – western central

Range Map: Click here to open the map viewer and explore range.

Population [top]

Population: The population structure and phylogeography of *S. guianensis* along the Brazilian coast was investigated by Cunha (2007), using mtDNA control region sequences. Different analyses showed evidence for at least six MUs: Pará, Ceará, Rio Grande do Norte, Bahia, Espírito Santo and the South-Southeastern area (from Rio de Janeiro to Santa Catarina states). Those MUs were highly differentiated, indicating severe restrictions to gene flow among them (Cunha *et al.* 2010). An interesting finding was a lack of variation in the control region of dolphins from South-Southeastern Brazil (between parallels 22º and 25ºS, extending 900 km). Caballero *et al.* (2006) analyzed populations of *S. guianensis* from the northern part of South America, Central America and the Caribbean and proposed two MUs for that area: one for Central America, Colombia and Venezuela, and another for Guyana, Suriname and French Guiana. Those authors noted that dolphins from Maracaibo Lake, despite being included in the first MU, had some unique haplotypes and advised that their genetic distinctiveness be further investigated. However, only three individuals from southern Maracaibo were analyzed; the others were from the northern portion of the lake where it opens to the Gulf of Venezuela. Clearly, further analyses of samples from Maracaibo Lake must be analyzed.

This structuring pattern is probably due to the patchy and discontinuous distribution of *Sotalia guianensis* (Borobia *et al.* 1991, Flores and da Silva 2009). Abundance estimates are not available for the total population or for any of the proposed MUs. Although the species appears relatively abundant in many parts of its range, estimates of absolute or relative abundance, such as minimum number sighted, encounter rate, or estimated minimum density, are available only for small areas. Not all estimates are consistent and some lack methodological rigor. Some of the differences observed in the same areas over time might be due to different methodologies rather than decrease or increase. For instance, Geise (1991) estimated that there were just over 400 dolphins in Guanabara Bay (Rio de Janeiro State), southeastern Brazil. More recent estimates using photo-identification mark-recapture analysis indicate that there may be only 69-75 individuals in that area (Pizzorno 1999). It is not clear whether the difference is a result of population decline or of using different estimation methods. Geise *et al.* (1999) estimated that approximately 704.8 ± 367.7 individuals inhabited the area around Cananéia (São Paulo State), also in southeastern Brazil, where recent mark-recapture estimates suggest there are only 290-360 dolphins (Santos and Zerbini 2006). In Sepetiba Bay (Rio de Janeiro State), density was estimated as 2.79 dolphins/km², implying a total of 1,269 individuals (CI=739-2,196) (Flach *et al.* 2008). Density and abundance were similar for the entrance and interior of the Bay. In southern Brazil, abundance has been estimated only for Babitonga Bay (Santa Catarina State) where estimates varied from 231 (CI = 147-365; density of 1.44/km²) in 2001 to 154 (CI = 71-332; density = 0.96/km²) in 2003. Density of dolphins in Guaratuba Bay and Paranaguá and Antonina estuaries varied from 0.15/km² in the Bay (Filla 2004) to 11.56-23.16/km² in the estuaries, respectively (Filla 2004, Japp

2004). Bolaños-Jiménez (in IWC 2007) reported observations of groups as large as 70 in Lake Maracaibo, Venezuela. In Colombia, Bossenecker (1978) estimated 100-400 dolphins near the mouth of the Magdalena River and noted that the species was abundant in the Gulf of Cispata, near San Antero (Colombia). In Golfo de Morrosquillo, Colombia, an abundance of 70-90 individuals was estimated based on mark-recapture of photo-identified animals (Dussán-Duque *et al*. 2006). *Sotalia* have been described as common in the Marowijne River (border between Suriname and French Guiana) and also in the mouths of the larger rivers of Suriname (Husson, 1978, in da Silva and Best 1994, Duplaix, 1980). In Guyana, they have been reported from the Demerra, Cuyuni, Mazaruni and Essequibo river mouths (Williams 1928, Herald 1967 in da Silva and Best 1994). Edwards and Schnell (2001) estimated that there were about 50 *Sotalia* in Nicaragua's Cayos Miskito Reserve.

Population Trend: ? Unknown

Habitat and Ecology [top]

Habitat and Ecology: Preferred habitats appear to be estuaries, bays, and other shallow, sheltered coastal waters. The southernmost limit of this species, at Santa Catarina State, southern Brazil (Simões-Lopes 1986), is thought to be defined by the low sea-surface temperature under influence of the Malvinas/Falkland Current (Flores and da Silva 2009), though no supporting data exist for this. In Guanabara Bay, Rio de Janeiro, the dolphins prefer the deeper channels (25 m depth) and avoid areas shallower than about 6 m (Azevedo *et al.* 2007). In open coastal areas, they seem to avoid deep waters (e.g. Edwards and Schnell 2001), although they can be sighted several kilometers from shore in areas where the continental shelf is shallow or in waters over offshore banks such as Abrolhos Bank, up to 70 km off the coast of Bahia State, northeastern Brazil (Rossi-Santos *et al.* 2006). In the Orinoco River, dolphins seen as far up as Ciudad Bolivar, Venezuela, probably belong to this species (Flores and da Silva 2009). *S. guianensis* is also often seen at the mouth of the Amazon River. Fresh water from the Amazon River reaches hundreds of kilometers into the sea (Muller-Karger *et al.*, 1988, quoted in Cunha *et al.* 2010), so the animals sampled in Pará were actually living in fresh water. It would be interesting to analyze samples from intermediate locations along the Amazon River to determine how far upstream *S. guianensis* occurs and whether there is sympatry in any region with *S. fluviatilis*.

Sotalia guianensis is patchily distributed (Borobia *et al.* 1991, Flores and da Silva 2009) as evident from the relatively small home ranges of individuals. In its southernmost limit at Baia Norte, estimated individual home ranges were only about 10-15 km² (Flores and Bazzalo 2004). In the Cananéia estuary, São Paulo state, where Guiana dolphins were found in water depths ranging from 1 to 23 m, observed home ranges varied from 1.6 to 22.9 km² (Santos and Rosso 2007).

Guiana dolphins consume both marine and estuarine species such as demersal and pelagic fish of the families Sciaenidae, Clupeidae, Mugilidae, Trichiuridae and Batrachoididae as well as neritic cephalopods, family Loliginidae (Borobia and Barros 1991, da Silva and Best 1994, 1996, Santos *et al.* 2002, Di Beneditto and Ramos 2004). They also prey on penaeid shrimps (Santos *et al.* 2002) and crabs (Flores and da Silva 2009). Young age classes of teleost fishes, including over 60 species, are usually the most important items in the diet (Flores and da Silva 2009). In northern Rio de Janeiro, for example, lengths of fish preyed upon by *S. guianensis* ranged from 1.2 to 106.9 cm and mantle lengths of cephalopods varied from 3.4 to 22.2 cm (Di Beneditto and Ramos

2004). Sciaenid fishes that produce relatively loud sounds by swim bladder contraction were observed as common prey items. Feeding occurs both individually and in large groups.

Predators of Guiana dolphins may include Killer Whales (*Orcinus orca*) (Bittencourt 1983) and sharks, although there are no confirmed records other than an observed predation attempt by a Bull Shark (*Carcharhinus leucas*) (Santos and Gadig in press).

Males reach sexual maturity at seven years and at body lengths of 170–175 cm. Females mature at 5-8 years of age and at body lengths of 164–169 cm (Di Beneditto and Ramos 2004). Calving is year-round and gestation lasts around 11–12 months, with newborn calves ranging in size from 90 to 100 cm (Di Beneditto and Ramos 2004, Rosas and Monteiro-Filho 2002). The reproductive cycle is estimated at 2 years, with no marked seasonality in ovulation or timing of birth (Santos *et al.* 2001, Rosas and Monteiro-Filho 2002, Di Beneditto and Ramos 2004). The breeding system is promiscuous (Rosas and Monteiro-Filho 2002) within a fusion-fission society (Santos and Rosso 2008). Females older than 25 years have senescent ovaries (Rosas and Monteiro-Filho 2002). Maximum observed age (uncalibrated Growth Layer Groups) was 29 for males and 30 for females (Rosas *et al.* 2003, Santos *et al.* 2003, Di Beneditto and Ramos 2004).

Group size ranged between 1 and 40 individuals, and groups of 2–10 were most common in Guanabara Bay, southeastern Brazil (Azevedo *et al.* 2007). In the Cananeia estuary, group size varied from lone individuals to aggregations of up to 60 (mean ± SD: 12.4 ± 11.4 individuals) (Santos and Rosso 2007). No seasonal variation in group size was observed in either of those studies. Nursery groups were twice as large as non-calf groups in Guanabara Bay and much more frequent in the Cananeia estuary. In the Cayos Miskito Reserve, Nicaragua, the mean group size was three (Edwards and Schnell 2001). Although Flores and da Silva (2009) reported that Guiana Dolphins do not associate with Bottlenose Dolphins (*Tursiops truncatus*) in Brazilian waters, there are records of aggression of Bottlenose Dolphins towards Guiana Dolphins in Santa Catarina State (Wedekin *et al.* 2004).

Systems: Marine

Threats [top]

Major Threat (s): Guiana Dolphins are vulnerable to incidental mortality in fishing gear, especially monofilament gillnets, seine nets, and shrimp and fish traps (da Silva and Best 1994, IWC 2007). Significant catches have been reported in many parts of their range (*e.g.* Siciliano 1994, da Silva and Best 1994, 1996, Beltrán 1998, Di Beneditto 2003, IWC 2007). In addition there has been some direct killing for human consumption and for shark and shrimp bait (da Silva and Best 1994, IWC 2007). Beltran (1998) recorded 938 animals taken in drift nets from the port of Arapiranga (Pará State) during the summer of 1996 and a further 125 taken during the winter. These data were collected by interviewing fishermen in the port after trips and collecting carcasses. More recently, Monteiro-Neto *et al.* (2004) estimated that approximately 90 Guiana Dolphins were killed every year in the passive gill net fisheries along the Brazilian coast. In the metropolitan area of Fortaleza, the capital of Ceará State, 32 bycaught animals were recorded (Monteiro-Neto *et al.* 2004).

Although there is no evidence of past or recent commercial hunting, molecular data indicated that dolphin-derived products illegally sold in the Brazilian Amazon as amulets or love charms came from *S. guianensis* instead of from Botos (*Inia geoffrensis*) as

advertised by sellers (Cunha and Solé-Cava 2007, Gravena *et al.* 2008, Sholl *et al.* 2008). They were probably accidentally captured in the Amazon estuary and along the adjacent Pará and Amapá coasts. *S. guianensis* amulets were found not only in Belém (Pará State, at the Amazon Estuary) but also in Manaus, Amazonas State, and Porto Velho, Rondônia State, despite the availability of Botos and Tucuxis in those areas. In one market in Porto Velho, however, 90% of the eyeballs sold as dolphin products were in fact from pigs or sheep (Gravena *et al.* 2008). It is unclear what proportion of the dolphins that supplied or supply such markets are taken incidentally in fishing gear as opposed to killed deliberately. Dolphin charms may originate both from bycatch in legal fisheries and as a secondary product of the illegal catch of dolphins for bait (Cunha *et al*. 2010). The catch or bycatch of Guiana Dolphins for such purposes can be high. A single boat had 83 carcasses on board (footage done obtained by IBAMA and broadcast by a Brazilian television network on 07/16/2007), probably intended as bait for the shark fishery. Some Guiana Dolphins taken off the coast of Panamá and Colombia in the late 1970s were kept in captivity in Europe for more than 20 years (Terry 1986). A few dolphins are still kept in Colombian facilities, although since 2005 live-capture for captivity has been illegal (Culik 2004).

Pollution from industrial and agricultural activities may be a threat both directly, through the destruction of habitat, and indirectly, through contamination of prey. Large harbours such as Baia de Guanabara (Rio de Janeiro), Santos (São Paulo) and Paranaguá (Paraná), are very polluted with effluent, including heavy metals, posing a serious potential threat (da Silva *et al.* 2003, Medeiros and Bícego 2004, Bícego *et al.* 2006). The continued use of insecticides containing substances banned elsewhere is common in South America (da Silva and Best 1994, Yogui *et al*. 2003). Studies that included determination of micropollutant concentrations in Guiana dolphins from Guanabara Bay demonstrated the estuary to be a world hotspot for environmental contamination by persistent bioaccumulative toxicants (PBTs). In general, the PBT concentrations found in Guiana dolphins from this area are in the same range as the levels verified in coastal cetaceans from highly industrialized countries of the Northern Hemisphere. This latter statement holds for dichlorodiphenyltrichloroethane (DDT) and its metabolites, polychlorinated biphenyls (PCBs), hexachlorobenzene (HCB) (Lailson-Brito *et al.* in press), polychlorinated dibenzo-*p*-dioxins (PCDDs), polychlorinated dibenzo-*p*-furans (PCDFs), dioxin-like PCBs (Dorneles *et al.* 2008a), organotin compounds (Dorneles *et al.* 2008b), and perfluorooctane sulfonate (PFOS) (Dorneles *et al*. 2008c), as well as polybrominated diphenyl ethers (PBDEs) (Dorneles *et al*. 2010). Although the Cananéia estuary is known to be polluted by both chlorinated pesticides and polychlorinated biphenyls (PCBs), organochlorine concentrations were lower in the blubber of Guiana dolphins than in that of small cetaceans from developed areas (Yogui *et al.* 2003). Mercury is used in the refining of fluvial gold and then, like the pesticides, probably enters the aquatic food chain of the rivers and coasts. Mercury and selenium were found in the livers of two *Sotalia* from Suriname (da Silva and Best, 1994 and ref. therein). The detection of Cd, Hg and Pb in tissue samples of *S. guianensis* off the coast of Ceará, Brazil, indicated that heavy metals are locally present in the water and bioaccumulation probably occurs through the food web. Contamination levels were not considered critical, but they could be related to Ceará's growing industrial development (Monteiro-Neto *et al.* 2002). Exploration for oil in the offshore regions of Brazil, Venezuela and Colombia may not pose a direct threat to *Sotalia,* but spills in estuaries could affect local subpopulations (da Silva and Best 1994, Culik 2004). In recent years, skin diseases have been observed in estuaries (Van Bressem *et al.* 2009).

Conservation Actions [top]

Conservation Actions:	*Sotalia* species are listed in Appendix I of CITES and *S. guinanensis* is listed in Appendix II of CMS. The species is legally protected in most of the range countries.

Citation:	Secchi, E. 2012. *Sotalia guianensis*. In: IUCN 2012. IUCN Red List of Threatened Species. Version 2012.2. <www.iucnredlist.org>. Downloaded on **16 March 2013**.
Disclaimer:	To make use of this information, please check the <Terms of Use>.
Feedback:	If you see any errors or have any questions or suggestions on what is shown on this page, please fill in the feedback form so that we can correct or extend the information provided