

Lagenorhynchus obscurus (Gray, 1828)

English: Dusky dolphin
German: Schwarzdelphin
Spanish: Delfín oscuro
French: Dauphin sombre

Family Delphinidae

1. Description

Dusky dolphins are small and moderately robust. They have virtually no beak, as the head slopes evenly down from the blowhole to the tip of the beak. The tip of the dorsal fin is rather blunt and is not markedly hooked. The tail and back are bluish-black, and a dark band runs diagonally across the flanks from below the dorsal fin towards the vent and along the tailstock. The underside of the body is white, and whitish-grey colour extends over the flanks. The tips of the snout and lower jaw are dark. A grey area extends from the eye down to the flipper. Two diagonal whitish streaks run forward from the tail up past the base of the dorsal fin (Baker, 1990, Jefferson et al. 2008). The largest dusky dolphin males and females reach 211 and 205 cm, respectively, attaining a body mass of rarely higher than 100 kg (van Waerebeek and Würsig, 2009).

Yazdi (2002) reported a possible hybrid between a dusky dolphin and a southern right-whale dolphin (*Lissodelphis peronii*), south of Peninsula Valdés in Golfo Nuevo, Argentina.

2. Distribution

<http://www.iucnredlist.org/apps/redlist/details/11146/0/rangemap>

Distribution of the various subspecies of Lagenorhynchus obscurus: coastal temperate waters off Australia, New Zealand, South America and Southern Africa and oceanic islands (Hammond et al. 2008; © IUCN).

Lagenorhynchus obscurus is widespread in the southern hemisphere, but its distribution is probably not continuous. Populations in the South American, African, and New Zealand sectors of the range are sufficiently distinct to be regarded as subspecies, according to Van Waerebeek et al. (1993), although he did not apply scientific names to them. However, Cassens et al. (2005) found only low levels of genetic differentiation among most dusky dolphin populations. Only the Peruvian dusky dolphin stock is highly differentiated.

Rice (1998) listed three subspecies which are still recognized (Hammond et al. 2008; Jefferson et al. 2009):

L. o. fitzroyi (Waterhouse, 1838), ranges in coastal waters of South America from Isla Matorca to Mar del Plata. However, Cassens et al. (2003) using genetic analysis found no evidence for recent female gene flow between Atlantic and Pacific waters, indicating that the eastern South Pacific dusky dolphins stock (e.g. the Peruvian stock) should be considered a separate management unit.

L. o. obscurus ranges in coastal waters of southern Africa from Lobito in Angola south to Cape Agulhas in Cape Province. It has been reported from Prince Edward Islands (subspecies?) and Ile Amsterdam (subspecies?). Purported sightings and specimens from Iles Crozet and Iles Kerguelen are erroneous or unverified (Rice, 1998).

L. o. subsp.: Ranges on the east coast of New Zealand from Whitianga on North Island south to Stewart Island and is also found on Campbell, Auckland and Chatham Islands (Rice, 1998).

In addition, there may be an unrecognised subspecies at the Falkland Islands/Islas Malvinas, and another around Gough Island in the South Atlantic Ocean (Rice, 1998), a melanistic form of *L. o. obscurus* (van Waerebeek, 2002).

Gill et al. (2000) reported the sighting of a school of 15 dusky dolphins off eastern Tasmania, suggesting that the species does, in fact, also occur in Australian waters. However, The low rates of observation or stranding, compared to those of other inshore dolphins such as *Delphinus delphis*, which is well-known along the southern Australian coast, strongly suggest that dusky dolphins occur rarely in coastal waters of southern Australia and are unlikely to be resident. Dusky dolphins may occur far offshore, visiting coastal waters in response to unusual oceanographic conditions. Another possibility is that members of the population around St Paul and Amsterdam Islands may visit Australian waters (Gill et al. 2000).

Based on new mitochondrial and nuclear DNA sequence data, Harlin-Cognato et al. (2007) proposed a Pacific/Indian Ocean origin of the species, with a relatively early and continued isolation of Peru from other regions. Dispersal of the dusky dolphin into the Atlantic would be correlated with the history of anchovy populations, including multiple migrations from New Zealand to South Africa. They suggest that changes in primary productivity and related abundance of prey played a key role in shaping the phylogeography of the dusky dolphin, coincident with periods of ocean change.

3. Population size

The population off Kaikoura, New Zealand was estimated at 12,000. (Markowitz, 2004). In the southern Ocean, during the Southern Hemisphere minke whale assessment cruises between 1978/79 and 1987/88, a total of 2,665 dusky dolphins in 27 schools were observed. These observations were made while in transit between home ports and the Antarctic, but no abundance estimates were calculated (Brownell and Cipriano, 1999 and refs. therein). The total number of dusky dolphins in the fishing area off the Patagonian coast was estimated to be close to 7,252 individuals (Dans et al. 1997), and the number given by Schiavini et al. (1999) for the area between Punta Ninfas and Cabo Blanco, Argentina is 6,628. Off the Peruvian coast, dusky dolphins were the third most abundant cetacean species sighted (Sanchez et al. 1998).

4. Biology and Behaviour

Habitat: This coastal species is usually found over the continental shelf and slope (Jefferson et al. 1993; Aguayo et al. 1998), in waters up to 2,000 m deep (Würsig et al. 2007) The distribution of dusky dolphins along the west coast of South Africa and both coasts of South America is associated with the continental shelves and cool waters of the Benguela, Humboldt and Falkland Currents. Around New Zealand these dolphins are associated mainly with various cold water currents (Brownell and Cipriano, 1999; Würsig et al. 2007). Off

Argentina, dusky dolphins have been sighted from the coast to just before the 200 nautical miles Exclusive Economic Zone border (Crespo et al. 1997). They seem to prefer waters with sea surface temperatures between 10°C and 18°C (Brownell and Cipriano, 1999).

Behaviour: Dusky dolphins are highly inquisitive and usually easy to approach. They seem to enjoy the contact with boats and people and readily bow-ride (Carwardine, 1995). They are one of the most acrobatic of dolphins, frequently leaping high out of the water, at times tumbling in the air (Jefferson et al. 1993). Mean dive time for 10 radio tagged dolphins off Argentina was only 21.0 sec, and the number of long dives (>90 sec), probably associated with feeding, peaked in mid-day to afternoon in summer (Würsig, 1982).

Subgroups of dusky dolphins within larger schools off New Zealand sometimes were observed to dive synchronously, and occasionally almost the entire group would be underwater for several minutes (Brownell and Cipriano, 1999 and refs. therein). Group sizes, behaviours, social affiliations and general habitat-use patterns differ between Kaikoura and Admiralty Bay, Outh Island, even though some of the same animals utilise both habitats in different seasons. Off Kaikoura, there are daily and seasonal differences in behaviours and movement patterns, with daytime rests around midday, social activities in the mornings and afternoons, and feeding in deeper oceanic waters at night (Würsig et al. 2007).

Schooling: The species is highly gregarious and seems to welcome the company of other species as well as its own: it is often seen with seabirds and frequently associates with other cetaceans. Its own group sizes vary according to the time of year, with larger numbers living together during the summer (Carwardine, 1995). School size is fairly variable, with a range of 2-500 and a mean of 98.7 individuals. During the winter months, groups of less than 20 are more common than at other times of the year. Stable subgroups were observed within a more fluid society of changing group size (Würsig and Würsig, 1980) and probably displayed a high degree of individual-to-individual fidelity (Würsig and Bastida, 1986).

In Argentina large groups are more efficient at herding schools of anchovy than small ones, and it appears that methods for calling in distant groups evolved because the food benefit for each dolphin is increased when groups join forces. Cooperative herding appears essential in their effort to feed on small schooling fish. An original group of eight to 10 dolphins often increases to more than 200 by the time feeding is completed. After they have fed, high levels of social and sexual activity take place in the large group (Würsig et al. 1989).

In New Zealand, the feeding and social behaviour of dusky dolphins are very different. Instead of traveling, as their Argentine kin do, in a widespread school with small groups some distance apart, New Zealand dusky dolphins move in closely knit schools, made up of subgroups of about ten individuals. There is usually an unbroken and tight perimeter surrounding an entire school so that two- or three hundred animals cover an area generally no larger than one square kilometer. The entire school travels in search of food as a directed unit rather than meandering in groups. Like the dusky dolphins of Argentina, they split into small groups to rest near shore during the day (Würsig et al. 1989).

Off Kaikoura, thousands of dusky dolphins gather, feeding nocturnally on deep scattering layer prey, resting and socializing diurnally. Group size, distance from shore, ranging along shore, travelling, inter-individual distance, and noisy leaping peaked in winter; during the spring- summer-autumn reproductive seasons dolphins maintaining closer proximity to each other in smaller, more quiescent groups, closer to shore (Markowitz, 2004). In the same area, mother-calf pairs are often found in small groups with other mother-calf pairs, with calves of roughly the same age. Nursery groups were encountered in shallow waters (≤ 20 m)

significantly more often than in deeper waters, thus effectively avoiding marine predators such as sharks and killer whales (Weir et al. 2008).

Dusky dolphins have been observed in mixed cetacean schools with southern right-whale dolphins (*Lissodelphis peronii*) off Namibia. In summer, *L. obscurus* groups off Kaikoura, New Zealand were occasionally accompanied by small groups of common dolphins (*Delphinus delphis*), which travelled as a cohesive subgroup within the larger dusky dolphin group. Dusky dolphins were also observed with pilot whales (*Globicephala* sp.) off Southwest Africa and the Prince Edward Islands (Brownell and Cipriano, 1999, and refs. therein). Off Argentina, dusky dolphins were also observed in association with 2 *Delphinus capensis* females and one *Tursiops truncatus* male (Yazdi, 2000).

Reproduction: In New Zealand and Argentina, calving is believed to peak in summer (November to February; Jefferson et al. 1993). In Peruvian waters most births occurred in late winter (August, September, and October; Van Waerebeek & Read, 1994). In Peru, sexual maturity in females is estimated at 4.3 – 5 years and in males at 3.8-4.7 years (Van Waerebeek and Würsig, 2009).

Food: *L. obscurus* take a wide variety of prey, including southern anchovy and mid-water and benthic prey such as squid and lanternfishes. They may also engage in nocturnal feeding. Co-operative feeding is practised commonly in some areas (Jefferson et al. 1993).

Their most important prey in Peruvian coastal waters is anchoveta (*Engraulis ringens*). It constituted almost 90% of the dusky dolphin's diet by percent gross energy (Mc Kinnon 1994). Other prey species commonly found in dolphin stomachs were horse mackerel (*Trachurus symmetricus*), hake (*Merluccius gayi*), sardine (*Sardinops sagax*), Patagonian squid (*Loligo gahi*) and jumbo flying squid (*Dosidicus gigas*) (Mc Kinnon, 1994).

The most important prey of Patagonian dusky dolphins off Argentina is the southern anchovy (*Engraulis anchoita*), representing 39% of prey by number and 46% by weight (Alonso et al. 1998). The most frequent prey was the patagonian squid (*Loligo gahi*), which was present in 84% of stomachs. Other prey species found were hake (*Merluccius hubbsi*), the "pampanito" (*Stromateus brasiliensis*), the southern cod (*Nothotenia* sp.), shortfin squid (*Illex argentinus*), a sepiolid (*Semirossia tenera*) and an octopus (*Octopus tehuelches*).

Stomachs from 24 dusky dolphins incidentally killed in fishing operations in New Zealand waters contained remains of mesopelagic fishes, mainly myctophids and hoki (*Macruronus novaezelandiae*), and squids (*Nototodarus* spp., *Moroteuthopsis* spp. and *Teuthowenia* spp.; McKinnon, 1994; Brownell and Cipriano, 1999). In Admiralty Bay and Current Basin, New Zealand, dolphin feeding tactics were different from May through July than from August to November. From May through July, dolphins fed on mobile prey at depth; from August to November, they herded small schools of fish (including pilchard *Sardinops neopilchardus*) to the surface (Vaughn et al. 2007).

5. Migration

Dusky dolphin may cover large distances: Würsig and Bastida (1986) equipped two animals with spaghetti tags in Jan. 1975 off Golfo San José Argentina. The two dolphins were sighted approximately 20 km (1 day after tagging) and 35 km (5 days after tagging) from the tagging site, respectively. In December 1982, both dolphins were observed swimming side by side in

a school of approximately 150 dusky dolphins about 10 km off Mar del Plata, approximately 780 km north-east of the original tagging location.

In New Zealand, photographic identification data indicate a seasonal shift in residency of dolphins between Kaikoura and the Marlborough Sounds (approx. 200 km apart) (Harlin et al. 2003; Markowitz, 2004).

On a smaller scale, the Argentinian and New Zealand populations exhibit inshore-offshore movements both on a diurnal and on a seasonal rhythm (van Waerebeek, 2002). They were found during most of the year in Golfo San José, Argentina, with a seasonal low in abundance during winter and a peak in summer (Würsig and Würsig, 1980). In summer, these dolphins were also found more often in deeper water near the mouth of the bay, at a time when southern anchovy (*Engraulis anchoita*) was probably moving into deeper water.

In the Kaikoura area off South Island, New Zealand, dolphins moved from nearshore to off-shore waters during the course of the day, apparently feeding on mesopelagic fishes in deep water during evening and night but consistently remained closer to shore than during winter months (Brownell and Cipriano, 1999 and refs. therein). Residence in Kaikoura is seasonal, with 1,969 from a population of 12,626 dolphins spending 103 consecutive days in the area per year (Markowitz, 2004). Mark-recapture data indicate that more than 1000 dusky dolphins used Admiralty Bay, Marlborough Sound, over the course of a 5-year study, with an average of 220 individuals inhabiting the bay on any given week during the winters of 1998- 2002. As many as 55% of individuals returned to Admiralty Bay in consecutive winters (Markowitz et al. 2004). Off the west coast of South Island, dusky dolphins occurred almost exclusively in summer in groups of 2-150 individuals, often with calves, especially at Cape Foulwind and Jackson Head (Braeger and Schneider, 1998).

The intermittent nature of 12 records in Tasmania, Australia, over 175 years is puzzling. Setting aside concerns about identification, the dates of records are quite seasonal, occurring from October/November (8) through January (1) and March/April (3). Such seasonality suggests a causal link with changes in one or more oceanographic features in this region, perhaps, for example, in the position of the Subtropical Convergence, a feature which appears to coincide with the northern limit of distribution for this species off eastern New Zealand, and/or ENSO events (Gill et al. 2000).

6. Threats

Direct catch: Large catches (approximately 10,000) of small cetaceans were reported from the coastal waters of central Peru in 1985 (Read et al., 1988). In the 1991–1993 period, an estimated 7,000 dusky dolphins were captured per year, an exploitation thought to be unsustainable. It is believed, but not confirmed, that this level of exploitation has diminished since dolphin hunting was banned by law in 1996 and due to depletion of the population (van Waerebeek, 2002). Captured dusky dolphins and other small whales are still used in Perus as shark bait in long-line and gillnet fisheries and landed illegally to be sold in public markets, largely due to a lack of law enforcement (Van Waerebeek and Würsig, 2009).

Incidental catch: Of 722 cetaceans captured mostly in multi-filament gillnets and landed at Cerro Azul, central Peru, in 87 days during January-August 1994, 82.7% were dusky dolphins. The total kill estimate for a seven-month period, stratified by month, was 1,567 cetaceans. Data collected at 16 other ports showed that high levels of dolphin and porpoise mortality persisted in coastal Peru at least until August 1994 when an unimplemented 1990

ban on small cetacean exploitation was renewed. Circumstantial evidence suggests that, thereafter, increasing enforcement reduced direct takes and illegal trade in meat but also hampered monitoring. The absence of abundance data precludes any assessment of impact on populations (van Waerebeek et al. 1997).

Dusky dolphins continue to be affected by the trawl fishery off Patagonia (Crespo et al. 2007) and mortality estimates for 1994 reached a minimum value of 36 dolphins per year, mostly females and young matures (Dans et al. 1997). Dans et al. (2003) concluded that this incidental mortality could be, or may become, a threat for the regional dusky dolphin population.

In New Zealand, some dusky dolphins are entangled in gill nets. Incidental mortality at one fishing port was estimated to be 100 to 200 animals per year (Jefferson et al. 1993) and within the range of 50–150 during the mid-1980s (Würsig *et al.* 1997). However, this is not repeated in the recent literature (Würsig et al., 2007), whereas in Australian waters the pelagic drift-net fishery in Tasman Sea as well as entanglement in drift-nets set outside Australian Economic Exclusion Zone and in lost or discarded netting are a cause for concern (Ross, 2006).

Aquaculture: Aquaculture may threaten dusky dolphin foraging habitat in Admiralty Bay, Marlborough Sound, New Zealand, where an estimated 220 dolphins gather to feed each winter. Overlap of dusky dolphin habitat use with proposed marine farms is high, and dolphins rarely used areas within the existing farms (Markowitz et al. 2004).

Pollution: The maximum concentration (ppm wet weight) of DDT reported in the blubber of this species in New Zealand waters was 175 (Brownell and Cipriano, 1999 and refs. therein).

Tourism: Commercial dolphin watching and swim-with-dolphin operations started in the late 1980s and are a major industry in Kaikoura, New Zealand. During summer, boats approach the same dolphin groups throughout the day. While there are behavioural reactions by the dolphins, no large-scale or long-term adverse reactions to human tourism have been documented to date. It is presently unknown whether more subtle chronic effects could be detrimental to the population (Würsig et al. 1997). The discovery of midday resting has led to a voluntary 'down-time' of no tourism boats by a local dolphin tourism enterprise, Dolphin Encounter (Würsig et al. 2007). Since 1997, dusky dolphin watching activities have also increased in Patagonia, from 1,393 tourists in 1997 to 1,840 in 2000, with unknown effects on the animals (Coscarella et al. 2003).

7. Remarks

Range states (Hammond et al. 2008):

Argentina; Australia; Chile; Falkland Islands (Malvinas); French Southern Territories (the Amsterdam-St. Paul Is.); Namibia; New Zealand; Peru; South Africa (Marion-Prince Edward Is., Northern Cape Province, Western Cape Province).

L. obscurus is included in Appendix II of CMS. IUCN Status: "Data Deficient" (Hammond et al. 2008). The species is listed in Appendix II of CITES.

Bycatch in gillnets occurs at an unknown and in some regions like Peru and Patagonia, presumably intolerable level. This needs to be investigated. For South American stocks, see recommendations in the Huckle-Gaete (2000) report in Appendix 1.

8. Sources

- Aguayo A, Bernal R, Olavarria C, Vallejos V, Hucke R (1998) Cetacean observations carried out between Valparaiso and Easter Island, Chile, in the winters of 1993, 1994 and 1995. *Rev Biol Mar Ocean* 33: 101-123.
- Alonso MK, Crespo EA, Garcia NA, Pedraza SN, Coscarella MA (1998): Diet of dusky dolphins, *Lagenorhynchus obscurus*, in waters off Patagonia, Argentina. *Fishery Bulletin* 96 (2): 366-374.
- Baker AN (1990) Whales & Dolphins of New Zealand & Australia. Victoria University Press, Wellington.
- Braeger S, Schneider K (1998) Near-shore distribution and abundance of dolphins along the west coast of the South Island, New Zealand. *N Z J Mar Freshwat Res* 32:105-112
- Brownell RL, Cipriano F (1999) Dusky dolphin - *Lagenorhynchus obscurus* (Gray, 1828) In: Handbook of Marine Mammals (Ridgway SH, Harrison SR Eds.) Vol. 6: The second book of dolphins and porpoises. Pp. 85 – 104
- Carwardine M (1995) Whales, Dolphins and Porpoises. Dorling Kindersley, London, UK, 257 pp.
- Cassens I, Van Waerebeek K, Best PB, Tzika A, Van Helden AL, Crespo EA, Milinkovitch MC (2005) Evidence for male dispersal along the coasts but no migration in pelagic waters in dusky dolphins (*Lagenorhynchus obscurus*). *Mol Ecol* 14: 107-121
- Cassens I, Van Waerebeek K, Best PB, Crespo EA, Reyes J, Milinkovitch MC (2003) The phylogeography of dusky dolphins (*Lagenorhynchus obscurus*): a critical examination of network methods and rooting procedures. *Mol Ecol* 12: 1781-1792
- Coscarella MA, Dans SL, Crespo EA, Pedraza SN (2003) Potential impact of unregulated dolphin watching activities in Patagonia. *J Cetacean Res Manage* 5: 77-84
- Crespo EA, Pedraza SN, Coscarella M, Garcia NA, Dans SL, Iniguez M, Reyes LM, Alonso MK, Schiavini ACM, Gonzalez R (1997) Distribution and school size of dusky dolphins, *Lagenorhynchus obscurus* (Gray, 1828), in the southwestern South Atlantic Ocean. *Rep Int Whal Commn* 47: 693-697.
- Crespo EA, Dans SL, Koen Alonso M, Pedraza SN (2007) Interacciones entre mamíferos marinos y pesquerías. The Argentine Sea and its fisheries resources. Vol. 5. The marine ecosystem. pp. 151-169
- Dans SL, Crespo EA, Garcia NA, Reyes LM, Pedraza SN, Alonso MK (1997) Incidental mortality of patagonian dusky dolphins in mid-water trawling: Retrospective effects from the early 1980s. *Rep Int Whal Commn* 47: 699-703.
- Dans SL, Koen Alonso M, Pedraza SN, Crespo EA (2003) Incidental catch of dolphins in trawling fisheries off Patagonia, Argentina: Can populations persist? *Ecol Appl* 13: 754-762
- Gill PC, Graham J, Ross B, Dawbin WH, Wapstra H (2000) Confirmed sightings of dusky dolphins (*Lagenorhynchus obscurus*) in southern Australian waters. *Mar Mamm Sci* 16: 452-459.
- Hammond PS, Bearzi G, Bjørge A, Forney K, Karczmarski L, Kasuya T, Perrin WF, Scott MD, Wang JY, Wells RS, Wilson B (2008) *Lagenorhynchus obscurus*. In: IUCN 2009. IUCN Red List of Threatened Species. Version 2009.2. <www.iucnredlist.org>.
- Harlin-Cognato AD, Markowitz T, Wuersig B, Honeycutt RL (2007) Multi-locus phylogeography of the dusky dolphin (*Lagenorhynchus obscurus*): passive dispersal via the west-wind drift or response to prey species and climate change? *BMC Evol. Biol* 7: 131
- Harlin AD, Markowitz T, Baker CS, Wuersig B, Honeycutt RL (2003) Genetic structure, diversity, and historical demography of New Zealand's dusky dolphin (*Lagenorhynchus obscurus*). *J Mammal* 84: 702-717
- Hucke-Gaete R (ed.) (2000) Review on the conservation status of small cetaceans in southern South America. UNEP/CMS Secretariat, Bonn, Germany, 24 pp.
- Jefferson TA, Leatherwood S, Webber MA (1993) FAO Species identification guide. Marine mammals of the world. UNEP/FAO, Rome, 320 pp.
- Jefferson TA, Webber MA, Pitman RL (2008) Marine mammals of the world. Elsevier, Amsterdam, 573 pp.
- Markowitz TM (2004) Social organization of the New Zealand dusky dolphin. *Diss Abst Int Pt B - Sci & Eng* 65: 2200
- Markowitz TM, Harlin AD, Würsig B, McFadden CJ (2004) Dusky dolphin foraging habitat: overlap with aquaculture in New Zealand. *Aquat Conserv Mar Freshwat Ecosyst* 14: 133-149

- Mckinnon J (1994) Feeding habits of the dusky dolphin, *Lagenorhynchus obscurus*, in the coastal waters of central Peru. Fish Bull 92: 569-578.
- Read AJ, Van Waerebeek K, Reyes JC, McKinnon JS, Lehman LC (1988) The exploitation of small cetaceans in coastal Peru. Biol Conserv 46: 53-70.
- Rice DW (1998) Marine mammals of the world: systematics and distribution. Society for Marine Mammalogy, Special Publication 4, Lawrence, KS. USA.
- Ross GJB (2006) Review of the conservation status of Australia's smaller whales and dolphins. Australian Government. 124 pp.
- Sanchez R, Arias Schreiber M, Onton K (1998) Sightings of cetacean in Peruvian sea and its relation with the main pelagic resources. Cruise RV Humboldt 9803-05 from Tumbes to Tacna. Inf Inst Mar Peru 135: 163-179
- Schiavini A, Pedraza SN, Crespo EA, Gonzalez R, Dans SL (1999) Abundance of dusky dolphins (*Lagenorhynchus obscurus*) off north and central Patagonia, Argentina, in spring and a comparison with incidental catch in fisheries. Marine Mammal Science 15:828-840
- Van Waerebeek K (2002) Pacific White-Sided Dolphin and Dusky Dolphin - *Lagenorhynchus obliquidens* and *L. obscurus*. In: Encyclopedia of marine mammals (Perrin WF, Würsig B, Thewissen JGM, eds.) Academic Press, San Diego, 859 - 861.
- Van Waerebeek K, Wuersig B (2009) Dusky dolphin – *Lagenorhynchus obscurus*. In: Encyclopedia of marine mammals (Perrin WF, Würsig B, Thewissen JGM, eds.) Second Edition. Academic Press, Amsterdam, pp. 335-338.
- Van Waerebeek K, Reyes JC, Alfaro J (1993) Helminth parasites and phoronts of dusky dolphins *Lagenorhynchus obscurus* (Gray, 1828) from Peru. Aquat Mamm 19:159-169
- Van Waerebeek K, Van Bree PJH, Best PB (1995) On the identity of Prodelphinus petersii Luetken, 1889 and records of dusky dolphin *Lagenorhynchus obscurus* (Gray, 1828) from the southern Indian and Atlantic Oceans. S Afr J Mar Sci 16:25-35
- Van Waerebeek K, Van Bresselem M-F, Felix F, Alfaro Shigueto J, Garcia Godos A, Chavez Lisambart L, Onton K, Montes D, Bello R (1997) Mortality of dolphins and porpoises in coastal fisheries off Peru and Southern Ecuador in 1994. Biol Conserv 81:43-49
- Van Waerebeek K, Read A (1994) Reproduction of the dusky dolphins *Lagenorhynchus obscurus*, from coastal Peru. Journal of Mammology 75 (4): 1054-1062.
- Vaughn RL, Shelton DE, Timm LL, Watson LA, Wuersig B (2007) Dusky dolphin (*Lagenorhynchus obscurus*) feeding tactics and multi-species associations. N Z J Mar Freshw Res 41: 391-400
- Weir JS, Duprey NMT, Würsig B (2008) Dusky dolphin (*Lagenorhynchus obscurus*) subgroup distribution: are shallow waters a refuge for nursery groups? Can J Zool 86: 1225-1234
- Würsig B (1982) Radio tracking dusky porpoises in the South Atlantic. Mammals in the seas, volume 4, small cetaceans, seals, sirenians and otters. Selected papers of the scientific consultation on the conservation and management of marine mammals and their environment. FAO Adv Comm Experts Mar Resour Res, Rome Italy, pp. 145-160.
- Würsig B, Bastida R (1986) Long-range movement and individual associations of two dusky dolphins (*Lagenorhynchus obscurus*) off Argentina. J Mamm 67: 773-774.
- Würsig B, Cipriano F, Slooten E, Constantine R, Barr K, Yin S (1997) Dusky dolphins (*Lagenorhynchus obscurus*) off New Zealand: Status of present knowledge. Rep Int Whal Commn 47: 715-722.
- Würsig B, Würsig M (1980) Behaviour and ecology of the dusky dolphin, *Lagenorhynchus obscurus*, in the south Atlantic. Fish Bull 77: 871-890.
- Würsig B, Würsig M, Cipriano F (1989) Dolphins in different worlds. Oceanus 32: 71-75.
- Wuersig B, Duprey N, Weir J (2007) Dusky dolphins (*Lagenorhynchus obscurus*) in New Zealand waters: Present knowledge and research goals. New Zealand Dep. Conserv. Res. Develop. Series 270, 28pp.
- Yazdi, P (2002) A possible hybrid between a dusky dolphin (*Lagenorhynchus obscurus*) and the southern right whale dolphin (*Lissodelphis peronii*). Aquat Mamm 28: 211-217.

© Boris Culik (2010) Odontocetes. The toothed whales: “*Lagenorhynchus obscurus*”.
UNEP/CMS Secretariat, Bonn, Germany.

http://www.cms.int/reports/small_cetaceans/index.htm

© Illustrations by Maurizio Würtz, Artescienza.

© Maps by IUCN.