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Orcaella heinsohni, Australian Snubfin Dolphin

Errata version

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Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Chordata	Mammalia	Cetartiodactyla	Delphinidae

Taxon Name: *Orcaella heinsohni* Beasley, Robertson & Arnold, 2005

Synonym(s):

- *Orcaella brevirostris*

Common Name(s):

- English: Australian Snubfin Dolphin

Taxonomic Notes:

Until 2005, the genus *Orcaella* was considered monotypic, with the Irrawaddy Dolphin (*Orcaella brevirostris*) being the only species (Rice 1998). In 2005, a study on the external and skull morphology, colour pattern, and mitochondrial DNA control region using samples from much of the genus's range, showed that the *Orcaella* in Australia differ from those elsewhere and they are now regarded as a separate species, the Australian Snubfin Dolphin (*Orcaella heinsohni*) (Beasley *et al*. 2005). No subspecies are recognised.

Recent genetic analyses including samples from Papua New Guinea, and new samples from northern Australia (including the type specimen of *O. heinsohni*), confirmed the occurrence of the Australian Snubfin Dolphin in at least southern Papua New Guinea (Beasley *et al*. 2017).

Assessment Information

Red List Category & Criteria: Vulnerable A2cd+3cd+4cd; C2a(i) ver 3.1

Year Published: 2017

Date Assessed: June 6, 2017

Justification:

Considering the available evidence and following a precautionary approach, Snubfin Dolphins are Vulnerable under IUCN criterion C2a(i) because: 1) the total number of mature individuals is likely fewer than 10,000, 2) there is an inferred continuing decline due to cumulative impacts of habitat degradation and modification, incidental capture in recreational and commercial fishing gear, water pollution, and climate change, and 3) each of the defined subpopulations studied to date is estimated to contain fewer than 1,000 mature individuals. Furthermore, the species meets criterion A for Vulnerable under the subcriteria A2, A3 and A4 because a reduction of at least 30% over three generations (60 years) is suspected in the past (A2), in a time period including both the past and the future (A4), and in the future alone (A3) based primarily on (c) a decline in habitat quality and (d) actual and potential levels of exploitation (in the form of bycatch in nets). In all three cases, the causes of the reduction have not ceased, are not well understood and may be irreversible. Although the species may not meet any of the criteria for Endangered at this time, it is likely to do so under C2a(i) in the near future because: 1) the number of mature individuals is or will be fewer than 2,500, 2) the reductions in population size either have been or will be large and pervasive enough to cause a net reduction for the entire species of at least 20% over a period of 2 generations, and 3) the number of mature individuals in each subpopulation across the range either is or will be ≤ 250 individuals.

Previously Published Red List Assessments

2008 – Near Threatened (NT)
http://dx.doi.org/10.2305/IUCN.UK.2008.RLTS.T136315A4273414.en

Geographic Range

Range Description:

Australian Snubfin Dolphins (hereafter referred to as Snubfin Dolphins) inhabit coastal, shallow waters of the tropical and subtropical zones of Australia and southern Papua New Guinea (Beasley *et al*. 2017, Parra and Cagnazzi 2017). The distribution map accompanying this assessment depicts the inferred distribution as a continuous band throughout coastal waters within the 20 m isobath in countries where these dolphins are known or believed to occur. Although distribution is considered continuous across the range, the occurrence of Snubfin Dolphins along the northern Australia coast and southern Papua New Guinea is poorly documented (Parra *et al*. 2002). Gaps in occurrence of several hundred kilometres are apparent along the east coast of Queensland (Cagnazzi *et al*. 2013b).

In Australia, Snubfin Dolphins have been reported from Exmouth Gulf in Western Australia (Allen *et al*. 2012), across the northern coastline (Palmer *et al*. 2011) and the Gulf of Carpentaria, and south along the east coast to as far south as the Brisbane River (Paterson *et al*. 1998, Parra *et al*. 2002). Sightings south of Roebuck Bay in Western Australia and south of Keppel Bay in Queensland are rare and considered extralimital.

In Papua New Guinea, Snubfin Dolphins are known to inhabit the Kikori Delta from Morigio Island east to Baimurru. It is likely that they also occur further east to Karema, which is situated at the headwaters of the Purari River. No Snubfin Dolphins have been sighted around the Daru region or west of Morigio Island, although only limited opportunistic surveys were undertaken (Beasley *et al*. 2014, 2017).

There are currently no confirmed records of Snubfin Dolphins from other regions of the Pacific Islands. Anecdotal sightings of Snubfin Dolphins have been reported from the Solomon Islands (Bass 2010). However, these records were provided during interviews to investigate the status of Dugongs (*Dugong dugon*) in the Solomon Islands, therefore the identification (at both species and genus levels) is highly uncertain.

Country Occurrence:

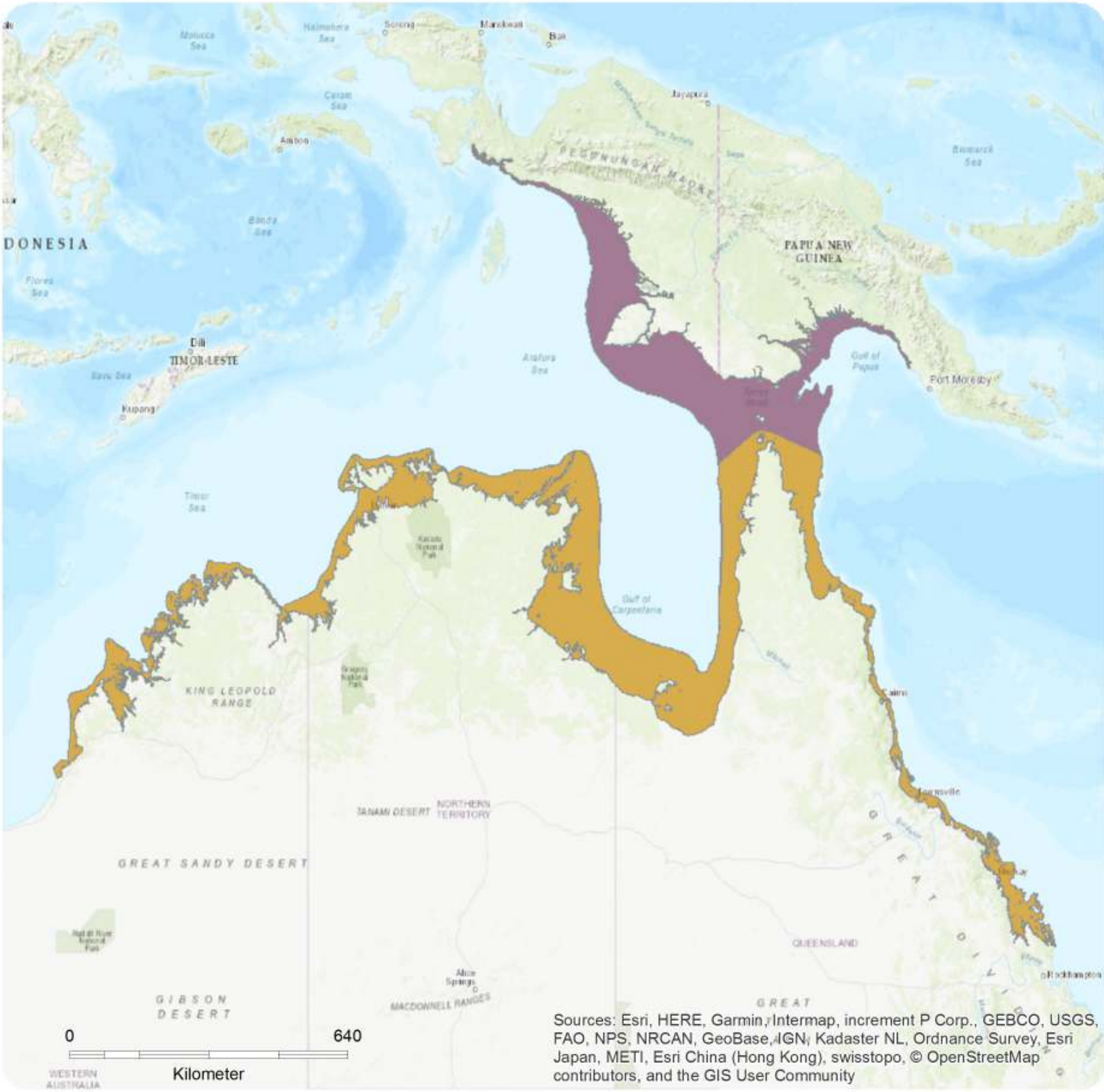
Native: Australia

FAO Marine Fishing Areas:

Native: Indian Ocean - eastern, Pacific - western central

Distribution Map

Orcaella heinsohni



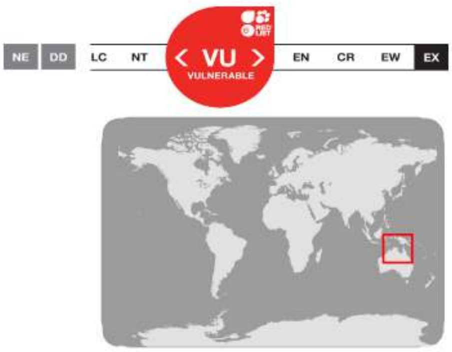
Range

Extant (resident)

Possibly Extant (resident)

Compiled by:

IUCN SSC Cetacean Specialist Group



The boundaries and names shown and the designations used on this map do not imply any official endorsement, acceptance or opinion by IUCN.

Population

Population Abundance

At present, there is no range-wide estimate of the abundance of Snubfin Dolphins. Estimates of abundance from mark-recapture studies of photo-identified individuals are only available for a few selected populations across Australia (see Table 1 in the Supplementary Material). Available abundance estimates indicate that Snubfin Dolphins occur in small populations of typically fewer than 150 individuals. Places where abundance has been estimated in Queensland include Cleveland Bay (310 km^2) with estimates ranging from 64 (95% confidence interval (CI) 51-80) to 76 (95% CI 65-88) (Parra *et al*. 2006a) and Keppel Bay with estimates of 71 (95% CI 61-80) to 80 (95% CI 68-93) (Cagnazzi *et al*. 2013b). Available abundance estimates in the Northern Territory are of 19 (18-20) to 70 (49-90) in the Darwin region (1,086 km^2) (Brooks *et al*. 2017) and 136 (95% CI 58-317) to 222 (95% CI 146-336) in Port Essington (Palmer *et al*. 2014a). An estimated 133 (95% CI 127-148) Snubfin Dolphins inhabit waters of Roebuck Bay and 48 (95% CI 41-58) to 54 (95% CI 51-60) the waters of Cygnet Bay, Western Australia (Brown *et al*. 2016).

Population Trend

There is no quantitative information on trends in abundance across the species' range. Studies in Cleveland Bay indicated that even with relatively unbiased and precise abundance estimates, population trends would be extremely difficult to detect in less than three years unless changes in population size were greater than 20% per year (Parra *et al*. 2006a). A multiyear study (ongoing since 2006) in Keppel Bay, Central Queensland, showed that between 2006-2010 abundance estimates of Snubfin Dolphins remained stable at around 70-80 individuals (Cagnazzi 2013), before starting to decline slightly in 2011 to about 68 (64-72) individuals in 2013 (Cagnazzi unpub. data). The decline in abundance estimates was associated with a period of extensive summer flooding that has been affecting this region every summer since 2010. Even though the negative trend is small and the 95% CIs of the estimates overlap, the decline has been consistent since 2011. Indices of abundance, including proportion of marked individuals observed in recent surveys (2014-2016) in the same area, showed a substantial variation across years with the lower estimates being 100 (68-147) in 2014, 163 (132-200) in 2015 and 103 (74-144) in 2016 (Cagnazzi unpub. data).

Population Structure

Genetic analyses conducted on biopsies collected across two nearby populations in the Kimberly, Western Australia (i.e., Roebuck Bay and Cygnet Bay ~ 250 km apart) showed significant levels of population structure at both mitochondrial and nuclear markers (Brown et al. 2014). Contemporary migration rates per generation (20 years) between these two sampling locations were low (< 10%, $m < 0.1$). Similar results were obtained for three sampling locations in Central Queensland (Cleveland Bay, Keppel Bay, Whitsundays) that are 250-400 km apart (Parra et al. unpublished data). No genetic information on population structure is available from the Northern Territory of Australia or from Papua New Guinea. Overall, the available genetic data suggest that Snubfin Dolphins exist as a metapopulation of small, largely isolated population fragments with limited gene flow.

Summary

The limited data presented above indicate that the Snubfin Dolphin has a restricted and discontinuous geographical distribution, occurs mainly over a narrow strip of shallow coastal waters, occurs in relatively small subpopulations, and the subpopulations are relatively isolated with limited gene flow among them. No subpopulation studied to date is larger than 250 mature individuals (Table 1 in the Supplementary Material). Therefore, it is highly likely that the largest subpopulation has <1,000 mature individuals and that there could well be fewer than 10,000 mature individuals across the range.

Similar to other small cetaceans, Snubfin Dolphins are long-lived (at least 28-30 years), have slow rates of increase (0.037, range 0.02-0.06), late maturity (reproductive maturity at 8-10 years of age) and low reproductive rates (one calf every 2-5 years) (Moore 2015), making them particularly vulnerable to even low rates of human-caused mortality. For example, based on model estimates of intrinsic growth rate (0.037) and generation time (20) for Snubfin Dolphins, Moore (2015) estimated that human-caused mortality rates of 4.4%, 5.0% and 6.5% would lead to declines of 30%, 50% and 80% in population size after three generations. These threshold mortality rates correspond to Vulnerable (VU), Endangered (EN) and Critically Endangered (CR) under the A criterion (population size reduction).

Although there is little quantitative data on Snubfin Dolphin population trends, a declining population can be inferred throughout many parts of the range given the species' high vulnerability to human-caused mortality (e.g., from bycatch in gillnets and shark nets), its restricted distribution and reliance on coastal and riverine waters, the low estimates of abundance in surveyed areas, and the increasing habitat degradation and destruction throughout its range.

Current Population Trend: Decreasing

Habitat and Ecology (see Appendix for additional information)

Studies to date indicate that Snubfin Dolphins occur mainly within shallow, protected coastal and estuarine habitats (Parra *et al.* 2002, 2006b; Parra 2006, Allen *et al.* 2012, Palmer *et al.* 2014b, Brown *et al.* 2016). A study conducted in far northern Queensland indicated that Snubfin Dolphins occurred mostly in waters less than 15 m deep, within 10 km of the coast, and no more than 20 km from the nearest river mouth (Parra *et al*. 2006b). In Cleveland Bay, Snubfin Dolphins preferred shallow water < 2 m deep and shallow areas with seagrass beds (Parra 2006). Similarly, in Keppel Bay the dolphins' core area of use coincided with the Fitzroy River estuary (Cagnazzi *et al.* 2013b). Within this range, Snubfin Dolphins used shallow (2–5 m), shallow subtidal (5–10 m), and moderate-depth (10–15 m) habitat more frequently than expected by chance. In contrast, intertidal (0–2 m) and deeper water (15–20 m) were used less frequently than expected by chance (Cagnazzi *et al.* 2013b). Boat-based surveys conducted between Keppel Bay and Cleveland Bay further strengthen the importance of riverine-estuarine systems to Snubfin Dolphins in Queensland. The only resident population of Snubfin Dolphins along 800 km of coastline between Cleveland Bay and Keppel Bay was found at the mouth of the Proserpine River in the Whitsundays (Cagnazzi 2017). In the Northern Territory, most records of Snubfin Dolphins are from estuaries, tidal rivers and coastal areas within 20 km of river mouths. In the Gulf of Carpentaria, Snubfin Dolphins occur up to 20 km offshore, likely because of the consistently shallow waters of the Gulf, being less than 10 m deep in many regions 20-30 km offshore. Some Snubfin Dolphins have been recorded up to 30–50 km upstream in larger tidal rivers and at least as far as 10 km offshore (Palmer *et al*. 2014a,b). Studies in Western Australia also indicate Snubfin Dolphins mainly occur in shallow coastal areas (Brown *et al.* 2016).

Systems: Marine

Use and Trade

There is no evidence of traditional use or trade for consumption or medicinal use across the Snubfin Dolphin's range in Australia. There are anecdotal reports of deliberate catches in southern Papua New Guinea, particularly from the Daru and Baimurru regions (Beasley *et al.* 2014, 2017).

Threats (see Appendix for additional information)

General

The biological features discussed above render the Snubfin Dolphin particularly vulnerable to anthropogenic threatening processes, including habitat degradation and modification, accidental captures in gillnets and shark exclusion devices, direct catches, vessel strikes, noise pollution, chemical pollution, prey depletion, disease and climate change. The impact and extent of anthropogenic threats varies across regions, with some subpopulations facing greater threats than others. The most pervasive threats across the species' distribution are habitat degradation and modification, incidental capture in fishing gear and shark control nets, water pollution, climate change and the cumulative impact of these threats.

Current threats affecting the population now, and likely to affect the population in future

Habitat degradation and modification

Habitat loss and degradation has been identified among the primary drivers of population declines of large marine animals (Lotze and Worm 2009). Habitat degradation and modification consists of human activities associated with land reclamation, dredging, seismic surveys, drilling, blasting, shipping, and resource extraction that can result in habitat loss and degradation for Snubfin Dolphins. These activities are known to cause local changes in the composition, structure, and function of the coastal and estuarine habitats, through direct removal of habitat (seagrass, mangroves), physical disturbance, sedimentation, increasing commercial and recreational vessel traffic, increasing noise and chemical pollution, and introduction of viral and bacterial pathogens. Such stressors, when combined with the continuing intensification of the El Niño Southern Oscillation (ENSO) as a result of climate change, and the associated fluctuations in sea levels, are likely to reduce the quality of Snubfin Dolphin habitat. For example, recent extensive diebacks (7,400 ha) of mangrove forests in the Gulf of Carpentaria in northern Australia and in Mangrove Bay (40 ha) in north Western Australia were associated with prolonged drought, high temperatures, and a low sea-level event (Duke *et al*. 2017, Lovelock *et al*. 2017). The individual, as well as the cumulative, effects of the above threats are a cause of concern for the long-term viability of Australia's inshore dolphin populations (Bejder *et al*. 2012, DOE 2015, Parra and Cagnazzi 2017).

The coastal zone along Snubfin Dolphins' range, particularly in northwestern Australia and along the central coast of Queensland, has been substantially modified both inland, to allow mining, agricultural and grazing activities, and along the coast to allow industrial ports, marinas, aquaculture and residential developments (Allen *et al*. 2012, Bejder *et al*. 2012, Queensland Government 2012). For example, by 2020 the port capacity along the coast of the Great Barrier Reef World Heritage Area (GBRWHA) is expected to triple to support the predicted growth in Queensland's annual coal production (Grech *et al*. 2013, 2015). IUCN considered this unprecedented scale of development as a serious threat to biodiversity in the GBRWHA (Douvere and Badman 2012).

Activities associated with coastal development, such as land reclamation, vessel traffic and construction, may result in the physical loss and degradation of habitat for cetaceans (Jefferson et al. 2009, Pirotta *et* *al*. 2013). The reduction of suitable habitat may force local populations of Snubfin Dolphins to adjust to the remaining resources through a reduction in survival rate and population size, or emigration to more suitable (though probably suboptimal) areas (Andren 1994, Fahrig 1997, Jefferson 2000). Dredging involved in the construction, maintenance and expansion of ports is of particular concern (Pirotta *et al*. 2013, Todd *et al*. 2015). Because most ports across the Snubfin Dolphins' range are located in relatively shallow waters, they all require large volumes of dredging. For example, the Gladstone Western Basin project in Queensland involved the dredging of 22 million cubic meters of soil (Ports Australia 2014).

In addition to their impacts on dolphin habitat, these activities may disturb cetaceans through physical displacement and increased underwater noise (Jensen *et al*. 2009, Pirotta *et al*. 2013, Rako *et al*. 2013). For example, in the Fitzroy River, Queensland, it was estimated that two proposed port developments would have overlapped with 14% (49 km^2) of the representative range and 17.7% (41 km^2) of the core area used by Snubfin Dolphins (Cagnazzi *et al*. 2013b). The impacted area likely would have been substantially larger considering the indirect effects of the construction activities on the nearby habitats and the long-term consequences of daily operating activities on the entire area as result of seabed 'reclamation', percussive pile driving, dredging, increased vessel traffic and a decline in water quality (Cagnazzi *et al*. 2013b).

Additionally, habitat loss and fragmentation from coastal zone developments and associated activities can influence the population genetic structure of biological populations through their isolation (Keyghobadi 2007). Given the low densities, population genetic structure and limited gene flow found among populations of Snubfin Dolphins, a further loss of genetic variation may reduce the ability of individuals to adapt to a changing environment, cause inbreeding depression (reduced survival and reproduction) and increase their probability of extinction (Dixon *et al*. 2007, Andrews 2014, Brown *et al*. 2014).

Incidental capture

Entanglement or bycatch of dolphins in recreational and commercial fishing gear is one of the most serious threats to marine mammal populations and species around the world (Read *et a*l. 2006, Read 2008). Snubfin Dolphins are susceptible to entanglement, especially in gillnets, which are often found closer to the mouths of rivers, creeks and estuaries where Snubfin Dolphins are more likely to be found (Parra *et al*. 2002, Parra and Jedensjö 2009). Snubfin Dolphins have been killed in localized areas along the east coast of Queensland in anti-shark nets set to protect bathers (Heinsohn 1979, Parra *et al*. 2004). The Queensland Shark Control Program (QSCP) has been in operation since the early 1960s across many Queensland beaches, using nets, drum lines, or a combination of both to reduce the perceived risk of shark attack. Between 1967 and 1987, 520 dolphins were caught in Queensland shark nets. The Snubfin Dolphin was the most frequently bycaught species in nets north of Mackay (Paterson 1990) with the maximum average of about 10 Snubfin Dolphins per year (assuming that all dolphins caught were Snubfin). In 1992, following the introduction of new methods to minimise by-catch, the number of Snubfin Dolphins caught in the shark nets between 1992 and 1995 declined to a maximum of 1.3 per year (Gribble *et al*. 1998). At present, 13 shark nets and 149 drum lines are operating in Queensland. Between 1997 and 2011, a total of 11 Snubfin Dolphins were caught in the QSCP corresponding to about 1.8 per year (Meager *et al*. 2012). Most captures of Snubfin Dolphins in shark nets occurred in the Cairns, Townsville, and Mackay areas, suggesting the potential for local stock depletion (Parra *et al*. 2002).

Snubfin Dolphins are also known to die in inshore gillnets set across creeks, rivers and shallow estuaries (Hale 1997, Parra *et al*. 2002). In southern Papua New Guinea bycatch in gillnet fisheries and at least occasional direct catches (of which there are anecdotal records, Beasley *et al*. 2014, 2017) are considered the most significant threats to Snubfin Dolphins. During a 15-day field trip to the Kikori Delta in 2015, five Snubfin Dolphins were confirmed as having been bycaught in large-mesh gillnets (Beasley *et al*. 2017). Although it is impossible to estimate the magnitude of Snubfin Dolphin bycatch throughout the species' range, it is clear that even small numbers are unsustainable and would result in rapid local population declines.

Water pollution and climate change

Sources of anthropogenic contaminants are likely to increase in the future across northern Australia, as a result of the widespread use of several new pesticides (Smith *et al*. 2012), increasing annual runoff (Chiew and McMahon 2002), and rapid urban and industrial development. The water discharge by many rivers across the Snubfin Dolphin's range in Australia is of poor quality, often with contaminant concentrations expected to cause environmental harm (Francey *et al*. 2010, Brodie *et al*. 2012, Schaffelke *et al*. 2012). Accordingly, a recent study detected high levels of organochlorines (PCBs) and polycyclic aromatic hydrocarbons (PAHs) in biopsies collected from Snubfin Dolphins on the Great Barrier Reef along the Queensland coast (Cagnazzi *et al*. 2013a). Although exposure to contaminants may not directly cause the death of an animal, it may affect its health in numerous ways, including increased susceptibility to disease and impairment of metabolic functions (De Swart *et al*. 1996, Bossart 2011).

In Queensland, floods normally exceed their natural ranges of variation due to inland catchment modifications that result in large amounts of fresh water discharge, sediment, heavy metals, nutrients and pesticides being discharged into the estuary and adjacent coastal areas (Brodie *et al*. 2003, Furnas 2003). The effects of a flood on dolphins generally are temporary until natural conditions are re-established (Fury and Harrison 2011). However, it has been suggested that peaks in dolphin mortality (Holyoake *et al*. 2009, Meager and Limpus 2014), such as those recorded in Queensland in 2011 (DEHP 2012), occur when floods are sustained for long periods. Modelling studies estimated that the annual runoff in catchments on the east coast of Australia could increase by up to 15% by the year 2030 (Chiew and McMahon 2002). Altered coastal conditions and projected increases in cyclone severity, floods, storm surges, and sea surface temperature could affect dolphin habitat and food resources (Lawler *et al*. 2007, Meager and Limpus 2014).

Cumulative impacts

The ongoing alteration of coastal systems has greatly undermined the resilience of many biotic communities, populations, and species living in estuaries, making them more vulnerable to environmental stochasticity and anthropogenic stressors (Hobday and Lough 2011). Such effects are likely to be exacerbated when natural systems are subjected to multiple stressors as a result of cumulative impacts and negative synergistic interactions (Venter et al. 2006, Crain et al. 2008, Halpern et al. 2008). Recent studies on other inshore dolphin populations living in highly industrialized regions have reported negative population trends. In the Pearl River estuary, China, modelling of demographic data suggested that Indo-Pacific Humpback Dolphins (*Sousa chinensis*) have declined at about 2.4% per year (Huang *et al*. 2012), in the Yangtze River the population of Yangtze Finless Porpoises (*Neophocaena asiaeorientalis asiaeorientalis*) has been declining at a rate of about 6% per year (Mei *et al*. 2012), while in Doubtful Sound, New Zealand, the local isolated Bottlenose Dolphin (*Tursiops* sp.) population declined by about 30% over a 12-year period (Currey *et al*. 2007). By analogy, a reduction in the number of Snubfin Dolphins is likely given the multiple impacts of port expansion, development projects, water pollution, vessel traffic and increasing frequency of natural catastrophic events.

Conservation Actions (see Appendix for additional information)

Globally, this species was listed on the IUCN Red List as Near Threatened in 2008. It is listed in Appendix I of the Convention on International Trade in Endangered Species (CITES) on Appendix II of the Convention on the Conservation of Migratory Species of Wild Animals (CMS). In Australia, Snubfin Dolphins are included on the list of migratory species under the Environment Protection and Biodiversity Conservation (EPBC) Act of 1999 and are listed as Near Threatened in The Action Plan for Australian Mammals 2012 (Woinarski *et al.* 2014) The Australian Government invested $2 million over three years (2014-15 to 2016-17) for the implementation of a Whale and Dolphin Protection Plan. The National Dolphin Conservation Plan has promoted the conservation of dolphins in Australian waters by supporting research into inshore dolphin conservation, including investigating key threats and determining the conservation status of priority species such as the Snubfin Dolphin and the Australian Humpback Dolphin (*Sousa sahulensis*). To identify the primary research objectives to inform the conservation and management of Australia's tropical inshore dolphins, an expert workshop was held on April 9-10, 2015 in Canberra. The resulting Inshore Dolphin National Research Strategy (DOE 2015) identified the following research objectives applicable to Snubfin and Humpback Dolphins: 1) provide for access to and analysis of standardised national tropical dolphin data to assess distribution and underpin management and conservation, 2) conduct long-term monitoring project to determine trends, mitigate impacts from threats, and support adaptive management and conservation of tropical inshore dolphins, 3) identify, map and assess threats to tropical inshore dolphins, understand related impacts, and mitigate risks, 4) improve knowledge of genetic connectivity dispersal and movement at national, regional and local scales, 5) foster collaborative and national approaches to effectively gather mortality, life history and dietary information from stranded and by-caught specimens, 6) foster community participation in data collection on tropical inshore dolphins and develop a continuous improvement approach to methods and related programs. Guidelines on sampling and statistical methods to achieve some of these objectives have been recently described in Brooks *et al.* (2014). The highest-priority enabling objective was 1) Indigenous Engagement**:** Foster effective and informed partnerships with Australia's Indigenous communities to enable sustainable conservation management of tropical inshore dolphins. Multiple-use marine protected areas in Western Australia (e.g., Shark Bay and Ningaloo Reef Marine Park) and Queensland (Great Barrier Reef Marine Park, Dugong Protected Areas; Moreton Bay Marine Park) cover a substantial portion of the Snubfin Dolphin's known and presumed habitat and may provide some protection for this species. Snubfin Dolphins were identified as having conservation value in Commonwealth waters around Australia in the North, Northwest, and Temperate East Marine bioregional plans (DSEWPaC 2012c,b,a). These plans were developed under section 176 of the EPBC Act and are aimed at improving management and decision making in relation to Australian marine biodiversity and resources. National Guidelines for Whale and Dolphin Watching and for interaction with seismic surveys provide some protection for inshore dolphins (DOE 2005, 2008). Strategies to reduce the entanglement and death of Snubfin Dolphins in nets set by the QSCP for protection of bathers include the use of acoustic alarms, mixed use of nets and drumlines, overall reduction in the number of nets, and establishment of mammal rescue squads (Gribble *et al.* 1998, DPI 2001). However, continued deaths indicate that more effective strategies are required.

Credits

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External Resources

For Images and External Links to Additional Information, please see the Red List website.

Appendix

Habitats

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Habitat	Season	Suitability	Major Importance?
9. Marine Neritic -> 9.1. Marine Neritic - Pelagic	Resident	Suitable	Yes
9. Marine Neritic -> 9.9. Marine Neritic - Seagrass (Submerged)	Resident	Suitable	Yes
9. Marine Neritic -> 9.10. Marine Neritic - Estuaries	Resident	Suitable	Yes

Threats

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Threat	Timing	Scope	Severity	Impact Score
1. Residential & commercial development -> 1.1. Housing & urban areas	Ongoing	Minority (50%)	Slow, significant declines	Low impact: 5
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.2. Species disturbance		
1. Residential & commercial development -> 1.2. Commercial & industrial areas	Ongoing	Minority (50%)	Slow, significant declines	Low impact: 5
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.2. Species disturbance		
1. Residential & commercial development -> 1.3. Tourism & recreation areas	Ongoing	Minority (50%)	Slow, significant declines	Low impact: 5
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.2. Species disturbance		
11. Climate change & severe weather -> 11.1. Habitat shifting & alteration	Ongoing	Whole (>90%)	Slow, significant declines	Medium impact: 7
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.1. Species mortality 2. Species Stresses -> 2.2. Species disturbance		
11. Climate change & severe weather -> 11.4. Storms & flooding	Ongoing	Whole (>90%)	Slow, significant declines	Medium impact: 7
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.1. Species mortality 2. Species Stresses -> 2.2. Species disturbance		
3. Energy production & mining -> 3.1. Oil & gas drilling	Ongoing	Minority (50%)	Slow, significant declines	Low impact: 5
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.1. Species mortality 2. Species Stresses -> 2.2. Species disturbance		
4. Transportation & service corridors -> 4.3. Shipping lanes	Ongoing	Minority (50%)	Causing/could cause fluctuations	Low impact: 5
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.1. Species mortality		

		2. Species Stresses -> 2.2. Species disturbance		
5. Biological resource use -> 5.4. Fishing & harvesting aquatic resources -> 5.4.3. Unintentional effects: (subsistence/small scale) [harvest]	Ongoing	Minority (50%)	Slow, significant declines	Low impact: 5
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.1. Species mortality 2. Species Stresses -> 2.2. Species disturbance		
5. Biological resource use -> 5.4. Fishing & harvesting aquatic resources -> 5.4.4. Unintentional effects: (large scale) [harvest]	Ongoing	Minority (50%)	Slow, significant declines	Low impact: 5
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.1. Species mortality 2. Species Stresses -> 2.2. Species disturbance		
6. Human intrusions & disturbance -> 6.1. Recreational activities	Ongoing	Minority (50%)	Slow, significant declines	Low impact: 5
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.1. Species mortality 2. Species Stresses -> 2.2. Species disturbance		
9. Pollution -> 9.2. Industrial & military effluents -> 9.2.1. Oil spills	Ongoing	Minority (50%)	Rapid declines	Medium impact: 6
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.1. Species mortality 2. Species Stresses -> 2.2. Species disturbance		
9. Pollution -> 9.3. Agricultural & forestry effluents -> 9.3.1. Nutrient loads	Ongoing	Minority (50%)	Slow, significant declines	Low impact: 5
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.1. Species mortality 2. Species Stresses -> 2.2. Species disturbance		
9. Pollution -> 9.6. Excess energy -> 9.6.3. Noise pollution	Ongoing	Minority (50%)	Slow, significant declines	Low impact: 5
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.1. Species mortality 2. Species Stresses -> 2.2. Species disturbance		

Conservation Actions in Place

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Conservation Actions in Place
In-Place Research, Monitoring and Planning
Action Recovery plan: Yes
Systematic monitoring scheme: No
In-Place Land/Water Protection and Management
Conservation sites identified: Yes, over entire range
Occur in at least one PA: Yes
Area based regional management plan: Yes

Conservation Actions in Place
In-Place Education
Included in international legislation: Yes
Subject to any international management/trade controls: Yes

Conservation Actions Needed

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Conservation Actions Needed
1. Land/water protection -> 1.1. Site/area protection
1. Land/water protection -> 1.2. Resource & habitat protection
2. Land/water management -> 2.1. Site/area management
4. Education & awareness -> 4.3. Awareness & communications
5. Law & policy -> 5.2. Policies and regulations
5. Law & policy -> 5.4. Compliance and enforcement -> 5.4.2. National level

Research Needed

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Research Needed
1. Research -> 1.2. Population size, distribution & trends
1. Research -> 1.3. Life history & ecology
1. Research -> 1.5. Threats
1. Research -> 1.6. Actions
3. Monitoring -> 3.1. Population trends
3. Monitoring -> 3.4. Habitat trends

Additional Data Fields

Distribution
Lower depth limit (m): 20
Upper depth limit (m): 0
Population
Number of mature individuals: 9000-10000
Continuing decline of mature individuals: Yes

Population
Extreme fluctuations: No
Population severely fragmented: No
No. of subpopulations: 6
Continuing decline in subpopulations: No
Extreme fluctuations in subpopulations: No
All individuals in one subpopulation: No
Habitats and Ecology
Continuing decline in area, extent and/or quality of habitat: Yes
Generation Length (years): 20
Movement patterns: Not a Migrant

Errata

Errata reason: The original version of this assessment was published with an older version of the distribution map. This errata assessment uses the updated distribution map.

The IUCN Red List Partnership

The IUCN Red List of Threatened Species™ is produced and managed by the IUCN Global Species Programme, the IUCN Species Survival Commission (SSC) and The IUCN Red List Partnership.

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