Prepared by: Aquatic Species Program, Department of Environment and Heritage Protection


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Reviewer

Dr Kris Carlyon. Department of Primary Industries, Parks, Water and Environment, Tasmania.

Citation

Foreword

The Department of Environment and Heritage Protection (EHP) monitors cetacean and pinniped strandings and mortality along the Queensland coast via StrandNet, the marine wildlife strandings and mortality database. StrandNet records sick, injured, incapacitated or dead wildlife in Queensland from reports received by the Department of National Parks, Recreation and Sport (NPRS), EHP, the Great Barrier Reef Marine Park Authority (GBRMPA) and the Department of Agriculture and Fisheries (DAF), in addition to those received directly from the public and rehabilitation facilities. This report has been published as part of EHP’s Conservation Technical and Data Report series. Any request to access these data for research purposes should be made in writing to the StrandNet Coordinator, email: strand.data@ehp.qld.gov.au.
Contents

Foreword.............................................................................................................................................................................. iii
List of acronyms and abbreviations ...................................................................................................................................... 5
General summary.................................................................................................................................................................. 6
Introduction .......................................................................................................................................................................... 6
Methods ................................................................................................................................................................................ 7
Results................................................................................................................................................................................... 8
  Annual trend since 1996.................................................................................................................................................... 8
  Case histories.................................................................................................................................................................. 8
    Records from outside of Queensland (not included further) ........................................................................................ 8
    Pinnipeds from 2013 to 2015..................................................................................................................................... 8
Cetaceans in 2013............................................................................................................................................................ 8
  Strandings and mortality from natural causes............................................................................................................. 8
  Anthropogenic causes of strandings and mortality ................................................................................................. 9
  Fisheries interactions ................................................................................................................................................. 10
  Causes of strandings and mortality unknown ........................................................................................................ 10
  Killer whale mass stranding event ............................................................................................................................. 12
Cetaceans in 2014............................................................................................................................................................ 12
  Strandings and mortality from natural causes............................................................................................................. 12
  Anthropogenic causes of strandings and mortality ................................................................................................. 13
  Causes of strandings and mortality unknown ........................................................................................................ 14
  Unconfirmed reports ................................................................................................................................................. 15
Cetaceans in 2015............................................................................................................................................................ 15
  Strandings and mortality from natural causes............................................................................................................. 15
  Anthropogenic causes of strandings and mortality ................................................................................................. 16
Discussion............................................................................................................................................................................ 18
References........................................................................................................................................................................... 20
List of acronyms and abbreviations

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>COD</td>
<td>Cause of death</td>
</tr>
<tr>
<td>COS</td>
<td>Cause of stranding</td>
</tr>
<tr>
<td>Cwlth</td>
<td>Commonwealth</td>
</tr>
<tr>
<td>DAF</td>
<td>Department of Agriculture and Fisheries</td>
</tr>
<tr>
<td>DPA</td>
<td>Dugong Protection Area</td>
</tr>
<tr>
<td>NPRS</td>
<td>Department of National Parks Recreation and Sport</td>
</tr>
<tr>
<td>EHP</td>
<td>Department of Environment and Heritage Protection</td>
</tr>
<tr>
<td>GBRMPA</td>
<td>Great Barrier Reef Marine Park Authority</td>
</tr>
<tr>
<td>JCU</td>
<td>James Cook University</td>
</tr>
<tr>
<td>MOP</td>
<td>Member of the public</td>
</tr>
<tr>
<td>Qld</td>
<td>Queensland</td>
</tr>
<tr>
<td>QBFP</td>
<td>Queensland Boating and Fisheries Patrol</td>
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<tr>
<td>QSCP</td>
<td>Queensland Shark Control Program</td>
</tr>
<tr>
<td>SOCI</td>
<td>Species of Conservation Interest</td>
</tr>
</tbody>
</table>
General summary

This report summarises whale, dolphin (cetaceans) and pinniped (seals) strandings and mortalities in Queensland waters from 2013 to 2015. A total of 75 cases were recorded in 2013, including 29 that were that were either rescued or left alive to natural processes, and 56 cases were recorded in 2014 (including 17 rescued/left alive). In 2015, a total of 57 cases were recorded, including 13 that were that were either rescued or left alive to natural processes. This represented a decline in the annual number of records from 2011 (86) and 2012 (82 cases).

Most records were of resident inshore dolphins or the migratory humpback whale, although a total of 22 species were identified across the reporting period (including one species of seal). One mass stranding event occurred in the period when 8 killer whales stranded in the Great Sandy Strait Marine Park (2013). Three of these whales died and five survived.

In 2013, the cause of death was identifiable in 14 of 46 mortalities (30%), compared to 18 of 39 in 2014 (46%) and 21 of 44 (48%) in 2015. This is similar to that reported from 2008-2011 (44%), but higher than in 2012 (24%). Identifying the cause of death in stranded cetaceans remains a challenge, especially in remote areas, where decomposition has occurred, or where there may have been a number of contributing factors. A total of 9 mortalities were attributed to natural causes that included disease and parasites.

Across the reporting period, incidental catch in the Shark Control Program was comprised mostly of common dolphins (23 mortalities and two released alive) and humpback whales (14 released alive). One Australian humpback dolphin, one Antarctic minke whale and 8 bottlenose dolphins (including one released alive) were also caught. Entanglements from other sources were predominantly tropical inshore dolphins with line-fishing gear (14 cases) or humpback whales with ropes, pots and/or floats (7 cases). Two mortalities of inshore dolphins were associated with entanglement in fishing nets and three mortalities were suspected to be because of entanglement in line-fishing gear. Three injuries and 4 mortalities were attributed to interactions with vessels, all of which involved medium to large whales, of which most occurred in southern Queensland (6 of 7). Entanglement in a plastic bag (one humpback dolphin observed alive) and ingestion of fishing line (one melon-headed whale) were also reported.

Introduction

Strandings\(^1\) programs provide important data on marine mammal populations that can be difficult and expensive to survey in their natural environments (Geraci and Loundsbury 1993; Maldini et al. 2005; Pyenson 2011). Long-term strandings programs are also informative of long-term trends of marine mammal mortality (Truchon et al. 2013), and are fundamental in detecting unusual marine-mammal stranding or mortality events which may serve as indicators of larger environmental issues or threats to human health (Norman et al. 2012). Where strandings programs are supplemented with a carcass salvage program and necropsies, they can also be a useful tool to monitor sources of mortality and the effectiveness of existing conservation management (Mannocci et al. 2012).

A diverse range of marine mammals are found in Queensland waters, including cetaceans (dolphins and whales), pinnipeds (seals) and one sirenian (the dugong), all of which are protected by the Nature Conservation Act 1992 (Qld). The Australian snubfin dolphin, *Orcaella heinsohni*; the Australian humpback dolphin, *Sousa sahulensis*; the subantarctic fur seal, *Arctocephalus tropicalis*; the humpback whale, *Megaptera novaeangliae* and the dugong, *Dugong dugon* are listed as vulnerable by the Nature Conservation (Wildlife) Regulation 2006 (Qld) under the Nature Conservation Act 1992 (Qld). A number of species listed as threatened under the Environmental Protection and Biodiversity Conservation Act 1999 (Cmwlth) and occasionally found in Queensland waters include southern right whales, *Eubalaena australis* and blue whales, *Balaenoptera musculus* (Allen and Bejder 2003; Chilvers et al. 2005).

Within state and Commonwealth waters, the Marine Parks Act 2004 (Qld) and the Great Barrier Reef Marine Park Act 1975 (Cwlth) provide the capacity for spatial protection measures for marine mammals. State marine parks include the

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\(^1\) The term ‘stranding’ is here used to include sick, injured, incapacitated or dead marine wildlife which were washed ashore or encountered at sea; in addition to animals which were entangled in fishing nets/synthetic debris or rescued from a situation where they would have died had they not been rescued (Geraci and Loundsbury 1993).}
Moreton Bay Marine Park, the Great Sandy Marine Park and the Great Barrier Reef Coast Marine Park. Marine mammals in Queensland are also protected by a series of management arrangements specific to the East Coast Inshore Fin Fish Fishery, and the two-tiered Dugong Protection Area (DPA) system. DPAs were declared under the *Fisheries Act 1994* (Qld) by the *Fisheries Amendment Regulation (No. 11) 1997* (Qld), with restrictions on the type, size and locations of nets, and requirements for net attendance. A range of special management provisions for marine mammals were also implemented by the *Nature Conservation and Other Legislation Amendment and Repeal Regulation (No. 1.) 2013*.

Monitoring the incidence of marine mammals that are sick, injured, incapacitated or dead assists in assessing the effectiveness of the above legislation for maintaining sustainable marine mammal populations. In Queensland, these data are recorded in the StrandNet database. The current report presents a summary of records of cetacean and pinniped strandings and mortality in StrandNet from 2013-2015. Dugong and marine turtle strandings for the time period are reported elsewhere. The focus of the current report is on presenting case histories and summaries. Detailed analyses are undertaken elsewhere (e.g. Meager and Limpus 2014; Meager and Sumpton 2016).

**Methods**

All records of sick, injured, incapacitated or dead marine wildlife reported to the Department of Environment and Heritage Protection (EHP) are entered into the StrandNet database (https://www.derm.qld.gov.au/strandnet/application/). From 2013 to 2015, most cetacean and pinniped strandings were reported by staff from the Department of National Parks Recreation and Sport (NPRS). Other records were received from the Great Barrier Reef Marine Park Authority (GBRMPA), Australia Zoo, university researchers, the Water Police, directly from the public or via the state-wide stranding telephone hotline (1300 264 625). In 2015, Sea World also provided records to StrandNet. Searches of online media were used to check for strandings that were not reported to StrandNet. Records of marine mammal entanglement and incidental catch (bycatch) in the Queensland Shark Control Program (QSCP) were received from the Queensland Boating and Fisheries Patrol (QBFP) of the Department of Agriculture and Fisheries (DAF), NPRS or directly from the public. Net strikes, where net damage occurred but no animal was sighted, were not recorded in StrandNet.

Records were lodged in StrandNet by registered users via a web-based interface and each record was assigned a unique alphanumeric identifier. A record that could not be confirmed as a cetacean or pinniped, or where there was insufficient evidence to establish whether the stranding occurred at the time and location reported, was entered into StrandNet as an unconfirmed record. Additional details that were recorded included the coordinates, location details and date of the report; the sex, life-history stage, size and condition of the animal, and the fate of the animal or carcass. Where available, photos and necropsy reports were attached to the record.

Records were then verified by a NPRS regional stranding coordinator. This process was overseen by the EHP state-wide stranding coordinator to ensure that records were accurate, complete and consistent. Records that occurred outside of Marine Parks were entered directly by the state-wide stranding coordinator. Species identification was established with taxonomic evidence including photographs, morphometric measurements, teeth/baleen, skulls or genetic samples. Where possible, the cause of death (COD) or stranding (COS) was established by (1) the circumstances of the incident, (2) examination of carcass or photographic records, (3) post-mortem examination by trained staff or (4) necropsies. The level of certainty to the COD/COS assignation was also recorded, as ‘confirmed’ or ‘suspected’. ‘Confirmed’ diagnoses were the most probable and parsimonious based of the available evidence. In contrast, in ‘suspected’ diagnoses there was evidence for the COD/COS assignation, but either the mechanism was substantially unclear or there was considerable uncertainty (see Moore et al. 2013 and references therein for a further discussion of uncertainty in necropsies). Where there was limited or no evidence, the COD/COS was recorded as ‘unknown’.

It is recognised that StrandNet represents only a proportion of stranded and dead cetaceans and pinnipeds occurring in Queensland. The number of carcasses or debilitated animals that reach the shoreline depends on factors such as currents, wind and carcass buoyancy, and losses to scavengers (Peltier et al. 2012). This also means that a carcass or debilitated animal may drift substantial distances before stranding. It is acknowledged that coverage is less

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1 For the purposes of this report, a necropsy is defined as a systematic procedure to gain insight into the cause of death of an animal whereby gross observations are first generated to establish a differential diagnosis. Subsequent tests (such as histopathology) are then used to eliminate diagnoses until an etiology is established (Pugliares et al. 2007). This procedure is usually undertaken by a veterinarian or in consultation with a veterinarian.
comprehensive in sparsely populated areas or where there are no regular ranger patrols (i.e. outside of marine parks). It is also acknowledged that fisheries bycatch records in StrandNet may be incomplete. Cetaceans can be unintentionally caught as bycatch in nets or other gear associated with fisheries activities. Since 2002, it has been a Commonwealth and State obligation for commercial fishers to report interactions with all protected species including cetaceans in their Species of Conservation Interest (SOCl) logbook. Where available, bycatch records were downloaded from the Queensland Government Open Data portal (https://data.qld.gov.au/dataset/total-number-of-species-of-conservation-interest-interactions-with-released-conditions-from-06-to-13/resource/bb2a337d-70d3-4a94-b69b-98a2e332b7a1) and cross-referenced against records in StrandNet.

Age class and maturity was estimated from total body length following Best (2007), unless other data were available (e.g. internal examination). No detailed information of length or age at maturity Australian snubfin and Australian humpback dolphins were available.

Results

Annual trend since 1996

The overall number of stranded or dead pinnipeds and cetaceans has declined each year since the peak in 2011 (Figure 1). In 2013, the number of cases per year remained above the 10-year annual average (mean from 2003-2012 ± standard deviation = 69.4 ± 14.5) but was less than in 2012. In 2014 and 2015, the number of cases per year was below the 10-year annual average (Figure 1). Pinniped strandings and mortalities continue to be rare events, with two records between 2013 and 2015. As in previous years, humpback whales were the most numerous species recorded, and together with short-beaked common and Indo-Pacific bottlenose dolphins accounted for close to half of the overall number of cases (45 to 53% of cases, Table 1).

Case histories

In the following summarised case histories, the alphanumeric number (e.g. W230093) is the unique identifier. The coordinates of the reported position are in parentheses and the measurement in metres represents standard length. Species names are provided in Table 1. Carcass condition: D1, alive by subsequently died; D2: dead, fresh carcass; D3: decomposing but internal organs intact; D4: advanced decomposition; D5: skin holding bones together; and D6: disarticulated bones.

Records from outside of Queensland (not included further)


Pinnipeds from 2013 to 2015


Cetaceans in 2013

Strandings and mortality from natural causes

1.75 m. Necropsy: David Blyde, Sea World. Genetic and toxicology samples taken


Anthropogenic causes of strandings and mortality

Unknown anthropogenic cause.


Interactions with vessels


Entanglement in ropes


Queensland Shark Control Program (QSCP)


Fisheries interactions

24. W230017. Unidentified bottlenose dolphin

Causes of strandings and mortality unknown

male, 18.6 m. Left in situ


Killer whale mass stranding event
65. W230095. Killer whale. 03-Jul-13. Sheridan Flats, Great Sandy Strait (152.85447°E; -25.52151°S). Left alive in situ. Reported in the morning. NPRS staff attended and monitored whales until flooding tide in the afternoon. Adult male. 7.9 m

Cetaceans in 2014
Strandings and mortality from natural causes
Justin Meager, EHP. Juvenile female. 5.55 m. Skeleton sampled by Queensland Museum. Genetic, toxicology and stomach content samples taken. Buried on site.

Anthropogenic causes of strandings and mortality

Interactions with vessels


Queensland Shark Control Program (QSCP)


25. W230306. Humpback whale. 16-Oct-14. Rainbow beach (153.096°E; -25.896°S). Released alive from net. Heavily entangled in net but was able to breathe easily. Rescued from MART and in good condition with all net removed. Calf, sex unknown. 5.5 m

Fisheries interactions

Causes of strandings and mortality unknown
37. W230243. Australian humpback dolphin 16-May-14. Pumicestone Passage (153.0991°E; -27.0269°S). Left alive in situ. Cause unknown. Multiple reports described the dolphin as spending unusually long periods at the surface, shallow diving and being approachable to one metre. It was unclear whether this represented poor health or unusual behaviour. Subsequent descriptions of a very similar behaviour were received in the same area in the following year (2015, see below). The 2015 reports related to the same animal. Sex, age class and size unknown.
41. W230255. Humpback whale. 08-Jul-14. Main Beach, Gold Coast (153.46806°E; -28.11072°S). Rescued from beach stranding by NPRS, EHP and SeaWorld. Cause of stranding unknown. First two rescue attempts were unsuccessful, rescued on 10-July-14. Juvenile male, 8 m.
Cause unknown. Stranded on sandbank on the ebbing tide. Monitored by MOP and presumed to have escaped on the flood tide that night. Sex, size and age class unknown.


49. W230282 Unidentified dolphin. 18-Sep-14, Port of Brisbane (153.1736°E; -27.3668°S) Carcass state unknown. Cause unknown. Reported by port staff but not attended by staff. Left in situ.


Unconfirmed reports


Cetaceans in 2015

Strandings and mortality from natural causes


2. W232432. Bryde’s whale. 03-Jul-15, Elford Reef lagoon (146.22166°E; -16.92026°S). Released alive via natural escape. Cause of entrapment unknown. Reported in a lagoon for several weeks and monitored by NPRS. Poor condition. Last reported on 18-Jul-15, a site assessment on 04-Aug-15 revealed that it had left the lagoon. Adult sized, sex and length unknown.


length. Assessed to be approximately two days old by Sea World.


**Anthropogenic causes of strandings and mortality**

**Interactions with vessels**


9. W232455. Humpback whale. 8-Sep-15. Hay Point (149.3121°E; -21.25833°S). D2. Suspected interaction with a commercial vessel. A tugboat had engine failure during port manoeuvres and found a small humpback whale lodged between the propeller and rudder. The carcass was fresh but it could not be ruled out that the interaction before death without a necropsy. Genetic, baleen and toxicology samples taken. Carcass removed piecewise by divers and disposed off-site. Immature, but age, sex and size unknown.

**Entanglement in ropes**


**Ingestion or entanglement in debris**


**Queensland Shark Control Program (QSCP)**


Fisheries interactions


Causes of strandings and mortality unknown

38. W232450. Common dolphin. 24-Jun-15, Brisbane (153.11652°E; -27.47655°S). D5. Cause unknown. Head found on Gateway Motorway. Head severed from body and cuts made to tissue from a knife but not known if the cuts were ante or post-mortem. Taken to the Queensland Museum. Adult sized, length and sex unknown.
46. W233468. Australian humpback dolphin:
   2. 6-Dec-15. Bribie Island (153.20708°E; -27.07505°S). Subsequent report. Presumed to the same dolphin as the earlier sightings, but high quality photos of the dorsal fin were not available for all reports. Continued reports in this area of a dolphin exhibiting similar issues suggests that it is not an acute health issue. Adult size, sex unknown. Sex, age class and size unknown. Subsequent report on 22-Dec-15 (153.20707°E; -27.07579°S).

Discussion
The total number of stranded or dead cetaceans has declined since 2011 (Figure 1). Understanding the reasons for long-term trends requires detailed analyses on a species-by-species basis, which is outside the scope of this data report (but see Meager and Limpus 2014; Meynecke and Meager 2016; Meager and Sumpton 2016). Contributing factors include changes in population size, reporting effort, vulnerability/health and external drivers such as the environment. The strandings assemblage continues to be dominated by migratory humpback whales and resident inshore dolphins.
(mostly bottlenose and Australian humpback dolphins). As in earlier analyses, common dolphins were the main species incidentally caught in the QSCP and bycatch was comprised mostly of adult females and calves (Meager and Sumpton 2016). The remaining species were rare and represented pelagic species (e.g. pygmy sperm whales, short-finned pilot whales and melon-headed whales), migrant (e.g. dwarf minke whales and southern right whales) and vagrants (e.g. the leopard seal).

Mass stranding events are rare on the Queensland coastline. It is not known why the group of killer whales stranded in the Great Sandy Strait in 2013. Although the carcasses were examined, tests for the full range of differential diagnoses were not possible because of carcass decomposition. Adjacent Fraser Island is a recognised strandings ‘hotspot’, with the highest species diversity of cetacean strandings (Meager 2013). The reasons for this are not fully understood, but the proximity of the coastline to the edge of the continental shelf and East Australia Current; a local upwelling (Brieva et al. 2015); local bathymetry and the function of Hervey Bay as a resting area for migrating whales (e.g. Chaloupka et al. 1999) are likely to be contributing factors.

An analysis of cause-specific trends in strandings and mortalities comes with the caveat that it is easier to diagnose some causes than other causes. Collisions with vessels or incidental fisheries catch may be directly observed, whereas other causes of death such as viral/bacterial infections or biotoxins are much more difficult to detect or confirm as the ultimate cause of a stranding or mortality. This problem can be compounded in subtropical-tropical climates, where rapid autolysis of carcasses can make diagnoses difficult even when a necropsy is performed. Hence, the fact that net entanglement was reported more often than disease does not necessarily mean that the latter is less prevalent.

A total of eight mortalities and three strandings were attributed to natural causes. Identified natural etiologies included pneumonia (pathogen unidentified), morbillivirus, shark attack, poor condition/high parasite load, suspected birthing/mothering failure and becoming trapped in a lagoon. Incidental catch in the QSCP in 2013 and 2015 was below the long-term average (1992-2012, mean ± SD: 17.3 ± 6.8), but was elevated in 2014 (14 mortalities and eight releases, Table 3). Other than the QSCP, the major cause of direct anthropogenic mortality was from collisions between vessels and cetaceans, with seven recorded in the time period. While there was no evidence that the number of vessel-related injuries or mortalities has increased in recent years (Table 4) the number of vessel interactions with cetaceans is likely to be underestimated because (a) not all collisions are reported by vessel crew, (b) it is not always possible for crew to ascertain exactly what a vessel has interacted with (especially for small cetaceans) and (c) not all carcasses of cetaceans killed by vessels drift into areas where they are likely to be reported.

In the current reporting period, all vessel-related records involved collisions with migratory whales (humpback, dwarf minke and southern right whales), and six of the seven records occurred in southern Queensland. Four cases involved medium-sized commercial vessels (three involved passenger ferries and one a tugboat), but information on the vessel type was not available for the other three cases. Three of the seven reports of vessel interactions were not confirmed, because a necropsy was not undertaken to determine if the interactions occurred ante or post-mortem. Vessel crew or other observers confirmed interactions with live animals in the remaining four cases. Accurate data on the location of the vessel-whale interaction was available for six of the seven reports. Three reports occurred near Peel Island in Moreton Bay, one at Hay Point and two occurred in the waters offshore of the Sunshine Coast/Moreton Island.

Vessel speed reductions are known to reduce the risk of collision with marine wildlife (Vanderlaan and Taggart 2007; Work et al. 2010; Conn and Silber 2013; van der Hoop et al. 2015) and have been implemented to protect turtles and dugongs in the Moreton Bay and the Great Sandy Strait Marine Parks (‘Go Slow’ areas). The scale and movement patterns of migratory whales make static protection areas difficult to implement in Queensland, and suggest that dynamic speed rules based on when and where whales are present may be more appropriate. Regulations are already in place for vessel approach distances to dolphins and whales, but vessel skippers are not always aware of the presence of cetaceans—especially at night, when visibility is poor or when animals are submerged.

Fisheries interactions over the reporting period were mostly because of inshore dolphins entangling in line-fishing gear or humpback whales entangling in ropes that were mostly associated with floats or crab/lobster pots. Some of the humpback whales, especially those reported in southern Queensland on the northwards migration, may have become entangled outside of Queensland. Line-fishing entanglement was suspected to have caused to the death of three bottlenose dolphins and ingestion of fishing line was suspected to have caused the death of a melon-headed whale. Two mortalities and one suspected entanglement of an inshore dolphin were attributed to net fishing. One of these mortalities was of a threatened species (the Australian snubfin dolphin) and resulted in an infringement notice being issued, the other mortality occurred in a remote area and it was not known if the bottlenose dolphin died before or...
after becoming entangled.

The number of records of line-fishing entanglement has increased since 2012 (Tables 4 and 5), with 14 records in the reporting period. It is possible that the rate at which fishers report entanglements has increased in recent years with the availability of smart phones and increased public awareness. Yet it is unlikely that all incidents are reported. Most recorded incidents involved bottlenose dolphins, with two incidents involving a threatened species (the Australian humpback dolphin). The survival of dolphins entangled in recreational fishing gear depends on factors such as the severity and location of entanglement, or where hooks are embedded (Wells et al. 1998; Powell and Wells 2011; Stolen et al. 2013). Simple measures that anglers can undertake to reduce the risk of dolphin entanglement include (a) not fishing close to dolphins, (b) not feeding dolphins, (c) not discarding fishing line and (d) using corrodiible, barbless and/or non-offset circular hooks (see also Rec Fish Australia, 2014 and http://www.nmfs.noaa.gov/pr/pdfs/education/dolphin_friendly_tips.pdf.)

References


Norman, S.A., Huggins, J., Carpenter, T.E., Case, J.T., Lambourn, D.M., Rice, J., Calambokidis, J., Gaydos, J.K., Hanson, M.B., Duffield,


Table 1: Number of strandings and mortalities recorded by species from 2013 to 2015 (% of occurrence in parentheses). Repeated sightings of known individuals are counted as one case.

<table>
<thead>
<tr>
<th>Species</th>
<th>Common name</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Megaptera novaeangliae</em></td>
<td>Humpback whale</td>
<td>20(27)</td>
<td>13(23)</td>
<td>11(19)</td>
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<tr>
<td><em>Delphinus delphis</em></td>
<td>Short-beaked common dolphin</td>
<td>10(13)</td>
<td>13(23)</td>
<td>7(12)</td>
</tr>
<tr>
<td><em>Tursiops spp.</em></td>
<td>Unidentified bottlenose dolphin</td>
<td>9(12)</td>
<td>2(4)</td>
<td>5(9)</td>
</tr>
<tr>
<td><em>Tursiops aduncus</em></td>
<td>Indo-Pacific bottlenose dolphin</td>
<td>4(5)</td>
<td>4(7)</td>
<td>11(19)</td>
</tr>
<tr>
<td><em>Tursiops truncatus</em></td>
<td>Common bottlenose dolphin</td>
<td>0</td>
<td>1(2)</td>
<td>2(3)</td>
</tr>
<tr>
<td><em>Sousa sahulensis</em></td>
<td>Australian humpback dolphin</td>
<td>7(9)</td>
<td>6(11)</td>
<td>6(10)</td>
</tr>
<tr>
<td><em>Orcinus Orca</em></td>
<td>Killer whale</td>
<td>8(11)</td>
<td>0</td>
<td>0</td>
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<tr>
<td><em>Physeter macrocephalus</em></td>
<td>Sperm whale</td>
<td>3(4)</td>
<td>2(4)</td>
<td>0</td>
</tr>
<tr>
<td><em>Kogia breviceps</em></td>
<td>Pygmy sperm whale</td>
<td>3(4)</td>
<td>2(4)</td>
<td>1(2)</td>
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<tr>
<td><em>Orcaella heinsohni</em></td>
<td>Australian snubfin dolphin</td>
<td>3(4)</td>
<td>0</td>
<td>1(2)</td>
</tr>
<tr>
<td><em>Peponocephala electra</em></td>
<td>Melon-headed whale</td>
<td>0</td>
<td>0</td>
<td>3(5)</td>
</tr>
<tr>
<td><em>Eubalaena australis</em></td>
<td>Southern right whale</td>
<td>1(1)</td>
<td>2(4)</td>
<td>0</td>
</tr>
<tr>
<td><em>Globicephala macrorhynchus</em></td>
<td>Short-finned pilot whale</td>
<td>0</td>
<td>3(5)</td>
<td>0</td>
</tr>
<tr>
<td><em>Steno bredanensis</em></td>
<td>Rough-toothed dolphin</td>
<td>1(1)</td>
<td>0</td>
<td>1(2)</td>
</tr>
<tr>
<td><em>Lagenodelphis hosei</em></td>
<td>Fraser’s dolphin</td>
<td>0</td>
<td>1(2)</td>
<td>1(2)</td>
</tr>
<tr>
<td><em>Pseudorca crassids</em></td>
<td>False killer whale</td>
<td>1(1)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><em>Mesoplodon densirostris</em></td>
<td>Blainville’s beaked whale</td>
<td>1(1)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><em>Balaenoptera acutorostrata</em></td>
<td>Dwarf minke whale</td>
<td>0</td>
<td>0</td>
<td>1(2)</td>
</tr>
<tr>
<td><em>Balaenoptera edeni</em></td>
<td>Bryde’s whale</td>
<td>0</td>
<td>0</td>
<td>1(2)</td>
</tr>
<tr>
<td><em>Balaenoptera bonaerensis</em></td>
<td>Antarctic minke whale</td>
<td>0</td>
<td>1(2)</td>
<td>0</td>
</tr>
<tr>
<td><em>Ziphius cavirostris</em></td>
<td>Cuvier’s beaked whale</td>
<td>0</td>
<td>1(2)</td>
<td>0</td>
</tr>
<tr>
<td><em>Grampus griseus</em></td>
<td>Risso’s whale</td>
<td>0</td>
<td>0</td>
<td>1(2)</td>
</tr>
<tr>
<td><em>Hydrurga leptonyx</em></td>
<td>Leopard seal</td>
<td>0</td>
<td>1(2)</td>
<td>0</td>
</tr>
<tr>
<td>Unidentified whale</td>
<td>-</td>
<td>2(3)</td>
<td>0</td>
<td>2(4)</td>
</tr>
<tr>
<td>Unidentified dolphin</td>
<td>-</td>
<td>2(3)</td>
<td>4(7)</td>
<td>2(4)</td>
</tr>
<tr>
<td>Unidentified fur seal</td>
<td>-</td>
<td>0</td>
<td>0</td>
<td>1(2)</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td>75</td>
<td>56</td>
<td>57</td>
</tr>
</tbody>
</table>
Table 2: Cetacean and pinniped strandings and mortality with identified sources of mortality for Queensland in 2013. Numbers in parentheses represent additional animals that were released alive. Note that not all identified sources of mortality are confirmed by necropsy, refer to main text for individual case histories.

<table>
<thead>
<tr>
<th>Species</th>
<th>Natural causes</th>
<th>Human related</th>
<th>Unidentified causes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vessel interaction/ fractures</td>
<td>Fisheries-related activity and entanglement*</td>
<td>Shark Control Program</td>
</tr>
<tr>
<td>Megaptera novaeangliae</td>
<td>(1)</td>
<td>(1)</td>
<td>(5)</td>
</tr>
<tr>
<td>Delphinus delphis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tursiops spp.</td>
<td>(1)</td>
<td>(1, 3r)</td>
<td>8(1)</td>
</tr>
<tr>
<td>Tursiops aduncus</td>
<td>2</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Sousa sahulensis</td>
<td>1</td>
<td>1</td>
<td>4(1)</td>
</tr>
<tr>
<td>Orcinus orca</td>
<td>3(5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physeter macrocephalus</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kogia breviceps</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Orcaella heinsohni</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Eubalaena australis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Steno bredanensis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pseudorca crassidens</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mesoplodon densirostris</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unidentified whale</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unidentified dolphin</td>
<td></td>
<td>(1)</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>2(2)</td>
<td>(1)</td>
<td>1(11)</td>
</tr>
</tbody>
</table>

*includes commercial netting, crabbing, entanglement in fishing line or ropes, and ingesting hooks or fishing line. r includes known repeated observations of an individual.
Table 3: Cetacean and pinniped strandings and mortality with identified sources of mortality for Queensland in 2014. Numbers in parentheses represent additional animals that were released alive. Note that not all identified sources of mortality are confirmed by necropsy, refer to main text for individual case histories.

<table>
<thead>
<tr>
<th>Species</th>
<th>Natural causes</th>
<th>Human related</th>
<th>Unidentified causes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Vessel interaction/ fractures</td>
<td>Fisheries-related activity and entanglement*</td>
</tr>
<tr>
<td>Megaptera novaeangliae</td>
<td></td>
<td>(1)</td>
<td>(7)</td>
</tr>
<tr>
<td>Delphinus delphis</td>
<td></td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>Tursiops spp.</td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Tursiops aduncus</td>
<td></td>
<td></td>
<td>1(1)</td>
</tr>
<tr>
<td>Tursiops truncatus</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sousa sahulensis</td>
<td></td>
<td></td>
<td>(2)</td>
</tr>
<tr>
<td>Physeter macrocephalus</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kogia breviceps</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eubalaena australis</td>
<td></td>
<td>1(1)</td>
<td></td>
</tr>
<tr>
<td>Globicephala macrorhynchus</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lagenodelphis hosei</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ziphius cavirostris</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Balaenoptera bonaerensis</td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Hydrurga leptonyx</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unidentified dolphin</td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>TOTAL</td>
<td>3</td>
<td>1(2)</td>
<td>1(3)</td>
</tr>
</tbody>
</table>

*Includes commercial netting, crabbing, entanglement in fishing line or ropes, and ingesting hooks or fishing line.
Table 4: Cetacean and pinniped strandings and mortality with identified sources of mortality for Queensland in 2015. Numbers in parentheses represent additional animals that were released alive. Note that confirmed and suspected causes of death or stranding are pooled.

<table>
<thead>
<tr>
<th>Species</th>
<th>Natural causes</th>
<th>Human related</th>
<th>Unidentified causes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vessel interaction/fractures</td>
<td>Fisheries-related activity and entanglement*</td>
<td>Shark Control Program</td>
</tr>
<tr>
<td>Megaptera novaeangliae</td>
<td>2</td>
<td>2 (2)</td>
<td>(2)</td>
</tr>
<tr>
<td>Delphinus delphis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tursiops spp.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tursiops aduncus</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tursiops truncatus</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sousa sahulensis</td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Kogia breviceps</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Orcaella heinsohnii</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peponocephala electra</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Steno bredanensis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lagenodelphis hosei</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Balaenoptera acutorostrata</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Balaenoptera edeni</td>
<td>(1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grampus griseus</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unidentified whale</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unidentified dolphin</td>
<td></td>
<td></td>
<td>(1)</td>
</tr>
<tr>
<td>Unidentified fur seal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>4(1)</td>
<td>3</td>
<td>4(4)</td>
</tr>
</tbody>
</table>

*includes commercial netting, crabbing, entanglement in fishing line or ropes, and ingesting hooks or fishing line. †, includes a suspected re-sighting of the same individual
Table 5: Cetacean and pinniped strandings and mortalities by year and identified sources of mortality for Queensland, 2006-2015. Numbers in parentheses represent additional animals that were released alive or escaped unaided. Note that confirmed and suspected causes of death or stranding are pooled.

<table>
<thead>
<tr>
<th>Suspected or confirmed cause of stranding and mortality</th>
<th>Year</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Natural causes</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disease or ill health</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>1</td>
<td>9</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Trapped by natural event</td>
<td>(1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stingray barb</td>
<td>(1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Predation/ predator attack</td>
<td>(1)</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Undetermined or other natural cause</td>
<td>1</td>
<td>2</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td><strong>Anthropogenic causes</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vessel interaction (collision report, or blunt and/or sharp trauma)</td>
<td>(2)</td>
<td>(3)</td>
<td>(5)</td>
<td>1</td>
<td>(2)</td>
<td>1</td>
<td>(2)</td>
<td>(1)</td>
<td>(2)</td>
<td>3</td>
</tr>
<tr>
<td>Incidental catch in net fishery or entanglement in fishing net</td>
<td>(1)</td>
<td>(2)</td>
<td>(2)</td>
<td>2</td>
<td>(4)</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>(1)</td>
</tr>
<tr>
<td>Entanglement in fishing traps, ropes or floats (suspected to relate to fishing)</td>
<td>1</td>
<td>(4)</td>
<td>(7)</td>
<td>(1)</td>
<td>1</td>
<td>(1)</td>
<td>(4)</td>
<td>(4)</td>
<td>(2)</td>
<td></td>
</tr>
<tr>
<td>Incidental catch in line fishery, entanglement in or ingestion of line-fishing gear</td>
<td>(1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>(6)</td>
<td>(6)</td>
<td>(3)</td>
</tr>
<tr>
<td>Incidental catch in Queensland Shark control program</td>
<td>21</td>
<td>21</td>
<td>28</td>
<td>14</td>
<td>21</td>
<td>15</td>
<td>8</td>
<td>10</td>
<td>14</td>
<td>10</td>
</tr>
<tr>
<td>Ingested foreign material or entangled debris (excluding fishing gear)</td>
<td>(1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(1)</td>
</tr>
<tr>
<td>Undetermined human cause</td>
<td>3</td>
<td>3</td>
<td>(1)</td>
<td>1</td>
<td></td>
<td>2</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Undetermined cause</strong></td>
<td>20</td>
<td>31</td>
<td>20</td>
<td>31</td>
<td>34</td>
<td>43</td>
<td>42</td>
<td>32</td>
<td>19</td>
<td>23</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>49</td>
<td>52</td>
<td>48</td>
<td>55</td>
<td>58</td>
<td>70</td>
<td>55</td>
<td>46</td>
<td>38</td>
<td>44</td>
</tr>
</tbody>
</table>

*Data for 2001-2012 were taken from previous reports (Greenland and Limpus 2008; Meager et al. 2012; Meager 2013). † includes known repeated reports of an individual (separated by ≥ 3 months)
Figure 1: Cumulative cetacean and pinniped strandings and mortalities in Queensland per month and year for the 10 year-period between 2005 and 2015.
Figure 2: Distribution of cetacean and pinniped strandings and mortalities, 2013.
Figure 3: Distribution of cetacean and pinniped strandings and mortalities, 2014.
Figure 4: Distribution of cetacean and pinniped strandings and mortalities, 2015.
Figure 5: Distribution of humpback whale strandings and mortalities, 2013-2015.
Figure 6: Distribution of inshore dolphin strandings and mortalities, 2013-2015.