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APPENDIX C

Compilation of incidental marine mammal and sea turtle sightings in the Mariana Islands Range Complex

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Compilation of incidental marine mammal and sea turtle sightings in the Mariana Islands Range Complex



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Cover photo: by Paul Wenninger, NAVFAC Marianas. Sperm whale sighted incidentally on aerial transit between Saipan and Farallon de Medinilla, 20 September, 2011.

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1 INTRODUCTION

In order to train with mid-frequency active sonar (MFAS) and underwater detonations, the Navy obtained incidental take permits and Letters of Authorization from the National Marine Fisheries Service (NMFS) under the Marine Mammal Protection Act and Endangered Species Act. The Mariana Islands Range Complex (MIRC) Monitoring Plan was developed by Commander, U.S. Pacific Fleet with NMFS to comply with the requirements under the permit. The monitoring plan and reporting are intended to provide science-based answers to questions regarding whether or not regulated marine species are exposed to or affected by Navy training and testing activities.

The purpose of this report is to compile previously unpublished sightings of marine mammals and sea turtles made in the Mariana Islands Range Complex. The original primary goal of this report was to compile such sightings incidentally made during Navy-funded field efforts or other Navy training. However during the course of compiling these data, additional incidental sightings made by other sources were encountered. Because these additional sightings were large in quantity and generally unavailable in existing reports or publications, these have also been included here.

This report also describes the process of consideration applied to these incidental sightings for their incorporation into a georeferenced database (HDR 2014) developed for the MIRC marine species monitoring program. Each source from which incidental sightings were collected is described, and all such sighting data are presented in this report in tabular form, whether or not they were further incorporated into the georeferenced database.

The georeferenced data from these incidental sightings will be processed through a separate effort as part of the existing data management process encompassing all survey effort made under the MIRC monitoring plan. The incidental sightings identified in this report were added to the GIS database for surveys and sightings in the MIRC, and the results presented in a separate report (HDR 2014), produced by HDR under contract N62470-10-D-3011 Task Order KB23 to Naval Facilities Engineering Command (NAVFAC), Pacific.

2 METHODS

Reports of sightings of marine mammals and sea turtles made within the Mariana Island Testing and Training (MITT) study area (DoN, 2013) that were previously unpublished, or not widely distributed, were compiled and the sources of these data recorded. Sighting data was evaluated and standardized with the intent of incorporation through a separate effort into a larger georeferenced database encompassing sightings and survey effort for all MIRC monitoring.

Excluded from collection were sightings from dedicated surveys for marine mammals and sea turtles, such as Navy-funded at-sea surveys under the MIRC monitoring plan, and Navy-funded shoreline surveys for turtle nesting on Guam and Tinian.

Sightings that were previously noted in reports, but did not have their timing and location

individually described in these reports, were also included in collection. An example are the in-water sea turtle sightings made by the Navy's aerial avian survey effort at Farallon de Medinilla, where totals of sightings in some years have been reported as totals, but have not been broken out into individual sightings at discrete locations on particular dates.

Sightings were compared between all sources to remove duplicated sightings. Also excluded from incorporation into the georeferenced database were marine mammal strandings found to be already documented by the NMFS Pacific Islands Regional Office (PIRO). When photographs were available, verification of species identification was performed.

There were no survey tracklines associated with the sighting data in this report, since all were made incidentally, and not as a result of a directed survey effort. Also, for the purposes of later entry into the database, data fields were populated with best estimates based on information accompanying the data sources; these assumptions are detailed in the description for each source in the Results section below. In particular, latitude and longitude was estimated for all records described in this report which qualified for integration into the database.

3 RESULTS

3.1 Sea turtle nesting surveys on Tinian

The Navy began a monitoring program for sea turtles on Tinian in 1998, which involves surveys of all sandy areas within military leased lands on Tinian on an approximately monthly basis (e.g., see Vogt 2009). As noted in section 3.10 below, sea turtle sightings from these surveys were not considered incidental and were not included in this compilation. Only one marine mammal was incidentally sighted during these shoreline surveys on Tinian, a stranded deceased Bryde's whale found on 23 February 2005 at Masalog beach. This sighting was not included in the compilation because it: a) corresponds to a known stranding with the identification NMFS-BE-05-15-SD; and b) was previously reported by Trianni & Tenorio (2012) as being reported to NMFS on February 16, 2005.

In summary no sea turtle or marine mammal sightings from the Navy's regular shoreline surveys are included in this compilation.

3.2 Farallon de Medinilla aerial avian surveys

The Navy began a program of monthly, and later quarterly, aerial avian monitoring surveys of Farallon de Medinilla (FDM) in 1997 under the Migratory Bird Treaty Act (MBTA). Although seabirds are the focus, the presence of sea turtles and marine mammals are recorded. Because these data have not previously been reported individually, or as georeferenced data, all sea turtle and marine mammal sightings from this survey series were included in the current compilation. Also included were incidental sightings of marine mammals made on transits to or from Saipan to FDM for these surveys. Sources of data included the formal reports (i.e., Vogt 2005; Vogt

2008; Wenninger 2010), raw survey data sheets (between 21 February 1997, and 26 January 2009), and unpublished tabular data compiled and provided by Paul Wenninger at NAVFAC Marianas (19 January 2004 through 20 August 2013). Tabular listings of all sightings are listed in Table 1 for marine mammals, and Table 2 for turtles and elasmobranchs. Surveys were conducted approximately monthly 1997–2009, and quarterly thereafter.

When compiling sightings for later incorporation into a georeferenced database, assumptions were made on fields for which exact information was not available:

- 1) Latitude and longitude: Sightings at FDM were recorded in reference to 43 survey stations spaced approximately equally around the entire perimeter of the island's shoreline (Figure 1). The positions of these sightings were assumed to be located at 75m offshore of the survey station, presuming that on average, the survey helicopter was about 150m offshore, and sightings at about half that distance; 75m also was found to be at nearly the maximum practical distance from shore, because if sightings were placed 100m perpendicularly offshore, the derived positions at adjacent survey stations along curved portions of the shoreline were overlapped and indistinguishable. In the few cases that distance from shoreline was specified by source data, that distance was used in estimating position.

Some sightings occurred during the aerial transit either to or from FDM, and were recorded as either a) the approximate proportion of the transit between islands, or b) an approximate distance from an island. Therefore, the position of these sightings were estimated as the location at that fraction or distance of the straight-line position between the closest points of both islands, for example, "half way between Saipan and FDM," or "16 km south of FDM."

- 2) Time: Time was not recorded per sighting, so was estimated based upon the arrival and departure times from FDM. If no arrival or departure times were recorded, a time of 10:15 am (local time) was assumed for the sighting, since the majority of surveys occurred around this time. If the sighting occurred during transit to or from FDM, 10:00 was assumed if it occurred before arrival at the island, or 11:30 am if it occurred after departure from the island.

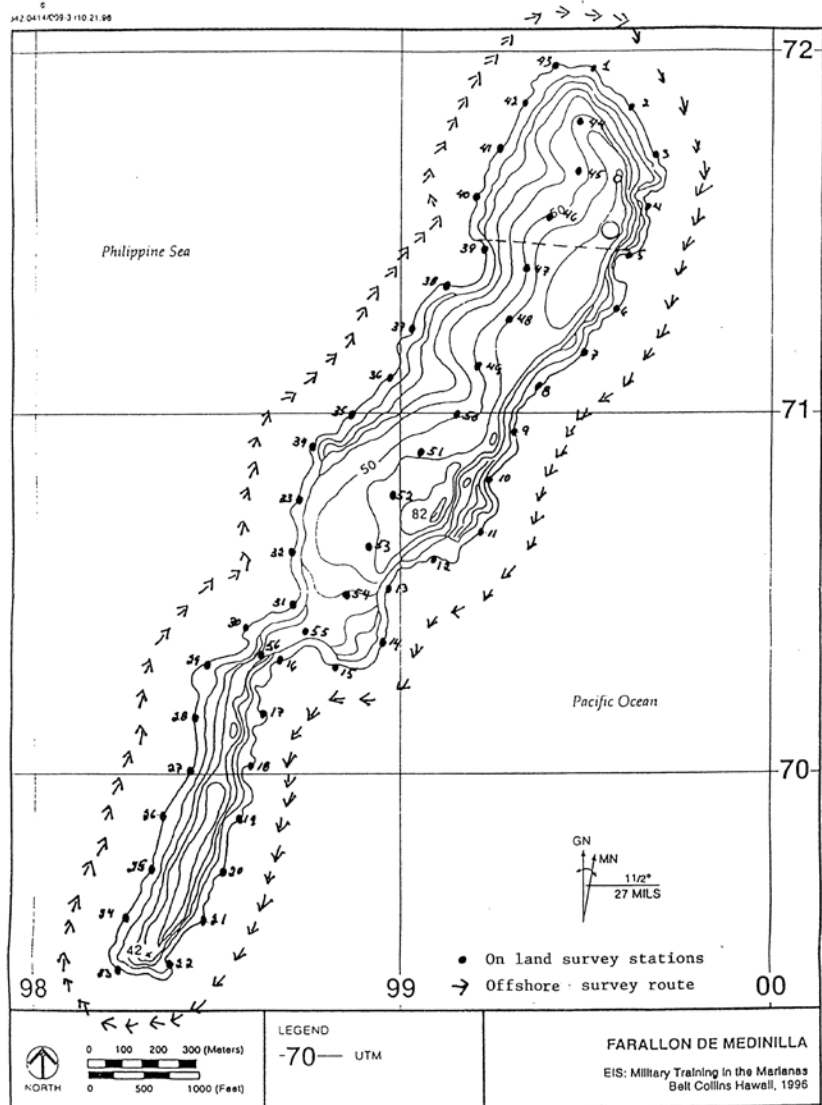


Figure 1. Numbered survey stations at Farallon de Medinilla

- 3) Altitude. Based on survey methodology notes and correspondence with NAVFAC Marianas, an altitude of 229 m (750 ft) was assumed for sightings at FDM, and 610 m (2000 ft) for sightings during interisland transits. However it is unlikely this field will be utilized, for example for computing perpendicular distance from trackline which would require a protocol recording vertical angles to sightings.
- 4) Beaufort sea state is not recorded in these surveys, so this field was left blank. Direct correspondence with NAVFAC Marianas (Anne Brooke, pers. comm.) indicated that turtles were generally not possible to sight unless the survey occurred on a day with relatively calm seas. The bay on the NE side of the island between stations 5 & 6 (Figure 1) was a frequent location for sighting turtles.

- 5) Species: Turtle species were generally not identified, so were recorded in the database as “unidentified sea turtle.” In the two cases where species was identified (both green sea turtle), that identification was retained. For marine mammals, all identifications of humpback whales were retained, due to relatively obvious species-specific features such as long pectoral fins; the few cases where photographs were available (Figure 2; Figure 3; Figure 4), these corroborated identifications of this species. All sightings of small dolphins were reclassified as “unidentified dolphin,” even in cases where spinner dolphins were identified, due to possible confusion with pantropical spotted dolphins, especially when sighted offshore between islands. In other whale and dolphin sightings where photographs were available, these were examined by marine mammal subject matter experts (SMEs) at NAVFAC Pacific EV24 for species identification.

For example, sightings of dolphins and whales ~50km north of Saipan on 28 July 2007 were reported in Vogt (2008) as spinner dolphins, and either a Bryde’s whale or minke whale. Upon examination of the photos, the dolphins were determined to be a mixed-species group consisting of spinner dolphins and pantropical spotted dolphins (Figure 5; Figure 6), and the whale confirmed as a Bryde’s whale (Figure 7). Wenninger (2010) reports that on 25 May 2010, a group of killer whales (*Orcinus orca*) were sighted approximately 20 miles south of FDM (Figure 8). The animals had apparently were hunting an unidentified whale that remained below the water surface the entire duration of the sighting opportunity (which was time-limited due to fuel constraints), and blood was visible in the water. One animal in the group, a calf or juvenile, was reported to be noticeably smaller at one-third the size of the females, and at least one male was confirmed in the group (Paul Wenninger [NAVFAC MAR], pers. comm., 3 June 2010). On 20 September 2011, Wenninger (pers. comm., 2 June 2013; unpublished tabular data) reported sighting a single sperm whale on the transit to FDM (Figure 9).

In addition, two notable sightings that were neither sea turtle nor marine mammal were included in the database: one sighting of a manta ray off FDM on 29 October 2001, and a whale shark on 21 May 2007 on the transit between FDM and Saipan.



Figure 2. Humpback whale sighted ¼ mi offshore at FDM on 26 February 2001
Photo credit: Tim Sutterfield (U.S. Navy)



Figure 3. Humpback whale mother-calf-escort pod sighted at FDM 400m offshore of station 1 on 24 March 2003
Only mother and calf visible in photo. Photo credit: Scott Vogt (U.S. Navy).



Figure 4. Humpback whale sighted at FDM on February 18, 2007
Photo Credit: Tim Sutterfield (U.S. Navy).



Figure 5. Mixed-species pod 50km north of Saipan in transit to FDM on 28 July 2007
Top: pantropical spotted dolphin. Bottom: spinner dolphin. Photo credit: Scott Vogt and Anne Brooke (U.S. Navy).



Figure 6. Pan-tropical spotted dolphin from mixed-species pod 50km north of Saipan in transit to FDM on 28 July 2007

Photo credit: Scott Vogt and Anne Brooke (U.S. Navy).



Figure 7. Unidentified balaenopterid whale 50km north of Saipan in transit to on 28 July 2007

Photo credit: Scott Vogt and Anne Brooke (U.S. Navy).

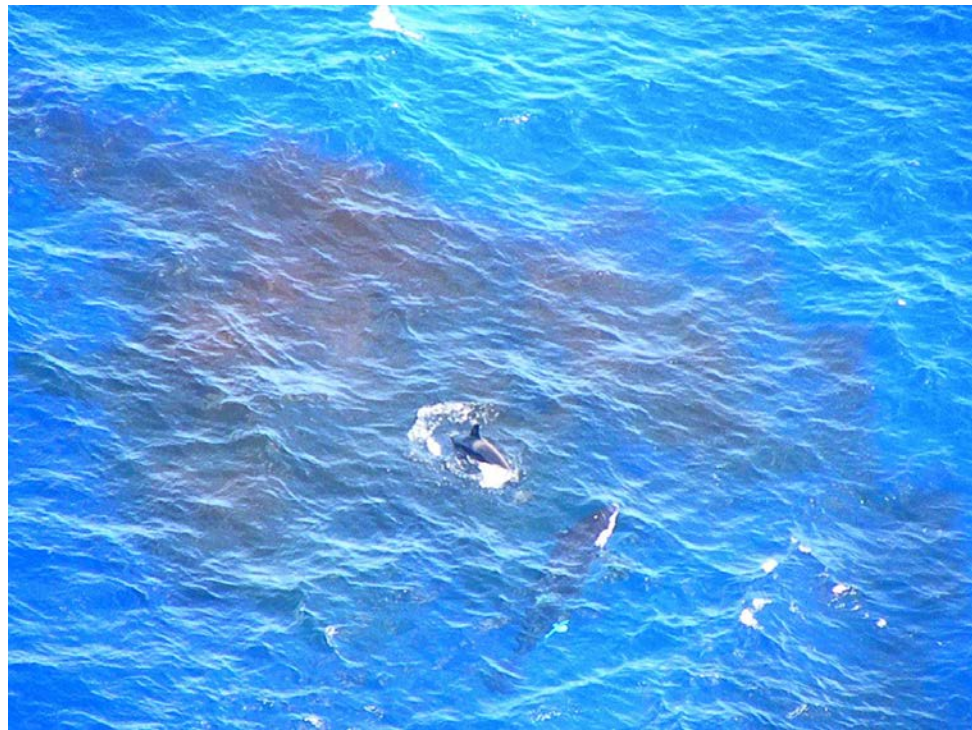


Figure 8. Two views of killer whales 20 miles south of FDM on 25 May 2010
Photo credit: Paul Wenninger (U.S. Navy).



Figure 9. Sperm whale sighted 20 September 2011 sighted during aerial transit between Saipan and Farallon de Medinilla

Photo credit: Paul Wenninger (U.S. Navy).

3.3 Assessment of Marine and Fisheries Resources, FDM

Annual marine and fisheries assessments were conducted at FDM in 1997, and in the years 1999-2004. These surveys were continued by a Navy biologist survey team from 2005-2010 and in 2012 (Smith et al. 2013). Although sea turtles have been sighted in the water in all years 1999-2008 (mostly green, with four hawksbills over this span), these were not included at this time pending an attempt to locate exact position data from the survey performers. Also, elasmobranch sightings made in these surveys were also not considered incidental to these surveys, and were not considered for inclusion in the database.

All marine mammal sightings made during these surveys as well as during transits to and from the island are included in this compilation. In the case of sightings during surveys, some data fields were filled by best estimates. If the date was not given in the report, then the day at the midpoint of the survey was used. If time was not given, then 12:00 noon local time was used. Location was estimated at the midpoint of the survey leg described in the report. In some cases a distance from shore was given, and that distance was used to estimate a position laying beyond the survey track. In the case of sightings made on transits to or from FDM, the location estimate was based on information given in the report, for example “halfway between Saipan and FDM.”

In other cases, given recollections of when incidental sightings were able to be made on the transit (Steve Smith [NAVFAC Expeditionary Warfare Command Scientific Diving Services (EXWC SDS)], pers. comm., 22 August 2014), the location was estimated at three-quarters of the distance from Saipan to FDM.

Species identifications of spinner dolphins were retained as such if sighted nearshore to FDM, but were changed to “unidentified small dolphin” if sighted in the deep water between islands, consistent with this treatment or the helicopter-based FDM surveys described above in 3.2, based on the possibility of misidentification of pantropical spotted dolphins. For sightings at FDM, times were not specified, so these sightings were arbitrarily assumed to have been at 12:00 local time.

During the 1999 survey, a pod of spinner dolphins was sighted on two separate days on the outer banks surrounding the Island, approximately one mile from land; the exact date of the sightings were not specified, so the first and last days of the survey were arbitrarily assigned. During the 2001 survey, a school of spinner dolphins was observed by divers during a tow survey approximately 50 meters from land near the northwestern tip of the Island. For this survey series, this 2001 sighting represented the first time that any marine mammal had been observed at FDM by this marine resource survey series.

During the 2006 survey, a pod of spinner dolphins was sighted near the southern tip of FDM, and two similar pods were reported near the same location during the 2007 survey. Since dates were not specified in the report, a date at the midpoint of the survey period was arbitrarily chosen for the 2006 survey, and because there were two sightings in 2007, the first and last days of the survey were arbitrarily chosen. The group size for the three sightings in 2006 and 2007 was approximated at 15.

3.4 Navy survey to Sarigan

On March 24, 2003, during an aerial transit to Sarigan for a Navy terrestrial biology survey, three sperm whales were sighted approximately four miles north of Anatahan (Vogt 2005). The date of the sighting stated in Vogt (2005) as “February 2003” is in error, and the group size was three (Scott Vogt [NAVFAC Far East], pers. comm., 27 May 2014.). Location was estimated according to the above information, and time arbitrarily estimated at 10:00 local time, based on a typical mid-morning outbound departure.

3.5 EOD DET MARI sighting

On 1 September 2010, during a transit by small boat by Explosive Ordnance Disposal Detachment Marianas (EOD DET MARI) from Guam to Saipan, a marine mammal was sighted feeding on squid. NAVFAC PACIFIC EV24 confirmed the species identification from a photo as a pilot whale. Only a single animal was sighted, and the waypoint and time of day were estimated on observer recollections (Steve Smith [Naval Facilities Engineering Service Center (NFESC)], pers. comm., 29 Aug 2012).

3.6 Servicing of MIRC EARs by HDR

Several incidental sightings of marine mammals were made by HDR, Inc. personnel during deployment of moored passive acoustic monitoring devices in the Marianas. These device servicings occurred in the course of performance of tasks in contract #N62470-10-D-3011 task orders KB10 and KB17 to NAVFAC Pacific, funded by Commander, U.S. Pacific Fleet. Each deployment team included at least one marine mammal observer whose experience included conducting line transect surveys for marine mammals aboard a NOAA large vessel in the Pacific Ocean. Therefore species identifications were deemed reliable and brought forward into the database even though the work team was not equipped with photographic equipment. Estimates for waypoints, sea state, and time of day for all sightings were also provided by this observer (Michael Richlen [HDR], pers. comm. 13 March 2013).

These sightings were comprised of the following:

- Pantropical spotted dolphins were sighted on all three acoustic device deployment mobilizations on 4 September 2011, 7 April 2012, and 14 January 2013 west of Saipan and Tinian in the vicinity of Coke Reef, in approximately the same area on each occasion. Therefore the estimated waypoint was glossed as the same point for all three sightings. Each deployment mobilization consisted of two boat trips on separate days, and the dolphins were sighted on one boat trip each.
- Pantropical spotted dolphins were also sighted once at Guam relatively nearshore north of Apra Harbor on 3 April 2012.
- Baleen whales sighted in January 2013 near Saipan. The sighting on 15 January was not confirmed to species, and only blows were sighted nearshore off the northwest coast of Saipan. The sighting on 16 January was originally sighted west of Saipan Harbor as the vessel went out for its deployment operations, and continued to be visible for 4-5 hours until the vessel's return journey, when it was confirmed as a humpback whale after a fluke-up was observed. After the vessel returned to port, this individual was later also sighted continuing to blow just outside of the harbor entrance, and continued to be visible from the local hotel.

3.7 Marine Patrol Volunteer Program (MPVP)

The Andersen Air Force Base (AAFB) Marine Patrol Volunteer Program (MPVP) regularly surveys the shoreline at AAFB, and reported that they frequently sight spinner dolphins and whales along the Tarague Basin perimeter ocean frontage, and also regularly sight spinner dolphins at Tumon Bay on both sides (i.e., near Hilton Guam Resort, as well as near Gun Beach), Piti Channel Hap Reef, Agat Bay, and Cetti Bay (Felix Reyes [Guam Visitors Bureau], pers. comm., 25 June 2013). The point of contact for the AAFB MPVP, Felix Reyes, also provided the author with photographs of whales sighted offshore of the Agat Bay and Umatac Area on 20 February 2010 (Felix Reyes, pers. comm., 11 June 2014 and 25 June 2013). Upon examination by NAVFAC EV24, these were identified as sperm whales. At least six animals were visible in one photograph (Figure 10), and that number was used as the group size. Following other nearshore sightings in the DAWR set (see below Section 3.8) that were referenced to terrestrial landmarks, the location of the sighting was estimated to be 500m offshore of the reef margin. The time of day was transcribed from the photograph file metadata.



Figure 10. Sperm whales sighted 20 February 2010

Photo credit: Felix Reyes.

3.8 Guam Department of Agriculture's Division of Aquatic and Wildlife Resources (DAWR) compilation of sightings and strandings

The initial intention of this report had been to compile marine mammal sightings made incidentally to Navy-funded surveys. However during the course of the collection of these data, the author was informed of the existence of a record of marine mammal sightings and strandings reported to the Guam Department of Agriculture's Division of Aquatic and Wildlife Resources (DAWR). This record was originally created by Gerry Davis, the DAWR list is currently maintained by Brent Tibbatts who provided a spreadsheet data file of these reports (pers. comm., 25 June 2013), covering a span from September 7, 1962, to June 12, 2013. Because these data are so extensive but unpublished, it was decided to be presented here as an important contribution to the incidental record of marine mammals in the Marianas. These data are presented described below, and presented in tabular form (Table 3; Table 4) separately from other sources in this report (Table 1). In September 2014 during the final stages of preparation of this report, the author was informed that Guam DAWR also possesses an unpublished record of other marine sightings including sea turtles and elasmobranchs, but these data were not incorporated into the current report.

Some of the records in the DAWR marine mammal compilation have been previously presented in other sources. Therefore the DAWR compilation was compared against other data sources in this report, and those sightings removed before integration into the geo-referenced database; for example the killer whale sighting on May 25, 2010 (Section 3.2; Figure 8) by NAVFAC Marianas during the survey to FDM had also been reported to DAWR, and was removed as a duplicate before integration into the database. Additionally, all entries were compared against incidental sightings previously reported by Eldredge (2003); however since this is a source with relatively small distribution, these entries were brought forward into the geo-referenced database. Finally, the DAWR compilation was also compared for duplicates against lists of previously-known strandings, specifically the numbered catalog of strandings from NMFS PIRO PRD (Dalin D'Alessandro, pers. comm., 10 December 2013). Strandings that were listed in the NMFS source were flagged and not brought forward into the geo-referenced database.

All strandings were also compared against the list of records from Hawaii Pacific University (Kristi West [HPU], pers. comm., 4 December 2013); this list comprised data from Guam spanning five years (2008-2013), and represented processed tissue samples from strandings. Three discrepancies were noted from the HPU source: 1) The spinner dolphin stranding on 20 July 2009 which was described as a mother-calf pair, was presumed to correspond to NMFS stranding # NMFS-SA-09-46-SD of a stranded calf of a different species, pantropical spotted dolphin, dated October 20, 2009. HPU confirmed their record for a processed tissue from a spotted dolphin calf in 2009 that was frozen and later sent, which might explain the date discrepancy. Under this presumption, this stranding was not brought forward into the database. 2) An unidentified stranded cetacean of 18 May 2012 that was 20 feet in length and missing the head was identified by HPU as a likely sperm whale. Since the species identification was tentative and stranding did not correspond to a stranding in the NMFS list, this stranding was brought forward into the database as an unidentified cetacean. 3) HPU noted one stranding that occurred after the author's receipt of the DAWR and NMFS lists, a bottlenose dolphin stranded

near Tumon, Guam, on 14 September, 2013. This stranding was not brought forward into the database on the presumption it was recorded by NMFS.

All entries from the DAWR source are described in the data tables (Tables 3, 4), even those not subsequently brought forward into the georeferenced database. The stranding data table (Table 4) lists redundancies with the NMFS stranding records, with the designated NMFS stranding number cited when available. Also, records previously reported by Eldredge (2003) in the data table, as are ones from other sources in this report. Dates are listed chronologically, with strandings being listed separately in the second half.

Since time was not given for any records, 12:00 noon local time was arbitrarily assigned to all entries in the DAWR source when brought forward into the database. In records where only a year is listed, the month and date of January 1 was assigned. In cases of nearshore sighting records that were referenced to terrestrial landmarks and were not strandings, the location of the sighting was estimated to be 500m offshore of the reef margin. If no group size was given, it was assumed to be "1." If the group size was given as a "pod," a conservative group size of "3" was assigned. If a range of numbers was in the source, then the middle of the range was assigned. In two cases, "several hundred" was specified, and a conservative group size of "200" was assigned, and when "more than several hundred" was the description, "201" was used.

3.9 Extralimital dugong from University of Guam Technical Report 17

One previously-reported sighting is included here because it was an unusual species, a dugong, and it was reported with relatively small distribution, a University of Guam (UoG) Technical Report (Randall et al., 1975), that was further cited in Eldredge (2003). This sighting was not included in the DAWR list. According to one of the observers (Michael Gawel [National Park Service], pers. comm., 13 July 2014), the sighting was made during a regular scuba dive at Cocos Lagoon, Guam. The dives had been occurring two to three times per week for several months, and on February 16, 1974, a dugong was sighted in a part of Cocos Lagoon that was about 20 feet deep with sand and seagrass substrate near the center of the Lagoon, just northeast of Cocos Island. The closest approach was less than 20 feet, and another observer, Dave Hotaling, who had previous experience sighting dugongs in Australia, also confirmed the sighting and identified the individual as an adult. Fishermen that Gawel and Hotaling had interviewed reported seeing the dugong that year, and one also commenting he believed dugongs are good to eat. Gawel noted this may have been learned from former Palau residents then living on Guam, because Palau has had a tradition of harvesting dugongs. The dugong was not resighted on further surveys by marine scientists, and was certainly an extralimital individual; Gawel speculated it is possible it may have been harvested and eaten.

For purposes of the database, the location was estimated based on the description above, and following all other cases in this report where the time of the sighting was not recorded, the time was arbitrarily set at noon local time when integrated into the database.

3.10 Surveys not included in compilation

The surveys listed here were not included in the compilation of sightings of this report, because

these surveys were dedicated to marine mammals and sea turtles and therefore these data were not considered incidental in nature. The surveys in this list were all conducted in the Mariana Islands Range Complex, and were either partially or fully Navy-funded and have been reported elsewhere.

List of Navy-funded and partially Navy-funded surveys not included in this compilation of incidental sightings:

2007

- 16 January–12 April large vessel systematic line transect survey (DoN 2007; Fulling et al. 2011; Norris et al. 2012); Contract #N68711-02-D-8043 Task Order 0036.
- 13–17 August aerial survey after Valiant Shield training exercise (Mobley 2007); Contract #N62742-07-P-1903.

2010

- Various NMFS 2010 line transect surveys (summarized in Oleson & Hill 2010¹):
 - Oscar Elton Sette, Cruise SE-10-01; 20 January–6 February (not all survey within MIRC)
 - Oscar Elton Sette, Cruise SE-10-03; 20 March 20–12 April
 - Oscar Elton Sette, Cruise SE-10-04; 19 April–4 May (not all survey within MIRC)
- 9 February–3 March PIFSC (Pacific Islands Fisheries Science Center) small boat survey (Ligon et al. 2011; Oleson & Hill 2010)

2011

- 17 February – 3 March HDR small boat survey (HDR 2011); Contract #N62470-10-D-3011 Task Order KB08.
- 26 August – 29 September PIFSC small boat survey (Hill et al., 2011)

2012

- 15 – 20 March HDR small boat survey (HDR 2012); Contract #N62470-10-D-3011 Task Order KB17.
- 25 May – 3 July PIFSC small boat survey (Hill et al., 2013a)

2013

- 22 June – 27 July PIFSC small boat survey (Hill et al., 2013b)
- 2013 PIFSC sea turtle tagging surveys (Jones & Van Houtan, 2014)
- 11 – 20 May HDR shore station survey (Deakos et al., 2014)

2014

- 11 – 27 April PIFSC small boat survey (Hill et al., 2014)
- 15 May – 20 June PIFSC small boat survey (report TBA)

In addition to the above, also not included with regard to turtle surveys are the series of in-water sea turtle surveys conducted at Guam and Tinian by NAVFAC EXWC Scientific Diving Services, and the sea turtle nesting surveys conducted at Guam and Tinian by NAVFAC

¹ See also cruise reports corresponding to these survey: PIFSC 2010a, 2010b, 2010c.

Marianas.

4 DISCUSSION

4.1 Unusual sightings

There were number of unusual sightings in the course of this compilation. The dugong noted by the UoG technical report (Randall et al. 1974) was almost certainly an extralimital individual. Eldredge (1991, 2003) also noted a likely dugong sighting in 1984 or 1985, based on a sketch made by picnickers on the southeastern coast of Guam.

DAWR sighting and stranding record had a number of unusual or unique sightings, including a blue whale (7/1/1995) and common dolphin (7/8/1990). The DAWR source also included some sightings of long-finned pilot whales (*Globicephala melas*), as well as unidentified pilot whale (*Globicephala* sp.; either long-finned or short-finned). For the purposes of this report and the accompanying database, all records for pilot whales including these were brought forward into the database with the tentative species assignment *Globicephala macrorhynchus* (short-finned pilot whale). However during the finalization of this report, additional information was received by the author supporting the veracity of sightings of *G. melas*, as well as the possible existence of a photographic record (Gerry Davis [National Marine Fisheries Service], pers. comm. 30 September 2014). Therefore these database records may be adjusted in the future pending updated information of the presence of this species in the area. Also one DAWR record was described as *Tursiops aduncus* (Pacific bottlenose dolphin). Due to genetic analyses of bottlenose dolphins from the Marianas by NMFS PIFSC (Hill et al. 2014; Martien et al. 2014) that showed no *Tursiops aduncus* haplotypes in morphological bottlenose dolphins, all bottlenose dolphins were tentatively assigned *Tursiops truncatus* when brought forward into the database. These database records may also be adjusted in the future pending updated information.

Other odontocete species sighted only once or twice in the DAWR record have been subsequently sighted by dedicated marine mammal nearshore surveys (Hill et al. 2014), including Cuvier's beaked whale, false killer whale, melon-headed whale, pantropical spotted dolphin and rough-toothed dolphin. The only exceptions are: 1) Risso's dolphin, although this species has been sighted in an offshore survey (PIFSC 2010b); and 2) killer whales, for which there were six records in the DAWR set, one being a duplicate of the killer whale sighting from the Navy's FDM surveys (10 May 2010; Figure 8). The records for both the rough-toothed dolphin and Risso's dolphin lacked both a location and date in the description.

4.2 Seasonality

Because baleen whales have never been visually sighted on the dedicated nearshore marine mammal surveys utilizing small boats conducted in recent years (e.g., Oleson & Hill 2010, Ligon et al. 2010, Hill et al. 2011, Hill et al. 2013a, Hill et al. 2013b, Hill et al. 2014, HDR 2011, HDR 2012), nor by shore station (Deakos et al. 2014), sightings of these species are of particular interest, even in an incidental context.

From incidental sightings made by Navy-funded efforts (from Table 1), humpback whales were sighted predominantly in February and March on the following dates, listed here by month first to illustrate potential seasonality: 1/16/2013, 1/23/2006, 2/18/2007, 2/22/2000, 2/26/2001, 3/20/2006, and 3/24/2003. One of these, on 1/16/2013, was made by HDR during acoustic survey device deployments (Section 3.6) nearshore off the west coast of Saipan; HDR also sighted an unidentified balaenopterid at the same location and previous day, 1/15/2013. The remaining six humpback whale sightings were made at FDM during the aerial avian surveys (Section 3.2). Of all surveys made to FDM in this series between 1997 and 2013, there were a total of 40 made on calendar days during these three months (i.e., with dates between 1 January and 1 April), therefore overall humpback whales were sighted on 15% of surveys during these months. Variation in Beaufort sea state across these surveys is unlikely to be a factor in artificially lowering the rate of sightings, based on HDR's (2012) sighting rate analysis for surveys in Hawaii, including aerial surveys, which did not find a decrease in the sightability of humpback whale cues, even in poor conditions of Beaufort 5-7. Two unidentified whales were also sighted at FDM on 1/22/2007 and 2/22/2000.

This survey series to FDM was the only regular year-round visual survey over water conducted by the Navy in the Marianas that incidentally searched for marine mammal sightings, and was performed almost monthly from 1997 through 2009, and quarterly thereafter. Therefore other water areas in the Marianas did not proportionately receive this quantity of search effort, especially during the relevant winter months. Accordingly, records from other sources also confirm sightings of humpback whales, at different locations in the Marianas during the same months. The DAWR sightings (from Table 3) were also made during February and March: 2/13/1991 (East Agana, Guam), 2/16/1996 (Rota), 2/24/1996 (Ritidian Pt., Guam), 2/25/1978 (Urunao, Guam), 3/2/1996 (Facpi Pt., Guam), and 3/19/1996 (Cocos Island, Guam).

The other baleen whales sighted were: a) unidentified balaenopterid whale (7/28/2007 between Saipan and FDM (Figure 7); b) from the DAWR records a stranding at Umatac, Guam of unconfirmed species on 8/31/1978 listed as NMFS-XX-78-07-SD); c) also from DAWR records, a blue whale sighted near Cocos Island, Guam on 7/1/1995; d) a sei whale from DAWR records sighted west of Saipan with no date listed.

Other species did not show an obvious seasonal grouping in this small compilation. Species that were sighted at months through the year included spinner dolphins, pantropical spotted dolphins, short-finned pilot whales and sperm whales. The six killer whale sightings (Table 1; Table 3) also did not show an obvious season pattern, with sightings on 1/16/2010 (Umatac, Guam), 5/25/2010 (between Saipan and FDM), summer 1987 (between Orote Pt. and Facpi Pt.), 9/17/1993 (west side of Galvez Bank south of Guam), 10/11/1995 (east of Cocos Island, Guam), and 10/12/2003 (near Cocos Island, Guam).

5 INCIDENTAL SIGHTING DATA TABLES

Table 1. Incidental marine mammal sightings

Date	Species	Scientific name	group size (best)	# calves	estimated decimal latitude	estimated decimal longitude	sighting source
2/22/2000	Unidentified whale ¹	-	5	0	15.747491	145.967922	FDM aerial avian survey
2/22/2000	Humpback whale	<i>Megaptera novaeangliae</i>	1	0	16.028848	146.063307	FDM aerial avian survey
9/25/2000	Unidentified dolphin	-	5	0	16.028852	146.061430	FDM aerial avian survey
2/26/2001	Humpback whale	<i>Megaptera novaeangliae</i>	1	0	16.031287	146.062539	FDM aerial avian survey
9/24/2001	Unidentified dolphin	-	60 ²	0	16.004056	146.051149	FDM aerial avian survey
2/25/2002	Sperm whale	<i>Physeter macrocephalus</i>	1	0	16.182555	145.888458	FDM aerial avian survey
8/25/2002	Unidentified dolphin	-	40	0	16.013253	146.052143	FDM aerial avian survey
3/24/2003	Unidentified small dolphin	-	30	0	16.021936	146.054953	FDM aerial avian survey
3/24/2003	Humpback whale	<i>Megaptera novaeangliae</i>	3	1	16.023561	146.059402	FDM aerial avian survey
3/24/2003	Humpback whale	<i>Megaptera novaeangliae</i>	3	1	16.031230	146.062972	FDM aerial avian survey
1/23/2006	Humpback whale	<i>Megaptera novaeangliae</i>	1	0	16.031148	146.062635	FDM aerial avian survey
3/20/2006	Humpback whale	<i>Megaptera novaeangliae</i>	3	0	16.015059	146.063355	FDM aerial avian survey
3/20/2006	Unidentified small dolphin ³	-	11	0	16.015059	146.063355	FDM aerial avian survey
1/22/2007	Unidentified whale	-	1	0	15.645636	145.939310	FDM aerial avian survey
2/18/2007	Humpback whale	<i>Megaptera novaeangliae</i>	2	0	15.537198	145.909844	FDM aerial avian survey
6/25/2007	Unidentified cetacean	-	16	-	15.867396	146.007521	FDM aerial avian survey
7/28/2007	Bryde's whale ⁴	<i>Balaenoptera brydei</i>	1	0	15.721037	145.952558	FDM aerial avian survey
7/28/2007	Spinner dolphin ⁵	<i>Stenella longirostris</i>	15	-	15.721037	145.952558	FDM aerial avian survey
7/28/2007	Pantropical spotted dolphin ⁵	<i>Stenella attenuata</i>	15	-	15.721037	145.952558	FDM aerial avian survey
5/19/2008	Unidentified small dolphin	-	12 ⁶	-	16.028536	146.060997	FDM aerial avian survey

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7/21/2009	Unidentified small dolphin ⁷	-	5 ⁸	-	15.643839	145.926703	FDM aerial avian survey
5/25/2010	Killer whale	<i>Orcinus orca</i>	5	1	15.726274	145.954478	FDM aerial avian survey
9/20/2011	Sperm whale	<i>Physeter macrocephalus</i>	1	0	15.645636	145.939310	FDM aerial avian survey
3/24/2003	Sperm whale	Physeter macrocephalus	3	0	16.424151	145.698040	Navy survey to Sarigan
9/4/2011	Pantropical spotted dolphin	<i>Stenella attenuata</i>	2	-	15.066667	145.366667	Servicing of MIRC EARs by HDR
4/3/2012	Pantropical spotted dolphin	<i>Stenella attenuata</i>	2	-	13.524067	144.656517	Servicing of MIRC EARs by HDR
4/7/2012	Pantropical spotted dolphin	<i>Stenella attenuata</i>	2	-	15.066667	145.366667	Servicing of MIRC EARs by HDR
1/14/2013	Pantropical spotted dolphin	<i>Stenella attenuata</i>	2	-	15.066667	145.366667	Servicing of MIRC EARs by HDR
1/15/2013	Unidentified balaenopterid	-	1	-	15.275372	145.778050	Servicing of MIRC EARs by HDR
1/16/2013	Humpback whale	<i>Megaptera novaeangliae</i>	2	-	15.233333	145.666667	Servicing of MIRC EARs by HDR
7/11/1999 ⁹	Spinner dolphin	<i>Stenella longirostris</i>	10 ¹⁰	-	16.019353	146.042213	Contractor FDM Assessment of Marine and Fisheries Resources
7/16/1999 ⁹	Spinner dolphin	<i>Stenella longirostris</i>	10 ¹⁰	-	16.019353	146.042213	Contractor FDM Assessment of Marine and Fisheries Resources
7/11/2001	Spinner dolphin	<i>Stenella longirostris</i>	10	-	16.026879 ¹¹	146.060745	Contractor FDM Assessment of Marine and Fisheries Resources
9/20/2006 ¹²	Spinner dolphin	<i>Stenella longirostris</i>	15	-	16.004867 ¹³	146.051793	Navy FDM Assessment of Marine and Fisheries Resources
9/10/2007 ¹⁴	Spinner dolphin	<i>Stenella longirostris</i>	15 ¹⁵	-	16.004867	146.051793	Navy FDM Assessment of Marine and Fisheries Resources
9/15/2007 ¹⁴	Spinner dolphin	<i>Stenella longirostris</i>	15 ¹⁵	-	16.004867	146.051793	Navy FDM Assessment of Marine and Fisheries Resources
8/31/2009	Unidentified small dolphin	-	5	-	15.828284	145.992342	Navy FDM Assessment of Marine and Fisheries Resources
10/4/2010	Unidentified small dolphin	-	5	-	15.828284	145.992342	Navy FDM Assessment of Marine and Fisheries Resources
8/8/2012	Unidentified small dolphin	-	25	-	16.018158	146.064008	Navy FDM Assessment of Marine and Fisheries Resources

2/20/2010	Sperm whale	<i>Physeter macrocephalus</i>	6	-	13.341389	144.627885	Marine Patrol Volunteer Program
9/14/2014	Spinner dolphin	<i>Stenella longirostris</i>	10 ¹⁶	-	13.62916	144.90101	Marine Patrol Volunteer Program
9/1/2010	Short-finned pilot whale	<i>Globicephala macrorhynchus</i>	1	-	14.392826	145.276465	EOD DET MARI
2/16/1974	Dugong	<i>Dugong dugon</i>	1	-	13.253682	144.660918	University of Guam Technical Report 17

Notes:

1. This sighting originally identified as Bryde's whale. Species ID changed to "unidentified whale" due to difficulty of differentiating similar species (e.g., sei whale) and lack of a photographic record.
2. Group size described by sighting record as 60+. Therefore best and minimum group size was assigned "60," and maximum group size was conservatively assigned "61." Also another sighting of 60+ dolphins was also made on the same trip that day at the northern end (approximately N 16.028910, E 146.062482); the first sighting was near the southern end. The author made the conservative assumption this was likely the same group of animals, and removed this second sighting as a duplicate.
3. The species was originally identified as spinner dolphin. Due to lack of photographs and behavioral description (e.g., spinning), species adjusted to "unidentified small dolphin."
4. Vogt (2008) tentatively identified species as Bryde's whale or minke whale. Photographic record (Figure 7) indicates a likely sei whale, but due to uncertainty the sighting classified as "unidentified balaenopterid."
5. This sighting originally identified in Vogt (2008) as spinner dolphin. Photographic record indicated a mixed species group of spinner dolphins and pantropical spotted dolphins (Figs. 5, 6).
6. Group size was noted as "9-15." Therefore best group size was assigned "12" as the midpoint. Minimum group size was assigned "9", and the maximum "15."
7. Species was originally identified as spinner dolphin. Due to lack of photographs and behavioral description (e.g., spinning), as well as large distance from shore in the channel between Saipan and FDM, species adjusted to "unidentified small dolphin."
8. Group size was not given in the sighting record, and was noted only as a "pod." Group size (best, minimum, and maximum) was conservatively assigned as "5."
9. Dates of the two spinner dolphin sightings not given in report (Smith et al., 2013). Therefore arbitrarily chose the first and last days of the 11-16 July 1999 survey.
10. Group size in the sighting record was described as about 10, possibly 12. Therefore best and minimum group size were assigned "10," and maximum "12."
11. Distance of 50m from shore used to estimate location.
12. Date of sighting not given in report (Smith et al. 2013). Therefore arbitrarily chose midpoint, September 20, of the 18-21 September 2006 survey.
13. The report noted that sighting was made off the southern tip of FDM. Since the sighting was made during the dive survey, a distance of 50 m offshore was used to estimate location.
14. Dates of the two spinner dolphin sightings not given in report (Smith et al. 2013). Therefore arbitrarily chose the first and last days of the 10-15 September 2007 survey.
15. Although no group size given in report source, group size was assigned "15" because the report stated that the 2007 pods were similar to the pod of about 15 in 2006.
16. The source indicated there were likely many more individuals, but only 10 were confirmed from any single photo, so this number was assigned to group size.

Table 2. Incidental sea turtle and elasmobranch sighting

Date	Species	Scientific name	group size (best)	estimated decimal latitude ¹	estimated decimal longitude	sighting source
1/28/1999	Unidentified sea turtle	-	1	16.014537	146.059276	FDM aerial avian survey
3/25/1999	Unidentified sea turtle	-	2	16.011453	146.052555	FDM aerial avian survey
8/30/1999	Unidentified sea turtle	-	1	16.018386	146.061796	FDM aerial avian survey
8/30/1999	Unidentified sea turtle	-	1	16.010761	146.055266	FDM aerial avian survey
11/27/1999	Unidentified sea turtle	-	1	16.013812	146.054109	FDM aerial avian survey
3/27/2000	Unidentified sea turtle	-	1	16.028244	146.062994	FDM aerial avian survey
4/24/2000	Unidentified sea turtle	-	1	16.025794	146.064963	FDM aerial avian survey
4/24/2000	Unidentified sea turtle	-	1	16.014259	146.058545	FDM aerial avian survey
4/24/2000	Unidentified sea turtle	-	1	16.012238	146.055847	FDM aerial avian survey
4/24/2000	Unidentified sea turtle	-	1	16.014497	146.054998	FDM aerial avian survey
5/22/2000	Unidentified sea turtle	-	1	16.021488	146.064594	FDM aerial avian survey
6/23/2000	Unidentified sea turtle	-	1	16.024053	146.065069	FDM aerial avian survey
6/23/2000	Unidentified sea turtle	-	1	16.021488	146.064594	FDM aerial avian survey
6/23/2000	Unidentified sea turtle	-	1	16.028176	146.061573	FDM aerial avian survey
7/24/2000	Unidentified sea turtle	-	1	16.012238	146.055847	FDM aerial avian survey
8/28/2000	Unidentified sea turtle	-	1	16.012039	146.056719	FDM aerial avian survey
8/28/2000	Unidentified sea turtle	-	1	16.024593	146.059364	FDM aerial avian survey
9/25/2000	Unidentified sea turtle	-	1	16.016894	146.055226	FDM aerial avian survey
11/25/2000	Unidentified sea turtle	-	1	16.023027	146.064809	FDM aerial avian survey
12/26/2000	Unidentified sea turtle	-	5	16.023027	146.064809	FDM aerial avian survey
12/26/2000	Unidentified sea turtle	-	1	16.015609	146.055145	FDM aerial avian survey
1/22/2001	Unidentified sea turtle	-	1	16.014537	146.059276	FDM aerial avian survey
3/19/2001	Unidentified sea turtle	-	1	16.024053	146.065069	FDM aerial avian survey
3/19/2001	Unidentified sea turtle	-	1	16.014259	146.058545	FDM aerial avian survey

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7/22/2001	Unidentified sea turtle	-	1	16.027093	146.064218	FDM aerial avian survey
7/22/2001	Unidentified sea turtle	-	1	16.025794	146.064963	FDM aerial avian survey
8/27/2001	Unidentified sea turtle	-	1	16.028244	146.062994	FDM aerial avian survey
8/27/2001	Unidentified sea turtle	-	1	16.025794	146.064963	FDM aerial avian survey
9/24/2001	Green turtle	<i>Chelonia mydas</i>	2	16.027093	146.064218	FDM aerial avian survey
10/29/2001	Unidentified sea turtle	-	1	16.014537	146.059276	FDM aerial avian survey
10/29/2001	Manta ray	<i>Manta sp.</i>	1	16.028244	146.062994	FDM aerial avian survey
11/27/2001	Unidentified sea turtle	-	1	16.025794	146.064963	FDM aerial avian survey
11/27/2001	Unidentified sea turtle	-	1	16.024053	146.065069	FDM aerial avian survey
1/27/2002	Unidentified sea turtle	-	1	16.028244	146.062994	FDM aerial avian survey
1/27/2002	Unidentified sea turtle	-	1	16.027007	146.060538	FDM aerial avian survey
3/22/2002	Unidentified sea turtle	-	1	16.020313	146.063676	FDM aerial avian survey
4/22/2002	Unidentified sea turtle	-	1	16.019846	146.062902	FDM aerial avian survey
4/22/2002	Unidentified sea turtle	-	1	16.014259	146.058545	FDM aerial avian survey
4/22/2002	Unidentified sea turtle	-	1	16.028176	146.061573	FDM aerial avian survey
5/25/2002	Unidentified sea turtle	-	4	16.027608	146.063695	FDM aerial avian survey
5/25/2002	Unidentified sea turtle	-	1	16.014537	146.059276	FDM aerial avian survey
7/26/2002	Unidentified sea turtle	-	1	16.010761	146.055266	FDM aerial avian survey
7/26/2002	Unidentified sea turtle	-	1	16.005640	146.053409	FDM aerial avian survey
8/25/2002	Unidentified sea turtle	-	1	16.027007	146.060538	FDM aerial avian survey
9/25/2002	Unidentified sea turtle	-	1	16.027093	146.064218	FDM aerial avian survey
10/25/2002	Unidentified sea turtle	-	1	16.028244	146.062994	FDM aerial avian survey
10/25/2002	Unidentified sea turtle	-	1	16.025794	146.064963	FDM aerial avian survey
11/25/2002	Unidentified sea turtle	-	1	16.021488	146.064594	FDM aerial avian survey
12/16/2002	Unidentified sea turtle	-	1	16.012238	146.055847	FDM aerial avian survey
12/16/2002	Unidentified sea turtle	-	1	16.027007	146.060538	FDM aerial avian survey
3/24/2003	Unidentified sea turtle	-	2	16.028244	146.062994	FDM aerial avian survey

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3/24/2003	Unidentified sea turtle	-	1	16.027195	146.067643	FDM aerial avian survey
5/19/2003	Unidentified sea turtle	-	1	16.028244	146.062994	FDM aerial avian survey
6/23/2003	Unidentified sea turtle	-	1	16.028244	146.062994	FDM aerial avian survey
6/28/2003	Unidentified sea turtle	-	1	16.012238	146.055847	FDM aerial avian survey
8/25/2003	Unidentified sea turtle	-	3	16.028910	146.062482	FDM aerial avian survey
9/21/2003	Unidentified sea turtle	-	1	16.028244	146.062994	FDM aerial avian survey
10/27/2003	Unidentified sea turtle	-	1	16.028536	146.060997	FDM aerial avian survey
12/15/2003	Unidentified sea turtle	-	1	16.028244	146.062994	FDM aerial avian survey
12/15/2003	Unidentified sea turtle	-	2	16.010761	146.055266	FDM aerial avian survey
3/22/2004	Unidentified sea turtle	-	1	16.024053	146.065069	FDM aerial avian survey
3/22/2004	Unidentified sea turtle	-	2	16.013812	146.054109	FDM aerial avian survey
4/26/2004	Unidentified sea turtle	-	1	16.025794	146.064963	FDM aerial avian survey
1/24/2005	Unidentified sea turtle	-	1	16.012039	146.056719	FDM aerial avian survey
3/28/2005	Unidentified sea turtle	-	1	16.028244	146.062994	FDM aerial avian survey
3/28/2005	Unidentified sea turtle	-	1	16.028244	146.062994	FDM aerial avian survey
5/23/2005	Unidentified sea turtle	-	1	16.028176	146.061573	FDM aerial avian survey
12/12/2005	Green turtle	<i>Chelonia mydas</i>	2	16.023027	146.064809	FDM aerial avian survey
1/23/2006	Unidentified sea turtle	-	1	16.028244	146.062994	FDM aerial avian survey
11/13/2006	Unidentified sea turtle	-	1	16.027093	146.064218	FDM aerial avian survey
11/13/2006	Unidentified sea turtle	-	1	16.028176	146.061573	FDM aerial avian survey
1/22/2007	Unidentified sea turtle	-	1	16.028244	146.062994	FDM aerial avian survey
2/18/2007	Unidentified sea turtle	-	1	16.011794	146.055295	FDM aerial avian survey
2/18/2007	Unidentified sea turtle	-	1	16.028176	146.061573	FDM aerial avian survey
4/27/2007	Unidentified sea turtle	-	2	16.028176	146.061573	FDM aerial avian survey
5/21/2007	Unidentified sea turtle	-	1	16.013812	146.054109	FDM aerial avian survey
5/21/2007	Whale shark	<i>Rhincodon typus</i>	1	15.668333	145.938333	FDM aerial avian survey
11/13/2007	Unidentified sea turtle	-	10	16.023027	146.064809	FDM aerial avian survey

11/13/2007	Unidentified sea turtle	-	1	16.012039	146.056719	FDM aerial avian survey
11/13/2007	Unidentified sea turtle	-	1	16.004947	146.050911	FDM aerial avian survey
12/10/2007	Unidentified sea turtle	-	1	16.013812	146.054109	FDM aerial avian survey
2/25/2008	Unidentified sea turtle	-	1	16.022580	146.064169	FDM aerial avian survey
3/24/2008	Unidentified sea turtle	-	1	16.022580	146.064169	FDM aerial avian survey
11/17/2008	Unidentified sea turtle	-	1	16.024053	146.065069	FDM aerial avian survey
12/15/2008	Unidentified sea turtle	-	1	16.004618	146.051685	FDM aerial avian survey
10/20/2009	Unidentified sea turtle	-	1	16.027093	146.064218	FDM aerial avian survey

Notes:

1. Location was in the FDM aerial survey data source was referenced in most cases to the numbered survey stations depicted in Figure 1. A few were referenced to general sides of the island. Sighting location was estimated as 75m offshore of these landmarks.

Table 3. Guam DAWR record of incidental marine mammal sightings

Provided by Brent Tibbatts (pers. comm., 25 June 2013)

Date	Species	Scientific name	Comments from source (location, group size, etc.)	Reported by Eldredge 2003?	integrated into database?	estimated latitude for database	estimated longitude for database	Assumptions used by author to estimate location of DAWR sighting record for entry in database
1977	Short-finned pilot whale	<i>Globicephala macrorhynchus</i>	Urunao Point- pod of 10 individuals	-	Y	13.62801	144.83171	
7/15/1965	Sperm whale	<i>Physeter macrocephalus</i>	Orote Point, 3 pods of 6,4,and 3 individuals	-	Y	13.44617	144.61353	
2/25/1978	Humpback whale	<i>Megaptera novaeangliae</i>	2 individuals 100 meters offshore at Urunao	Y	Y	13.62801	144.83171	
1987 summer	Killer whale	<i>Orcinus orca</i>	2 males, 2 females seen between Orote point and Facpi point	Y	Y	13.38737	144.64934	arbitrarily chose offshore of the reef fronting Ga'an point, which is about halfway between Orote and Facpi points.
7/8/1990	Common dolphin	<i>Delphinus spp.</i>	Galvez	-	Y	13.02222	144.45333	assumed center of Galvez Banks
2/13/1991	Humpback whale	<i>Megaptera novaeangliae</i>	3 individuals off East Agana	Y	Y	13.48453	144.71984	
5/14/1993	Short-finned pilot whale	<i>Globicephala macrorhynchus</i>	Urunao, approximately 50 individuals at sea	-	Y	13.62801	144.83171	
9/17/1993	Killer whale	<i>Orcinus orca</i>	-	-	Y	13.08578	144.38493	No location description given in DAWR spreadsheet; Gerry Davis emailed on 13 June 2014 and clarified location: "This sighting was made off the West Side of Galvez Bank off Southern Guam (17 miles south of Cocos Island). There were 5 individuals. They took pictures of the incident and I had the opportunity meet with them and discuss what they observed." Therefore this description was used to estimate location.
2/5/1994	Sperm whale	<i>Physeter macrocephalus</i>	Facpi FAD, 3 individuals	-	Y	13.34029	144.60837	
5/15/1994	Sperm whale	<i>Physeter macrocephalus</i>	Pati Point, 6 individuals	-	Y	13.60164	144.96021	
10/15/1994	Long-finned pilot whale	<i>Globicephala melas</i> ¹	Cocos FAD	-	Y	13.19990	144.69510	
1/11/1995	Short-finned pilot whale	<i>Globicephala macrorhynchus</i>	Cetti Bay	-	Y	13.31562	144.64767	
7/1/1995	Blue whale	<i>Balaenoptera musculus</i>	Cocos	-	Y	13.23168	144.65261	

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9/21/1995	Long-finned pilot whale	<i>Globicephala melas</i> ¹	SW of Cocos, 3 individuals	-	Y	13.23074	144.63572	
10/11/1995	Killer Whale	<i>Orcinus orca</i>	-	-	Y	13.23471	144.66720	no location description given in DAWR spreadsheet; email from Gerry Davis on 13 June 2014 clarified: "East side of Cocos Island. Three individuals. Very calm sea conditions. Whales came within 50 ft of boat. One large individual, accompanied by two slightly smaller individuals." Therefore arbitrarily chose 2.0km east of shorebreak of southern tip of Cocos Island
12/1/1995	Long-finned pilot whale	<i>Globicephala melas</i> ¹	Facpi FAD, 1 individual	-	Y	13.34029	144.60837	assuming this is not the "FACPI 2" FAD farther offshore at N13.32670; E 144.55518
12/7/1995	Sperm whale	<i>Physeter macrocephalus</i>	Orote Point, 5 individuals	-	Y	13.44617	144.61353	
1/27/1996	Short-finned pilot whale	<i>Globicephala macrorhynchus</i>	Urunao, approximately 25 individuals	-	Y	13.62801	144.83171	
2/16/1996	Humpback whale	<i>Megaptera novaeangliae</i>	Off Rota, 2 individuals	-	Y	14.11724	145.11717	arbitrarily chose west of western tip of Rota
2/24/1996	Humpback whale	<i>Megaptera novaeangliae</i>	Ritidian Point, 2 individuals	-	Y	13.65882	144.85988	
3/2/1996	Humpback whale	<i>Megaptera novaeangliae</i>	Facpi Point, 8 individuals	-	Y	13.34169	144.62740	
3/10/1996	Short-finned pilot whale	<i>Globicephala macrorhynchus</i>	East side of Cocos, approximately 40 individuals	-	Y	13.23525	144.65591	
3/19/1996	Humpback whale	<i>Megaptera novaeangliae</i>	East side of Cocos, 7 individuals	-	Y	13.23525	144.65591	
10/15/1998	Sperm whale	<i>Physeter macrocephalus</i>	Facpi Point, heading south	-	Y	13.34169	144.62740	
1/4/1999	Sperm whale	<i>Physeter macrocephalus</i>	unconfirmed (species ID)	-	N ²	na	na	no location description given
6/15/2001	Sperm whale	<i>Physeter macrocephalus</i>	Pod with new born calf. Photographed and widely distributed.	Y	Y	13.36935	144.59010	no location description given; see also http://www.news24.com/xArchive/Archive/Photos-of-new-born-whale-and-mother-20010617 which describes mother-calf and at least 8 in pod; also see http://www.kitsapsun.com/photos/2010/jun/24/118024/#axzz34P4MFNHX where location is given as ~ four miles off the coast of the Agat Marina in Guam.
10/1/2003	Pilot whale	<i>Globicephala sp.</i> ¹	Mouth of Apra Harbor	-	Y	13.45189	144.61741	

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10/12/2003	Killer whale	<i>Orcinus orca</i>	Near Cocos, 3 individuals, 2 adults and 1 juvenile	-	Y	13.23168	144.65261	
1/1/2005	Pilot whale	<i>Globicephala sp.</i> ¹	Near Alutom Island	-	Y	13.38186	144.64222	
7/16/2005	Pilot whale	<i>Globicephala sp.</i> ¹	Facpi Point, heading south	-	Y	13.34169	144.62740	
7/28/2005	Spotted dolphins	<i>Stenella attenuata</i>	Agat, several hundred individuals, unconfirmed	-	Y	13.38074	144.64187	
7/28-29/2005	Pilot whale	<i>Globicephala sp.</i> ¹	Double Reef, heading north	-	Y	13.59777	144.82730	
7/27/2007	Pilot whales	<i>Globicephala sp.</i>	More than 200 individuals along northwest coast of Guam	-	Y	13.63942	144.84096	arbitrarily chose point halfway between Ritidian point and next point to its south on the west coast.
7/27/2007	Pacific bottlenose dolphin	<i>Tursiops aduncus</i> ³	Ritidian Point- photographed	-	Y	13.65882	144.85988	
8/30/2007	Cuvier's beaked whale	<i>Ziphius cavirostris</i>	On reef flat in Piti, released alive	-	Y	13.46834	144.69187	arbitrary point on reef at Piti
2/12/2008	Sperm whale	<i>Physeter macrocephalus</i>	Orote Point- 4 individuals	-	Y	13.44617	144.61353	
7/19/2008	Beaked whale	<i>Ziphius sp.</i>	Beaked whale photographed near Rizal beach	-	Y	13.40554	144.65670	
11/8/2008	Pilot whales	<i>Globicephala sp.</i> ¹	5 individuals seen west of Cocos Lagoon, heading south	-	Y	13.24829	144.63938	
1/5/2009	Sperm whale	<i>Physeter macrocephalus</i>	2 individuals at Facpi Point	-	Y	13.34169	144.62740	
3/21/2009	Pilot whales	<i>Globicephala sp.</i> ¹	Approximately 30 individuals seen near Anae Island	-	Y	13.35989	144.63252	500m offshore of Anae island
12/23/2009	Melon-headed whale	<i>Peponocephala electra</i>	Orote Point- 4 individuals	-	Y	13.44617	144.61353	
1/16/2010	Killer whale	<i>Orcinus orca</i>	Pod of 6 killer whales video recorded near Umatac	-	Y	13.29637	144.65230	
2/20/2010	Sperm whale	<i>Physeter macrocephalus</i>	Pod of 9 sperm whales photographed near Orote point	-	Y	13.44617	144.61353	
4/24/2010	Sperm whale	<i>Physeter macrocephalus</i>	Pod of Sperm whales photographed near Agat	-	Y	13.38074	144.64187	

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5/25/2010	Killer whale	<i>Orcinus orca</i>	Orcas seen near FDM feeding on a large whale carcass. Photos provided	-	N ⁴	na	na	
7/31/2010	Pilot whales	<i>Globicephala sp.</i> ¹	Orote Point- 8 individuals	-	Y	13.44617	144.61353	
10/10/2010	False killer whale	<i>Pseudorca crassidens</i>	Rota Bank- west side. 5 individuals	-	Y	13.79722	144.95556	
10/16/2010	False killer whale	<i>Pseudorca crassidens</i>	Castro's beach and Tarague. 15-20 individuals	-	Y	13.62916	144.90101	Offshore of reef at Tarague beach
1/13/2011	unknown	unknown	About 20 small (3-4 feet) cetaceans staying near Tupalao Beach the morning of January 13	-	Y	13.41338	144.64222	Agat, near Tupalao
7/6/2011	Pilot whales	<i>Globicephala sp.</i> ¹	Seen near Orote Point	-	Y	13.44617	144.61353	
1/21/2012	Sperm whale	<i>Physeter macrocephalus</i>	Seen near Facpi Point, at least 7 adults	-	Y	13.34169	144.62740	
2/27/2012	False killer whale	<i>Pseudorca crassidens</i>	Facpi Point and south, heading north. Hundreds of individuals	-	Y	13.34169	144.62740	
3/19/2012	Sperm whale	<i>Physeter macrocephalus</i>	2 miles west of Apra mouth adult and young. Video footage taken	-	Y	13.45180	144.59171	
8/7/2012	Pilot whales	<i>Globicephala sp.</i> ¹	37 individuals seen swimming near Jinapsan. Last seen heading north.	-	Y	13.63900	144.89232	
3/31/2013	Pilot whales	<i>Globicephala sp.</i> ¹	Pod of between 12-20 heading south, some spyhopping. Off Luminao.	-	Y	13.503297	144.647448	assumed 4km north of Luminao
no date	Spinner dolphin	<i>Stenella longirostris</i>	Seen from aerial surveys frequently	-	N ²	na	na	no location or specific date description given
no date	Pantropical spotted dolphin	<i>Stenella attenuata</i>	Seen from aerial surveys frequently	-	N ²	na	na	no location or specific date description given
no date	Bottlenose dolphin	<i>Tursiops truncatus</i>	Seen from aerial surveys frequently	-	N ²	na	na	no location or specific date description given

no date	Sei whale	<i>Balaenoptera borealis</i>	West of Saipan	-	N ²	na	na	no date description given
no date	Risso's dolphin	<i>Grampus griseus</i>	unconfirmed	-	N ²	na	na	no location or date description given
no date	Rough-toothed dolphin	<i>Steno bredanensis</i>	unconfirmed	-	N ²	na	na	no location or date description given

Notes:

1. This record was either described as *Globicephala melas* (long-finned pilot whale) or *Globicephala* sp. All records for pilot whales including these were brought forward into the database with the tentative species assignment *Globicephala macrorhynchus* (short-finned pilot whale). However during the finalization of this report, additional information was received by the author supporting the veracity of sightings of *G. melas*, as well as the possible existence of a photographic record (Gerry Davis [National Marine Fisheries Service], pers. comm. 30 September 2014). Therefore these database records may be adjusted in the future pending updated information.
2. This record lacked either a date (minimum threshold was a description of the year of the sighting), and/or lacked a description of the sighting location. Such records were not brought forward into the database.
3. This record was described as *Tursiops aduncus*. Due to genetic analyses of bottlenose dolphins from the Marianas by NMFS PIFSC (Hill et al., 2014) that showed no aduncus haplotypes in morphological bottlenose dolphins, all bottlenose dolphins were tentatively assigned *Tursiops truncatus* when brought forward into the database. These database records may be adjusted in the future pending updated information.
4. This record is a duplicate from the Navy FDM data set, since this sighting was reported by Navy to DAWR. Therefore this duplicate record not brought forward into the database as part of the DAWR set, since already brought forward under the FDM set.

Table 4. Guam DAWR record of marine mammal strandings*Provided by Brent Tibbatts (pers. comm., 25 June 2013)*

Date	Species	Scientific name	Comments from source	reported by Eldredge (2003)?	NMFS stranding #	integrated into database? ¹	estimated decimal latitude for database	estimated decimal longitude for database	Assumptions used by author to estimate location of DAWR stranding record for entry into database
9/7/1962	Sperm whale	<i>Physeter macrocephalus</i>	Acho Beach	Y	NMFS-PM-62-01-SX	N	-	-	na
3/25/1970	Dwarf sperm whale	<i>Kogia sima</i>	Asan	Y	NMFS-KS-71-01-SX	N	-	-	na
5/1/1974	Pygmy killer whale	<i>Feresa attenuata</i>	confirmed, beached	-	NMFS-FA-74-02-SU	N	-	-	na
12/6/1974	Dwarf sperm whale	<i>Kogia sima</i>	Rizal Beach	Y	NMFS-KS-74-05-SU	N	-	-	na
8/31/1978	Bryde's whale	<i>Balaenoptera edeni</i>	unconfirmed	Y	assumed to be NMFS-XX-78-07-SD ("unidentified cetacean, 9/1/78, Umatac, Guam")	N	-	-	na
4/6/1980	Melon-headed whale	<i>Peponocephala electra</i>	Inarajan	Y	NMFS-PE-80-01-SA	N	-	-	na
7/6/1980	Short-finned pilot whale	<i>Globicephala macrorhynchus</i>	Togcha	Y	NMFS-GM-80-06-SA	N	-	-	na
8/2/1981	Killer whale	<i>Orcinus orca</i>	Orote Point	Y	In NMFS list, but no stranding number assigned: ("8/1/81 -- Orote Point, Guam")	N	-	-	na
7/24/1985	Striped dolphin	<i>Stenella coeruleoalba</i>	Dadi Beach- a dead female	Y	NMFS-SC-85-11-SD	N	-	-	na
2/9/1989	Pygmy sperm whale	<i>Kogia breviceps</i>	NSD [San Luis Beach]	Y	NMFS-KS-89-04-SU	N	-	-	na
1992	Spinner dolphin	<i>Stenella longirostris</i>	Hilaan, lacerated	-	NMFS-MS-92-17-SU	N	-	-	na
1993	Sperm whale	<i>Physeter macrocephalus</i>	Ypan, on beach	-	NMFS-PM-93-15-SD	N	-	-	na
1999	Baird's ² beaked whale	<i>Berardius bairdii</i>	Tipalao Beach; article in Stars and Stripes newspaper dated 1999	-	-	Y	13.41736	144.64769	Used beach posit, Old Wives beach

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8/24/2002	Dwarf sperm whale	<i>Kogia sima</i>	Found floating in Cocos Lagoon, sent to Hawaii with Dave Hamm	Y	NMFS-KS-02-54-SD	N	-	-	na
11/11/2002	Spinner dolphin	<i>Stenella longirostris</i>	Ylig, on shore. Buried at site.	-	-	Y	13.39335	144.77169	used shore at Ylig river outlet
6/25/2003	Ginkgo-toothed beaked whale	<i>Mesoplodon ginkgodens</i>	confiscated from Taiwanese fishing boat, captured near Pohnpei	-	assumed to be NMFS-MX-03-44-SA (Mesoplodon sp., 7/7/2003, Guam)	N	-	-	na
8/19/2003	False killer whale	<i>Pseudorca crassidens</i>	Inarajan, near pools. First IDd as a pilot whale	-	-	Y	13.26834	144.74144	arbitrary posit near tidepools immediately north of inarajan boat ramp
8/31/2004	Spinner dolphin	<i>Stenella longirostris</i>	Merizo, juvenile first found live but soon died.	-	-	Y	13.27210	144.66238	arbitrary shore north of Merizo Pier Park since in deeper water side of Merizo away from Cocos
9/26/2005	Spinner dolphin	<i>Stenella longirostris</i>	Ritidian, on refuge property near Urunao.	-	Note: assumed to be different from NMFS entry dated 10/3/2005 (with no stranding number assigned), because it was listed as from Saipan, not Ritidian Pt. Guam	Y	13.64296	144.84928	used southern west tip of refuge since closest to Urunao
11/29/2005	Spinner dolphin	<i>Stenella longirostris</i>	Ypan, near Jeff's	-	-	Y	13.36520	144.77028	used sandy beach near Jeff's Pirate Cove
12/14/2005	Bottlenose dolphin	<i>Tursiops truncatus</i>	Ypan, near Jeff's Pirates Cove, baby	-	-	Y	13.36520	144.77028	used sandy beach near Jeff's Pirate Cove
4/11/2007	False Killer Whale	<i>Pseudorca crassidens</i>	Ypan Beach, pushed out to sea	-	NMFS-PC-07-07-SD	N	-	-	
4/11/2007	Spinner dolphin	<i>Stenella longirostris</i>	floating in Umatac Bay	-	NMFS-SL-07-08-SD	N	-	-	
1/28/2008	Beaked whale	<i>Ziphius sp.</i>	near commercial port, badly decomposed when washed ashore	-	NMFS-XX-08-06-SD	N	-	-	
5/21/2008	Spinner dolphin	<i>Stenella longirostris</i>	young individual on shore near private residence in Inarajan	-	-	Y	13.26786	144.73905	arbitrary Inarajan position at shore (near boat ramp)
6/13/2008	Spinner dolphin	<i>Stenella longirostris</i>	young individual on shore near private residence in Piti	-	-	Y	13.46581	144.69465	used beach posit
10/26/2008	unknown	unknown	Agat, near Nimitz Beach, reported in paper, pushed back in water by Agat resident	-	-	Y	13.36168	144.64865	used beach posit

			Roque Chaco. Black whale approximately 8 feet long						
7/20/2009	Spinner dolphin; likely misidentified spotted dolphin ³	<i>Stenella longirostris</i> / but likely <i>Stenella attenuata</i>	Washed up on Haputo Beach. Female died during childbirth. Baby was removed and returned to DAWR offices.	-	Assumed to be NMFS-SA-09-46-SD (stranded spotted dolphin calf on 10/20/2009),	N	-	-	na
5/11/2011	Sperm whale	<i>Physeter macrocephalus</i>	Carcass washed up on reef flat near the Togcha Cemetary. Reported by a fisherman. Photos were taken.	-	NMFS-PM-11-27-SD	N	-	-	na
5/18/2012	Unknown ⁴	unknown	Yona, near Tagachang' washed up on Tagachang Beach-head missing large corpse 20 ft in length	-		Y	13.40459	144.78131	used beach posit
9/11/2012	Spinner dolphin	<i>Stenella longirostris</i>	Yona, near Togcha; washed up near Jeff's Pirates Cove. Animal was brought back to DAWR facilities	-	NMFS-SL-12-25-SD	N	-	-	na
6/12/2013	Sperm whale	<i>Physeter macrocephalus</i>	Yona, near turtle cove; large (9 meter) sperm whale washed up on reef margin. Photos taken.	-	NMFS-PM-13-34-SD	N	-	-	na

Notes:

- Records of strandings previously known to NMFS were not brought forward for integration into the database.
- Email from Gerry Davis (13 June 2014) clarified that this was a poaching case, and an incident report with photos may still be on file at DAWR. Whale had a 1 inch diameter piece of rebar stuck in its head and had been impaled close to shore-- it was still bleeding profusely and was trying to beach itself. This event was called in by Vic Torres (CZM) while doing a patrol as part of the Coast Guard Auxiliary, which may possess records as well. The whale died and was towed out to sea.
- Listing in DAWR record described as spinner dolphin mother-calf. This species identification is in this table changed to pantropical spotted dolphin based on their receipt by HPU of a dolphin calf carcass in 2009 (Kristi West [HPU], pers. comm., 4 December 2013). Therefore this stranding is assumed to be NMFS-SA-09-46-SD (pantropical spotted dolphin calf, 10/20/2009), and the date discrepancy is presumed to be due to the delay between the sample being frozen and eventually sent. Because known by NMFS, this stranding was not integrated into the database.
- Upon examination, this stranding was judged to likely be a sperm whale 2009 (Kristi West [HPU], pers. comm., 4 December 2013). However since species identification was not definite, this was integrated into the database as an unidentified cetacean.

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