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SPERM WHALES OF THE EASTERN NORTH PACIFIC AND EASTERN TROPICAL PACIFIC: PHOTO-IDENTIFICATION CATALOG, 1984–2026

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Cover photo: Flukes of a male sperm whale, SWFSC-112, photographed in the Gulf of Alaska. **Photo credit**: NOAA Fisheries.

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SPERM WHALES OF THE EASTERN NORTH PACIFIC AND EASTERN TROPICAL PACIFIC: PHOTO-IDENTIFICATION CATALOG, 1989–2026

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PROJECT OVERVIEW

This study presents a curated catalog of 107 photo-identified sperm whales (*Physeter macrocephalus*). The majority were compiled from research cruises conducted by the Southwest Fisheries Science Center (SWFSC) between 1991 and 2024, during which sperm whale photo-identification (photo-ID) data were collected. Additional photo-ID data were collected opportunistically by citizen scientists and naturalists working along the coastline of California and by the Grupo de Investigación y Conservación de Mamíferos Marinos in Mexico.

The objectives of publishing this catalog are three-fold: (1) to create a publicly available catalog of sperm whale photo-IDs from the eastern North Pacific and tropical Pacific (ETP) to facilitate research collaboration and comparison; (2) to promote understanding of the distribution, movement, and ecology of sperm whales in the region; and (3) to support the management and conservation of sperm whales under the U. S. Marine Mammal Protection Act (MMPA) and the Endangered Species Act (ESA).

INTRODUCTION

Status

Sperm whales are listed throughout their range as endangered under the ESA and depleted under the MMPA. They are listed globally as vulnerable by the International Union for the Conservation of Nature (IUCN) and are listed on Appendix I of the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES).

Sperm whales were targeted during two periods of commercial whaling that peaked in the 1840s and 1960s, respectively, and largely ended in the mid-1980s with the International Whaling Commission's moratorium on commercial whaling. The hunt was global in scale, with more than 300,000 sperm whales estimated to have been killed in the North Pacific during the 20th century alone (Rocha et al., 2014; Ivashchenko et al., 2014).

Today, sperm whales are a species of conservation concern because of both historical and contemporary anthropogenic impacts, including ship strikes, fishery interactions, pollutants, plastics, noise, and environmental change. Efforts by the National Marine Fisheries Service (NMFS) to assess conservation status and to mitigate current threats rely on the best available information on movements, population structure, and trends. These efforts are complicated by the species' wide distribution, nomadic nature, and hierarchical social structure.

Habitat, Life History, and Social Structure

The sperm whale, the largest of the toothed whales, is a globally distributed, deep-diving marine mammal generally inhabiting continental slope or oceanic waters (Rice, 1989). They prey primarily on mesopelagic and bathypelagic squid; males are more likely than females to prey on fish, sharks, and rays (Rice, 1989). Sperm whales exhibit pronounced sexual

dimorphism and sexual segregation of adults and a complex, hierarchical social structure (Rice, 1989; Whitehead, 2003).

In the Pacific, the foundation of female social structure consists of long-term social units of approximately 10.4 females and their dependent young (range = 3–24, SD = 6.23) (Whitehead, 2003). Units may travel with one or more other units forming temporary "groups" (Whitehead et al., 1991; Whitehead and Kahn, 1992) which, in turn, are structured into acoustic clans (Rendell and Whitehead, 2003; Hersh et al., 2022). In the Pacific, units and groups appear to be comprised of clusters of both related and unrelated individuals (Mesnick, 2001).

Males leave their natal units between 4 and 21 years of age and form "bachelor groups." As they mature, they disperse from these groups and the largest males tend to be solitary (Best, 1979).

In the North Pacific, females and their dependent young typically occur at latitudes lower than 40° and are occasionally found at latitudes up to 50°N (Rice, 1989). Males move to higher latitudes to feed, returning to lower latitudes to mate (Rice, 1989).

Stock Structure

For the purposes of managing sperm whales in U.S. waters under the MMPA, NMFS delineates sperm whales in the eastern North Pacific into three stocks: 1) California/Oregon/Washington Stock, 2) Hawai'i Stock, and 3) North Pacific (Alaska) Stock (Carretta et al., 2024). Sperm whales of the ETP are not a U.S. stock but are part of historical NOAA survey areas and are thereby included in this catalog.

Sperm whales found in the California Current are genetically distinct from those of Hawai'i and the ETP, indicative of demographic independence, based on analysis of single-nucleotide polymorphisms, microsatellites, and mitochondrial (mt) DNA (Mesnick et al., 2011). The genetic analyses also provide some support for the demographic independence of the Hawaii stock, with mtDNA, but not with the nuclear data, so results are inconclusive at this time. The North Pacific stock appears to have widespread genetic origin: some large males on Alaska feeding grounds appear to return to the region of their birth to mate but share high-latitude feeding grounds with males from other populations (Mesnick et al., 2011). It is hypothesized that the whales of the ETP constitute a single stock (Carretta et al., 2024 based on Dufault and Whitehead, 1995; Jaquet et al., 2003).

Movements

Both males and females are known to travel great distances in the Pacific Ocean basin, with males covering longer distances than females (Kasuya and Miyashita, 1988; Mizroch and Rice, 2013; Straley et al., 2014; Wild et al., 2024).

In the North Pacific, Discovery mark data from 1949 to 1976[1] showed females traveling distances over 621 nm (1,000 km) from southern California into the eastern North Pacific and movements between Hawai'i and the eastern and central North Pacific (Mizroch and Rice, 2013). Whitehead et al.'s (2008) 15-year photo-ID study of sperm whales in the ETP showed groups of females and immatures making regular movements between the Galápagos Islands and Panama, Ecuador, and Peru. Eight individuals moved from the Galápagos to the Gulf of California, and one individual from Panama to the Gulf of California—a distance of 2,632 nm (3,800 km).

Movement patterns of mature males in the eastern North Pacific remain unclear with respect to when, how often, and where mature male sperm whales migrate for purposes of mating (Whitehead, 2003; Whitehead et al., 2008). Satellite data from 29 adult males tagged in southeast Alaska showed five animals that moved south along the west coast of North America to areas offshore of southern California and central Mexico, with one male moving into the Gulf of California, before the tags stopped transmitting (Straley et al., 2014; Wild et al., 2024). Discovery mark data showed males traveling distances of up to 3,107 nm (5,000 km) from central Mexico and southern California into the eastern North Pacific and wide tracks longitudinally across the basin (Mizroch and Rice, 2013).

Photo-Identification

Photo-ID is a non-invasive method of measuring temporal and spatial movements of individuals and groups. The natural markings that are used to identify individual sperm whales are the trailing edge of the ventral side of the flukes, photographed as the whale lifts its tail just before diving. The trailing edge of the tail has a unique shape, and each whale can be uniquely identified by the shape of the flukes, distinctive nicks, scars, missing portions, and other features (Arnbom, 1987; Dufault and Whitehead, 1995).

Because scientists can identify specific individuals, photo-ID data can yield valuable information about sperm whales' spatial-temporal distribution, social associations, and other behavioral data. Long-term data sets are especially valuable for this highly mobile, long-lived species, and require collaborative research efforts to track movements over time within and between study areas (Mullin et al., 2022).

Two large language model web-based tools commonly used by researchers for photo-ID are Flukebook[2] and Happywhale[3] (Blount et al., 2022; Patton et al., 2023). These applications were used to supplement the process of comparing catalogs for potential matches, when the comparison catalog was available in the platform.

[1] See Brown, S. G. 1977. Whale marking: A short review. Pages 569–581 in M. Angel, ed. A voyage of Discovery. Pergamon Press, London, U.K.
[2] Flukebook. Available at https://www.flukebook.org/
[3] Happywhale. Available at https://happywhale.com/home

Terms and Definitions

The taking of a sperm whale identification photo is called a "capture"; it can be a "recapture" if an identification photo for that individual has been previously collected.

SWFSC ID = Southwest Fisheries Science Center Identification Number

Example: SWFSC-001

SWFSC = Southwest Fisheries Science Center

ID# = a unique three-digit number assigned to each individual sperm whale in the SWFSC catalog

Each identification photograph represents the best photograph of the individual available to the catalog. Whale identification numbers are not consistently sequential due to the timing of the photographs being incorporated into the catalog.

Photographs of each whale are labeled with the individual's identification number on the lower left corner, and year of the photograph on the lower right corner. Original photographs are archived at the Marine Mammal and Turtle Division of the SWFSC and can be obtained by contacting the Division Director.

The photographs are organized into four geographic regions from which the photographs were obtained:

REGION:	DESCRIPTION:
1. Alaska	Gulf of Alaska, Aleutian Islands, Bering Sea
2. U.S. West Coast	Washington, Oregon, California coast out to 300 nm (556 km)
3. Hawaii/Pacific Islands	Hawaiian EEZ, Pacific Islands EEZ,[4] central tropical Pacific
4. Eastern Tropical Pacific	Pacific coast from Mexico to northern Peru, including the Gulf of California, and west to −160° including the high seas

METHODS

The SWFSC has conducted shipboard visual line-transect cetacean abundance surveys since 1986 (Kinzey et al., 2000; Jackson et al., 2003). The cruises were conducted primarily off the U.S. West Coast and Alaska, throughout the ETP, and within the Gulf of California (Appendix 1).

During SWFSC visual line transect surveys, date, time, latitude and longitude, species, group size, and behavior were recorded for all cetacean sightings. Visual detections of discrete groups of cetaceans were called "sightings," and each group was given a unique sighting number for that cruise. SWFSC researchers documented a total of 809 sightings of sperm whales on cruises from 1990 to 2024 (Figure 1).

[4] The study areas included Johnston Atoll, Palmyra Atoll, Wake Island, and Midway Atoll.

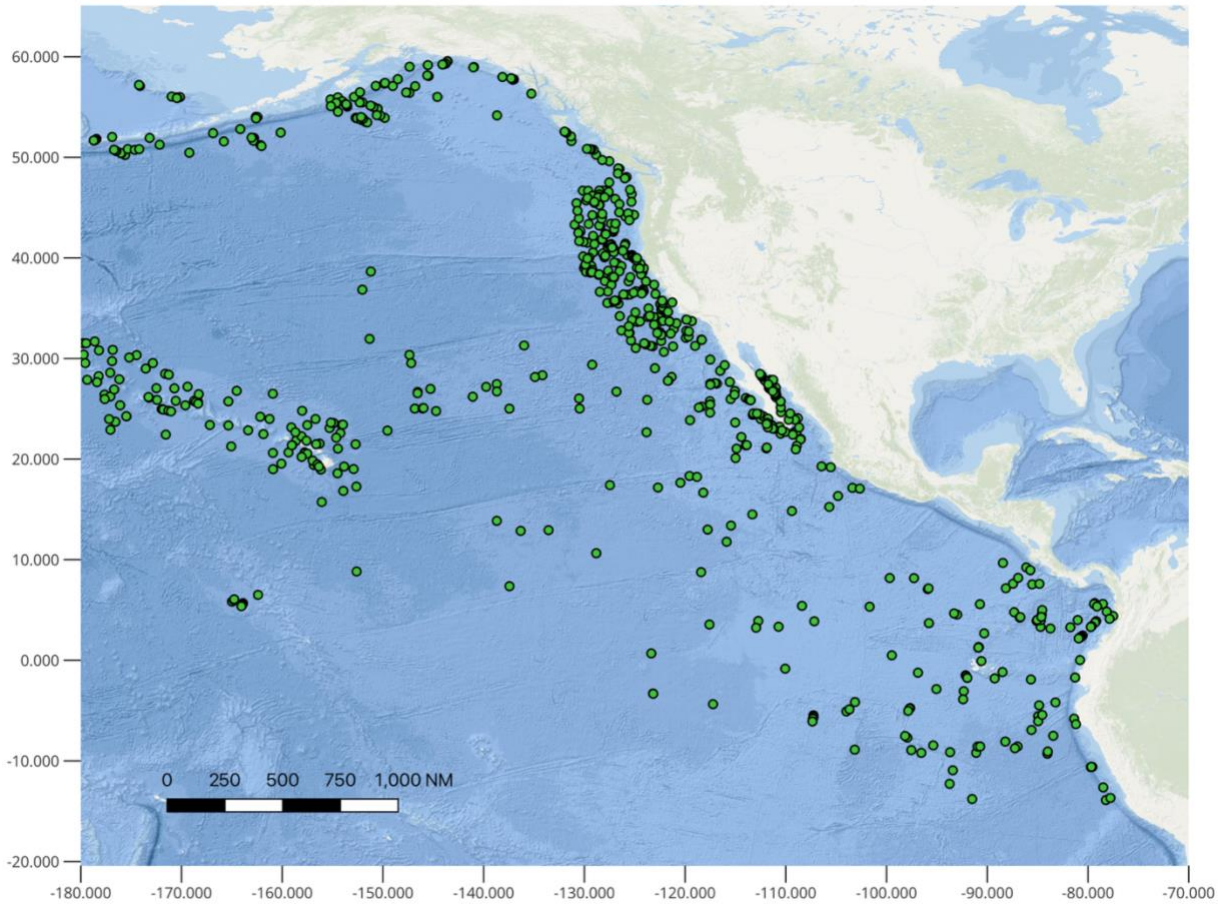

Figure 1. Locations of the 809 sperm whale sightings (green circles) recorded during SWFSC research cruises from 1990 to 2024.

Photographs of sperm whales were obtained opportunistically during the surveys as time permitted. Because the primary research objective was to collect line transect sighting and group size data, photographs were not obtained from every sighting, and not all individuals of a group were photographed. Thirty-five mm SLR film cameras using both black and white negative and color slide films were used through 2003; after 2003 digital SLR cameras were used almost exclusively. Black and white negative and color slide films were scanned into digital format for analysis. When possible, biopsy sampling was conducted concurrent with photography, and biopsy sample numbers were linked to identification photographs. (See Mesnick et al., 2011 for detailed biopsy methods.) Samples were analyzed for population structure, relatedness, and sex determination using single-nucleotide polymorphisms, microsatellites, and mtDNA. Scientists from the Grupo de Investigación y Conservación de Mamíferos Marinos provided photographs, date, and location data of sperm whales they encountered while conducting research near Guadalupe Island off of the west coast of Mexico.

Additional photographs were obtained from staff (naturalists) and independent photographers (citizen scientists) who collected photographs while aboard commercial whale watching cruises or private vessels off the central and southern California coast. Location and observational data were also provided. These contributed photographs and metadata were examined and collated by ASJ. Permission was granted for the use of these photos by all sources (Appendix 2). Recapture data obtained from these sources were confirmed by ASJ from a photo or videographic capture and represent the most conservative estimates of recaptures of identified individuals.

To be included in the catalog, photographs had to be sufficiently high resolution to show the unique shape of the fluke's trailing edge, from the ventral side, with enough clarity to differentiate the whale from other individuals. Researchers reviewing photographs selected good-quality photographs based on focus, resolution, angle, and visibility of the fluke's trailing edge. Photographs that were excessively grainy, angled, or with the fluke obscured by water or other objects were excluded unless a distinctive and highly identifiable feature was visible that could permit a positive identification in the future. Photographs were not scored for distinctiveness. The highest quality photo of each individual was selected to represent the individual and given a unique number in the catalog. Photographs of unique whales were compared by eye within and between years to identify any recaptures. Photographs lacking date or location data were excluded from the catalog.

To look for recaptures, comparisons of identification photographs within the SWFSC data were conducted by eye. Comparisons of the SWFSC catalog to other catalogs photographs from the region were conducted by eye and/or with machine learning algorithms within Flukebook (MiewID v3) and Happywhale, when the comparison catalog was available on these platforms[5] (Table 4).

Photographs from the central Pacific 2006–2023 (Pacific Islands Fisheries Science Center (PIFSC), unpub.) and Southeast Alaska 2003–2017 (Southeast Alaska Sperm Whale Avoidance Project (SEASWAP)) (Wild, unpub.) were compared by eye. Comparisons with the SEASWAP catalog were also conducted within Flukebook and Happywhale.

Flukebook was used to conduct an initial comparison of the SWFSC catalog with identified whales from the Galápagos Islands and ETP 2013–2024 (Whitehead et al., unpub.). Flukebook was also used to conduct an initial comparison with the sperm whale catalog of the Cascadia Research Collective (CRC) (U.S. West Coast, Hawai'i 1992–2025) (Calambokidis et al., unpub.). It should be emphasized that results of comparisons conducted using computer vision algorithms need to be validated by conducting a visual comparison. Work on this is currently underway.

[5] Flukebook's MiewID Deep Learning Matcher v3 algorithm tested on sperm whale ventral fluke images yielded results of 97-99% accuracy (Otarashvili et al., 2024). Happywhale achieved a 97-99% accuracy tested on humpback whale ventral fluke images (Patton et al., 2023).

RESULTS AND DISCUSSION

Photographs of 107 individual sperm whales meeting the quality and data criteria are presented in this catalog (Table 1) along with date, geographic region, latitude and longitude, and the source of the photo. Eighty-four identification photos were collected from 16 SWFSC research cruises conducted from 1991 to 2024 (Appendix 1). Two photo-identifications were obtained from the Grupo de Investigación y Conservación de Mamíferos Marinos near Guadalupe Island, Mexico. Twenty-one photographs contributed by citizen scientists on the west coast of California, between 1989 and 2026, are included.

The photo-identified whales were located throughout the eastern North Pacific and eastern tropical Pacific (Figure 2), consisting of 12 from the Gulf of Alaska and Aleutian Islands, 40 from the U.S. West Coast, four from Hawai'i and Pacific Islands, and 51 from the ETP.

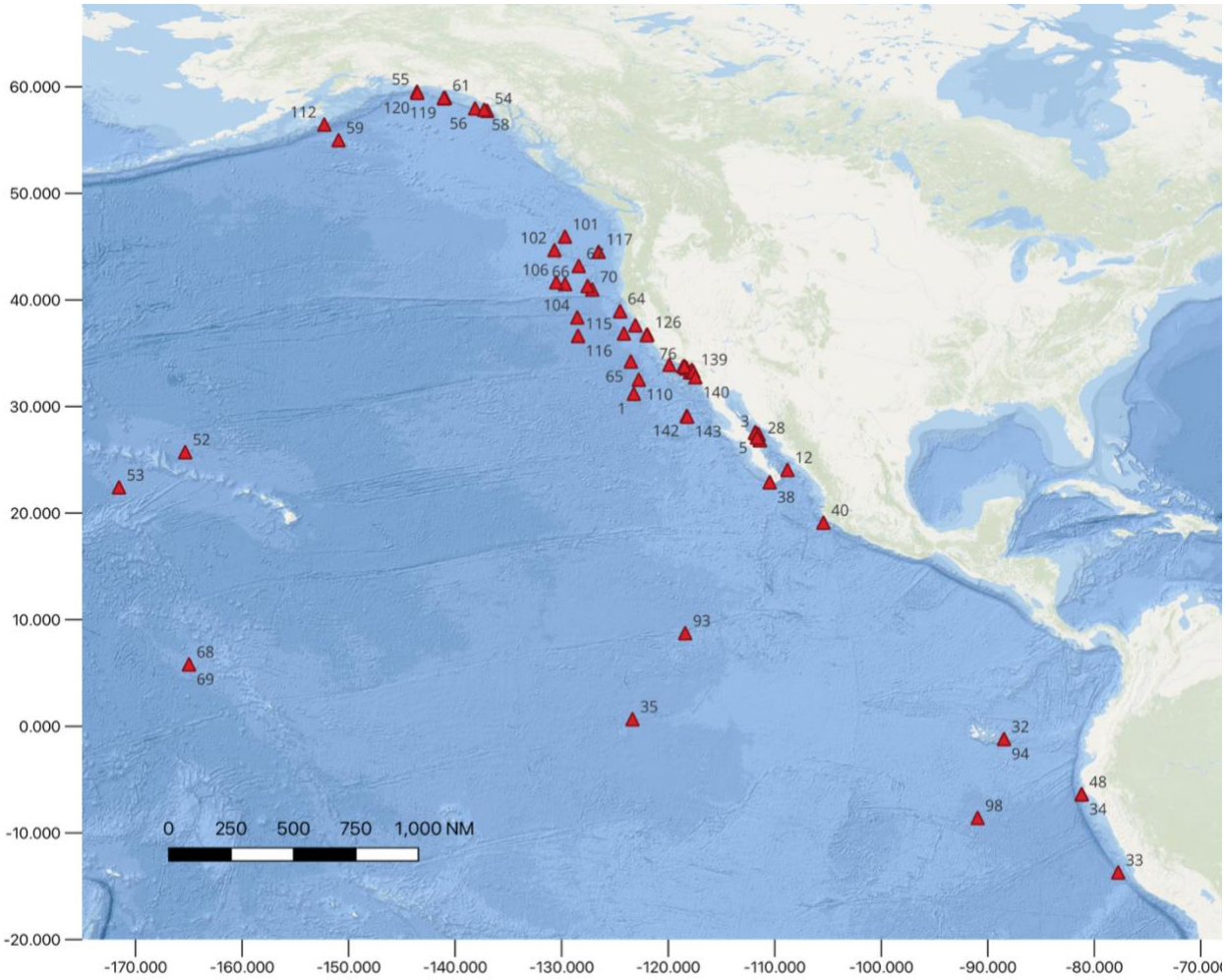

Figure 2. Locations of best photo-ID of individuals in the SWFSC sperm whale catalog (red triangles). Two photographs captured in the Western Pacific off the Western Aleutian Islands are not depicted.

Group Composition

Group composition was determined by visual observation for each sighting recorded by SWFSC (Table 3). “Mixed groups” of females and dependent young were identified by their body size (ca. 11 m / 36 ft), their cohesiveness, and (sometimes) the presence of calves or juveniles. Very large (ca. 15 m / 50 ft), solitary individuals were considered to be adult males. “Bachelor groups” were defined by their intermediate or large body size and individuals being loosely aggregated in singles or pairs over a large area. Designation of groups in the field was not always possible and composition was noted as “undetermined” in those cases. Of the 84 photo-IDs obtained on NOAA surveys:

- Forty-seven were obtained from mixed groups
- Eighteen were obtained of large, solitary males
- One was of a large male sampled from a mixed group
- One was obtained from a possible bachelor group
- The remaining 17 photo-IDs were from groups of undetermined composition

Sex of Photographed Whales

Of the SWFSC identified whales, 12 individuals were linked with a biopsy result to determine sex (Table 3). There were four females and eight males. Of the females, three were adults and one was estimated to be a sub-adult based on body size; one was sampled in the Gulf of California and three in ETP. Of the eight males, two were in the ETP (including one that was sampled in the ETP among a female group), four were in the Gulf of Alaska and Aleutian Islands, and two were photographed off the U.S. West Coast. The remaining whales were not sampled or did not yield a positive result in the genetic analysis (Mesnick et al., 2011).

Intra-Annual Matches

Six intra-annual matches were found within the SWFSC collection. Two matches are described below, and the remaining four were found in the citizen science data collected off central and southern California (Table 2).

SWFSC-018 was first photographed on 29 Sep 1995, in the southern Gulf of California (26.8502, −111.3942), and was recaptured on 19 Oct 1995 (27.1813, −111.5952), 22.5 nm (41.7 km) north of the first sighting (Figure 3).

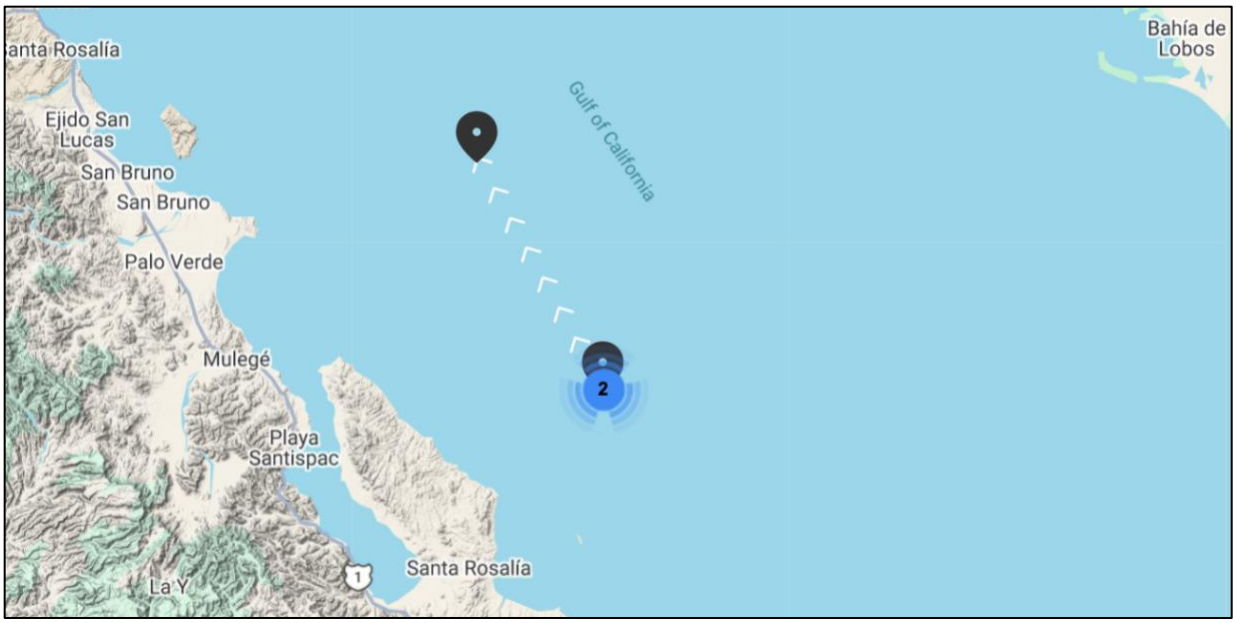

Figure 3. Movement of SWFSC-018 in the Gulf of California. SWFSC-018 was first photographed on 29 Sep 1995, in the southern Gulf of California, and was recaptured on 19 Oct 1995—a distance of 22.5 nm (41.7 km). Map: Flukebook.

Whale **SWFSC-101** was first photographed on 18 Aug 2014, off Oregon (45.9517, −129.6888), and recaptured on 13 Sep 2014, off the Oregon-California border (41.6657, −130.5113), 264 nm (489 km) south of the first sighting (Figure 4).

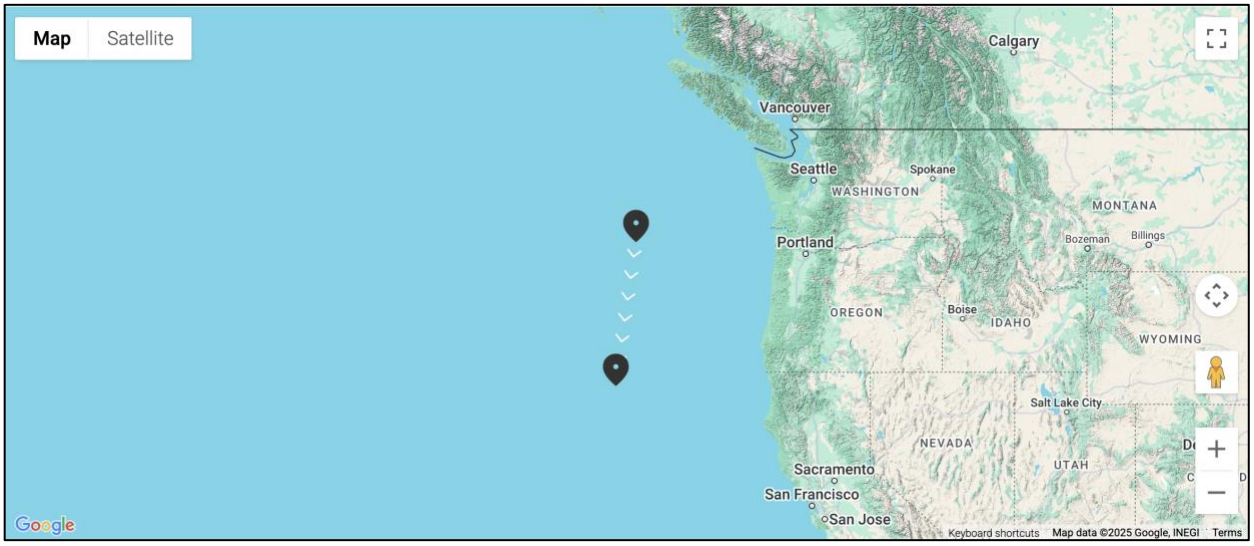

Figure 4. Movement of SWFSC-101 of U.S. West Coast. SWFSC-101 was first photographed 18 Aug 2014, off Oregon, and recaptured on 13 Sep 2014, 264 nm (489 km) from the first sighting. Map: Flukebook.

Inter-Annual Matches

The comparison of the 107 SWFSC photographs with the catalog of SEASWAP (Wild, unpub.) confirmed three matches all within the Gulf of Alaska. Three matches with the CRC catalog (Calambokidis et al., unpub.) were identified. No matches were identified conducting a manual comparison with NOAA PIFSC photographs collected from the Hawaiian EEZ and the Marianas EEZ (PIFSC unpub.). Apart from five matches previously identified to the Whitehead catalog of the ETP (Jaquet et al., 2003), no new matches were identified. Presented here are details of those matches not included in Jaquet et al. (2003); see below. No matches were identified with NOAA PIFSC photographs collected from the Hawaiian EEZ and the Marianas EEZ (PIFSC unpub.).

Matches to the SEASWAP Catalog

Three whales identified in the 2004 survey of the Gulf of Alaska (GOA) were recaptured by SEASWAP in the GOA in subsequent years. **SWFSC-058** (GOA-020) was first seen 16 Oct 2004, at 57.82883, −137.2568 and recaptured by SEASWAP 18 Aug 2011, at 56.60282, −135.8258, a distance of 87 nm (161 km). **SWFSC-061** (GOA-036) was first seen 13 June 2004, at 58.91933, −141.0443 and recaptured 26 May 2006, at 56.58933, −136.0635, a distance of 194 nm (359 km). **SWFSC-119** (GOA-037) was first seen 13 June 2004, at 58.96517, −141.0553 and recaptured 2 Aug 2009, at 59.25, −146.8517, a distance of 181 nm (335 km).

Matches to the Whitehead Lab Catalog

Photographs from this catalog match to five identified individuals from the Whitehead Lab catalog of whales near the Galápagos Islands and in the ETP and the Gulf of California (Whitehead et al., unpub.).

Four whales photographed by SWFSC in the Gulf of California on 23 Sep 1995, were recaptured in 1998, as first reported by Jaquet et al. (2003). All locations were in the Gulf of California. **SWFSC-022** (Gal8252), **SWFSC-023** (Gal8258), and **SWFSC-024** (Gal8259) were recaptured on 27 June 1998, within 51.8 nm (96 km) of the first sighting, and the fourth whale **SWFSC-032** (Gal8253) was recaptured on 16 July 1998, 14 nm (26 km) from the first sighting.

SWFSC-033 was first photographed on 27 Oct 1999, by the SWFSC off Peru (–13.6962, −77.756), and recaptured by the Whitehead Lab (Gal5481) on 27 July 2000, off the coast of Chile (–22.0503, −71.0485), a distance of 704.6 nm (1,305 km) (Figures 5).

Figure 5. Movement of SWFSC-033. First photographed by SWFSC off the coast of Peru 27 Oct 1999, SWFSC-033 was recaptured off the coast of Chile 9 months later, 705 nm (1,305 km) south of the first sighting. This individual was photographed 10 times in the same area between 22 and 28 July 2000, by the Whitehead Lab. Map: Flukebook.

Matches with the CRC Catalog

Two matches were identified with the CRC catalog (Table 2). **SWFSC-085** ("Mango") was matched to CRC_Pm_019; CRC recorded eight sightings of this individual confirmed by photo-ID, all within the Southern California Bight. **SWFSC-126** (CRC_Pm_119) was first captured by CRC on 6 Oct 2013, off Northern California (39.5412, −123.9727) and recaptured 3 years later in Monterey Bay, 20 Oct 2016 (36.7621, −121.956).

Individuals with Multiple Recaptures off the California Coast

Photographs collected by SWFSC, CRC, and naturalists and citizen scientists from whale watching and private vessels operating off the California coast and in the Southern California Bight showed intra- and inter-annual recaptures of 10 whales (Figure 6, Table 2). Two whales (**SWFSC-126**, and **SWFSC-141**) were sighted west of Northern California or in Monterey Bay, while the remaining eight were concentrated in the waters around the Southern California Bight. Seven of the 10 individuals had confirmed inter-annual recaptures—from 2 to 17 years. Three were recaptured in the same year. All of these individuals have been identified as likely adult or sub-adult males by visual estimation of body size. The following identified individuals had more than one sighting verified by photo-ID:

- **SWFSC-076** ("Doublescoop") was sighted 13 times from 1984 to 1991
- **SWFSC-085** ("Mango") was sighted 12 times from 1996 to 2013
- **SWFSC-126** was sighted 5 times from 2013 to 2016
- **SWFSC-132** was sighted 2 times in 2020
- **SWFSC-133** ("Papaya") was sighted 34 times from 2016 to 2025
- **SWFSC-137** ("Coconut") was sighted 4 times in 2023
- **SWFSC-138** was sighted 3 times in 2025

- **SWFSC-139** (“Guava”) was sighted 8 times from 2023 to 2025
- **SWFSC-140** (“Kiwi”) was sighted 8 times from 2024 to 2025
- **SWFSC-141** (“Fig”) was sighted 4 times from 2023 to 2026

Two pairs of photo-identified whales were observed together on multiple occasions: **SWFSC-124** (“Big Guy”) and **SWFSC-076** (“Doublescoop”) were seen together six times during 1989 and 1990, and **SWFSC-139** (“Guava”) and **SWFSC-140** (“Kiwi”) were seen together six times during 2024 and 2025 (ASJ and KJL, pers. obs.). In each case, the association was between a large male (“Big Guy” and “Guava”) and a smaller male (“Doublescoop” and “Kiwi”).

Relatively little is known about the movements, residency, and association patterns of adult male sperm whales. Foundational work on this topic has been conducted by Lettevall et al. (2002), Whitehead (2003), Mizroch and Rice (2013), Straley et al. (2014), Kobayashi et al. (2020), Dickson et al. (2021), and Wild et al. (2024). Oestreich et al. (2024) documented the year-round presence of adult male sperm whales in Monterey Bay. They also found evidence of seasonal movement patterns hypothesized to reflect shifts in prey availability. Additionally, adult males have been thought to be solitary (Best, 1979; Lettevall et al., 2002; Whitehead, 2003); however, data supported by photo-ID suggest that they may form pairs and forage in proximity to one another from 2 to at least 5 years (Kobayashi et al., 2020; Wild et al., 2024; this study).

The large number of sightings and recaptures over multiple years in this relatively small area, as well as resightings of the same pairs, was a surprising finding on several levels. The results reveal a remarkable level of site fidelity and social fidelity among males in lower latitudes. This is the first documented indication that the Southern California Bight is used as a feeding ground for mature and subadult males.

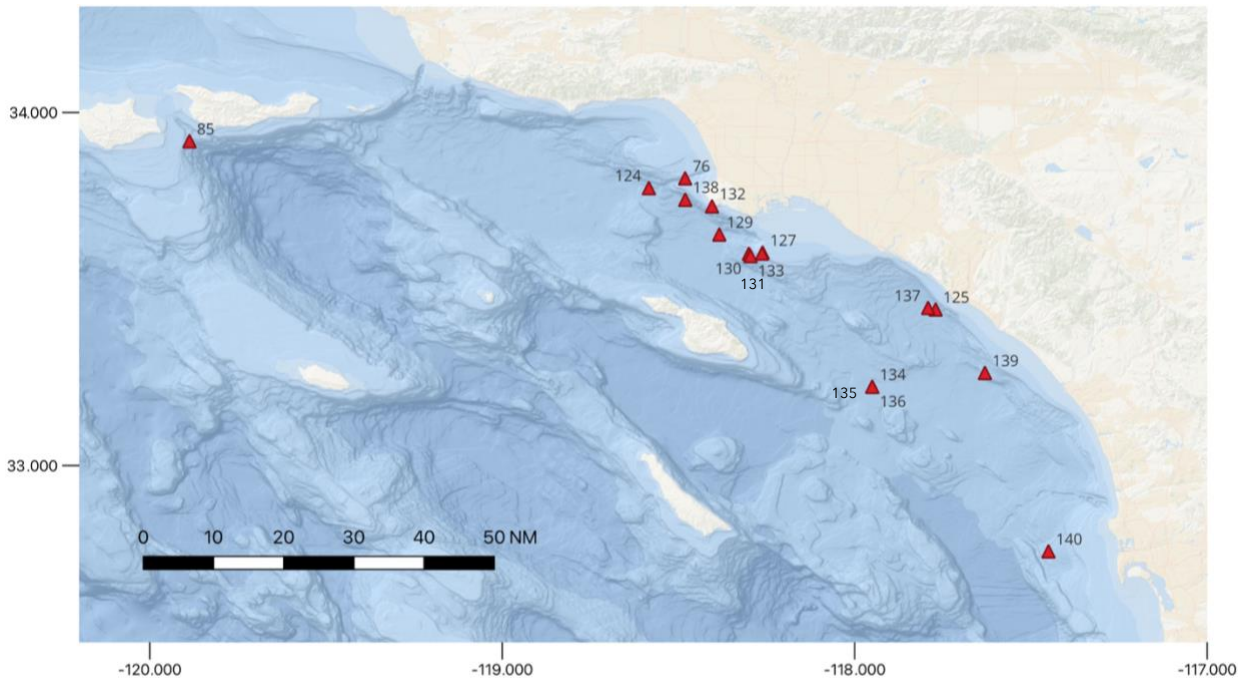

Figure 6. Locations of the best identification photo of each of the 18 individuals captured in the Southern California Bight. Eight of these individuals were sighted multiple times over multiple years by citizen scientists on recreational cruises operating in this area. All of these eight individuals were identified as adult or sub-adult males by visual estimation of body size.

This SWFSC catalog is uploaded into Flukebook in its entirety and can be searched by username noaa.swfsc and identified individuals can be searched by identification number (e.g., SWFSC-123). Photographs are also available on Happywhale.

In summary, we provide the first published catalog of sperm whales in the eastern North Pacific and tropical Pacific. Results show intra- and inter-annual matches of both males and females, over ranges of 3 weeks to 17 years, and 22.5 to 705 nm (42 to 1,305 km). It is our hope that this catalog will facilitate research collaboration, encourage photo comparisons, and promote the understanding of the distribution, movement, habitat use, and ecology of sperm whales in the region.

ACKNOWLEDGEMENTS

We are grateful to the many people whose efforts in the development of this catalog made it possible. Our sincere apologies to anyone we inadvertently may have omitted.

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Table 1. Identification photographs. Unique sperm whale photographs with whale identification numbers, date and location of photograph, latitude/longitude, and the photograph source. Note that in the case of whales with multiple years of photographs, the best identification photograph (listed here) may not be the first year that the whale was identified. Whale numbers were assigned as identification photographs were entered into the catalog and not always chronologically. Gaps in the numbering are due to the elimination of duplicates, photos of poor quality, and photos lacking sufficient data. Key: CA=California Current; Gulf CA=Gulf of California (Mexico); ETP=eastern tropical Pacific; U.S. West Coast= California, Oregon, Washington coast. Photo sources: ASJ=Alisa Schulman-Janiger; GICMM=Grupo de Investigación y Conservación de Mamíferos Marinos; KJL=Kiku J. Loomis; SWFSC=Southwest Fisheries Science Center. Individuals with multiple inter-annual sightings are indicated with an asterisk (*) and further described in Table 2. South latitudes and west longitudes are negative.

SWFSC ID	Photo Date YYYY-MM-DD	Location of Photo	Latitude of Photo	Longitude of Photo	Photo source
SWFSC-001	1991-09-20	U.S. West Coast	31.2092	−123.2248	SWFSC
SWFSC-002	1995-09-23	Gulf CA	27.3917	−111.519	SWFSC
SWFSC-003	1995-09-24	Gulf CA	27.4752	−111.6658	SWFSC
SWFSC-004	1995-09-24	Gulf CA	27.4752	−111.6658	SWFSC
SWFSC-005	1995-09-30	Gulf CA	27.5373	−111.8263	SWFSC
SWFSC-006	1995-10-01	Gulf CA	27.1592	−111.6535	SWFSC
SWFSC-007	1995-09-30	Gulf CA	27.6173	−111.8245	SWFSC
SWFSC-008	1995-10-19	Gulf CA	27.1813	−111.5952	SWFSC
SWFSC-009	1995-10-19	Gulf CA	27.1813	−111.5952	SWFSC
SWFSC-010	1995-10-19	Gulf CA	27.1813	−111.5952	SWFSC
SWFSC-011	1995-10-19	Gulf CA	27.1813	−111.5952	SWFSC
SWFSC-012	1995-10-27	Gulf CA	24.0645	−108.8028	SWFSC
SWFSC-014	1995-09-23	Gulf CA	27.3917	−111.519	SWFSC
SWFSC-015	1995-09-30	Gulf CA	27.5373	−111.8263	SWFSC
SWFSC-016	1995-09-30	Gulf CA	27.5373	−111.8263	SWFSC
SWFSC-017	1995-09-30	Gulf CA	27.5373	−111.8263	SWFSC
SWFSC-018	1995-09-29	Gulf CA	26.8502	−111.3942	SWFSC
SWFSC-019	1995-09-23	Gulf CA	27.3917	−111.519	SWFSC
SWFSC-020	1995-09-30	Gulf CA	27.5373	−111.8263	SWFSC
SWFSC-021	1995-09-23	Gulf CA	27.3917	−111.519	SWFSC
SWFSC-022	1995-09-23	Gulf CA	27.3917	−111.519	SWFSC
SWFSC-023	1995-09-23	Gulf CA	27.3917	−111.519	SWFSC
SWFSC-024	1995-09-23	Gulf CA	27.3917	−111.519	SWFSC
SWFSC-025	1995-09-23	Gulf CA	27.3917	−111.519	SWFSC
SWFSC-026	1995-09-23	Gulf CA	27.3917	−111.519	SWFSC
SWFSC-028	1995-09-29	Gulf CA	26.8502	−111.3942	SWFSC
SWFSC-030	1998-08-11	ETP	27.1013	−111.6522	SWFSC

SWFSC ID	Photo Date YYYY-MM-DD	Location of Photo	Latitude of Photo	Longitude of Photo	Photo source
SWFSC-031	1998-08-11	ETP	27.1013	−111.6522	SWFSC
SWFSC-032	1998-08-11	ETP	−1.1818	−88.4735	SWFSC
SWFSC-033	1999-10-27	ETP	−13.6962	−77.756	SWFSC
SWFSC-034	2000-11-03	ETP	−6.3658	−81.1842	SWFSC
SWFSC-035	1999-09-14	ETP	0.6747	−123.3497	SWFSC
SWFSC-037	1999-08-04	ETP	22.9037	−10.4737	SWFSC
SWFSC-038	1999-08-04	ETP	22.9037	−110.4737	SWFSC
SWFSC-040	1999-08-15	ETP	19.117	−105.4268	SWFSC
SWFSC-041	2000-11-03	ETP	−6.3658	−81.1842	SWFSC
SWFSC-042	2000-11-03	ETP	−6.3658	−81.1842	SWFSC
SWFSC-044	2000-11-03	ETP	−6.3658	−81.1842	SWFSC
SWFSC-045	2000-11-03	ETP	−6.3658	−81.1842	SWFSC
SWFSC-046	2000-11-03	ETP	−6.3658	−81.1842	SWFSC
SWFSC-047	2000-11-03	ETP	−6.3658	−81.1842	SWFSC
SWFSC-048	2000-11-03	ETP	−6.3658	−81.1842	SWFSC
SWFSC-049	2000-11-03	ETP	−6.3658	−81.1842	SWFSC
SWFSC-050	2000-11-03	ETP	−6.3658	−81.1842	SWFSC
SWFSC-052	2002-10-12	Hawaii	25.7302	−165.3457	SWFSC
SWFSC-053	2002-11-08	Hawaii	22.425	−171.5577	SWFSC
SWFSC-054	2004-07-09	Alaska	57.7513	−136.9922	SWFSC
SWFSC-055	2004-07-14	Alaska	59.5577	−143.5808	SWFSC
SWFSC-056	2004-10-15	Alaska	57.9803	−138.1293	SWFSC
SWFSC-057	2004-08-16	Alaska	51.726	179.1353	SWFSC
SWFSC-058	2004-10-16	Alaska	57.8522	−137.2738	SWFSC
SWFSC-059	2004-07-20	Alaska	54.9975	−150.9403	SWFSC
SWFSC-060	2004-07-13	Alaska	58.9723	−140.9595	SWFSC
SWFSC-061	2004-07-13	Alaska	58.9723	−140.9595	SWFSC
SWFSC-062	2004-08-18	Alaska	53.0403	171.362	SWFSC
SWFSC-063	2005-07-10	U.S. West Coast	38.948	−124.5127	SWFSC
SWFSC-064	2005-07-10	U. S. West Coast	38.948	−124.5127	SWFSC
SWFSC-065	2005-08-03	U.S. West Coast	34.2328	−123.502	SWFSC
SWFSC-066	2005-08-10	U.S. West Coast	41.5038	−129.6703	SWFSC
SWFSC-067	2005-08-23	U.S. West Coast	43.1905	−128.3963	SWFSC
SWFSC-068	2005-08-29	Pacific Islands	5.8173	−164.9858	SWFSC
SWFSC-069	2005-08-29	Pacific Islands	5.8173	−164.9858	SWFSC
SWFSC-070	2005-09-14	U.S. West Coast	40.9937	−127.1287	SWFSC
SWFSC-076*	1991-11-22	U.S. West Coast	33.6587	−118.4342	ASJ
SWFSC-085*	2010-08-16	U.S. West Coast	33.9187	−119.8875	SWFSC
SWFSC-093	2003-11-10	ETP	8.7498	−118.4038	SWFSC
SWFSC-094	1998-11-08	ETP	−1.1818	−88.4735	SWFSC
SWFSC-095	2000-11-03	ETP	−6.3658	−81.1842	SWFSC

SWFSC ID	Photo Date YYYY-MM-DD	Location of Photo	Latitude of Photo	Longitude of Photo	Photo source
SWFSC-096	2000-11-03	ETP	−6.3658	−81.1842	SWFSC
SWFSC-097	2000-11-03	ETP	−6.3658	−81.1842	SWFSC
SWFSC-098	2003-10-20	ETP	−8.5882	−90.949	SWFSC
SWFSC-101	2014-08-18	U.S. West Coast	45.9517	−129.6888	SWFSC
SWFSC-102	2014-08-19	U.S. West Coast	44.6785	−130.68	SWFSC
SWFSC-104	2014-08-19	U.S. West Coast	38.3653	−128.5322	SWFSC
SWFSC-106	2014-09-28	U.S. West Coast	41.6657	−130.5113	SWFSC
SWFSC-109	2014-09-30	U.S. West Coast	36.8575	−124.1548	SWFSC
SWFSC-110	2014-11-21	U.S. West Coast	32.5280	−122.7575	SWFSC
SWFSC-112	2014-11-29	CA/OR/WA/BC/AK	56.4693	−152.2807	SWFSC
SWFSC-114	2015-08-11	U.S. West Coast	41.3103	−127.5652	SWFSC
SWFSC-115	2018-10-18	U.S. West Coast	36.6277	−128.4607	SWFSC
SWFSC-116	2018-10-20	U.S. West Coast	36.6277	−128.4607	SWFSC
SWFSC-117	2018-10-20	U.S. West Coast	44.5253	−126.531	SWFSC
SWFSC-118	2024-08-10	Alaska	58.9135	−141.042	SWFSC
SWFSC-119	2004-07-13	Alaska	58.9652	−141.0553	SWFSC
SWFSC-120	2004-07-13	Alaska	59.4328	−143.5478	SWFSC
SWFSC-122	2022-11-30	U.S. West Coast	36.7515	−122.0019	ASJ
SWFSC-124*	1989-01-02	U.S. West Coast	33.7861	−118.5839	ASJ
SWFSC-125	2014-10-06	U.S. West Coast	33.4422	−117.7702	ASJ
SWFSC-126*	2016-10-20	U.S. West Coast	36.7621	−121.9564	ASJ
SWFSC-127	2016-12-05	U.S. West Coast	33.6035	−118.2612	ASJ
SWFSC-128	2016-12-05	U.S. West Coast	33.6006	−118.2631	ASJ
SWFSC-129	2016-12-05	U.S. West Coast	33.6545	−118.3841	ASJ
SWFSC-130	2016-12-05	U.S. West Coast	33.6000	−118.3	ASJ
SWFSC-131	2016-12-05	U.S. West Coast	33.6000	−118.3	ASJ
SWFSC-132*	2020-01-26	U.S. West Coast	33.7344	−118.4048	ASJ
SWFSC-133*	2021-10-27	U.S. West Coast	33.5934	−118.2955	ASJ
SWFSC-134	2022-11-21	U.S. West Coast	33.2235	−117.9501	ASJ
SWFSC-135	2022-11-21	U.S. West Coast	33.2235	−117.9501	ASJ
SWFSC-136	2022-11-21	U.S. West Coast	33.2235	−117.9501	ASJ
SWFSC-137*	2023-06-03	U.S. West Coast	33.4467	−117.7917	ASJ
SWFSC-138*	2025-01-01	U.S. West Coast	33.7530	−118.4807	ASJ
SWFSC-139*	2025-09-16	U.S. West Coast	33.2626	−117.6304	ASJ
SWFSC-140*	2023-09-02	U.S. West Coast	32.7571	−117.4500	KJL
SWFSC-141*	2025-09-13	U.S. West Coast	36.6957	−122.0001	ASJ
SWFSC-142	2025-06-23	Mexico	29.1333	−118.258	GICMM
SWFSC-143	2017-05-19	Mexico	29.0609	−118.2049	GICMM

Table 2. Individuals off the central and southern California coast with multiple recaptures. Recapture dates represent all sightings with photographic matches to the identification photo. These identification photos were collected by SWFSC, CRC, and citizen scientists operating off the California coast. Dates marked with "*" were collected by SWFSC. Those marked with "‡" were collected by CRC. Unmarked dates were collected by citizen scientists.

SWFSC ID	Date of identification photo	Dates of recaptures	Total sightings confirmed by photo-ID
SWFSC-076 "Doublescoop"	1991-12-22	1984-02-28, 1985-01-04, 1986-10-26, 1988-02-01, 1988-02-03, 1988-02-06, 1988-02-10, 1989-01-02, 1989-03-11, 1990-02-10, 1990-02-12, 1990-04-04	13
SWFSC-085 "Mango"	2010-08-16*	1996-12-01, 2003-07-30‡, 2010-08-30‡, 2010-09-05‡, 2010-09-06‡, 2010-09-27‡, 2011-08-08, 2012-10-13‡, 2013-08-04‡, 2013-12-02, 2013-12-13	12
SWFSC-126	2016-10-20	2013-10-06‡, 2016-10-01, 2016-10-11, 2016-10-13	5
SWFSC-132	2020-01-26	2020-02-01	2
SWFSC-133 "Papaya"	2021-10-27	2016-12-05, 2019-08-12, 2020-01-24, 2020-01-26, 2020-01-27, 2020-02-01, 2021-10-07, 2021-10-26, 2021-10-28, 2021-11-11, 2022-08-16, 2022-08-17, 2022-08-18, 2022-08-19, 2022-08-27, 2022-08-28, 2022-09-06, 2023-06-04, 2023-06-08, 2023-06-10, 2023-06-11, 2023-06-12, 2023-07-10, 2023-07-28, 2023-07-29, 2023-08-06, 2023-08-11, 2023-09-13, 2024-04-09, 2024-06-02, 2024-06-03, 2024-07-14, 2024-07-31	34
SWFSC-137 "Coconut"	2023-06-03	2023-06-04, 2023-06-09, 2023-06-11	4
SWFSC-138	2025-01-01	2025-01-03, 2025-01-26	3
SWFSC-139 "Guava"	2025-09-16	2023-06-03, 2023-06-09, 2024-07-30, 2025-06-08, 2025-09-07, 2025-09-14, 2025-09-18	8

SWFSC ID	Date of identification photo	Dates of recaptures	Total sightings confirmed by photo-ID
SWFSC-140 "Kiwi"	2025-9-13	2024-07-30, 2024-11-22, 2025-06-08, 2025-09-07, 2025-09-14, 2025-09-16, 2025-09-18	8
SWFSC-141 “Fig”	2025-06-23	2023-09-02, 2025-11-27,2026-01-31	4

* Collected by SWFSC

‡ Collected by CRC

Table 3. Photo-Identified whales: group size and composition, age class, and sex.
Data in this table were collected during the encounter in which the identification photo was collected. Whales photographed multiple times are represented only once in this table. Group size, composition of groups as recorded during sightings, the sex of the animal as determined by genetic analysis along with the observed size, if available, are presented. Group composition=mixed groups; mixed group with a large male; bachelor group; solitary large male; group of large males; or undetermined. “Mixed groups” were identified if females with young were observed in the field, or females were identified by genetics. If groups were comprised of clusters and large in size (about 10–15 or more individuals), they were labeled “mixed groups.” For males, individuals observed to be large and solitary were labeled as “solitary male.” “Bachelor groups” were identified if individuals (larger than juveniles in size) were observed in dispersed groups of singles or pairs over a large area. Group composition that was undetermined is labeled as "undetermined."

SWFSC ID	Estimated group size	Group composition determined by visual observation	Sex as determined by genetic analysis	Visual observer comment
SWFSC-001	3	Undetermined	N/A	-
SWFSC-002	20	Mixed group	N/A	-
SWFSC-003	51	Mixed group	N/A	-
SWFSC-004	51	Mixed group	N/A	-
SWFSC-005	39	Mixed group	N/A	-
SWFSC-006	18	Mixed group	N/A	-
SWFSC-007	15	Mixed group	N/A	-
SWFSC-008	78	Mixed group	N/A	-
SWFSC-009	78	Mixed group	N/A	-
SWFSC-010	78	Mixed group	N/A	-
SWFSC-011	78	Mixed group	N/A	-
SWFSC-012	15	Mixed group	N/A	-
SWFSC-014	20	Undetermined	N/A	-
SWFSC-015	39	Mixed group	N/A	-

SWFSC ID	Estimated group size	Group composition determined by visual observation	Sex as determined by genetic analysis	Visual observer comment
SWFSC-016	39	Mixed group	N/A	-
SWFSC-017	39	Mixed group	N/A	-
SWFSC-018	25	Mixed group	N/A	-
SWFSC-019	20	Undetermined	N/A	-
SWFSC-020	39	Mixed group	N/A	-
SWFSC-021	20	Undetermined	N/A	-
SWFSC-022	20	Undetermined	N/A	-
SWFSC-023	20	Undetermined	N/A	-
SWFSC-024	20	Undetermined	N/A	-
SWFSC-025	20	Undetermined	N/A	-
SWFSC-026	20	Undetermined	N/A	-
SWFSC-028	25	Mixed group	N/A	-
SWFSC-030	11	Mixed group	Female	-
SWFSC-031	11	Mixed group	N/A	-
SWFSC-032	25	Mixed group	N/A	-
SWFSC-033	9	Mixed group	Female	-
SWFSC-034	27	Mixed group	N/A	-
SWFSC-035	25	Undetermined	N/A	-
SWFSC-037	14	Mixed group	Female	Sub-adult
SWFSC-038	14	Mixed group	N/A	-
SWFSC-040	30	Mixed group w/ large male	Male	Adult
SWFSC-041	27	Mixed group	N/A	-
SWFSC-042	27	Mixed group	N/A	-
SWFSC-044	27	Mixed group	N/A	-
SWFSC-045	27	Mixed group	N/A	-
SWFSC-046	27	Mixed group	N/A	-
SWFSC-047	27	Mixed group	N/A	-
SWFSC-048	27	Mixed group	N/A	-
SWFSC-049	27	Mixed group	N/A	-
SWFSC-050	27	Mixed group	N/A	-
SWFSC-052	6	Mixed group	N/A	-
SWFSC-053	1	Solitary male	Male	Large
SWFSC-054	Undetermined	Solitary male	N/A	-
SWFSC-055	Undetermined	Large males	N/A	-
SWFSC-056	Undetermined	Solitary male	N/A	-
SWFSC-057	Undetermined	Solitary male	Male	Large
SWFSC-058	Undetermined	Large males	Male	Large
SWFSC-059	Undetermined	Solitary male	N/A	-
SWFSC-060	Undetermined	Large males	Male	-

SWFSC ID	Estimated group size	Group composition determined by visual observation	Sex as determined by genetic analysis	Visual observer comment
SWFSC-061	Undetermined	Large males	N/A	-
SWFSC-062	Undetermined	Large males	N/A	-
SWFSC-063	23	Mixed group	N/A	-
SWFSC-064	23	Mixed group	N/A	-
SWFSC-065	11	Mixed group	N/A	-
SWFSC-066	1	Solitary male	N/A	-
SWFSC-067	13	Undetermined	N/A	-
SWFSC-068	Undetermined	Mixed group	Female	-
SWFSC-069	Undetermined	Mixed group	N/A	-
SWFSC-070	15	Undetermined	N/A	-
SWFSC-076	1	Solitary male	N/A	-
SWFSC-085	Undetermined	Solitary male	Male	-
SWFSC-093	3	Undetermined – possible bachelor group	N/A	-
SWFSC-094	25	Mixed group	N/A	-
SWFSC-095	27	Mixed group	N/A	-
SWFSC-096	27	Mixed group	N/A	-
SWFSC-097	27	Mixed group	N/A	Sub-adult
SWFSC-098	1	Solitary male	N/A	-
SWFSC-101	1	Solitary male	N/A	-
SWFSC-102	1	Solitary male	N/A	-
SWFSC-104	6	Undetermined	N/A	-
SWFSC-105	18	Mixed group	N/A	-
SWFSC-106	18	Mixed group	N/A	-
SWFSC-109	16	Mixed group	N/A	-
SWFSC-110	1	Solitary male	Male	Adult
SWFSC-112	1	Solitary male	Male	Adult
SWFSC-114	8	Undetermined	N/A	-
SWFSC-115	14	Mixed group	N/A	-
SWFSC-116	14	Mixed group	N/A	-
SWFSC-117	1	Solitary male	N/A	Large male
SWFSC-118	Undetermined	N/A	N/A	-
SWFSC-119	Undetermined	N/A	N/A	-
SWFSC-120	Undetermined	N/A	N/A	-
SWFSC-122	Undetermined	N/A	N/A	-
SWFSC-123	Undetermined	N/A	N/A	-
SWFSC-124	2	N/A	N/A	-
SWFSC-125	50 - 75+	N/A	N/A	-
SWFSC-126	1	N/A	N/A	-

SWFSC ID	Estimated group size	Group composition determined by visual observation	Sex as determined by genetic analysis	Visual observer comment
SWFSC-127	40 - 70+	N/A	N/A	-
SWFSC-128	40 - 70+	N/A	N/A	-
SWFSC-129	40 - 70+	N/A	N/A	-
SWFSC-130	40 - 70+	N/A	N/A	-
SWFSC-131	41 - 70+	N/A	N/A	-
SWFSC-132	2	N/A	N/A	-
SWFSC-133	1	N/A	N/A	-
SWFSC-134	4-5	N/A	N/A	-
SWFSC-135	4-5	N/A	N/A	-
SWFSC-136	4-5	N/A	N/A	-
SWFSC-137	3	N/A	N/A	-
SWFSC-138	1	N/A	N/A	-
SWFSC-139	2	N/A	N/A	-
SWFSC-140	2	N/A	N/A	-
SWFSC-141	1	N/A	N/A	-
SWFSC-142	1	N/A	N/A	-
SWFSC-143	50+	N/A	N/A	-

Table 4. Table of comparisons within the SWFSC catalog and with other catalogs of the eastern North Pacific and the ETP. Comparisons were conduct by eye, Flukebook, or Happywhale.

Comparison of SWFSC photo-ID with …	By eye	Flukebook MiewID v3 Region: Pacific Ocean	Happywhale*
Southwest Fisheries Science Center	☑	☑	☑ (partial)
Pacific Islands Fisheries Science Center	☑	–	–
SEASWAP	–	☑	☑ (partial)
Cascadia Research Collective	–	☑	–
Whitehead Lab	–	☑	–

* Not all SWFSC and SEASWAP photos were imported to the centralized Happywhale catalog, therefore matching is only to a partial catalog in Happywhale.

Identification Photographs

Region 1: Gulf of Alaska and Aleutian Islands

Region 2: U.S. West Coast

Region 3: Hawaii/Pacific Islands

Region 4: Eastern Tropical Pacific

REGION 1: ALASKA

Gulf of Alaska, Aleutian Islands, Bering Sea

REGION 1: ALASKA

SWFSC-054 2004

SWFSC-055 2004

SWFSC-056 2004

SWFSC-057 2004

REGION 1: ALASKA

SWFSC-058 2004

SWFSC-059 2004

SWFSC-060 2004

SWFSC-061 2004

REGION 1: ALASKA

SWFSC-062 2004

SWFSC-118 2004

SWFSC-119 2004

SWFSC-120 2004

REGION 2: U.S. WEST COAST

Washington, Oregon, California coast (out to 556 km / 300 nmi)

REGION 2: U.S. WEST COAST

SWFSC-001 1991

SWFSC-063 2005

SWFSC-064 2005

SWFSC-065 2005

REGION 2: U.S. WEST COAST

SWFSC-066 2005

SWFSC-067 2005

SWFSC-070 2005

SWFSC-076 1991

REGION 2: U.S. WEST COAST

SWFSC-085 2010

SWFSC-101 2014

SWFSC-102 2014

SWFSC-104 2014

REGION 2: U.S. WEST COAST

SWFSC-106 2014

SWFSC-109 2014

SWFSC-110 2014

SWFSC-112 2015

REGION 2: U.S. WEST COAST

SWFSC-114 2018

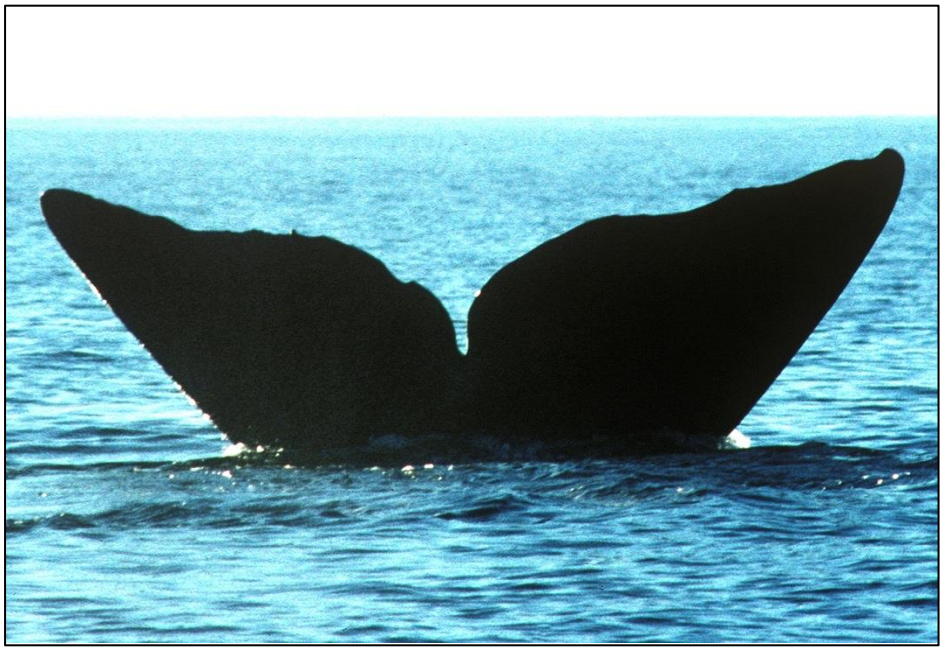
SWFSC-115 2018

SWFSC-116 2018

SWFSC-117 2024

REGION 2: U.S. WEST COAST

SWFSC-122 2022



SWFSC-124 1989

SWFSC-125 2014

SWFSC-126 2016

REGION 2: U.S. WEST COAST

SWFSC-127 2016

SWFSC-128 2016

SWFSC-129 2016

SWFSC-130 2016

REGION 2: U.S. WEST COAST

SWFSC-131 2016

SWFSC-132 2020

SWFSC-133 2021

SWFSC-134 2022

REGION 2: U.S. WEST COAST

SWFSC-135 2022

SWFSC-136 2022

SWFSC-137 2023

SWFSC-138 2025

REGION 2: U.S. WEST COAST

SWFSC-139 2025

SWFSC-140 2025

SWFSC-141 2025

REGION 3: HAWAII / PACIFIC ISLANDS

EEZ, Pacific Islands EEZ, central tropical Pacific

REGION 3: HAWAII / PACIFIC ISLANDS

SWFSC-052 2002

SWFSC-053 2002

SWFSC-068 2005

SWFSC-069 2005

REGION 4: EASTERN TROPICAL PACIFIC

Pacific coast from Mexico to northern Peru, including the Gulf of California, and west to -160° including the high seas

REGION 4: EASTERN TROPICAL PACIFIC

SWFSC-002 1995

SWFSC-003 1995

SWFSC-004 1995

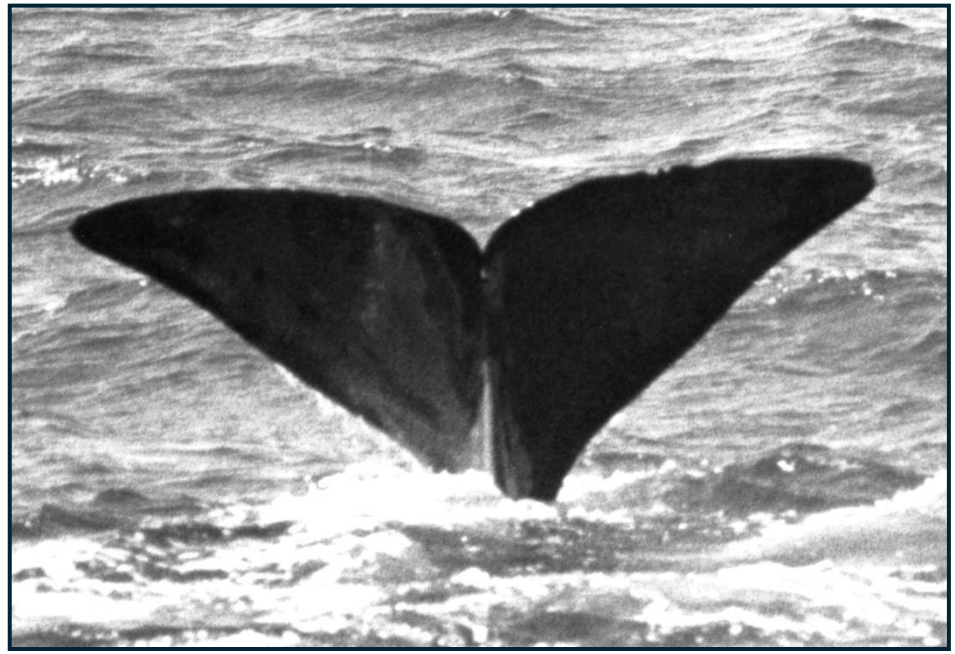
SWFSC-005 1995

REGION 4: EASTERN TROPICAL PACIFIC

SWFSC-006 1995

SWFSC-007 1995

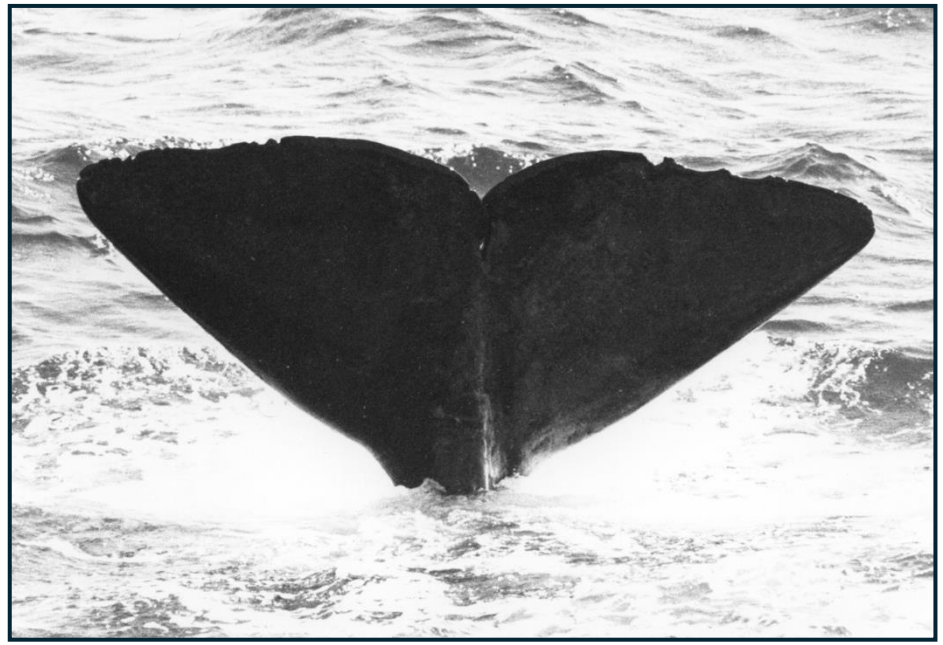
SWFSC-008 1995



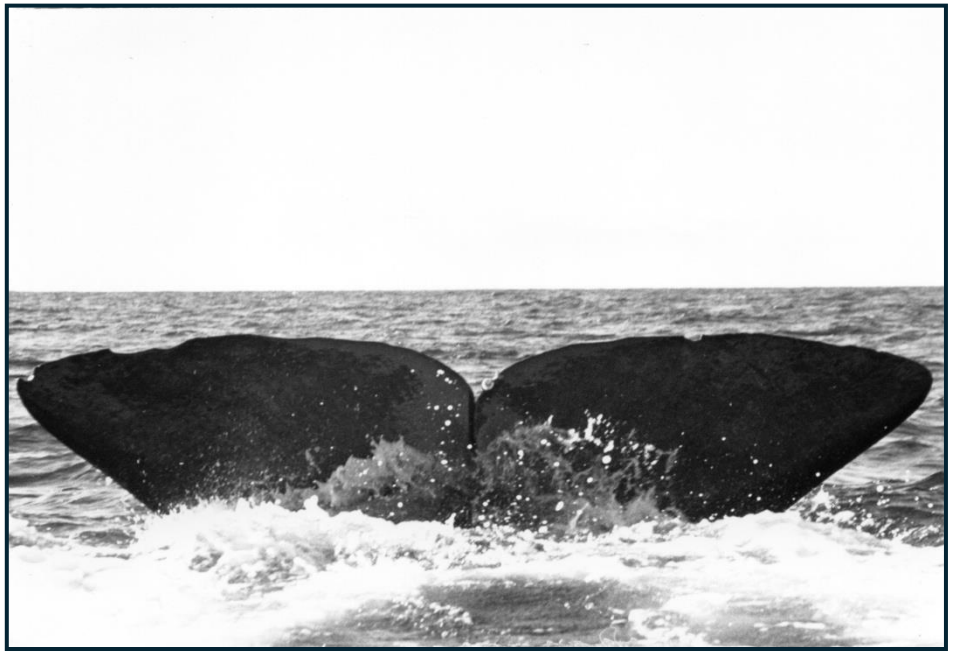
SWFSC-009 1995

REGION 4: EASTERN TROPICAL PACIFIC

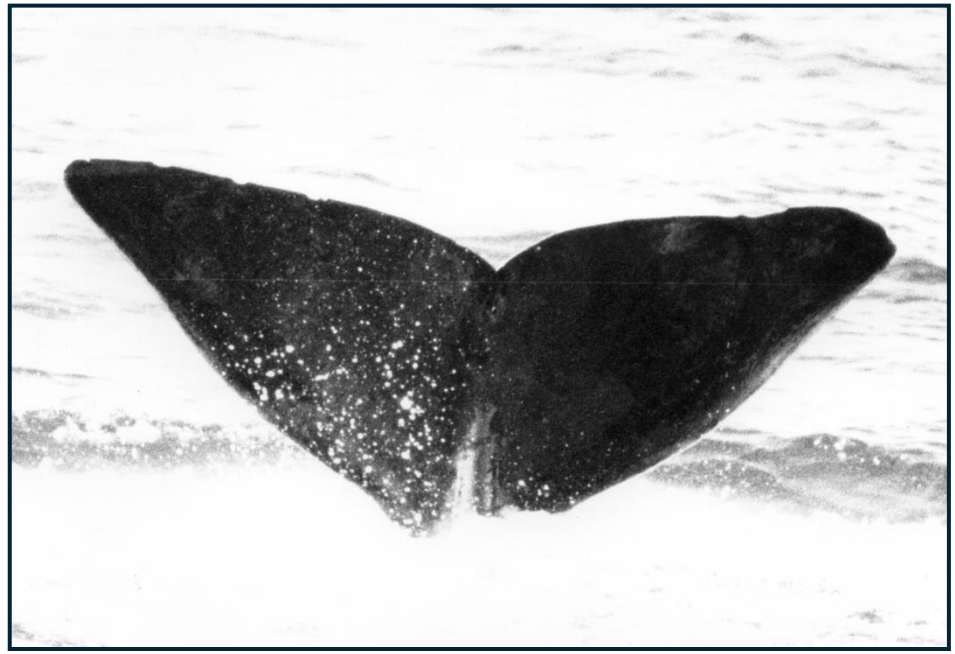
SWFSC-010 1995



SWFSC-011 1995



SWFSC-012 1995



SWFSC-014 1995

REGION 4: EASTERN TROPICAL PACIFIC

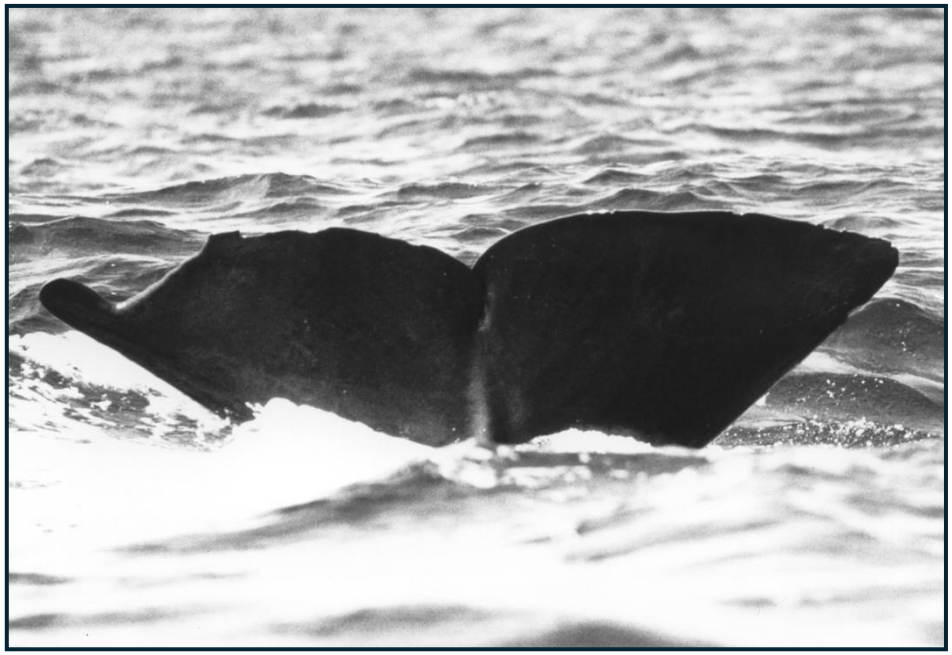
SWFSC-015 1995

SWFSC-016 1995

SWFSC-017 1995

SWFSC-018 1995

REGION 4: EASTERN TROPICAL PACIFIC



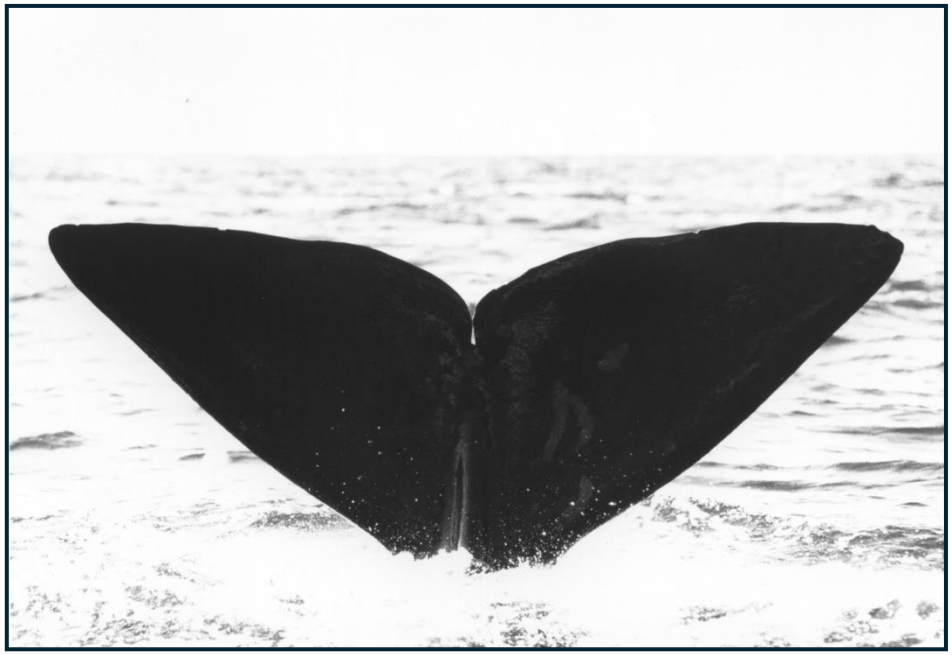
SWFSC-019 1995

SWFSC-020 1995

SWFSC-021 1995

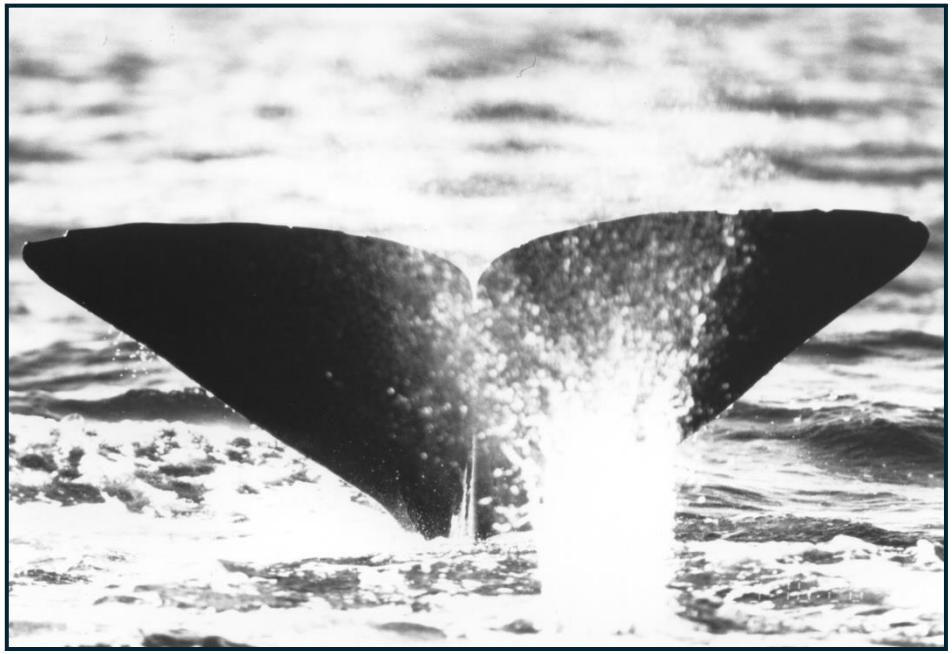
SWFSC-022 1995

REGION 4: EASTERN TROPICAL PACIFIC



SWFSC-023 1995

SWFSC-024 1995



SWFSC-025 1995

SWFSC-026 1995

REGION 4: EASTERN TROPICAL PACIFIC

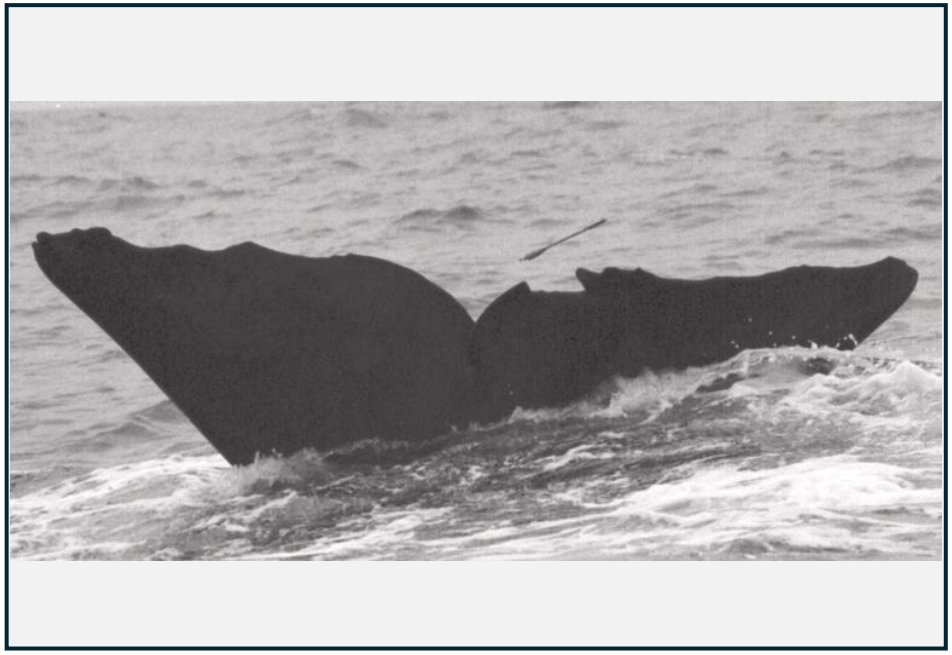
SWFSC-028 1995

SWFSC-030 1998

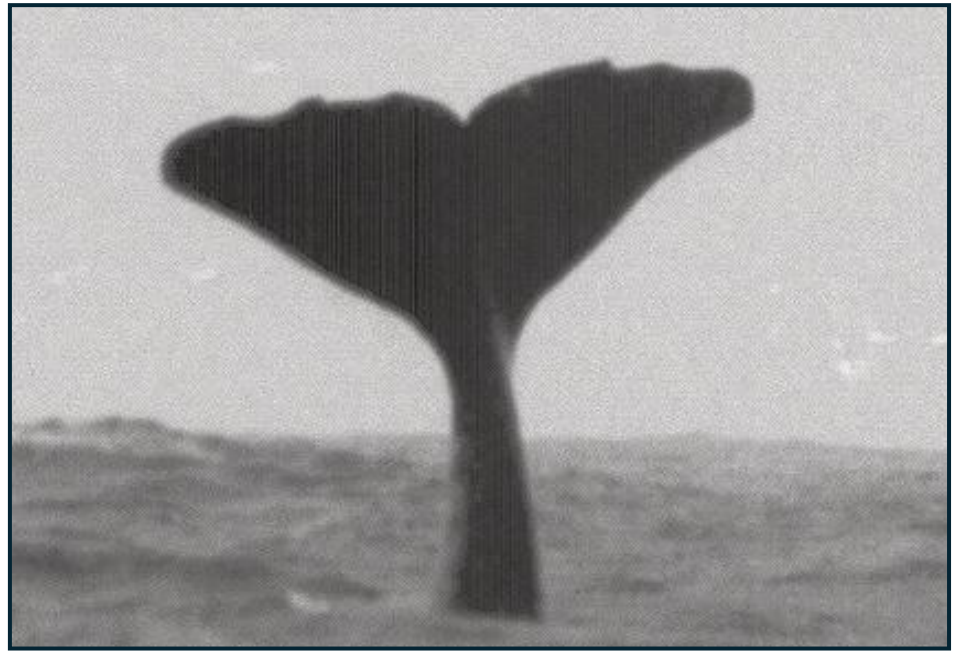
SWFSC-031 1998

SWFSC-032 1998

REGION 4: EASTERN TROPICAL PACIFIC

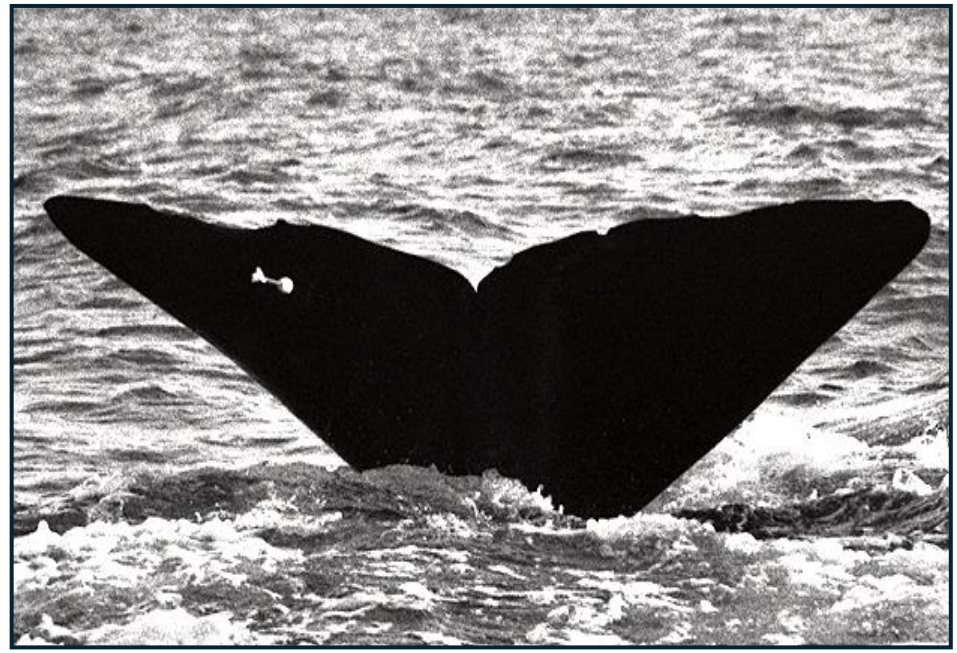


SWFSC-033 1999



SWFSC-034 2000

SWFSC-035 1999



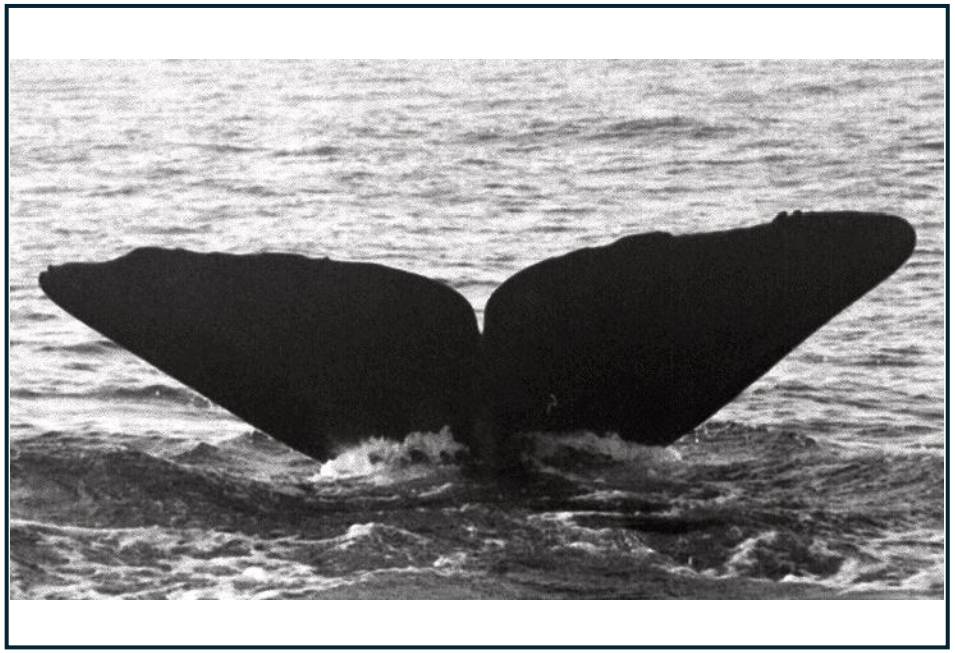
SWFSC-037 1999

REGION 4: EASTERN TROPICAL PACIFIC

SWFSC-038 1999

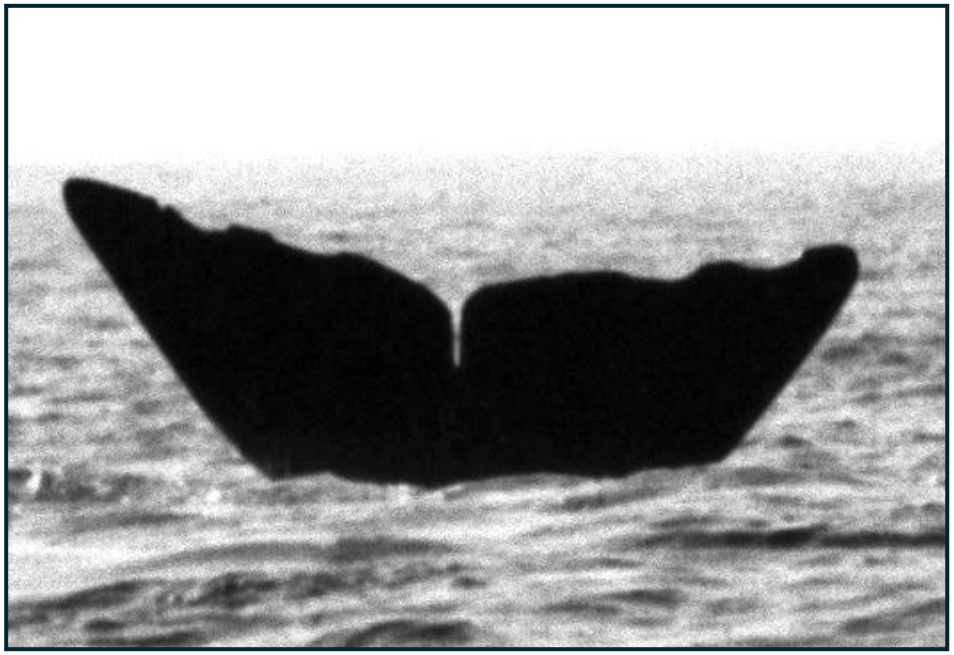
SWFSC-040 1999

SWFSC-041 2000

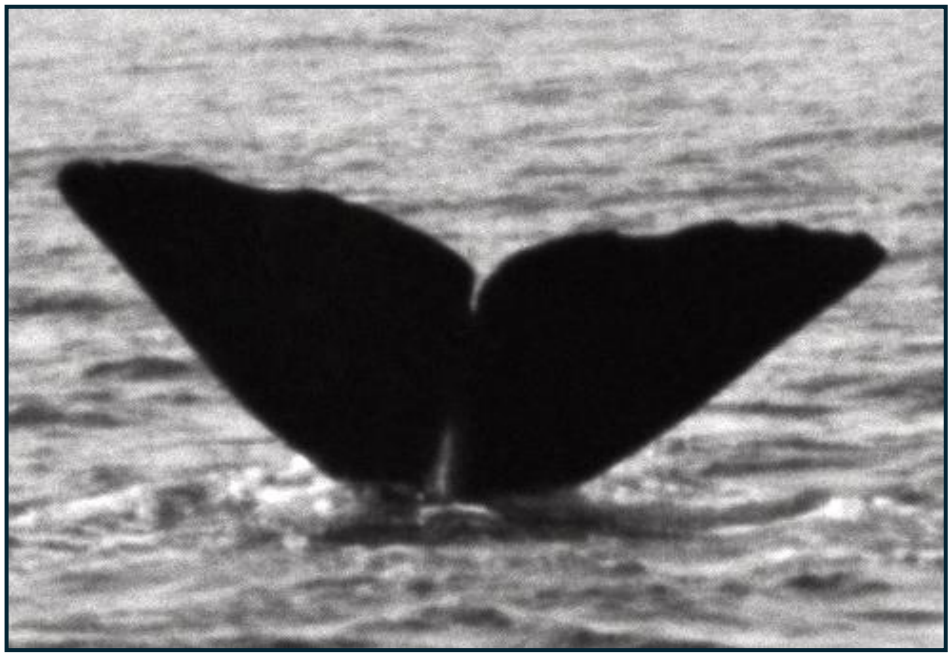


SWFSC-042 2000

REGION 4: EASTERN TROPICAL PACIFIC

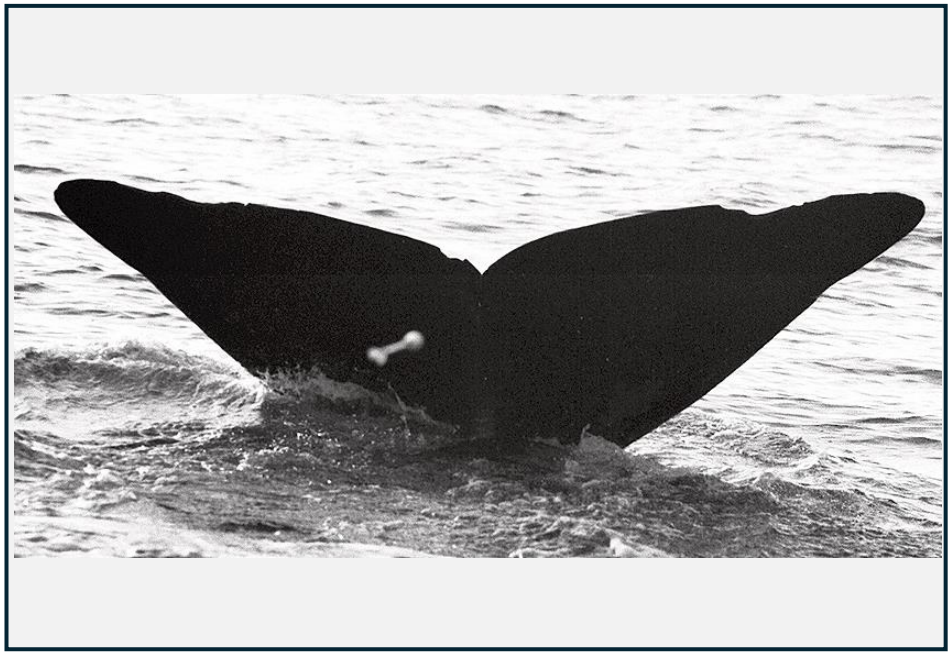


SWFSC-044 2000



SWFSC-045 2000

SWFSC-046 2000



SWFSC-047 2000

REGION 4: EASTERN TROPICAL PACIFIC

SWFSC-048 2000

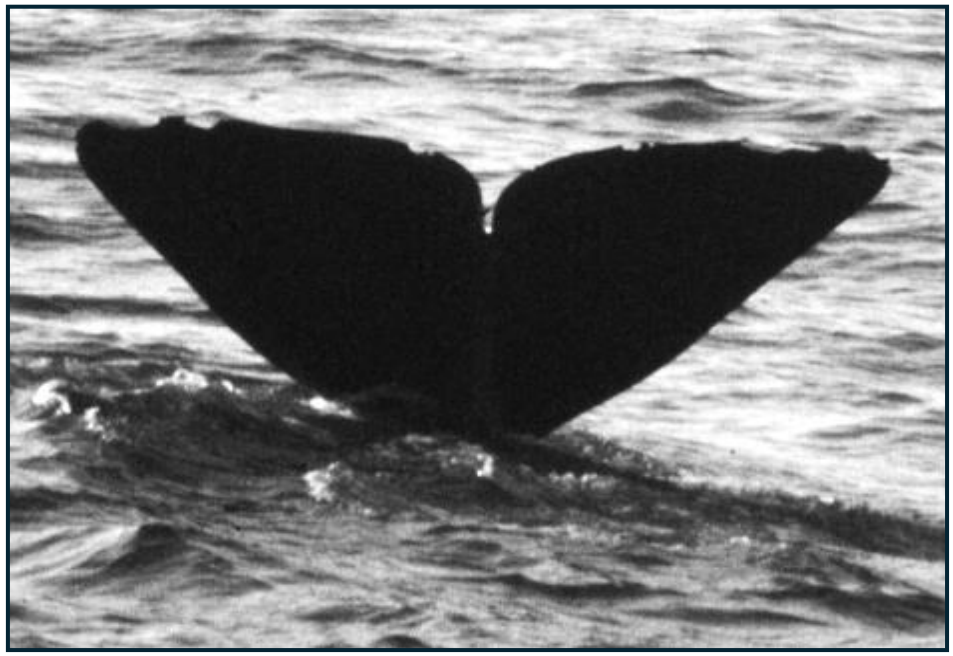
SWFSC-049 2000

SWFSC-050 2000

SWFSC-093 2003

REGION 4: EASTERN TROPICAL PACIFIC

SWFSC-094 1998



SWFSC-095 2000

SWFSC-096 2000

SWFSC-097 2000

REGION 4: EASTERN TROPICAL PACIFIC

SWFSC-098 2003

SWFSC-142 2017

SWFSC-143 2025

Appendix 1: Cruises with Sperm Whale Photo-ID

Technical Memorandums (TM) for NMFS Southwest Fisheries Science Center published for each of the cruises during which sperm whale identification photos were collected. NOAA SWFSC TMs are accessible at NOAA Institutional Repository (https://repository.library.noaa.gov/cbrowse?parentId=noaa:5). CA=California Current; Gulf CA=Gulf of California (Mexico); Hawaii=Hawaiian Islands; ETP=Eastern Tropical Pacific; Alaska=Gulf of Alaska; U.S. West Coast=California, Oregon, Washington coast and out to 300 nm; CA/OR/WA/BC/AK=California, Oregon, Washington, British Columbia, Alaska coast

Cruise No.	Cruise Year	Cruise Name	Vessel	Survey Region	TM Number
1426	1991	CAMMS	McArthur	CA	169
1601	1995	CADDIS	McArthur	Gulf CA	250
1612	1998	SPAM	McArthur / D.S. Jordan	ETP	283
1613	1999	STAR	D.S. Jordan	ETP	293
1614	1999	STAR	McArthur	ETP	293
1615	2000	STAR	D.S. Jordan	ETP	303
1616	2000	STAR	McArthur	ETP	303
1621	2002	HICEAS	McArthur/ D.S. Jordan	Hawaii EEZ	362
1623	2003	STAR	McArthur II	ETP	366
1624	2003	STAR	D.S. Jordan	ETP	366
1625	2004	SPLASH	McArthur II	Alaska	429
1627	2005	CSCAPE	McArthur II	CA/OR/WA	[1, 2]
1628	2005	CSCAPE	D.S. Jordan	CA/OR/WA	[1]
1629	2005	PICEAS	McArthur II	Hawaii EEZ	420
1635	2008	ORCAWALE	McArthur II	U.S. West Coast	465
1637	2008	Acoustic Vaquita	D.S. Jordan	Gulf CA	495
1647	2014	CalCurCEAS	Ocean Starr	CA/OR/WA	[2]
1648	2015	CLAWS	Reuben Lasker	CA/OR/WA/ BC/AK	[2]
1651	2018	CCES	Reuben Lasker	U.S. West Coast	636
1652	2024	-	Bold Horizon	U.S. West Coast	[3]

[1] 1627 & 1628. This two-ship cruise does not have a SWFSC TM, but a cruise report for 1628 is available at: https://sanctuarysimon.org/regional_docs/monitoring_projects/100273_dsj_report.pdf

[2] TM for this cruise was not produced.

[3] TM is in preparation at the time of publication.

Appendix 2. Citizen Science Photographers and Vessel Operators

Identification photographs contributed by citizen scientists/naturalists/photographers and assigned a SWFSC ID. This list contains the photographer for each photo-identification, as well as the vessel or whale watching company from which the photograph was taken. Inclusion in this list does not represent an endorsement by SWFSC/NMFS/NOAA. ASJ=Alisa Schulman-Janiger, KJL=Kiku J. Loomis

SWFSC ID	Photographer name	Vessel operator or organizations
SWFSC-076	ASJ	Eric Martin (private)
SWFSC-122	Douglas Croft	Blue Ocean Whale Watch
SWFSC-124	ASJ	Bob Talbot (private)
SWFSC-125	Michelle Wassell	Dana Wharf Whale Watch
SWFSC-126	ASJ	Monterey Bay Whale Watch
SWFSC-127	ASJ	Harbor Breeze Cruises
SWFSC-128	ASJ	Harbor Breeze Cruises
SWFSC-129	Polly Carrico	Harbor Breeze Cruises (for Aquarium of the Pacific)
SWFSC-130	Matt Jackson	Harbor Breeze Cruises
SWFSC-131	Matt Jackson	Harbor Breeze Cruises
SWFSC-132	Sarah Minamyer	Harbor Breeze Cruises (for Aquarium of the Pacific)
SWFSC-133	ASJ	Harbor Breeze Cruises
SWFSC-134	Mark Girardeau	Pacific Offshore Expeditions
SWFSC-135	Mark Girardeau	Pacific Offshore Expeditions
SWFSC-136	Mark Girardeau	Pacific Offshore Expeditions
SWFSC-137	Delaney Trowbridge	Newport Coastal Adventure
SWFSC-138	Jessamy Boas	SoCal Whale Watching
SWFSC-139	Erica Page	Pacific Offshore Expeditions
SWFSC-140	KJL	Legacy Whale Watch
SWFSC-141	Tomoko Shimotomai	Monterey Bay Whale Watch