



THE NATURAL HISTORY OF THE GRAY WHALE

Eschrichtius Robustus (E. Robustus)

A Presentation by Norma Jellison (Whale Watch)

Eastern North Pacific Gray Whale

- Mammal
 - Cetacean (Whales, Dolphins, Porpoises)
 - Mysticeti (Baleen Whale)
- Coastal Whale – visible from shore
- Migrates along North American Pacific Coast; between Arctic seas and lagoons of Baja California, Mexico

Identification

- Streamlined Body – Narrow tapered head
- Baleen: Upper jaw only
- Gray Mottled Skin
- No Dorsal (top) Fin
- Dorsal Hump w/ 6-12 knuckles
- Flippers – small paddle-shaped
- Fluke (tail) 10-12' across pointed at tips; deep center notch



Size:

- Adult Males 45-46'
- Adult females up to 50/55'
- Calves 12-15'

Weight:

- Adults – up to 45 Tons (average 35T)
- Calves 1500 – 2000 lbs at birth
- Calves can double in size in about a year

- Speed: 3-5 mph
- Breathing Pattern:
 - blows 3-5 times in 15-30 second intervals
 - followed by dive when submerged 2-5 minutes
 - can stay submerged up to 15 minutes
- Blow:
 - Bushy; heart shaped



Barnacles and Lice

Barnacles - *Cryptolepas rhachianecti* – only found on Gray Whales and live out life cycle on the whale

Lice – 3 kinds of lice (Amphipods) -2 only on Gray Whale:

- *Cyamus scammoni* and *Cyamus kessleri*
- *Cyamus ceti* found on other cetaceans

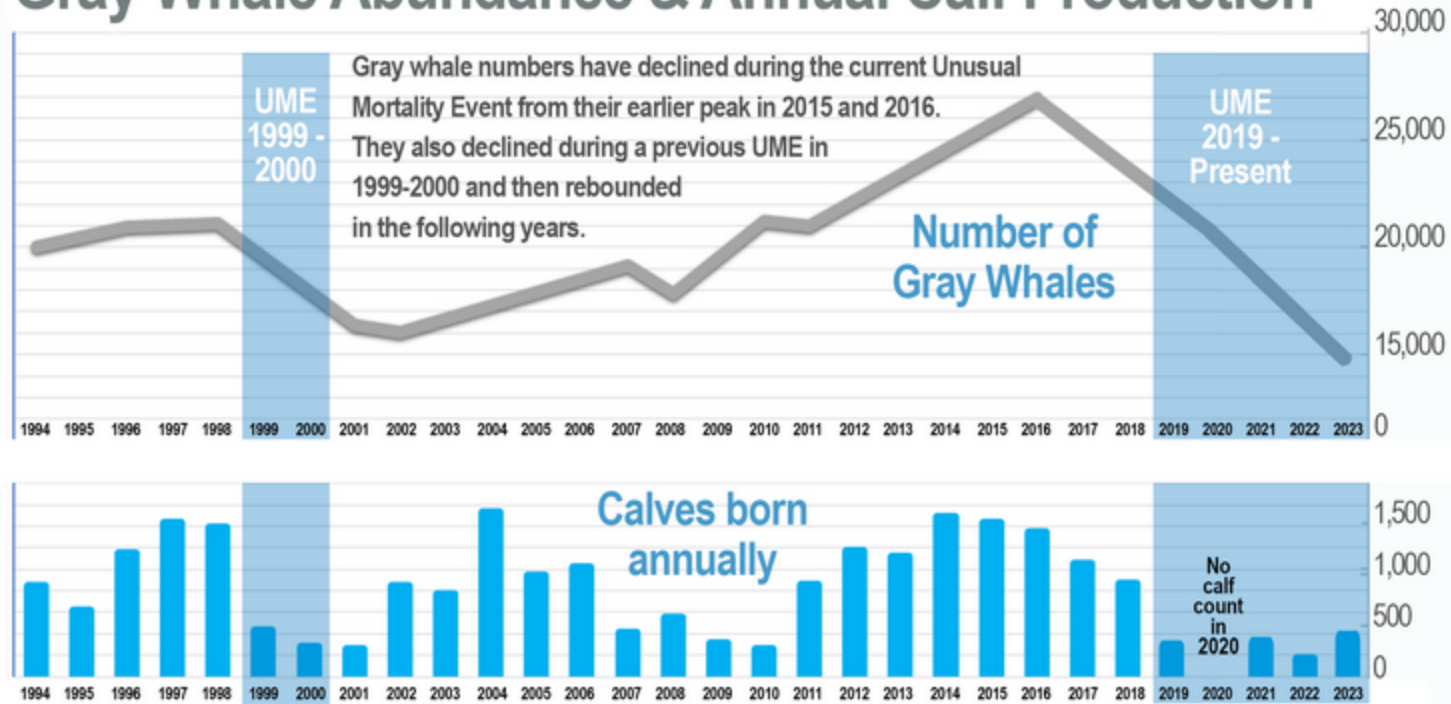


Population/Abundance

- Population
 - Population counts by NOAA began in late 1960s. The Southwest Fisheries Science Center conducts shore based surveys from its Granite Canyon site and issues annual abundance estimates based on counts and a model.
 - Estimates fluctuated from a high of 29,000 to a low of 14,500 (NOAA)
 - 2 multi-year Unusual Mortality Events (UME) in 1999-2000 and 2019-2023 contributed to declines. Abundance rebounded both times
 - The estimated total abundance of Gray Whales during the southbound 2023/2024 migration was 19,260, a 33% increase from the 2022/2023 season low. Low was roughly the same as when counts began
 - 2024 calf numbers (221) were one of lowest on record (Oct 31, 2024 NOAA)

Eastern North Pacific Gray Whale Population

Gray Whale Abundance & Annual Calf Production



Click to enlarge: Annual calf production estimates for the eastern North Pacific gray whale population from 1994 to 2023. This graph also shows the results of our population abundance assessment.

Lifecycle

- Sexual Maturity: 5 to 11 years or 36-39'
- Gestation: 12-13 months
- Calving Interval: 2 or more years
- Calves Nurse: 7-8 months > 50 gallons/day
- Milk: 53% Fat (human milk 2% fat; 15x fat of cow's milk)

Life Cycle

- Breeds on southbound migration mostly in So CA waters and in Pacific lagoons of Baja: Ojo de Libre, Laguna San Ignacio, Bahia Magdalena
- Calves mostly in Baja lagoons/some in So CA waters



Migration

- 10,000-14,000 mi (average 12,000 mi) round trip one of longest of all mammalian migrations
- Southbound – October (ice up) 2-3 months (October – February) on horizon generally using California Current
- Lagoon Time – 2-3 months average (December – April)
- Northbound – 2-3 months (February – July)
 - close to shore uses Davidson Current
 - Newly Pregnant Females first (mid Feb from Bodega Head)
 - Males; Immature Males and Females
 - Cows/Calves last (April – June; peak May) closest to shore calf still nursing; needs to rest

Summer Feeding Grounds

May - October

Pacific gray whales feed from late spring to early fall when ice melts and clears the way to abundant feeding waters in the Bering, Chukchi, and Beaufort Seas. The whales must gain the fat they'll need to sustain them for the roundtrip migration before the next feeding season.

Migration Route

The whales usually travel within 2.5 miles of shore along 5,000-7,000 miles of coastline. Their nearshore route makes this one of the few whale migrations that we can see from shore.

Winter Birthing and Mating Grounds

December - April

The warm, shallow waters in the lagoons of Mexico's Baja Peninsula are home to mothers and babies in winter. Many other gray whales are seen along the coast of Baja and off the mainland of Mexico. ★ Designates nursery lagoon.

Fall Migration

October - February

Southward migration is led by pregnant females, in a hurry to reach the warm birthing and nursery lagoons. Soon to follow are the males and other adult females. Juveniles join the parade, but some don't even reach Mexico before turning around and heading north.

Spring Migration

January - June

Northward migration occurs in pulses or waves. First to head north are adult males and juveniles, and newly pregnant females. Mothers and babies stay in the lagoons a month or two longer than the others so babies can gain blubber and strength before making the long journey north.

Feeding

- Feeds
 - Mostly in Alaska (Chucki, Beaufort, N Bering Seas)
+/- 5 months until ice forms
 - Opportunistic feeders during migration (Benthic to Pelagic)

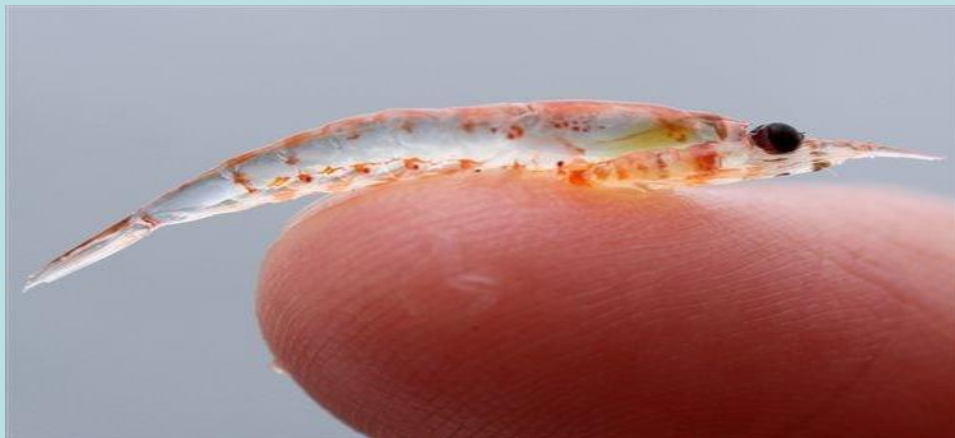
Feeding in Alaskan Waters

- Baleen: Upper jaw only; 130-180 plates on either side of jaw; 2-10"; up to 20" long (keratin)
- Sucks in mud/water; pushes through baleen with tongue; amphipods caught in bushy hairs of baleen; whale licks off and swallows
- Most whales are right sided
- 7 ft "craters" in mud = size of whale's head



Diet in Alaskan Waters

- Amphipods that live in sediment of shallow, cold Arctic seas (also bottom dwelling ghost shrimp)
- Eats about a ton/day during 24 hour daylight period (estimated 67 Tons during 5 months on feeding grounds)
- Stored as blubber; lives off blubber stores during migration south and back north



Opportunistic Feeders

Examples of feeding sources include: Amphipods, Mysid shrimp, porcelain crab larvae
Other sources include krill, ghost shrimp, pelagic red crabs, skeleton shrimp,
polychaete worms

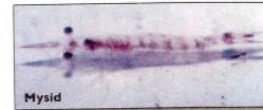
Guide to Summer Resident Gray Whales Along the Oregon Coast C Newell

What They Eat: Opportunistic Feeders

Gray whales are opportunistic feeders, which means they will eat food from a wide range of available sources. Along the coast of Newport and Depoe Bay, Oregon, it appears they feed primarily on large mysid shrimp swarms found in water depths of 30 feet around bull whip kelp beds. These swarms become dense enough to feed on in April or May when billions of mysids make up the swarms. A brief 1-2 day feast of porcelain crab larvae is usually seen in late May or June. In the Bering and Chukchi Seas around Alaska, they feed on bottom sediments packed with amphipods. Studies by researchers in British Columbia, Washington, and northern California have shown that prey items of local summer residents also include: amphipods, crab larvae, krill, ghost shrimp, pelagic red crabs, skeleton shrimp, small fish, polychaete worms and various other organisms, besides the mysids.



Amphipod



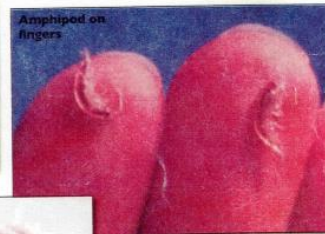
Mysid



Porcelain crab larvae



Porcelain crab larvae on finger



Amphipod on fingers



Mysid on finger

Pacific Coast Feeding Group

Pacific Coast Feeding Group (PCFG) +/- 200 summer/feed between Kodiak Island and No CA (J Calambodikis Cascadia Research):

- Puget Sound – Sounders (Cascadia Research);
- Depoe Bay OR (C Newell);
- Pt Arena (Mercer, Mercer, Goforth);
- Gulf of the Farallones and San Francisco Bay (Weber, Keener et al Marine Mammal Center)

Pacific Coast Feeding Group

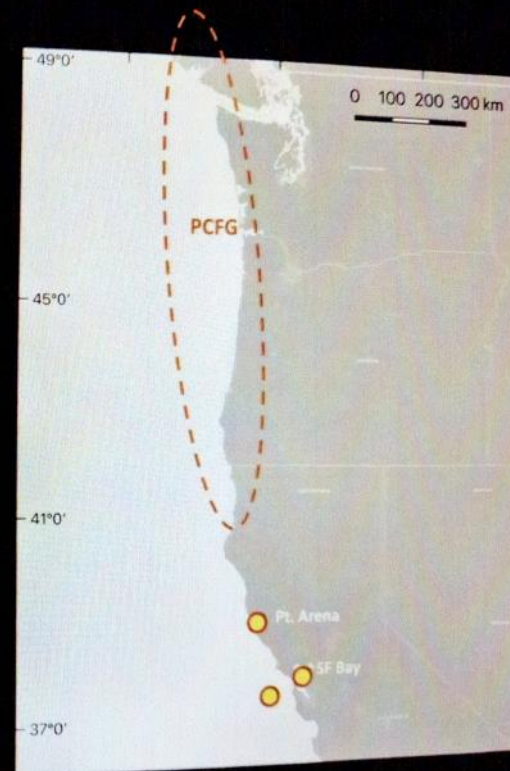
Expanded Areas in No CA
The Marine Mammal Center Map 2024

Pacific Coast Feeding Group

Gray Whales That Don't Migrate
North to the Arctic

Summering Whales in:

- Pt. Arena (Mercer, Mercer & Goforth, 2022)
- SF Bay
- Farallon Islands



Gray Whales in SF Bay, Farallones, Pacifica

- Increased Use of San Francisco Bay by Gray Whales Beginning in 2016
- Observations/Data Collected by Marine Mammal Center
- Photo ID Catalogue started in 2017, currently 75 whales
- One Whale Spent **75** days in San Francisco Bay - February to March 2023
- Research project (Masters) by Sonoma State Graduate Student on Changes in Feeding Behavior (Pending)

Recent New Foraging Methods Observed by Whales in SF Bay Area Waters

- In 2022, Gray Whales Observed Using 3 Mostly Atypical Foraging Methods off Pacifica: Lunge Feeding, Skimming, Bottom suctioning/grubbing*
- Questions remain re: are Gray Whales feeding in Bay Area waters and atypical feeding behaviors associated with the UME, a longer term change in feeding behavior, migration patterns, OR?
- Paper published in Aquatic Mammals by Marc Webber, Bill Keener, Tim Markowitz of MMC etal

Pacific Gray Whale



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