



Laguna San Ignacio Ecosystem Science Program

A Project of the Ocean Foundation in Baja California Sur, Mexico

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If not in the winter breeding lagoons, where are all 20,000 gray whales?

We are frequently asked *“If there are an estimated 20,000 gray whales in the Eastern North Pacific (ENP) population, but at the peak of their winter breeding season in Baja California, Mexico only 2,100 to 2,600 whales occupy the three primary breeding lagoons (1,500 to 1,800 whales in Laguna Ojo de Liebre, 400 to 500 in Laguna San Ignacio, and an estimated 200 to 300 in the Bahía Magdalena area). So...where are the rest of the gray whales?”*

To understand this disparity in the numbers of gray whales, we need to understand their distribution along the Pacific coast of North America during migration, the timing of their fall and spring migrations, the time required to undertake these migrations, the segregation of age-sex classes of whales during the migrations, and the duration of stay of whales in the winter range.



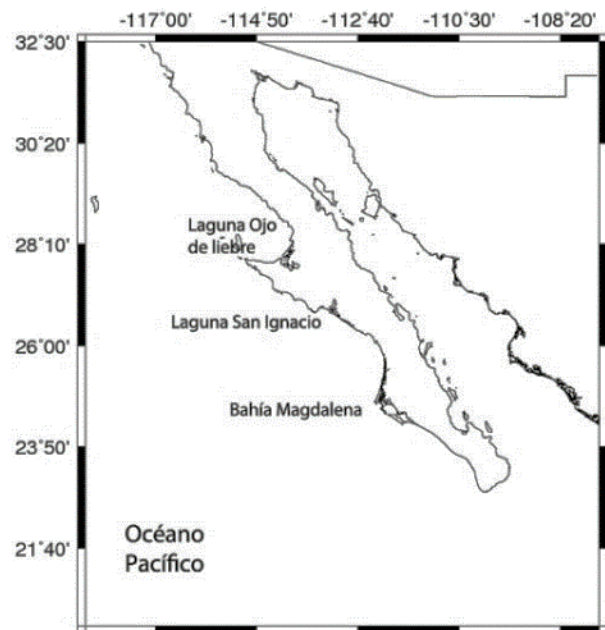
The gray whale’s migrations are dynamic, with several age, sex, and reproductive sub-groups migrating at different times and circulating within in many areas during their winter breeding season. Their 10,000-km fall southward migration route takes them from their summer feeding areas in the Bering, Chukchi, and Arctic seas to their winter breeding areas along the Pacific coast of Baja California, Mexico. In spring their northward migration returns them to summer feeding areas, for a total annual round-trip of approximately 20,000 km, one of the longest migrations known for any mammal species. Traveling at 7-km/hr., the entire population passes the NOAA census counting station at Granite Canyon in central California during a 90-day period from December through February each year (Swartz 2018).

Rather than traveling in one large group, the migrating population is distributed along the Pacific coast of North America with different sub-groups arriving at different locations at different times (Rice and Wolman 1971). The leaders of the fall southward migration are the near-term pregnant females that will birth their calves during the last portion of their migration or in the lagoons and coastal aggregation areas of Baja California. They are followed by adult males and females that will mate during the migration or in the coastal areas of Baja California. These females will give

birth to their calves the next year following a summer on the feeding grounds in the North Pacific, Bearing and Chukchi Seas. During the spring northward migration, the leaders are adult females that presumably have just conceived, then adult males, immatures, and lastly lactating females with calves of the year. Adult breeding whales without calves circulate among the breeding lagoons and aggregation areas of Baja California, and on average spend only 7-days in a specific lagoon. In contrast, lactating females with calves spend an average of 30-days in or near the lagoons, with some remaining for up to 3-months (Martinez 2020).

As the last of the southward migrants pass the Granite Canyon counting station, northward migrating whales are also observed suggesting that, after reaching their southern destinations, the whales then reverse direction as they begin their spring northward migration to return to their summer feeding range. In other words, at the time the last southward migrants arrive in their winter range, the first northward migrating whales pass them as they begin their return to the summer range.

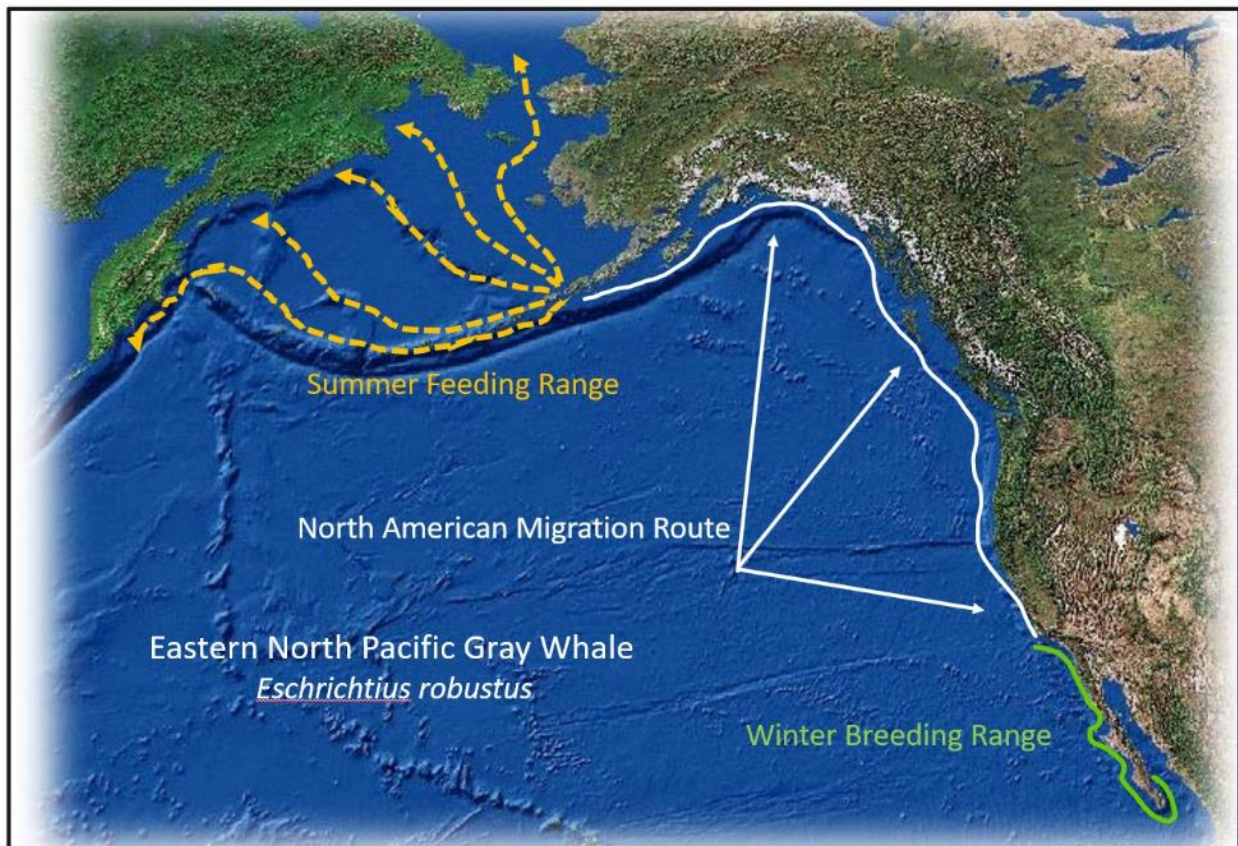
Considering the protracted distribution of migrating gray whales along the Pacific coast of North America, and the time the different sub-groups spend within their winter breeding and aggregation areas, their “Winter Range” is generally from Point Conception, California in the north, to Cabo San Lucas at the southern tip of the Baja California peninsula in the south, with individual whales continuously moving and circulating throughout this area. In some years gray whales will also visit the eastern coast of Baja California in the Gulf of California and various locations along the western coast of mainland Mexico. The whales generally occupy their “Winter Range” from mid-January to early-April each year.



NOAA’s Southwest Fisheries Science Center estimated the size of the ENP gray whale population at 20,000 whales in 2020 (Stewart and Weller 2021). The numbers of gray whales that occupy the breeding lagoons of Baja California (Laguna Ojo de Liebre, Laguna San Ignacio and Bahía Magdalena) at peak season are just a portion of the gray whale population, and those numbers continuously change during the whales’ 3-month winter reproductive season as whales arrive and depart from these areas. Boat surveys are used to “count” the number of gray whales inside the lagoons throughout each winter, and are not designed to estimate the size of the entire population. Rather, these lagoon “counts” provide weekly estimates of the number of whales that utilize these coastal lagoons to mate and birth their calves each winter. These “counts” are an “index” of how many whales utilize each area, their arrival and departure times, and they reveal trends in the whales’ use of different areas over time. The recent advent of UAV-Drone flights over Bahía Vizcaíno in front of Laguna Ojo de Liebre and Bahía Ballenas in front of Laguna

San Ignacio confirm that many gray whales use these vast bays as aggregation areas, while many more whales are also distributed along the Pacific shores of Baja California as they move between winter aggregation sites.

So, if it were possible to count all the gray whales distributed from Point Conception in the north, to Cabo San Lucas in the south during the winter months, including those whales within the breeding and aggregation lagoons in Baja California, in the bays in front of the lagoons, and all of the whales moving along the coast of Baja California, Mexico and Southern California in the United States, we would likely be able account for the entire ENP gray whale population. For the time being, the NOAA gray whale census from Granite Canyon in central California in the United States remains the best indicator of the overall size of the ENP gray whale population. While the abundance “counts” of gray whales within the lagoons of Baja California are the best indicators of the wintertime use of these areas by the whales.



References Cited:

- Martínez, S.A. 2020. Monitoreo de ballenas gris 2020. Laguna San Ignacio Ecosystem Science Program: <https://www.sanignaciograywhales.org/wp-content/uploads/2020/06/Monitoreo-de-ballena-gris-MAY-2020-WEB.pdf>
- Rice, D.W. and Wolman, A.A. 1971. The Life History and Ecology of the Gray Whale (*Eschrichtius robustus*). Special publication No. 3, The American Society of Mammalogists. 142 pp.
- Stewart, J.D. and Weller, D.W. 2021. Abundance of Eastern North Pacific Gray Whales 2019/2020. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-SWFSC-639.
- Swartz, S.L. 2018. The Gray Whale (*Eschrichtius robustus*). Pp. 422-428. In: B. Wursig, J.G.M. Thewissen, and K.M. Kovacs (Eds): Encyclopedia of Marine Mammals; Third Edition. Academic Press, San Diego. 1175 pp.