

ARE FIN WHALES RESIDENT TO THE GULF OF CALIFORNIA?

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Fin whales (*Balaenoptera physalus*) are relatively abundant in the Gulf of California, México and most technical papers, field guides, and popular articles report that this population may be, or appears to be, resident (e.g. Tomilin 1967, Johnson 1972, Balcomb *et al.* 1979, Wells *et al.* 1981, Leatherwood *et al.* 1982, Gambell 1985).

The earliest reference we could find to a resident Gulf of California fin whale population is Gilmore (1957 p. 23) "...finbacks inhabit the upper Gulf in numbers all year in what appears to be a land locked population". Gilmore's observation, the presence of fin whales in the Gulf of California throughout the year, and the paucity of sightings near the tip of Baja California appear to be the source of subsequent references (S. Leatherwood pers. comm.). In this note we examine existing evidence addressing the hypothesis that fin whales in the Gulf of California comprise a resident population.

Sightings off the Pacific coast of Baja California: According to Rice (1974) the

southern limit of the fin whale's distribution in the Eastern North Pacific is 22°50' N latitude (west of Cabo San Lucas, B.C.S.) during winter, and southern California, sometimes central Baja California, during summer. Urbán and Aguayo (1985) did not record fin whales among 15 cetacean species sighted during 10 cruises along the west coast of Baja California between 1982 and 1985. There were no sightings of fin whales off the Pacific coast of Baja California in the National Marine Fisheries Service data base of cetacean sightings (data provided by S. Reilly). However, the same data base had >25 sightings of blue whales *B. musculus* off the Pacific coast of Baja California Sur (Reilly and Thayer 1990). Blue whales are known to migrate between the Gulf of California and the eastern north Pacific (Tershy *et al.* 1990).

Sightings in the southern Gulf of California: Rojas (1984) reviewed sightings of fin whales in the Gulf from 1957 to 1983 and found none south of 24° N latitude (parallel to La Paz, B.C.S.). Between 1981 and 1987 researchers of the Facultad de Ciencias of the Universidad

Autónoma de México made numerous surveys for cetaceans across the mouth of the Gulf (between Cabo San Lucas, B.C.S. and Mazatlan, Sin. or Cabo Corrientes, Jal.) during all the months of the year and did not sight any fin whales (Aguayo *et al.* 1986, Urbán *et al.* 1988). No fin whales have been sighted during a 5-year study (1988-1992) of humpback whales *Megaptera novaeangliae* at the tip of the Baja California Peninsula (Urbán unpubl. data), however, research was conducted from January-April when one would not expect fin whales to be moving between the Gulf and the Pacific.

Seasonal distribution in the Gulf of California: Fin whales can be found in the Gulf of California in all months of the year. However, 78% of sightings in the southern Gulf (Urbán *et al.*, 1988), 70% of sightings in the Canal de Ballenas, central Gulf (Tershy *et al.*, 1990), 80% of sightings from Isla San Pedro Mártir, central Gulf (Tershy and Breese unpubl. data), 98% of sightings at Guaymas, Sonora, central Gulf (Findley, Vidal and Torre unpubl. data), and 83% of sightings in the northern Gulf (Rojas 1984), were in winter and spring.

Fin whales are more abundant in the Canal de Ballenas area than in other parts of the Gulf (Aguayo *et al.* 1986). In the Canal de Ballenas area summer sea surface temperatures are 2-5° lower (e.g. 25.5° in the Canal de Ballenas area, but 28-29.5° in the rest of the Gulf), and summer primary productivity is higher, than in other parts of the Gulf (Badan-Dangon *et al.* 1985, Alvarez-Borrego 1983). Thus, fin whales in the Gulf during the summer might be expected to concentrate in the Canal de Ballenas area.

Diet and prey availability: Existing evidence suggests that in the Gulf of California fin whales are primarily planktivorous, their most important prey probably being the euphausiid *Nyctiphanes simplex* (Tershy *et al.* in litt.). *N. simplex* is a temperate species and in the

Gulf of California is most abundant in the winter and least abundant in the summer (Brinton *et al.* 1986, Gendron 1990).

Swimming speed and movements in other areas: Southern hemisphere fin whales are thought to migrate 3,800 Km, from breeding grounds to Antarctic feeding grounds, in 1 month, about 130 Km/day (Laws 1961, Gambell 1985). Ray *et al.* (1978) tracked a radio tagged fin whale at an average speed of about 9 Km/hr. Watkins (1981) tracked a radio tagged fin whale which traveled 292 Km in one day, and 2,095 Km in 10 days. Thus, fin whales appear to travel between 100 and 300 Km/day and could thus swim the 1,000 Km length of the Gulf in roughly 3-10 days.

In summary, the available data neither support nor refute the hypothesis that the fin whales in the Gulf of California are a resident or isolated population. Rather, they present a paradox. Sighting data from the southern Gulf and the Pacific coast of Baja California give no indication that fin whales migrate between the Gulf of California and the adjacent Pacific. However, data on the seasonal distribution of fin whales in the Gulf show a marked decline during the summer, when limited evidence suggest that their primary prey is least abundant.

This apparent paradox can be resolved by combining more systematic sighting cruises in the Gulf of California and adjacent Pacific with genetic stock identification studies, comparison of photo-identifications of fin whales from the Pacific with the Gulf of California catalogue (Tershy *et al.* 1990), or satellite tagging of fin whales in the Gulf of California during the late spring. Until these data become available, Gilmore's (1957) hypothesis that fin whales are resident to the Gulf of California should be viewed as untested.

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In the Gulf of California, fin whales are seen throughout the year and are considered a resident population (Tershy et al., 1993). They have been observed feeding principally on euphausiids in the northern Gulf of California (Tershy, 1992) and occasionally on small pelagic fish (Gendron, 1993). $\delta^{15}\text{N}$ and $\delta^{13}\text{C}$ in skin biopsy samples: A note on their applicability for examining the relative trophic level in three rorqual species. These are whales that reside in the Gulf of California year-round, but migratory fin whales may also inhabit the Gulf of California at certain times of the year – these would not be considered “resident” fin whales because they are only visiting. Given the additional sources the researchers used to study the fin whales’ behavior this time around, they could conclude that the resident fin whale populations have learned to live only in this small community by year-round identifying prey hotspots and how they shift throughout the year as the seasons change. "Feeding year-round is what separate A fin whale surfaces in Gulf of California, Mexico, during the 2001 study showing the characteristic black coloration of the body contrasting with the white lower right jaw. Photograph by Craig Hayslip, Oregon State University Marine Mammal Institute, under U.S. National Marine Fisheries Service Permit 369-1757 issued to Bruce Mate. Credit: Craig Hayslip. "The Gulf of California has a strong seasonal transition driven by changing atmospheric winds that produce upwelling and productivity," said OSU's Palacios, who specializes in the habitats of whale species. "Over the course of the seasons, different parts of the gulf light up and there are hot spots of productivity. Whales have learned to identify these areas and have adapted their movements to track this seasonal shift."