
# Fin whales feeding on Northern krill off Pico Island (Azores) during spring migration

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## Introduction

Baleen whales are regularly seen around the Azorean archipelago in spring. Observations suggest that these animals are transient and probably on passage during their post-breeding migration to temperate waters[1]. Here we provide evidence that Fin whales (*Balaenoptera physalus)* fed on Northern krill (*Meganyctiphanes norvegica*) at this time near Pico and that Blue whales (*Balaenoptera musculus)*, Humpback whales (*Megaptera novaeangliae)*, Bryde's whales (*Balaenoptera brydei)* and probably Sei whales (*Balaenoptera borealis)* also fed in this area.




## Methods

Approximately 6300 nautical miles of navigation were undertaken within a study area of approximately 800 km$^2$ off south Pico (Fig. 1). Sighting and opportunistic photo-identification data were collected for cetaceans during whale watching trips run between 1st April and 30th September 2010. Upon observation of baleen whale feeding activity, prey specimens were collected on one occasion along with Fin whale faeces. The samples were stored in EtOH 96% at -18°C. Prey specimens were identified through optical microscopy.

**Figure 1.** Study area in gray *(from Garmin MapSource – licensed software)*

## Results

Out of a total of 461 sightings, 52 comprised baleen whales (11.3%) and 29 individuals were photo-identified (Table 1). One Fin whale was sighted 4 times over 20 days between 20th April and 10th of May 2010.

| Species | Sightings | Photo-ID (individuals) | Resighted individuals | Feeding activity (Y/N) | Prey samples (Y/N) | Red stained faeces (Y/N) |
|---|---|---|---|---|---|---|
| Blue whale | 10 | 5 | 0 | Y | N | Y |
| Fin whale | 25 | 16 | 1 | Y | Y | Y |
| Sei whale | 9 | 5 | 0 | Unconfirmed | N | N |
| Humpback whale | 3 | 1 | 0 | Y | N | Y |
| Bryde's whale | 4 | 1 | 1 | Y | N | N |
| Common Minke whale | 1 | 1 | 0 | N | N | N |

**Table 1.** Baleen whale sightings, photo-identified individuals and feeding activity

75% of baleen whale sightings occurred in April and May (Fig. 2), coinciding with peak productivity in the area (Fig. 3) that was exceptionally high in 2010 (fig. 4). In the presence of krill, Blue whales, Fin whales, Sei whales and Humpback whales showed behaviours indicative of feeding such as side-lunging, deep diving and circling. All except Sei whales were also seen producing red stained faeces (Fig. 5). While observing Fin whale feeding activity, on one occasion prey specimens were collected along with a faecal sample of the predator.

**Figure 5.** Fin whale faeces

### Microscopy analysis of Krill specimens

The Fin whale preys identified as Northern krill (*Meganyctiphanes norvegica*) through optical microscopy (Fig. 6). While relatively small[2], most of the female specimens had mated and were carrying spermatophores (Table 2).


**Figure 6.** Northern krill.

| Specimens analysed | Min. size (mm) | Max. size (mm) | Mean size (mm) |
|---|---|---|---|
| 12 | 16.0 | 22.0 | 20.1 |

**Table 2.** Northern krill microscopy analysis.

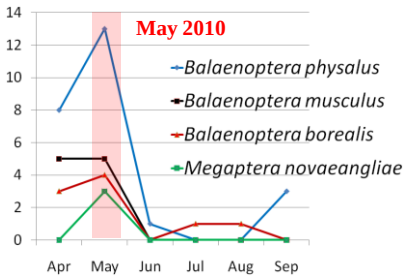


**Figure 2.** Baleen whale sightings

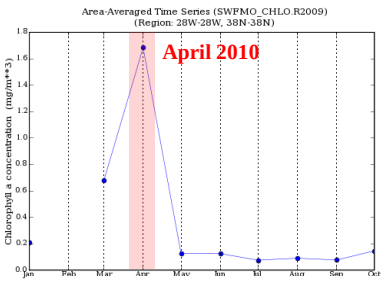


**Figure 3.** Chlorophyll-a data (year 2010, by month)[3]

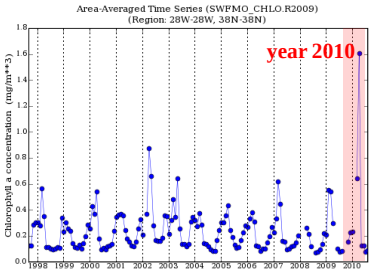


**Figure 4.** Chlorophyll-a data (1998-2010, by year)[3]

## Conclusions

The evidence suggests opportunistic feeding along the migration route and supports the hypothesis that the area off south Pico represents a strategic foraging habitat for several baleen whale species.

## References

1. Lockyer, C.L. and Brown, S.G. (1981). The migration of whales. In 'Animal Migration' (D.J. Aidley, ed.), pp105-137. Cambridge University Press. Cambridge.
2. Mauchline, J. and Fischer L.R. (1969). The biology of euphausiids. Adv. Mar. Biol. 7: 1-454.
3. Analyses and visualizations used in this poster were produced with the Giovanni online data system, developed and maintained by the NASA GES DISC.

## Acknowledgements

Many thanks to Dr. Malcolm R. Clarke, Dania Tesei, Antero Soares, Michael Costa, Petra Szlama, Eugénio Castro, Maddalena Jahoda and Caterina Lanfredi for advice and help with field work.