

# Whale population size, dynamics determined based on ancient DNA

May 9 2012

---

Estimates of whale population size based on genetics versus historical records diverge greatly, making it difficult to fully understand the ecological implications of the large-scale commercial whaling of the 19th and early 20th centuries, but a comparison of DNA samples from modern and prehistoric gray whales supports the idea that the population was substantially larger pre-whaling and saw a sharp, recent decrease that is consistent with whaling as the cause. The full results are reported May 9 in the open access journal *PLoS ONE*.

Previous estimates of pre-whaling population size in [gray whales](#) using historic records and census modeling suggest there used to be about 15,000 to 35,500 eastern Pacific gray whales. In contrast, estimates from genetic data suggest a much higher original population size of about 78,000 to 116,000 individuals. This discrepancy, though, could be explained by a pre-whaling decrease in population. The authors of the current study, led by Elizabeth Alter of City University of New York (York College), set out to test this hypothesis.

They isolated DNA from whale bones excavated from archaeological sites, ranging from about 150 to 2,500 years old. By comparing these sequences with sequences from modern whales, they determined that a severe decline in [whale population](#) occurred recently, suggesting that the original population size was indeed larger than estimated based on historical record and arguing against population decline caused by any pre-whaling forces.

"Retrieving DNA from ancient whales allows more direct insights into their population histories than using modern DNA alone. In this case, we were able to look at pre-whaling specimens of gray whales, and found that the genetic data are consistent with a sharp and recent bottleneck -- very likely the result of [commercial whaling](#). As methods for retrieval and analysis of ancient DNA improve, we'll be able to increasingly refine [population histories](#) for heavily exploited species like whales."

**More information:** Alter SE, Newsome SD, Palumbi SR (2012) Pre-Whaling Genetic Diversity and Population Ecology in Eastern Pacific Gray Whales: Insights from Ancient DNA and Stable Isotopes. *PLoS ONE* 7(5): e35039. [doi:10.1371/journal.pone.0035039](https://doi.org/10.1371/journal.pone.0035039)

Provided by Public Library of Science

Citation: Whale population size, dynamics determined based on ancient DNA (2012, May 9) retrieved 24 April 2024 from <https://phys.org/news/2012-05-whale-population-size-dynamics-based.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.