

# DNA analysis suggests under-reported kills of threatened whales

May 17 2007

---

A new study analyzing whale meat sold in Korean markets suggests the number of whales being sold for human consumption in the Asian country is much higher than that being reported to the International Whaling Commission – putting threatened populations of coastal minke whales further at risk.

The study, involving numerous researchers led by Scott Baker of Oregon State University, was just published in the journal *Molecular Ecology*. Baker, who is associate director of OSU's Marine Mammal Institute, also is presenting his findings to the International Whaling Commission this week at its annual meeting in Anchorage, Alaska.

Baker and his colleagues conducted 12 surveys at a selection of shops selling whale meat in certain Korean coastal cities from 1999 to 2003 and collected 289 samples. They initially expected to find that many of the cuts of meat they purchased would come from a small number of whales, but when they used DNA profiling or "fingerprinting" they discovered that their 289 samples came from 205 different whales.

Since the government of South Korea reported to the IWC just 458 minke whales killed overall during that five-year period, Baker said, the scientists began to question the accuracy of that reported number.

"We only sampled a portion of the shops selling whale meat, with gaps of several weeks and even months between surveys," Baker pointed out. "Since the average market 'half-life' of whale meat is six weeks, at most,

we should have found far fewer individuals – or the number of whales killed is actually much greater than is being reported."

To estimate the true number of whales in trade, the researchers used a novel model for "capture-recapture" analysis – characterized by DNA profiles from each slice of whale meat – which was developed by one of the co-authors of the study, Justin Cooke at the Center for Ecosystem Management Studies in Gutach, Germany. Although capture-recapture analysis is widely used to estimate the abundance of living whales in the while, it had not previously been used to estimate the number of dead whales available in trade. The analysis uses the frequency of whales found only once in a survey, and those found more than once in the same or later surveys.

The DNA profiling and capture-recapture analysis allowed the researchers to estimate how long an individual whale was available for sale in the markets – a process they compare to the decay of radio-isotopes. Fewer meat products from an individual whale remain on the market with each succeeding week, and their estimate of six weeks for the "half-life" of an individual whale gives future researchers a good idea of how frequently they will need to survey markets.

Whale meat is rarely frozen in Korea. It is usually par-boiled immediately after purchase by wholesalers or retailers and then sold over the next few weeks in thick slices of skin, blubber and meat – usually without refrigeration.

Using their "capture-recapture" model, which is based on statistical probability, the researchers estimate that the true number of minke whales that likely passed through Korean markets from 1999 to 2003 was probably 827 individuals, or nearly twice the number in official reports.

"If the mortality is really twice as great as the number reported to the government and to the International Whaling Commission, it has major implications for the survival of the species," Baker said. "Researchers who have done sighting surveys of minke whales report difficulty in even locating the whales, and it has been hard to reconcile the small numbers sighted at sea with the numbers reported via bycatch.

"This means that there is no accepted estimate of the total abundance of this population," Baker added, "but it seems likely that it is small and declining because of the unregulated exploitation."

The study focused on minke whales in the Sea of Japan known as "J stock." These genetically distinct whales are found closer to shore than other minke breeds, and were hunted to threatened levels until the IWC passed a moratorium on commercial whaling in 1986.

Though it is illegal to directly hunt minke whales in South Korea, those caught in fishing nets can be killed and sold as "bycatch" if officially reported. Economic incentives make such pursuits attractive, said Baker, who pointed out that individual whales are thought to fetch as much as \$100,000.

"The obvious question becomes how much of the mortality is caused by incidental bycatch, and how much of it is actually intentional," Baker said. "Beyond that, if more whales are being killed than reported, why aren't they being reported? Is it to avoid scrutiny of the practice? Or are there other reasons?"

The exploitation of illegal, unregulated and unreported seafood products is not restricted to minke whales, or even whales in general, nor is it a new dilemma. Scientists estimate that illegal Soviet whaling in the aftermath of World War II claimed about 48,000 humpback whales; the actual number reported was 3,000. Dolphins and other whale species also

have been exploited without regulation or reporting in many countries.

"The incentive, obviously, is financial," Baker said. "The result of under-reporting whale mortality is not simply the decline of the species and their ability to sustain their populations – it is the increasing difficulty the situation creates for protecting these animals."

Source: Oregon State University

Citation: DNA analysis suggests under-reported kills of threatened whales (2007, May 17)  
retrieved 10 April 2024 from

<https://phys.org/news/2007-05-dna-analysis-under-reported-threatened-whales.html>

<p>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.</p>
--