Whaling catch data are not reliable for analyses of body size shifts

To the Editor — Clements et al.[1] use length data from the International Whaling Commission's (IWC) catch database to support their contention that a negative shift in body size reflects an 'early warning signal' prior to the collapse of stocks of blue, fin, sei and sperm whales.

There are several problems with this analysis. First, length data for sperm whales were extensively falsified by both Japan and the Union of Soviet Socialist Republics (USSR). The USSR conducted extensive illegal whaling beginning in 1948[2], and submitted falsified data on both the length and sex of sperm whales to cover up extensive catches of animals below the minimum legal length (11.6 m)[3]. Clements et al. mention the absence of length data for Soviet Southern Hemisphere catches, but not for the North Pacific. This presumably means that they used the falsified North Pacific data, which were only recently replaced (without lengths) in the IWC database[4]. Similarly, it is now known that, for the same reason, Japan routinely falsified data on the lengths and sexes of sperm whales in shore-based whaling operations in the North Pacific[5], and on lengths for pelagic factory fleets there and throughout the Southern Hemisphere[6,7].

Consequently, any analysis of sperm whales will be fatally flawed: using changes in the 95% mean size does not help when the data concerned are largely fabricated. The Clements et al. analysis also failed to account for the age- and sex-segregated nature of sperm whale distribution, in which catches in high latitudes were primarily of large males while those elsewhere were biased towards the much smaller females and juveniles. Consequently, the shift over time in Southern Hemisphere whaling effort from the ice edge northwards would have resulted in increasing proportions of smaller animals in the catch (even if length and sex were accurately reported).

Another problem relates to Southern Hemisphere blue whales. In the early 1960s, catches shifted from 'true' blue whales in high latitudes to the significantly smaller pygmy subspecies (*Balaenoptera musculus brevicauda*)[8,9], yet the authors did not account for this in their analysis. Furthermore, the reported shift in length for Antarctic blue whales occurred after populations had collapsed to 1% of their former abundance in 1960[8]; thus, a decline in length should have been apparent well before this point.

Any as-yet unknown falsifications for other species will further complicate such analyses. A recent study suggested that, with some exceptions, length data reported by Japanese whalers for catches of Southern Hemisphere fin whales are probably largely reliable[10]. To date, no one has conducted such an assessment for sei whales; however, the USSR actually over-reported catch numbers for both fin and sei whales to camouflage takes of other species[2], which means that some of the North Pacific length data would have been from non-existent animals.

It is indeed likely that over-exploitation of whale stocks resulted in a decline in average lengths over time, and length data might be able to identify signals of diminishing abundance. However, this is valid only if the length data are both reliable and correctly interpreted, and that is not the case for at least two of the species here. ❐

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Competing interests

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