Media Release

Chiefs of Staff, News Directors

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Lessons from whale population collapse could help future species at risk

A study of historic whaling records has revealed there were warning signs that populations of commercially harvested whales were heading for global collapse up to 40 years before the event.

The research by scientists from IMAS and Switzerland's University of Zurich has the potential for application to other species to pinpoint early warning signs that a population is at risk of collapse due to pressures such as overfishing or climate change.

IMAS co-author Associate Professor Julia Blanchard said the study, published in the international journal *Nature Ecology & Evolution*, used International Whaling Committee (IWC) records of the abundance and body size of four whale species before the 1985 commercial whaling moratorium.

"In the face of global environmental change it's important that we can predict which species are at risk so appropriate conservation measures can be taken," Associate Professor Blanchard said.

"When abundance becomes more variable over time for a given species it can be a warning signal of an impending population collapse, but abundance estimates are low in reliability,"

Lead author Dr Chris Clements from the University of Zurich said previous work on experimental systems had suggested that combining extreme shifts in the body size of a population with abundance data can be indicative of an approaching collapse, but this had never before been demonstrated in a wild population.

"Our study of IWC catch records showed there was a dramatic decline in the average body size of whales last century, detectable up to 40 years before the global population collapse," Dr Clements said.

"We looked at data for blue, fin, sei and sperm whales and found significant declines in body size, with sperm whales taken in the 1980s four metres shorter on average than those taken in 1905.

"These results suggest that tracking changes in their mean body size might help to predict when populations are at risk of collapsing."

IMAS co-author Professor Mark Hindell said the technique could be used to help protect other species currently of conservation concern.

"Overfishing, which is likely to get worse with an increasing human population, is a threat faced by many marine species and can lead to changes in body size as well as the collapse of fish stocks that can take many decades to recover," Professor Hindell said.

"If we can use an approach such as this that takes into account traits of species and enables early detection it should be possible to determine which populations are at greater risk of collapse and to help put management in place to stop it happening."

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