

# What fish ears can tell us about sex, surveillance and sustainability

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A school of sardines in Italy. Credit: Wikimedia / Alessandro Duci

Scientists at the University of Southampton have found a way to pry into the private lives of fish - by looking in their ears.

By studying ear stones in fish, which act as tiny data recorders, scientists can now reveal [migration patterns](#) and even provide insights into their

[sex life](#).

Managing [fish stocks](#) in a sustainable way is a major challenge facing scientists, conservationists, policy makers and fishermen. To get the best results, accurate information about the movements of fish in the wild is needed but gathering this information is extremely difficult.

Tiny ear stones called 'otoliths', which are in all [bony fish](#), store chemical elements picked up from the surrounding water. As fish migrate, changes in the ambient water chemistry are recorded in the otoliths, but it is difficult to translate these signals into records of fish movements.

Now researchers have effectively created a translation dictionary -revealing what the different [chemical elements](#) stored in the chemical makeup of the stones can tell us about the environments fish have travelled through.

The research, conducted at the University of Southampton and the Centre for Environment, Fisheries and Aquaculture Science (Cefas) in Lowestoft, involved raising plaice in an aquarium for one year while measuring the chemistry of the water and the fishes' blood. At the end of the experiment, they compared the water, blood and otolith chemistry to better understand how elements become integrated into the growing otolith.

"These otoliths can now be used like the Rosetta Stone - allowing us to read the story of fish migrations from the chemistry of their ears," says Clive Trueman, co-author of the study and Associate Professor in Marine Ecology at the University of Southampton. "We also found that sex can interfere with the chemical signals. This complicates the job of translation, but provides us with new information about the biology, and [private lives](#), of [fish](#) at sea."

The new insights, which have been published in *Methods in Ecology and Evolution*, can now be used to better understand movements of fishes throughout the world's oceans and will help in science-based conservation and sustainable fisheries.

Provided by University of Southampton

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