

Migration critical to survival of dolphin populations, genetic study shows

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Bottlenose dolphins of Bunbury, Western Australia. Credit: Delphine Chabanne, Murdoch University

An analysis of dolphin genes has revealed information about their past migrations, showing just how crucial migrants might be for other populations.

A new study by an international team of researchers found that one Western Australian dolphin population was once an important source of migrants – that is, dolphins that support nearby populations.

The researchers analysed the genetic variants in [bottlenose dolphins](#) (*Tursiops aduncus*) to find out about past dolphin migration.

"These dolphin migrants from Bunbury were likely important in supporting the stability of nearby populations," says lead author Dr. Oliver Manlik, Conjoint Associate Lecturer at UNSW Sydney, who is also an assistant professor at the United Arab Emirates University.

"Dolphins have no borders, and persistence of [animal populations](#) often depends on a 'rescue effect', a scenario in which a declining population is 'rescued' from extinction by immigrants from other populations," he explains.

That's why it is important for scientists to identify 'source' populations, populations from which individuals emigrate, and 'sink' populations who receive the migrants.

"These coastal dolphins do not go on any migration 'journeys', like some whales and offshore dolphins do," Dr. Manlik says.

"Rather, they disperse, which means that some dolphins move from one population to another and reproduce with individuals of the other population, and leave their offspring and genes behind—that's how we detected this pattern."

Worryingly, a previous study had shown that the Bunbury dolphin population may decline because they were not producing enough offspring.

"If that is now true, then the Bunbury dolphins may no longer be able to continue supplying emigrants to support other populations, putting these other dolphin populations at risk as well," explains Dr. Manlik.

The previous study also showed that reproduction is key to the persistence of the Bunbury population, and, if undisturbed, it is possible that the Bunbury dolphins produce more offspring again.

"In that case, the Bunbury population might be OK, and will be able to support its neighbouring populations again," Dr. Manlik says.

Dr. Delphine Chabanne of Murdoch University, a co-author on the study, has been studying these dolphins in Australia for more than a decade.

"For the conservation of these dolphin populations, it is important to monitor them closely, and in particular, to keep a close eye on the reproduction of the Bunbury dolphins," she says.

Co-author Professor Bill Sherwin from UNSW adds: "Genes are information. They can tell us whether populations are isolated or connected, and shed light on migration patterns of the past – important information for wildlife conservation.

"We now know that we need to focus on the Bunbury dolphins, and especially on their reproductive rates, to protect several [dolphin populations](#)."

The new study, published in the journal *Marine Mammal Science*, is an illustration of how modern genetics can use information from genes to gain a glimpse into the past, unravelling past migration patterns of animals, and therefore help inform the future.

More information: Oliver Manlik et al. Demography and genetics suggest reversal of dolphin source-sink dynamics, with implications for conservation, *Marine Mammal Science* (2018). [DOI: 10.1111/mms.12555](https://doi.org/10.1111/mms.12555)

Oliver Manlik et al. The relative importance of reproduction and survival for the conservation of two dolphin populations, *Ecology and Evolution* (2016). [DOI: 10.1002/ece3.2130](https://doi.org/10.1002/ece3.2130)

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