Lack of diversity a weak link for dolphins

4 July 2014, by Kerry Faulkner

Mr Brown says both species are listed as ‘near threatened’ by the International Union for Conservation of Nature (IUCN) but a lack of data about their numbers and characteristics prevents a more rigorous assessment. Credit: Alex Brown/MUCRU

Limited gene flow between groups of Australian snubfin and Indo-Pacific humpback dolphins in WA's north may make them more vulnerable to the environmental impacts of coastal industrial developments.

Researchers tested 110 skin tissue samples from dolphin populations at Cygnet Bay, Roebuck Bay, Dampier Archipelago and North West Cape in the Kimberley and Pilbara between 2008 and 2013.

They used mitochondrial DNA (mtDNA) sequence data and nuclear microsatellite markers from small tissue samples taken from snubfin (Orcaella heinsohni) and humpback (Sousa chinensis) dolphins by a dart targeted near the dorsal fin.

The investigation was led by Murdoch PhD student Alex Brown and University of Groningen's Dr Anna Kopps.

Mr Brown says the study concluded that rather than existing in large and mixed populations, the dolphins live in metapopulations of small, genetically isolated population fragments.

As such they are vulnerable to genetic characteristics associated with such populations including the accumulation of deleterious mutations, the loss of genetic diversity through random genetic drift, inbreeding depression and a reduced ability to adapt to environmental change.

Mr Brown says both species are listed as 'near threatened' by the International Union for Conservation of Nature (IUCN) but a lack of data about their numbers and characteristics prevents a more rigorous assessment.

Dolphins impacted by industrial work

He says the new research provides valuable information on their vulnerability in a region where areas like the Burrup Peninsula are dense with heavy industry, shipping, dredging and construction.

"With so little data on coastal dolphins in this region, the potential impact of these developments remains unknown," Mr Brown says.

"This research is one piece of the puzzle, which is trying to determine population structure.

"The next thing we are working on is the abundance of animals in these areas and estimating how big these populations are.

"The consensus among the dolphin scientific community is they would qualify for a higher level of IUCN protection because it appears they are sufficiently rare—there are estimated to be considerably less than 10,000 mature individuals.

"But without a proper understanding of how many there are, we are not able to do a proper assessment and that's one of the driving factors of my PhD and this research."

The fieldwork revealed the first recorded snubfin-humpback hybrid which may be the result of living in small isolated populations and consequent lack

of same-species breeding opportunities.

Mr Brown says it is possibly a 'chance case' rather than one which has significant evolutionary implications but it does highlight how little is known about the animals.

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