

Sea snake at risk of being lost in hybrid swarm

February 17 2014, by Robyn Mills

A University of Adelaide-led project has found that the endangered dusky sea snake is even more at risk of extinction than thought because of surprising cross-species hybridisation.

This follows a pattern of unexplained drastically declining populations of sea snakes in the reefs of the Timor Sea in north-west Australia over the past 15 years.

Published in the journal *Biological Conservation*, the study found that at one of only two remaining coral reefs where they are still found, dusky sea snakes had hybridised almost completely with the closely related olive [sea snake](#).

"Genetically-pure duskyies might now only be found at one remaining reef- the isolated Scott Reef, an area of about 160 square kilometres in the Timor Sea, about 300km north of the Kimberley coast," says project leader and lead author Dr Kate Sanders. "Such loss of biodiversity because of hybridisation is an important conservation problem and there are dire implications for the conservation status of the dusky sea snake."

Referred to as the "miners' canary" of coral reef health, sea snakes bear live young rather than eggs and are the only fully aquatic reptile.

The sea snakes are Australian native animals. They evolved in Australia from a land snake ancestor and have been highly successful in adapting to a marine environment. There are 62 species, found mostly in Australia

and South-East Asia with the greatest diversity previously on the isolated reefs of the Timor Sea.

"Five Timor Sea reefs previously supported the highest diversity and abundance of sea snakes in the world, but the largest reef, Ashmore, has lost all of its nine resident species over the past 15 years," says Dr Sanders.

In this study the researchers collected and released sea snakes on the remaining four reefs by snorkelling with nets. They used DNA fingerprinting to show that endangered dusky sea snakes frequently interbreed with closely related olive sea snakes which are much more locally abundant and wide ranging.

"These reefs are largely undisturbed by fishing and habitats have remained intact so we had assumed the populations would have been stable," Dr Sanders says. "But when we surveyed at Hibernia Reef, we were very surprised to find interbreeding at that level, with the two species almost completely hybridised to produce a so-called 'hybrid swarm'.

"Hibernia is one of only two reefs that have supported dusky sea snakes following their extinction at Ashmore Reef. Now it seems that they are on the path of genetic extinction at Hibernia too. Olive and dusky sea snakes diverged about 500,000 years ago. The loss of biodiversity through this 'reverse speciation' is of particular concern because we don't know what has driven this change on our reefs. It certainly requires close monitoring and further investigation."

More information: Kate L. Sanders, Arne R. Rasmussen, Michael L. Guinea, High rates of hybridisation reveal fragile reproductive barriers between endangered Australian sea snakes, *Biological Conservation*, Volume 171, March 2014, Pages 200-208, ISSN 0006-3207,

[dx.doi.org/10.1016/j.biocon.2014.01.013](https://doi.org/10.1016/j.biocon.2014.01.013).

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