

Aestivating fish face extinction due to climate change

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Two endangered Western Australian fish species are facing a battle for survival due to habitat changes caused by the hotter and drier climate, a Murdoch University researcher has found.

Garry Ogston from the Centre for *Fish and Fisheries* Research said salamanderfish had been lost from 33 per cent of sites in which they were historically present, while black stripe minnows had been lost from 28 per cent of sites. Both are endemic to south west WA.

Mr Ogston, who studied the fish for his Honours research, said further losses should be expected as climate models predict increasing [water temperatures](#) and declining rainfall.

The two [species](#) are aestivating, which means they undergo periods of dormancy during dry spells. They survive over the summer by burrowing into sediment when the wetlands dry. As such they are particularly vulnerable to the impacts of climate change, said Mr Ogston.

"These species are the only two aestivating fish that we have here in WA," said Mr Ogston. "The ability to aestivate is a fascinating trait, similar to hibernation.

"The occurrence of both species is associated with lower water temperatures and pH, and higher oxidation-reduction potential. And these factors are influenced by the local climate.

"The declines we identified were quite alarming and active intervention is required to help save these species."

Based on his findings, Mr Ogston said artificial ponds and wetlands could be the key to protecting the species from further decline.

"Many of the pools we found them in were already artificial pits which were created when soil was removed for raising roads. The naturalness of the wetland did not seem to impact on the presence or absence of the species," he said.

"For salamanderfish, the depth of pools in winter and the length of dry period were significant for their presence. From satellite imagery, and evidence in the field, we observed the surrounding wetlands drying long before the artificial pits, and we believe this is attributed to the increased depth of the pools due to the excavated soil.

"In our drying climate, with less rainfall and increased dry season, the longer we can allow these pools to stay filled with water, the more hope there is for both species."

Mr Ogston studied populations of the fishes from Augusta to Albany, with many of the natural and artificial wetlands that contained them located around Northcliffe. The black stripe minnow also has some outlying populations including two north of Perth. This fragmentation is another risk factor for the fishes, he said.

Mr Ogston said there were plenty of steps that could be taken by people at a community level to help the salamanderfish and the black stripe minnow.

"In our drying [climate](#), being water wise is a major step. The less strain we put on our freshwater systems, the better for the sake of all our

freshwater species," he said.

"Many of the wetlands home to salamanderfish and black-stripe minnow are in conservation reserves, however, others border farmlands, so working with landowners regarding fertiliser runoff, and restricting access for livestock would also be key in helping protect these pools."

In the future, Mr Ogston said he and colleagues from the Centre for Fish and Fisheries Research were hoping to study the design and creation of artificial pits that would serve a double purpose as important refuges for fish like the salamanderfish and the black stripe minnow, as well as being bushfire water points.

More information: Garry Ogston et al. Living on burrowed time: Aestivating fishes in south-western Australia face extinction due to climate change, *Biological Conservation* (2016). [DOI: 10.1016/j.biocon.2016.01.008](https://doi.org/10.1016/j.biocon.2016.01.008)

Provided by Murdoch University

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