

Study probes how sewage affects oceans

It's only a small fry, but research on the hula fish could have big implications for our coastal waters, according to Dr Iain Suthers, a Senior Lecturer at UNSW's Centre for Marine and Coastal Studies.

Research is under way at the centre to develop the little hula fish as a bioindicator species for Australia's temperate rocky reef zones.

This means that the fish can be used to gauge water quality and to monitor the effect of pouring sewage into the sea.

It could allow environmental agencies, for the first time, to determine whether specific sewage outfalls are causing damage to the marine environment.

The research, funded by the Sea World Research and Rescue Foundation, follows on from a study recently carried out by PhD student Adam Smith and supervised by Dr Suthers – the first of its kind in Australia – which revealed that cliff-face sewage outfalls in Sydney's coastal waters caused a significant decrease in hula fish populations.

The PhD project also compared the health of hula fish near outfall sites, at Potters Point near Cronulla and Rosa Gully near Vacluse, with fish living away from outfalls, at Gordons Bay and North Head.

It found that hula fish near the outfall sites decreased in abundance and that the fish there were smaller and skinnier than those at the control sites.

Fish at the outfall sites also had an unusual left to right asymmetry in the size and shape of their otoliths, or ear bones, which is a sign of environmental stress.

The project will also rely on a new method of determining the nutrient source of the hula fish diet, by measuring the occurrence of stable carbon and nitrogen isotopes in muscle and liver tissue, which is being researched at the centre by PhD student Troy Gaston.

These isotopes tell researchers whether a fish's diet is sourced from nutrients found in natural oceanic upwellings or from coastal

outfalls, because the two sources of food have completely different isotopic signatures.

Dr Suthers said the hula fish could be used as a bioindicator species for the temperate rocky reef habitat, a vast area which spans the southern coastline, from the NSW/Queensland border around to Western Australia.

He said hula fish were an ideal bioindicator because they did not migrate and they fed on plankton, so their nutrients came from their watery environment.

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Dr Suthers also plans to extend the research to look at how sewage outfalls affect the health of commercial fish such as bream and snapper.

"The three major outfalls off Sydney discharge about 1,200 megalitres of nutrient-rich waste a day into our coastal waters – a flow equivalent to that of NSW's largest coastal river, the Clarence. Yet we have no idea how this is influencing our fisheries," Dr Suthers said.

"Our isotope research will allow us to indicate the source of nutrients in the marine food chain and to monitor how rapidly those nutrients are being recycled into our own diet.

"Fishing from rocks is one of NSW's most popular recreational activities. Yet people have little idea what effect our sewage outfalls have on the fish community or the marine environment.

"This is the first time someone has had the guts to look at food chain dynamics in fish in Australia and to question the effect of sewage on that food chain."

● Alison Laferla



Dr Suthers and the hula fish . . . small fry with an important role.