

# Shellfish reefs improve marine biodiversity

July 25 2023

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Juvenile whiting are common in Port Adelaide waters where shellfish beds are recovering. Credit: Brad Martin/Flinders University

Local shellfish including native razorfish and flat oysters, and feral pacific oysters, are showing strong ecosystem benefits for marine species within the Port River estuary ecosystem in Adelaide—with Flinders University researchers also discovering an exotic whelk that has found a foothold in the popular coastal area.

Environmental monitoring of the Port Adelaide marine environment, which features nearby natural assets including remnant mangrove forests and the International Bird and Dolphin Sanctuaries, has seen many changes in [water quality](#) and [species](#) composition over the years.

This led Flinders University Ph.D. candidate Brad Martin, from the Ecosystem Resilience research group, to conduct fieldwork of the different [shellfish](#) reefs throughout the Port River earlier this year to assess the species using these poorly understood habitats.

Following the outbreak of disease in feral oysters, the South Australian Government introduced bans on collecting shellfish including oysters, mussels and razorfish in the Port River in 2018. Around the same time, local community groups also began native flat oyster restoration projects, with native shellfish reefs once common to Australia's coastline.

As well as finding high numbers of native fishes and invertebrates, the fieldwork also found several [invasive species](#) using the feral oyster habitat, including the first detection of Hercules club whelk (*Pyrazus ebeninus*), which was "likely introduced through the ballast water from a shipping vessel."

"At present these intertidal species are unlikely to have significant negative impacts on other species, but could in spread in future beyond the Port River," he says.

"The establishment of species from the east coast like the mud whelk and Sydney cockles is also an indication of warmer conditions. Until recently, these species only appeared in the SA fossil record and had died out during one of the previous ice ages."

The Hercules club whelk is a large marine snail that can grow up to

10cm in length and are common to estuaries on the eastern seaboard.

He says the benefits of more shellfish in the area include improved water quality from their filter feeding, and providing habitat and nursery grounds for other species including recreationally important ones like whiting, bream and blue swimmer crabs.

Bradley Martin's research work from the Port River "Density and death: the habitat function of intertidal razorfish (*Pinna biocolor*) beds" recently won the Fisheries Research Development Corporation (FRDC) Prize for Best Oral Presentation at the [Australian Marine Sciences Association](#) conference on the Gold Coast.

His supervisor Dr. Ryan Baring also presented "Sediment stabilization of the restored shellfish reefs," from research conducted on the Glenelg shellfish [reef](#), with Associate Professor Graziela Miot da Silva, from the Beach and Dune Systems Laboratory at Flinders University

In the two years since construction, Dr. Baring says oysters are now growing on the restored Glenelg shellfish reef.

"The restored Glenelg shellfish reef has lots of oysters growing that are contributing to an ecologically important nutrient sink on the seafloor, which is important for turning bad nutrients from stormwater runoff into useful nitrogen in the sea and atmosphere," he says.

"We have also identified a reliable hydrodynamic and sediment model to performance check and fine-tune the Glenelg Shellfish Reef to improve its ability to stabilize sediments that are extremely challenging to manage along highly developed metropolitan coastlines under climate change."

- Native oyster (*Ostrea angasi*) reefs were once common to

Southern Australia until the 1940s when they declined due to overfishing, disease and habitat modification. In South Australia shellfish reefs occurred in coastal shorelines and estuaries, covering rocky reefs and the surface of razorfish (*Pinna bicolor*). Today less than

Citation: Shellfish reefs improve marine biodiversity (2023, July 25) retrieved 2 May 2024 from <https://phys.org/news/2023-07-shellfish-reefs-marine-biodiversity.html>

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