

Fostering the repair of Australia's saltmarshes and shellfish reefs

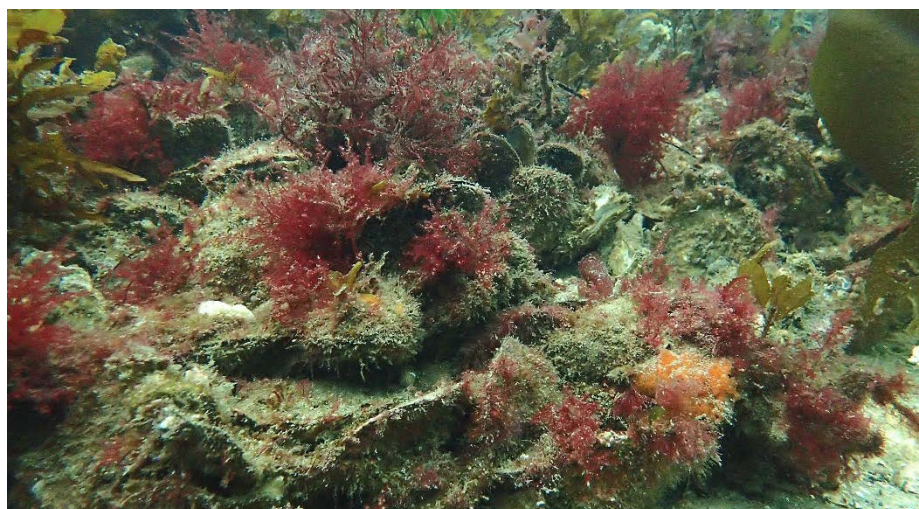
Scientists are charting the challenges and benefits of repairing nearshore ecosystems to inspire and guide the resurgence of these wellsprings of marine health and productivity.

Shellfish reefs and saltmarshes are vital to the health of Australia's bays and estuaries, supporting marine life and fish production, regulating water quality and curbing coastal erosion. But these valuable nearshore ecosystems are in serious decline due to coastal development and activities such as intensive agriculture. Reparation efforts have begun in some locations, with the promise of significant benefits. Further projects, however, hinge on increasing awareness and joint investment among governments, businesses and the community.

A collaborative study jointly led by TropWATER, James Cook University and The Nature Conservancy is distilling knowledge of shellfish reefs and saltmarshes, their distribution and ecology, to articulate the environmental, social and economic benefits of conservation and repair, as well as to provide practical guidance for repair. The study is part of the National Environmental Science Programme Marine Biodiversity Hub, an Australian Government initiative that aims to improve the knowledge of key marine species and ecosystems to underpin their management and protection.

Shellfish reefs ripe for reparation

Just as coral reefs are critical in tropical waters, shellfish reefs once formed the backbone of temperate coasts: filtering water, taking up nutrients, processing fine sediments and providing habitat for fish and other marine life. A 2009 report by The Nature Conservancy, [Shellfish Reefs at Risk](#), concluded that



A healthy oyster reef in Tasmania. Image: Chris Gillies, The Nature Conservancy

shellfish reefs were the world's most threatened marine habitat, with 85% of oyster reefs worldwide lost or functionally extinct. Despite this decline, opportunities existed for the cost-effective conservation, restoration and management of remnant reefs.

The United States is a leader in the repair of shellfish reefs, with many projects involving public-private partnerships. One example is the large-scale repair of oyster reefs in the Chesapeake Bay region of Maryland and Virginia.

In Australia, interest in reparation is mounting, as indicated by the Shellfish Reef Restoration Network established in early 2015. At Queenscliff in Victoria, native flat oysters are being raised to help repair Port Phillip Bay reefs that over the years have succumbed to lime harvesting, dredge fishing and pollution and disease that accompanied Melbourne's development.

Now that dredge fishing has ceased and pollution is much reduced, researchers suggest it is time for reparation. [The Port Phillip Bay](#) project involves the Victorian Government (Fisheries Victoria), The Nature Conservancy and Albert Park Yachting and Angling Club. This pilot, and the expansion of such work in Australia, is inhibited by a poor understanding of Australian shellfish reefs and the key ingredients required to ensure success.

The shellfish component of this study will conduct research reviews and expert workshops through the Shellfish Reef Restoration Network to synthesise existing knowledge. It will build a picture of what Australia's shellfish reefs were like before their decline: the species they harboured, indigenous use, and the value of ecological services provided in terms of fish production, water quality regulation, and coastal protection.

The project will also chart the decline and condition of shellfish reefs across southern Australia, and identify criteria and priorities for reparation.

Saltmarshes a haven for prawns

Saltmarshes act as carbon sinks and provide foraging habitat for migratory birds, and nursery grounds for fishes and prawns. Many of the fish and prawn species caught by anglers and commercial fishers spend part of their lives there. Australia's sub-tropical and temperate coastal saltmarsh is already listed as vulnerable under the *Environment Protection and Biodiversity Act 1999* and as endangered under the New South Wales *Threatened Species Conservation Act 1995*.

The saltmarshes component of this study will conduct research reviews and case studies to distill what is known about the location, ecology and condition of saltmarshes in southern and eastern Australia and identify priority opportunities for repair. It will identify key prawn species (such school prawns and banana prawns) that can be used as indicators of ecological health and productivity and as a focus of community awareness and education.

A business case that demonstrates the value of repair will be developed to engender investment in rejuvenating damaged and sometimes now tidally isolated saltmarshes so they once again can produce prawns and other key components of the marine food chain.



Old dead oyster reef at Geelong, Victoria. Image: Paul Hamer, Fisheries Victoria



Mussel bed restoration plots in Port Phillip Bay. Image: Paul Hamer, Fisheries Victoria

Guaranteed returns on investment

Research has shown that investment in the repair of shellfish reefs and saltmarshes offers an outstanding return on investment, with clearly demonstrated outcomes in [fisheries productivity](#) alone. An Australia-wide study of key repair opportunities found that the estimated costs of \$300 million in repair would be paid back just in increased food production in less than five years.

The improved understanding of the function, status and value of repairing shellfish reefs and saltmarshes generated by this study will provide a basis for prioritising and scoping repair investment opportunities, and devising associated data collection, analysis and reporting procedures. The results will be communicated to natural resource and fisheries management agencies, recreational and commercial fishing groups, the aquaculture industry, the community and Traditional owners in research locations.



The NESP Marine Biodiversity Hub is funded by the Australian Government's National Environmental Science Programme. Our goal is to assist decision-makers to understand, manage and conserve Australia's environment by funding world-class biodiversity science.

Further information

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