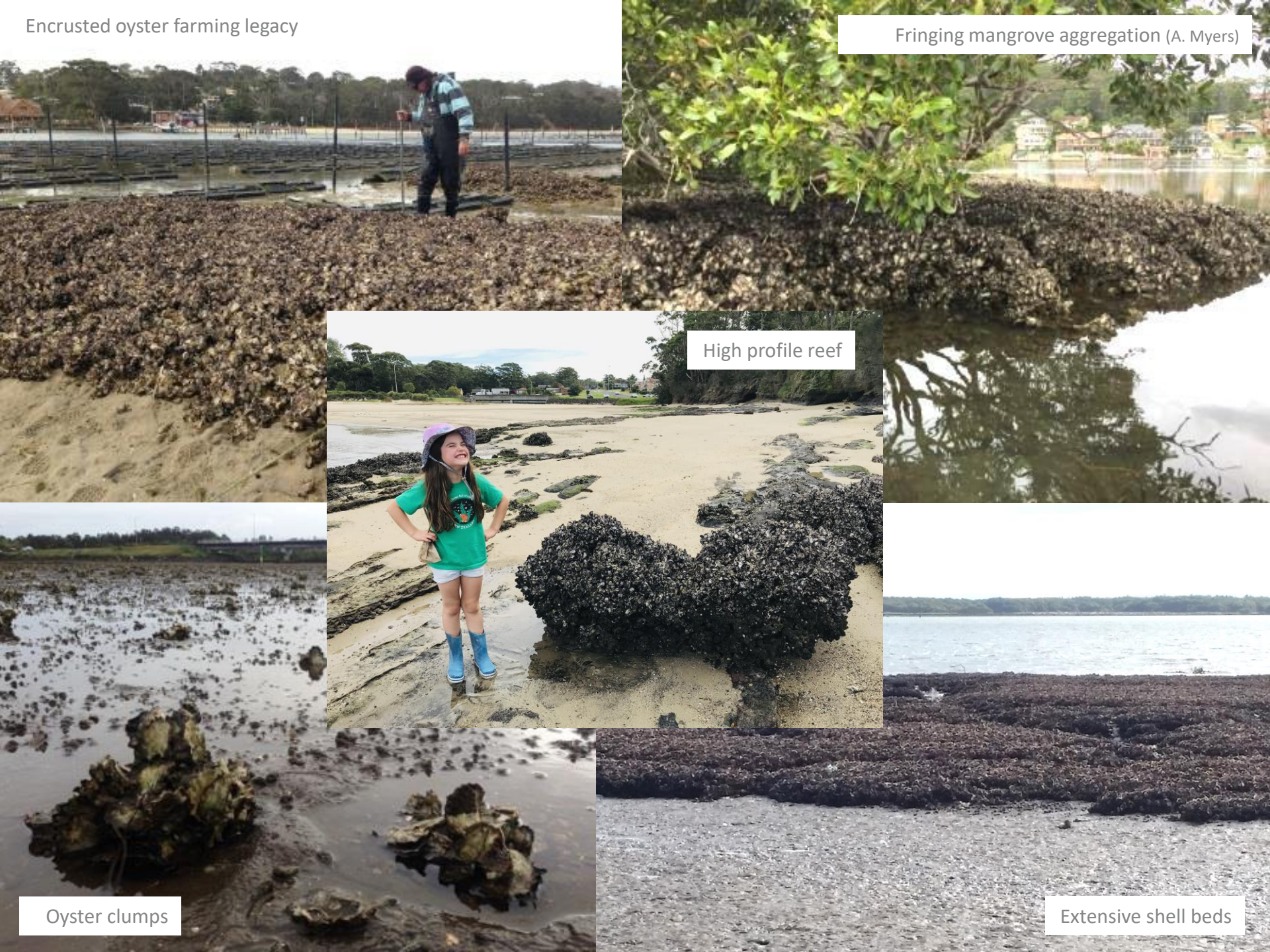
MARINE ESTATE MANAGEMENT AUTHORITY

Oyster Reef Restoration in NSW

NSW OYSTER REEF RESTORATION PROJECT

Jillian Keating, Kylie Russell, Charlotte Jenkins, Jon Thorne, Vicky Cole & Dave Harasti


Encrusted oyster farming legacy
Fringing mangrove aggregation (A. Myers)
High profile reef
Oyster clumps
Extensive shell beds

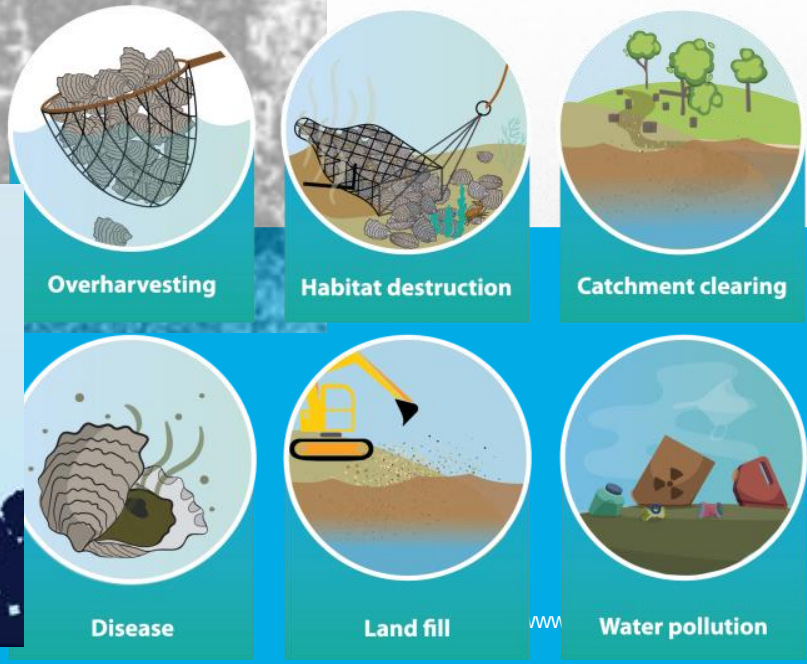
The loss of our Great Australian Oyster Reefs has been likened to losing the Great Barrier Reef today. Many people are unaware of this loss or the many benefits oyster reefs once provided.

Shellfish reefs: Australia's untold environmental disaster

Virtually all of Australia's shellfish reefs have disappeared, making them the co...

Virtually all of Australia's shellfish reefs have disappeared, making them the country's most threatened ocean ecosystem, scientists said Thursday, calling for more investment to rescue important marine habitats.

What happened to our oyster reefs?



What is **oyster reef restoration**?

- Reintroduction of hard substrate
- Known good levels of natural spat-fall (usually)
- Formation of a self-sustaining complex ecosystem forms and ecological function

What is happening **in NSW**?

Addressing the knowledge gap:

- Large-scale shellfish reef restoration trials – different areas, techniques, species
- Knowledge gathering – science, mapping, history, community
- Engaging the community and building social licence
- Building capacity of future practitioners – Guidelines, “How to” factsheets for CMPs, mapping

NSW's largest restored oyster reef – Port Stephens

NSW's largest restored oyster reef – Port Stephens

RESULTS STAGE 1&2: December 2019 – December 2021

Marine Estate Management Strategy

NSW GOVERNMENT

Port Stephens Shellfish Reef Restoration

Delivering the first large-scale shellfish reef restoration project in NSW

Located in two remote parts of the Port Stephens-Great Lakes Marine Park in the traditional lands of the Worimi people, the shellfish reef restoration project aims to restore natural shellfish reef habitat, enhance water quality and boost local fish numbers.

Nearly **$1.5M*** total project delivery

7.5 ha or **11** soccer pitches of SYDNEY ROCK OYSTER REEF created

7,500 tonnes of ROCK and **180** m³ of RECYCLED PORT STEPHENS OYSTER SHELL used to create reef bases

159 days reef construction

5+ LOCAL construction positions created by the project

35+ STAKEHOLDERS DIRECTLY and **75,000+** INDIRECTLY ENGAGED in the project

3,215+ hours of MONITORING the new reefs and analysing the results

www.marine.nsw.gov.au

Over **55 Million** BABY OYSTERS naturally recruited in the first **2** years

Oyster recruits **3/4** the size of wild adult oysters after only **22** months

34 DIFFERENT FISH SPECIES

Equal to that seen at natural reefs

Reefs filtering **~ 7.5 million litres** or **3 Olympic-sized swimming pools** of water AN HOUR

50 X more JUVENILE FISH at NEW REEFS compared to bare sand habitat

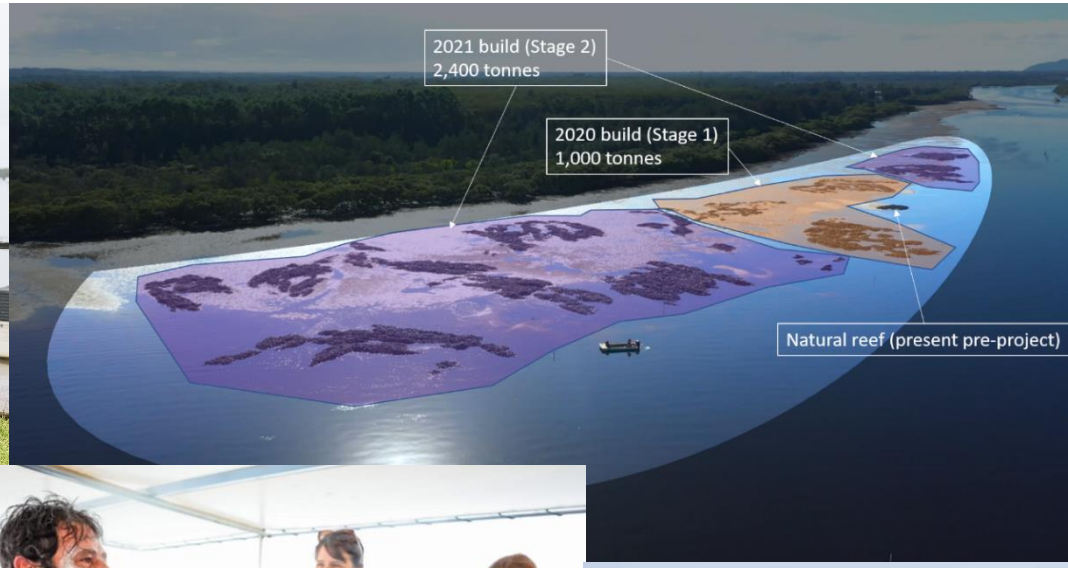
New habitat for over **8 Million** snails and other invertebrates

NSW GOVERNMENT | Australian Government Department of Agriculture, Water and the Environment | The Nature Conservancy Australia | NSW OYSTER REEF RESTORATION PROJECT

*This shellfish reef restoration project was funded by the NSW Marine Estate Management Strategy in partnership with the Australian Government's Reef Builder initiative which aims to protect and restore 13 shellfish reefs across Australia.

Barge and Bridge image: Jay Maartensz. All other images, football and pool icon: NSW DPI. All other icons: flaticon.com
Reference: OUT22/3294

NSW's largest restored oyster reef – Port Stephens



Wagonga Inlet Living Foreshore

Narooma

Prepared for:

The Nature Conservancy Australia

NSW OYSTER REEF RESTORATION PROJECT

NSW GOVERNMENT Department of Primary Industries

eurobodalla shire council

Wagonga Inlet Living Shoreline (WILS)

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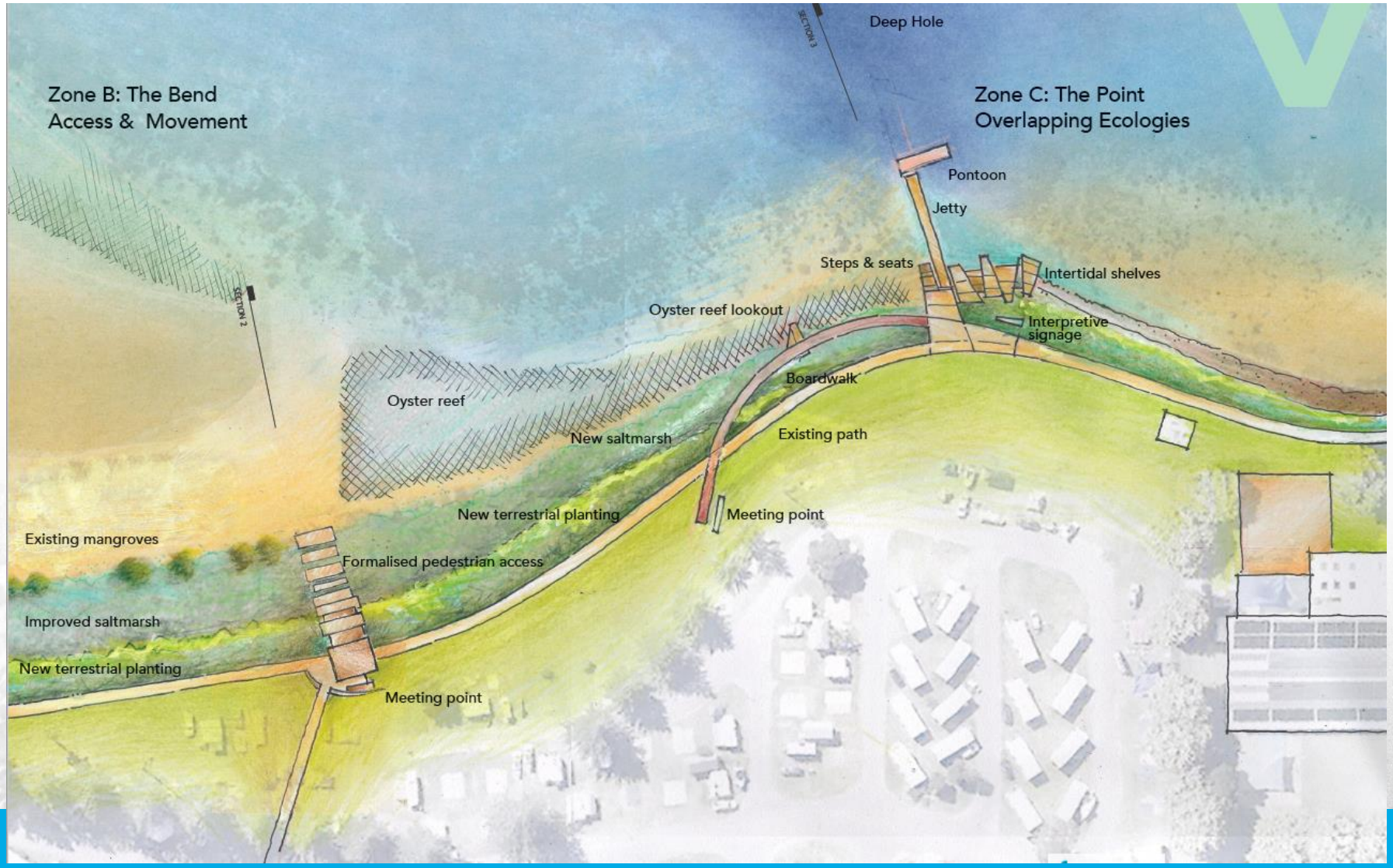
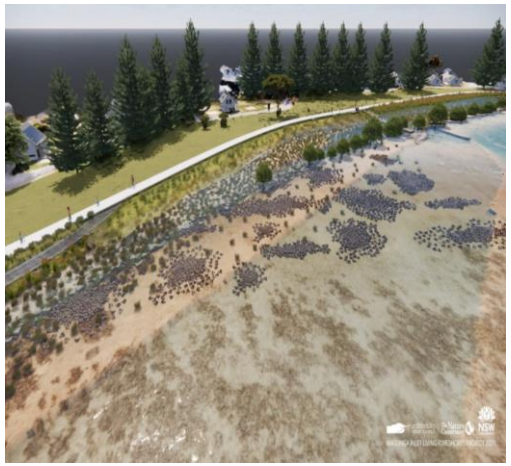


WILS – Intertidal reef + First subtidal Angasi reef restored in NSW

INTERTIDAL OYSTER REEF

- Species: Sydney Rock Oyster
- Depth: intertidal
- Area: ~0.3ha total
- Patches of reef to be interspersed with seagrass

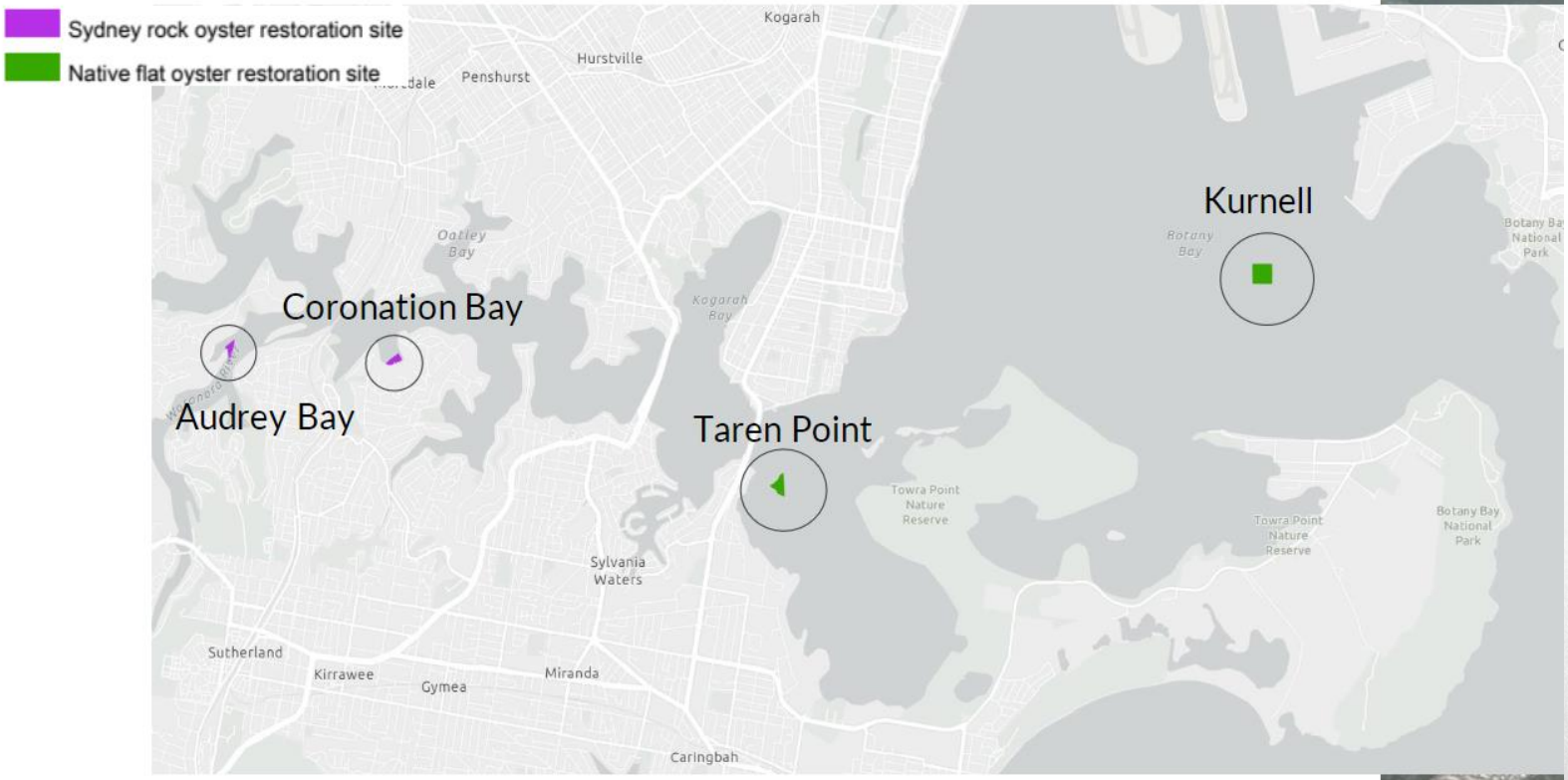


SUBTIDAL OYSTER REEF

- Species: Angasi Oyster
- Depth: subtidal (~7m)
- Area: ~0.1ha total area
- 6 discrete patches with terracotta pipes incorporated for juvenile Black Rock cod habitat

Botany Bay

RESTORATION **SITES**



Hastings and Richmond Rivers

HASTINGS

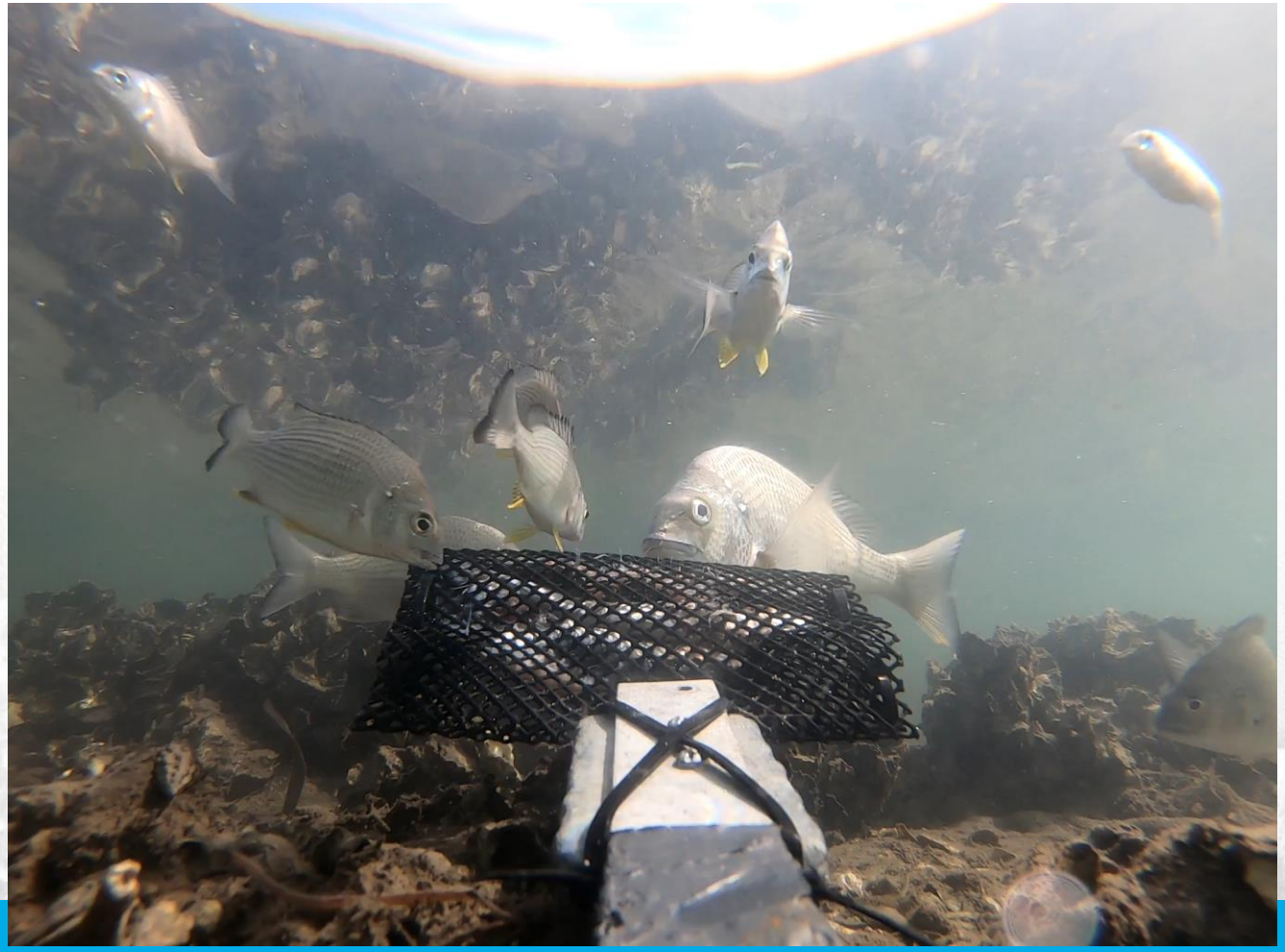
- OWA leading with support from LLS
- DA to be submitted to Port Macquarie Hastings Council
- DPI – monitoring & evaluation

RICHMOND

- OzFish leading
- DA to be submitted to Ballina Council

Knowledge gathering –

Shellfish Reef Science



Knowledge gathering – Industry and community information

Oyster Reef Restoration
NSW Oyster Industry Survey

Survey Results July 2019

Marine Estate Management Authority

Survey Snippets – from January to June 2019 NSW oyster farmers were invited to participate in a survey. Nearly 100 farmers responded; describing 102 oyster reefs and revealing a keen interest (81%) to learn more about oyster reef restoration.

managed for the greatest wellbeing of the community, now and into the future.

BACKGROUND

THE NSW OYSTER REEF RESTORATION PROJECT

The first large-scale Oyster Reef Restoration Project in NSW is focused on restoring one of the most impacted marine ecosystems in Australia - natural oyster reefs, and bringing back the many benefits they once provided. These benefits include filtering and cleaning water, fixing nitrogen, protecting shorelines and providing food and shelter to many marine animals.

Over the last 150 years natural oyster reefs have almost disappeared from our coastline due to the many changes we have made to our waterways coupled with oyster disease. These changes include historical over harvesting, land clearing and pollution.

Oyster reef restoration introduces a hard surface (e.g. shells and/or rock) to the bed of the estuary, in an area of good natural spat-fall to encourage oyster larvae settlement. Over time, given the right conditions, these spat grow and breed, creating a self-sustaining natural oyster reef.

The NSW Oyster Reef Restoration Project is a key action under the NSW Marine Estate Management Strategy (MEMS). This 10 year Strategy aims to deliver *A healthy coast and sea,*

Image 1. 'Encrusted oyster farming legacy' reef type

WHY WAS AN OYSTER INDUSTRY SURVEY NEEDED?

The once significant role of oyster reefs has largely been lost to living memory because many of the oyster reefs were gone long before their extent was well documented. However, recognising the extensive understanding oyster farmers have of the estuaries they work in, NSW DPI invited farmers to participate in an oyster industry survey to:

- Connect with farmers to build current and historical knowledge of oyster reefs.
- Gauge farmer knowledge of natural oyster reefs and oyster reef restoration.
- Determine the level of NSW oyster industry support for future oyster reef restoration projects in NSW.
- Understand industry concerns and draw-on farmers' expertise to improve the practicalities of future oyster reef restoration efforts.

NSW GOVERNMENT

NSW OYSTER REEF RESTORATION PROJECT

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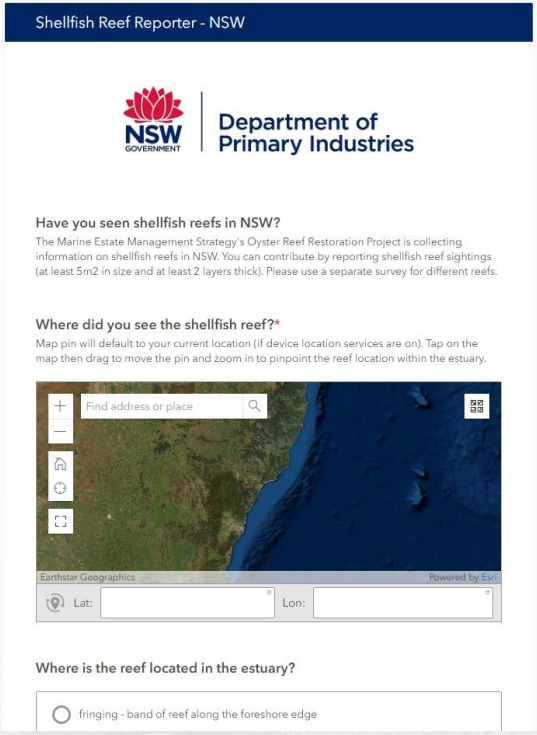
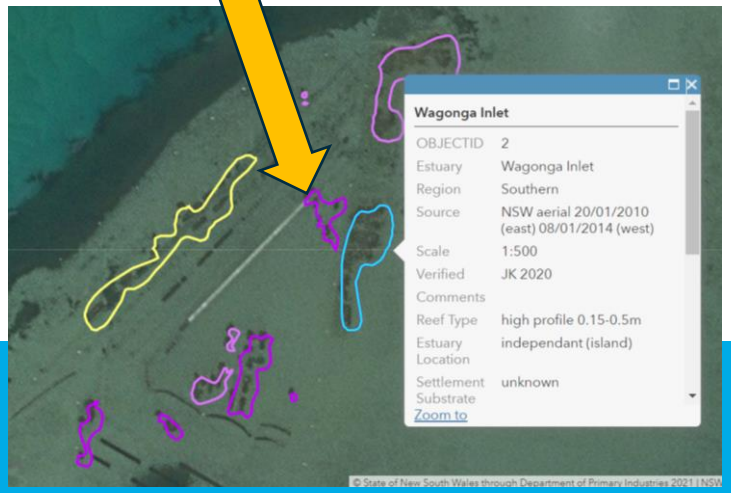
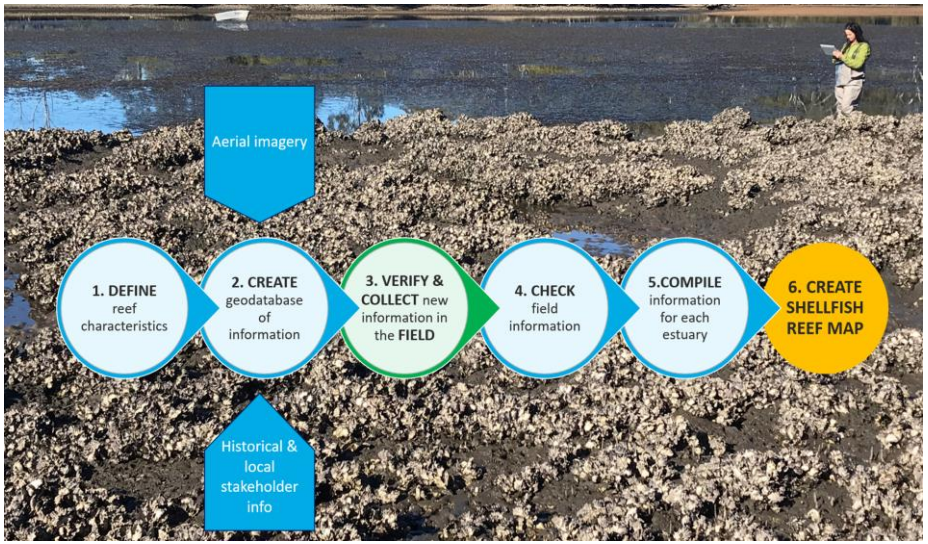
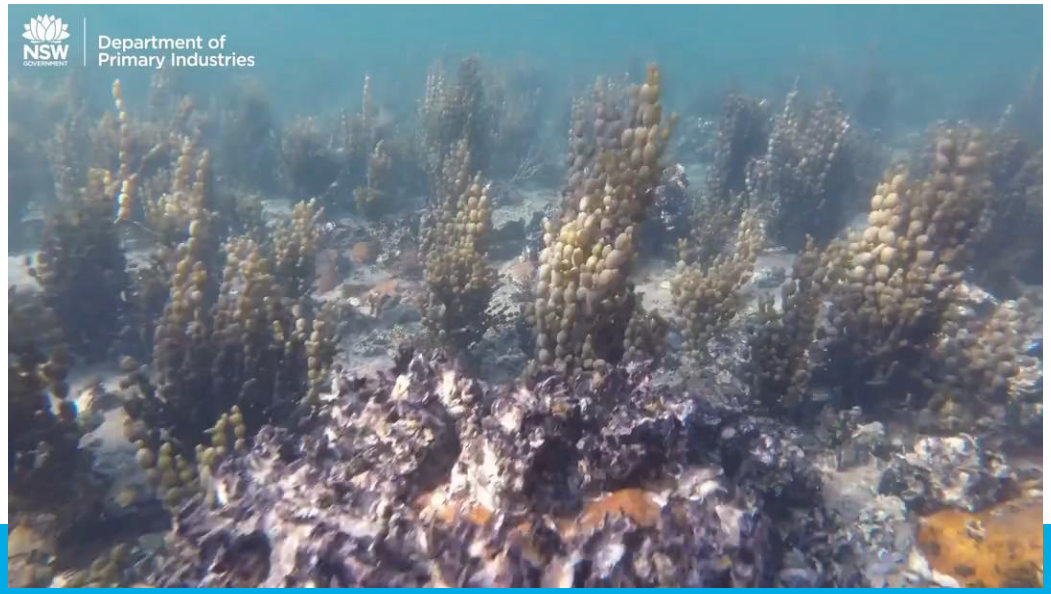


Knowledge gathering –

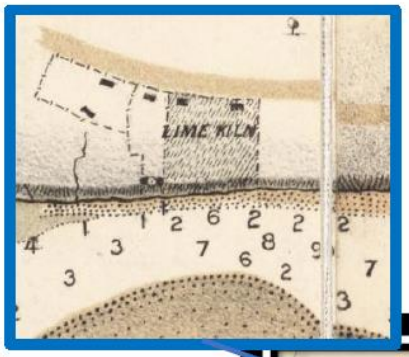
Mapping remnant reefs

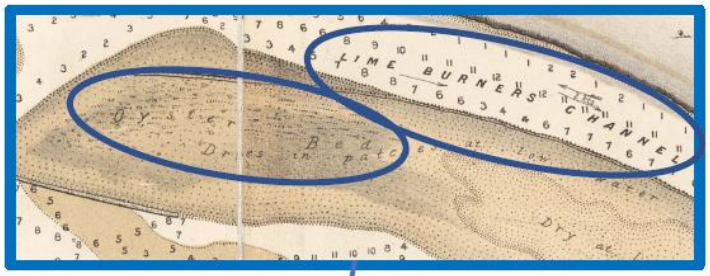


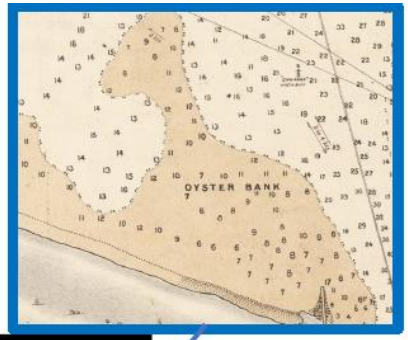




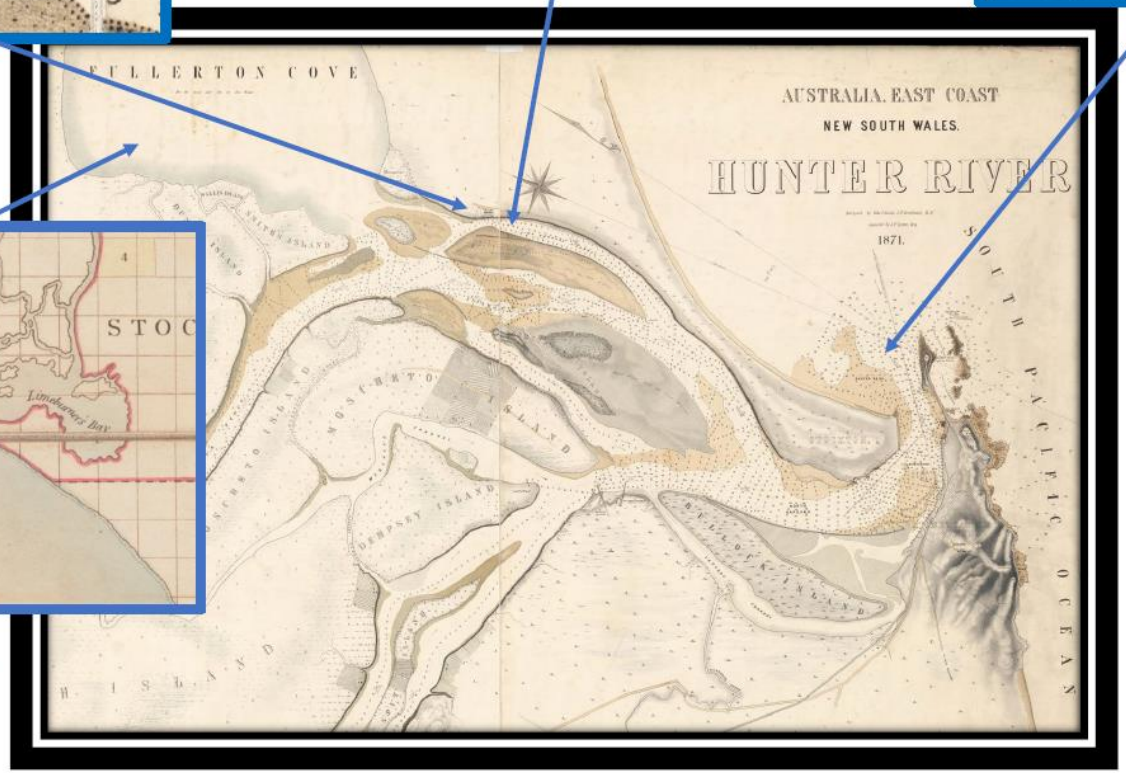
Knowledge gathering – Historical information







The infamous Hunter River oyster bank scuppered many unsuspecting ships



1828 map of the *River Hunter and its branches* names Fullerton Cove "Limeburners Bay"

Knowledge gathering – Cultural values

SCIENCE

Indigenous people sustainably harvested oysters for thousands of years before European colonisation, study finds

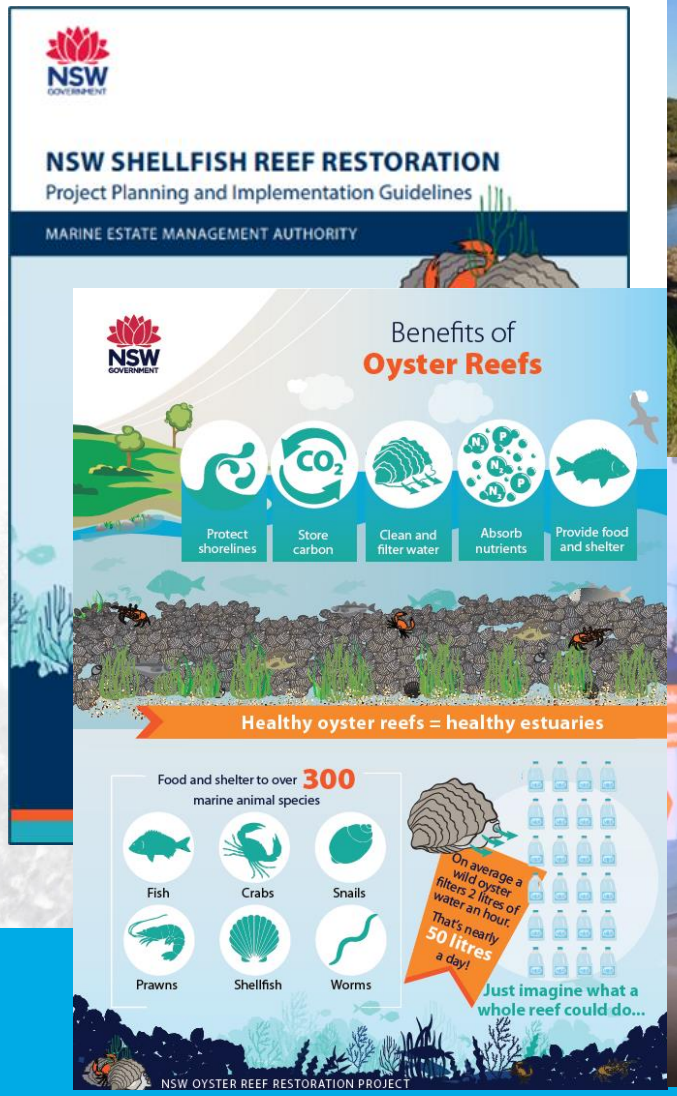
ABC Science / By Genelle Weule

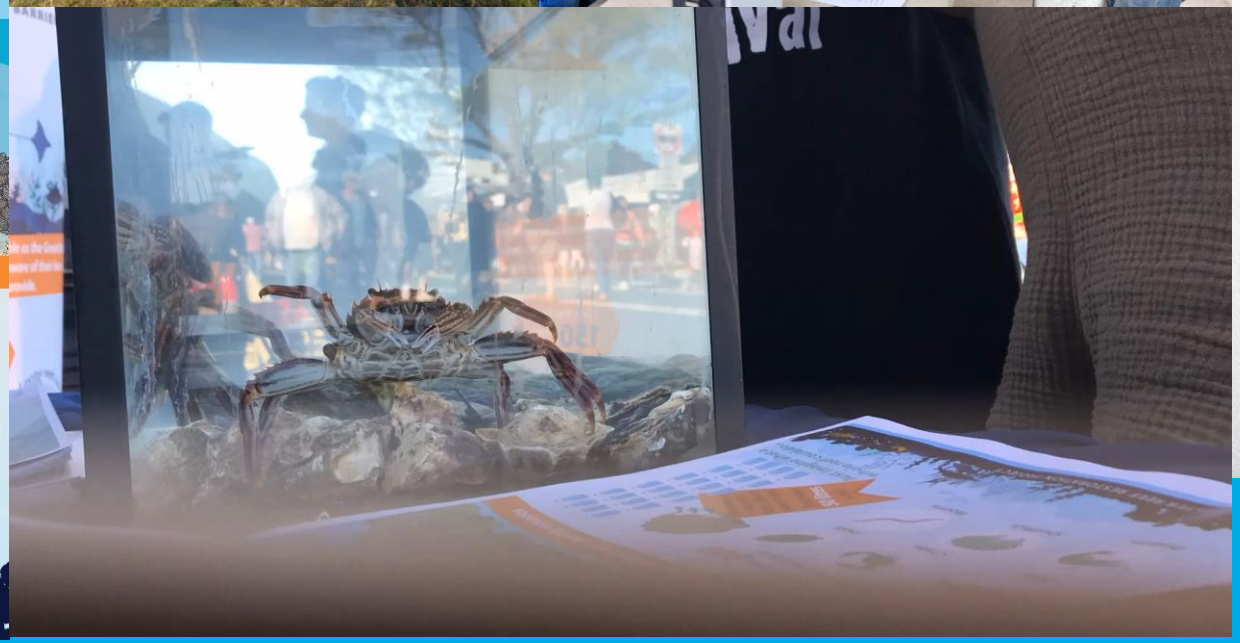
Posted Wed 4 May 2022 at 4:30am, updated Wed 4 May 2022 at 12:16pm

WAGONGA LOCAL ABORIGINAL LAND COUNCIL

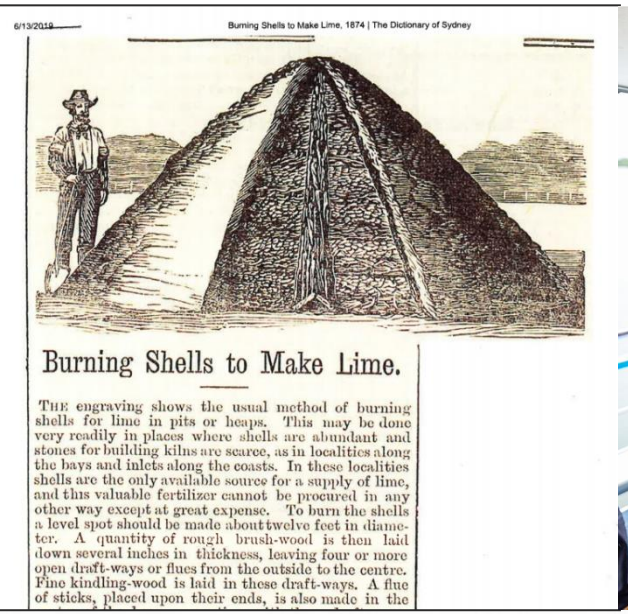
Gamay RANGERS

Engaging the community, building social licence and practitioner capacity





What’s next in NSW?



6/13/2019 Burning Shells to Make Lime, 1874 | The Dictionary of Sydney

Burning Shells to Make Lime.

THE engraving shows the usual method of burning shells for lime in pits or heaps. This may be done very readily in places where shells are abundant and stones for building kilns are scarce, as in localities along the bays and inlets along the coasts. In these localities shells are the only available source for a supply of lime, and this valuable fertilizer cannot be procured in any other way except at great expense. To burn the shells a level spot should be made about twelve feet in diameter. A quantity of rough brush-wood is then laid down several inches in thickness, leaving four or more open draft-ways or flues from the outside to the centre. Fine kindling-wood is laid in these draft-ways. A flue of sticks, placed upon their ends, is also made in the

- More community education and awareness e.g. National Maritime and SEA LIFE Aquarium exhibits
- Further integration of cultural connection to oyster reefs
- Trial other on-ground works e.g. new species – leaf oyster

Thank you!
NSW OYSTER REEF
RESTORATION PROJECT