



Carbon credits, carbon neutral certification and natural capital accounting

Oysters Australia | FRDC 2021-032

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Available material

OPPORTUNITIES AND ASSOCIATED VALUE IN CARBON NEUTRAL CERTIFICATION AND ENVIRONMENTAL ACCOUNTS

2022

STRATEGIC REPORT FOR THE AUSTRALIAN OYSTER INDUSTRY



FRDC Project 2021-032

NineSquared FRDC oysters australia

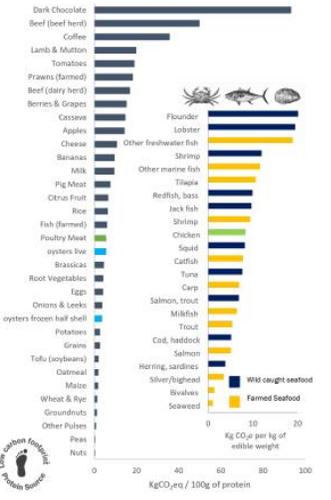
Carbon Neutral Certification for Oyster Farmers

Merimbula oyster farm

To understand the opportunities and value in carbon neutral certification for the Australian oyster industry, FRDC and Oysters Australia commissioned NineSquared Pty Ltd to outline the current policy climate, pathways to certification and knowledge gaps limiting opportunity and growth. This is a synopsis of a wider study.

Summary

- Oyster production is one of the lowest green house gas emission food sources per 100g protein and the lowest amongst land animals, farm fish and crustaceans.
- Oyster farming in Australia has been touted as an area for climate positive investment in sustainable aquaculture, involving zero supplementary feeding, low waste.
- Payments for carbon offsets from oyster farming is not currently available through the Australian Government Emission Reduction Fund.
- Carbon neutral certification may be achieved by minimising and offsetting product and supply chain emissions through the Climate Active framework.
- Further research is needed to accurately understand and quantify carbon footprints to assist the development of methodologies and to ensure integrity and transparency of sustainability claims.



Carbon footprints of different dietary proteins on the global market. It does not necessarily reflect Australian conditions.

FRDC Project 2021-032
2021-032 Provision of strategic advice to Oysters Australia - Identifying opportunities and associated value for the Australian oyster industry in carbon neutral accreditation and environmental accounts is supported by funding from the FRDC on behalf of the Australian Government.

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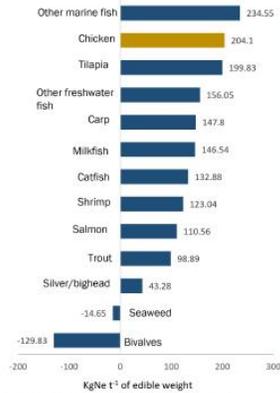
Ecosystem Services and Environmental Condition Accounting for Oyster Farmers

Merimbula Bay Rock Oyster Farm

Oyster aquaculture is well-known to provide a suite of ecosystem services and benefits, including the provision of aquatic habitat and nitrogen removal. In recognition of these benefits, FRDC and Oysters Australia commissioned NineSquared to identify opportunities for the oyster industry in the emerging field of ecosystem service and environmental condition accounting. This is a synopsis of a wider study.

Summary

- The oyster industry outperforms many other sources of land-based protein when viewed from an environmental stress perspective. This can enhance the potential opportunities and role that the oyster industry could play within sustainable diets and shifting demand from relatively high to low stressor foods. Valuing ecosystem services and tracking environmental condition over time allow for these benefits to be measured and communicated.
- Ecosystem services accounting provides a finance-based platform for quantifying natural goods and services to demonstrate the economic benefits of biodiversity and the significance of its loss.
- Environmental condition accounting can help to show the positive/negative effects of oyster aquaculture on ecosystem assets and services over time.
- Recent studies indicate that bivalve aquaculture is associated with higher abundance and species richness of wild macro-fauna when compared to both seaweed farms and reference sites highlighting the role that oyster farms can play as a habitat supporting service.



Aquaculture nitrogen emissions showing bivalves as one of two farmed seafoods which remove, rather than produce nitrogen. Chicken is included for comparison as the "lowest-carbon" land-based meat.

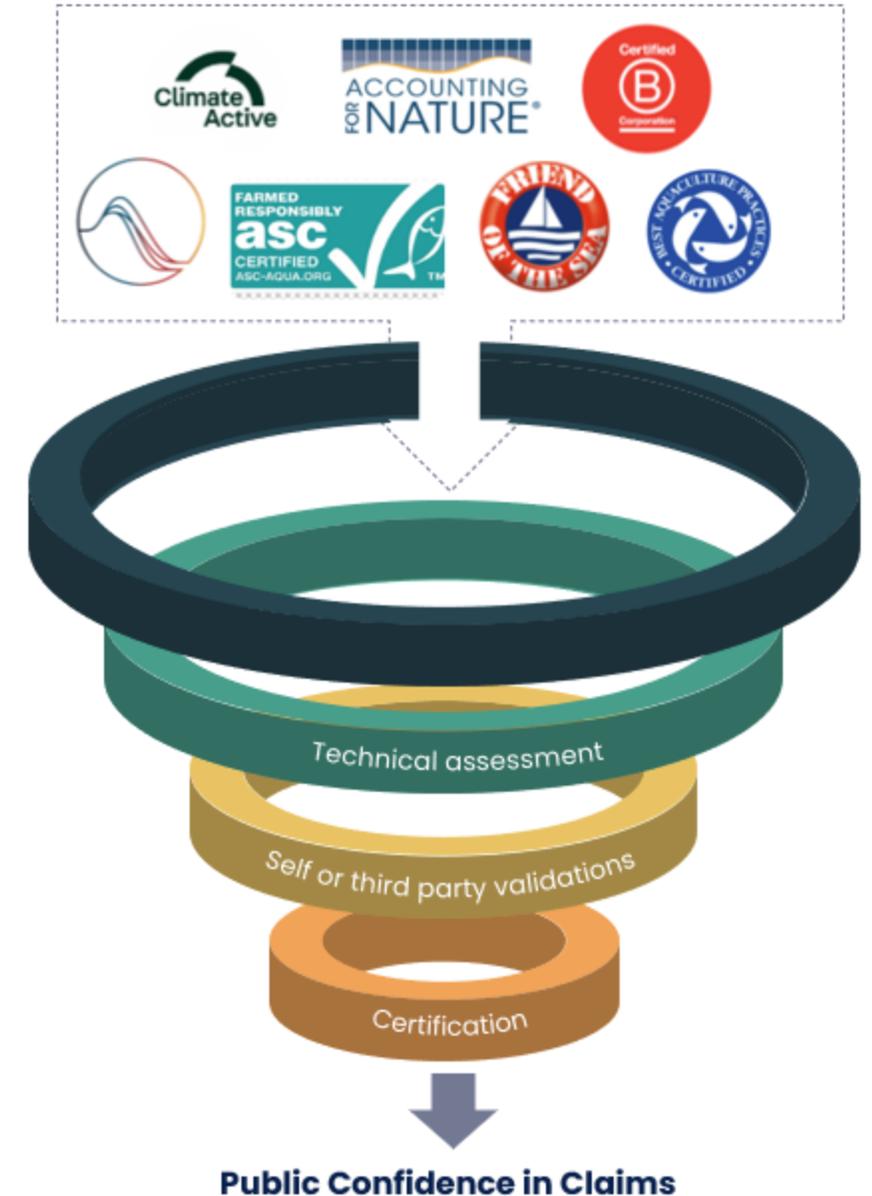
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Certifications

Proving sustainability claims

- Number of certification options
- “prove” sustainability, environmental stewardship and net zero claims
- Each certification option has a slightly different focus, approval process, cost and audit requirement



Oysters

Outperform land based protein from an environmental perspective

Oyster production is one of the lowest greenhouse gas emission food sources per 100g protein and the lowest amongst land animals, farm fish and crustaceans.

Oysters and carbon emissions

Oysters are carbon positive

- ~30 tonnes of CO₂e per tonne of protein (8,000 doz)
- Comparatively smaller footprints to other seafood industries

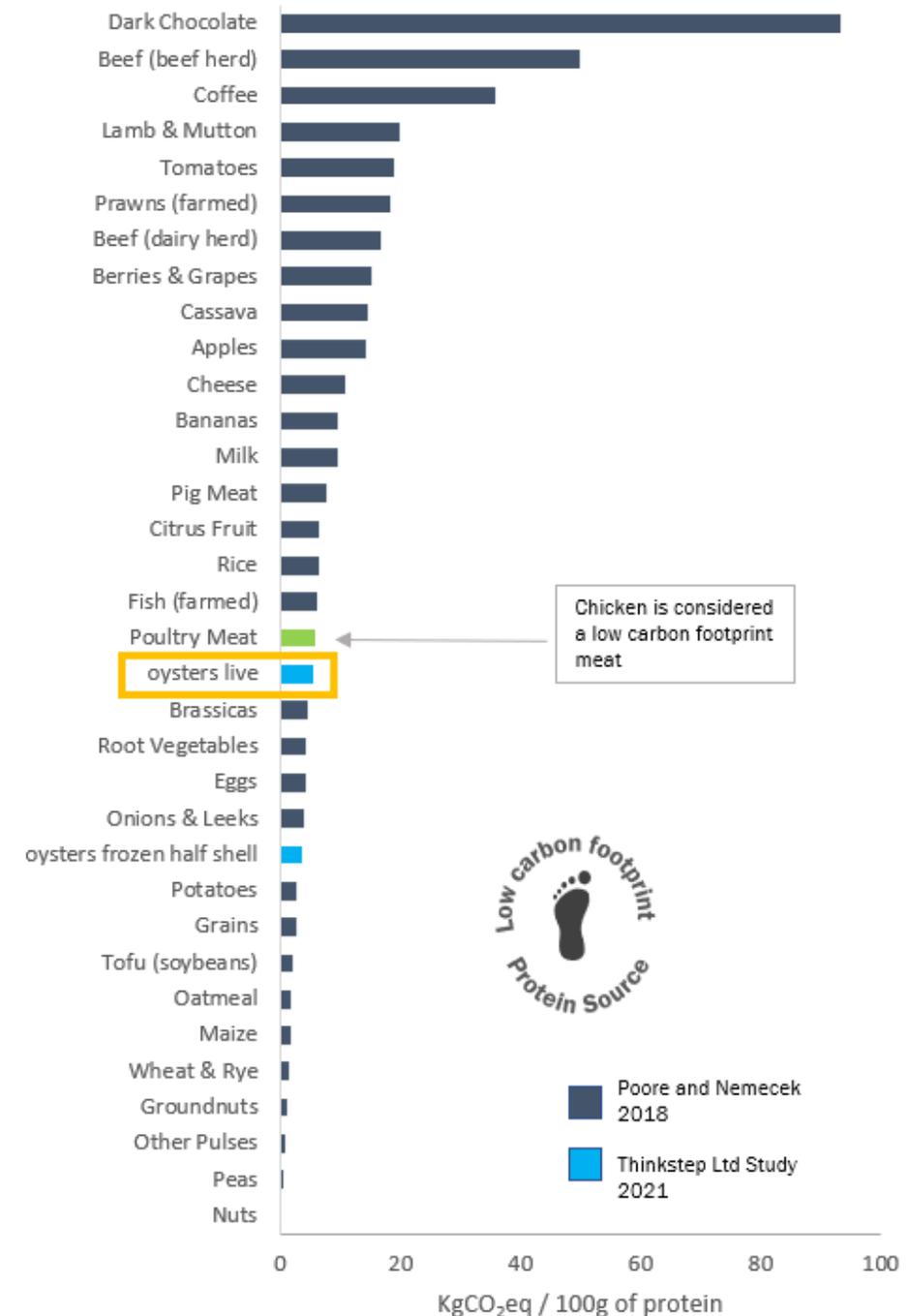
What does this mean?

- To become carbon neutral, emissions would need to be either reduced or offset
- carbon neutral certification process



“But oysters remove carbon from the water and store it in their shells, so we could be carbon negative already”

No, and we'll get to that in a few slides



Carbon neutral

Certification that demonstrates an entity has achieved zero emissions

Steps to achieve net zero

1. Set net-zero target (including emission boundary and target year)
2. Calculate carbon footprint through a lifecycle assessment
3. Develop and implement a plan for avoiding emissions / reducing emissions / producing / renewable energy
4. purchasing carbon offsets
5. Achieve net-zero



Social License and Product stewardship from cradle-to-gate

Differentiate product in the marketplace

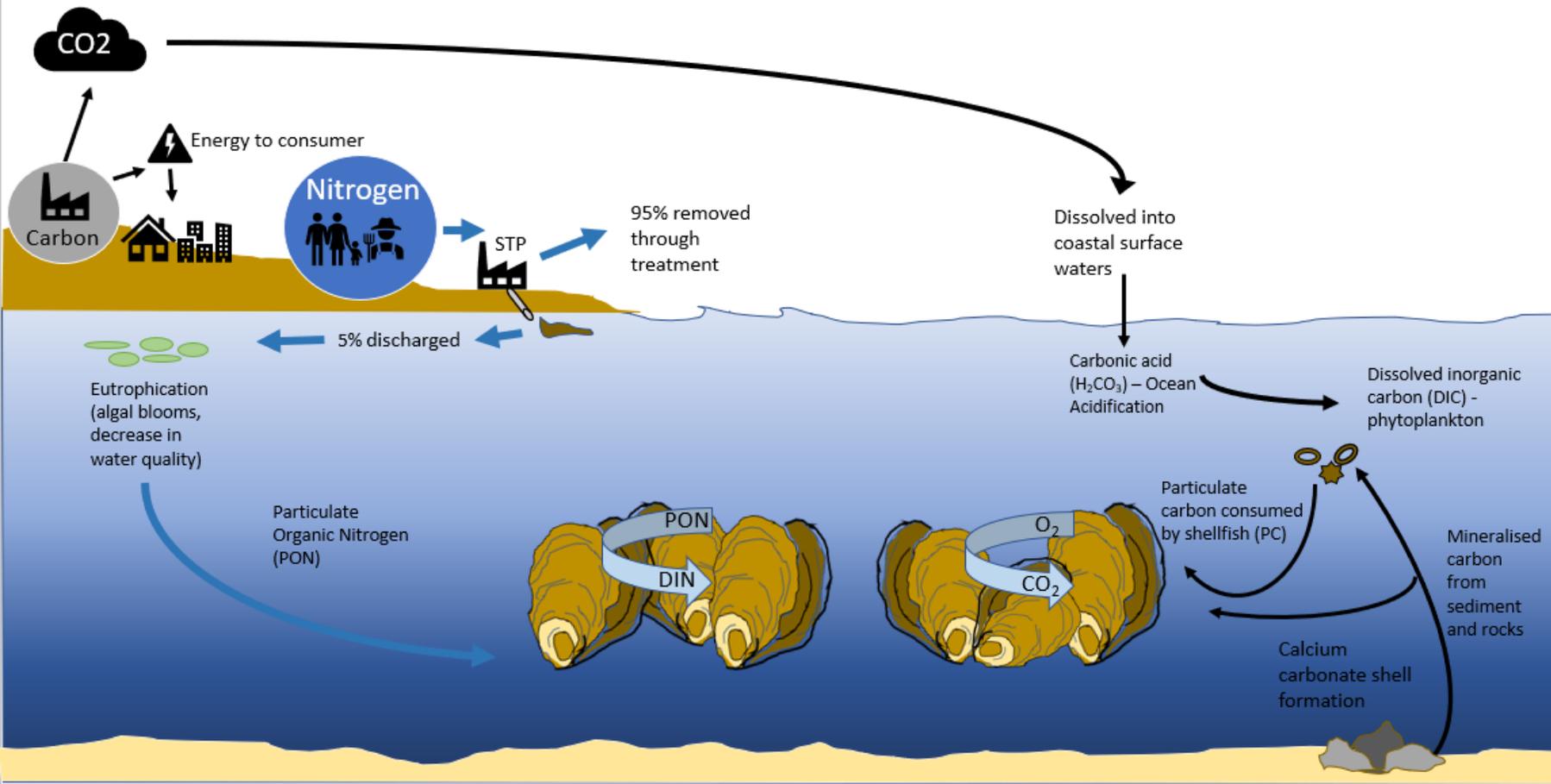
Participate in net zero seafood industry targets

Access international markets with trade emissions targets

Safeguard future operations from emission regulatory reform

Benefits

Oyster aquaculture and the environment



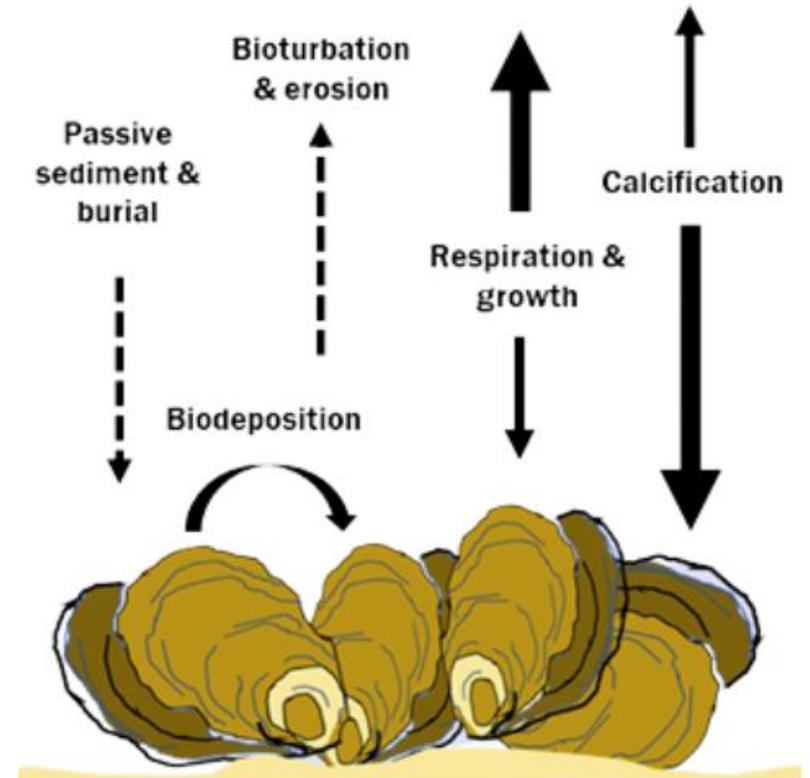
Opportunity for the oyster industry to use the certification pathways to:

- **highlight the low footprint and low environmental stress**
- **Highlight additional ecosystem benefits**

Carbon

Oyster shells and carbon sequestration

- Oysters remove, concentrate, and store carbon from the surrounding environment to grow their outer shells.
- Carbon contributes approximately 12g for every 100g shell, or 12% of overall shell mass over the period from spat to harvest.
- + Oysters also release carbon into the surrounding waters through respiration, shell erosion, and by-products of shell calcification.



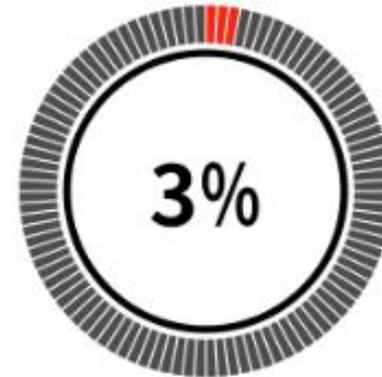
Carbon Offsets

ERF methodologies

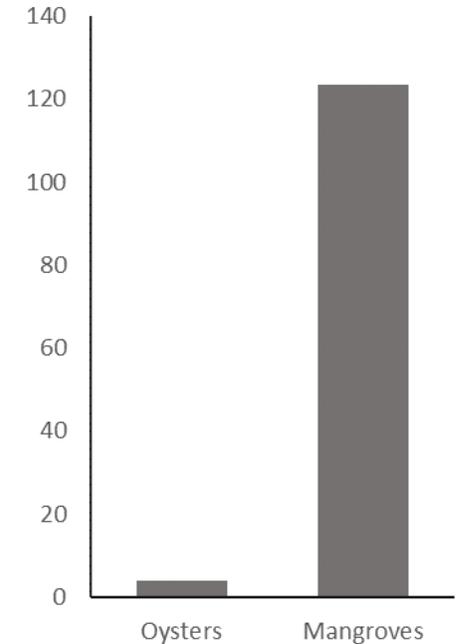
First blue carbon methodology developed in early 2022 – restoring mangroves and tidal marshes and reintroduction of tidal flows

Blue Carbon Challenges

- significant knowledge gaps hindering development of methods
- limited information on spatial extent of influencing factors
- natural seasonal fluxes
- legislation complexities
- tenure and ownership
- projects that show greatest carbon sequestration opportunities will be prioritised



\$70-\$150 per ha per yr



VS



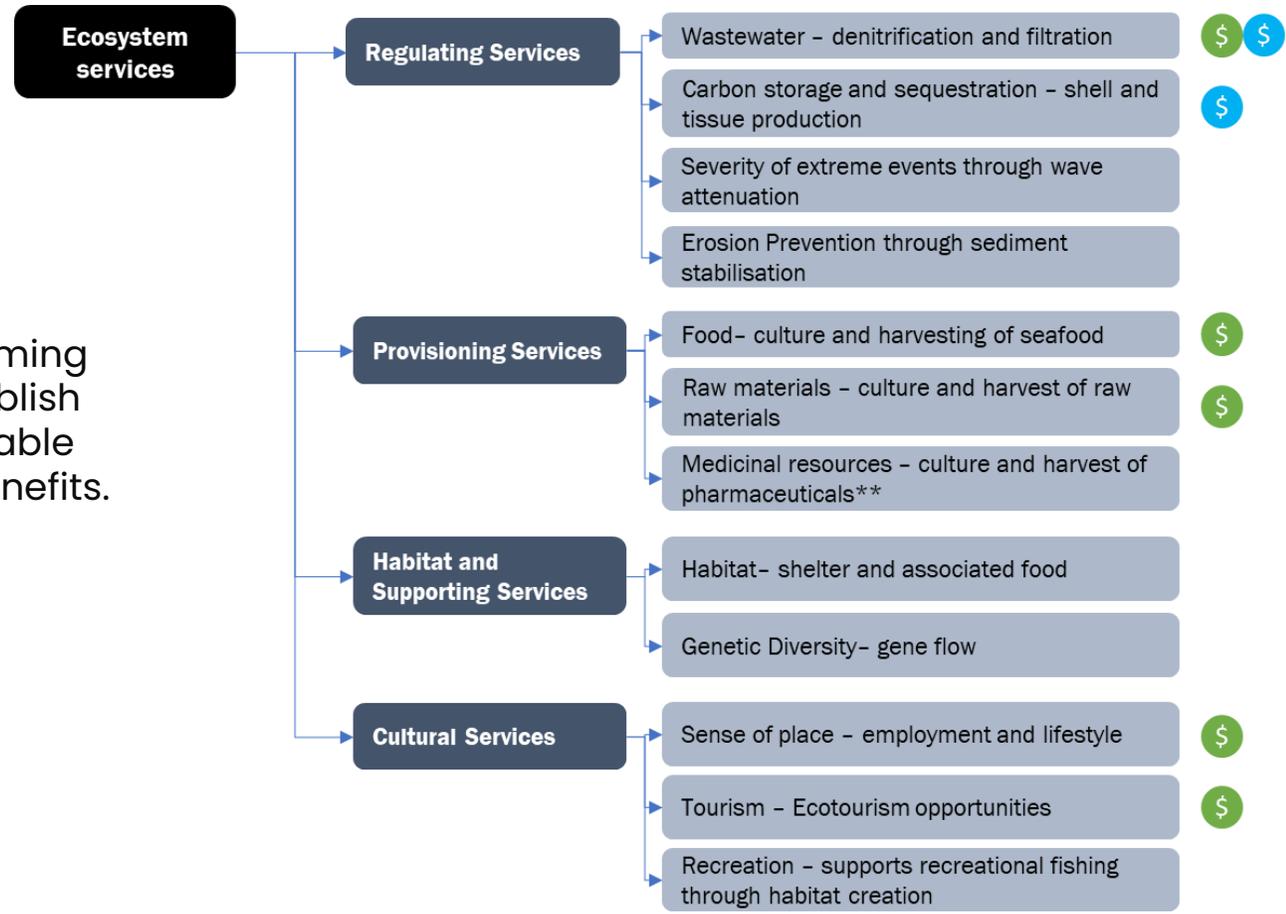
>\$4,000 per ha per yr

Recognising Benefits Through PES & certifications

Well known to provide several ecosystem services that can be:

- categorised and valued,
- In some instances, generate revenue (nitrogen)

Compared to **wetland construction**, oyster farming is less intensive and more cost efficient to establish and operate whilst also achieving sustainable food production and employment benefits.



Tracking asset condition

Natural capital accounting certification



Tracks the positive/negative effects of oyster aquaculture on ecosystem assets and service provision.



Australian Framework that complements other certification systems and consistent with UN's Standard for Environmental Economic Accounting (SEEA)

Tracks an environmental condition in a defined area via an "Econd"

Comprehensive long term data demonstrating sustainable, low impact practices

Assist in future expansion, operating in sensitive areas, green financing, impact investing

Enables natural resource managers, policy makers, investors and customers to link the condition of environmental assets with economic decision making

Summary

- Food production industries are being challenged more and more to prove sustainability approaches and claims
- Oyster Aquaculture is a no feed, no waste industry which also provides an array of ecosystem services which are currently not well captured or communicated
- There is a growing interest in regenerative agriculture and highlighting these benefits through incentives and programs to collect data and track condition over time to prove claims
- Unlikely to see an ERF carbon offset methodology developed for oyster aquaculture but there is incentive to understand carbon balance for carbon neutral claims
- Extensive incentives and programs available to the terrestrial sector, but not the aquaculture sector due to marine ecosystem 'complexities' and knowledge gaps
- **the challenge for industry moving forward is filling those gaps and understanding the timelines to achieve them**