# Aquaculture and Wild Catch

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## Request for Feedback

This document follows the *Agribusiness, Food and Fibre Industries Skills Report*, which was produced collaboratively with the assistance of 12 Industry Reference Committees. The *Agribusiness, Food and Fibre Industries Skills Report* documented the skills and issues that are common across those industries. This document is an attempt to identify how those common issues relate to the Aquaculture and Wild Catch Industry, and identify issues that are specific to these sectors.

The Aquaculture and Wild Catch Industry Reference Committee is seeking your feedback on this document, especially in the following areas:

1. Major priorities for Seafood, Fishing, Aquaculture and Wild Catch sectors (skills & training needs), such as:
    a) Workforce planning, skills identification, training gaps and other relevant research requirements
    b) Training Package work still to be addressed
    c) Areas where nationally consistent assessment and training resources may add value for industry
    d) Issues related to the implementation, delivery, promotion or quality of training
    e) Information and concerns on access to assessment and training, including from formal (e.g. VET and accredited programs) and informal (e.g. industry and short courses) sources
    f) Issues faced in regional, rural and remote Australia, and by Aboriginal and Torres Strait Islander people
2. Additional sources of information that would improve reporting of the various sectors covered in this report
3. Any data or informational gaps (relating to skills, training, industry or employment) within the document, and sources of information to address these gaps
4. Any incorrect or incomplete information
5. The suitability of the document's structure and how to maximise value for industry participants (including potential information 'products').
6. Critical challenges and opportunities (based on intelligence at hand) for the sectors
    a) Challenges achieving stakeholder consensus
    b) Intersection or cross collaboration with other industries

# Contents

# Purpose

Skills Impact has prepared this Industry Skills Report at the request of the Aquaculture and Wild Catch Industry Reference Committee (IRC). It provides in-depth information about industry-specific skills and issues covered in the *Agribusiness, Food and Fibre Industries Skills Report*.

As one of nine industry-specific Skills Reports with matching structures, this document is designed to assist collaboration across industries and the streamlining and reform of the Australian skills and VET system. This may aid the implementation of the Skills Minister's priorities by supporting:

- Greater labour mobility through stronger recognition of cross-sector and transferable skills
- Better use of industry and educator expertise to ensure better quality outcomes
- Improved pathways advice to support lifelong learning and build peoples' labour market resilience
- Australia's capacity to grow, compete and thrive in the global economy, especially in the context of the concurrent impacts of COVID-19, automation and digital transformation on the skills required for jobs now and into the future.

The IRC requested that this report be prepared to support improvements in the skills system, including work on:

- Industry workforce planning and strategies to address workforce shortages
- Documenting shared standards and regulations across industries to support end-to-end systems planning and avoid duplication
- The provision of evidence, data and intelligence to add value for industries beyond a narrow focus on training package development, and to inform future Industry Clusters or similar bodies approved to undertake work within the Australian skills and VET system
- Creating foundations for potential qualification reforms with a greater emphasis on skills families and portable skills
- Identifying shared 'skills domains' to aid in simplifying and streamlining national VET qualifications across industry groupings.

# Key Findings and Priorities

The value chain encompassing the Aquaculture and Wild Catch Industry has been meeting the needs of Australians through a time of rapid change and increasing challenges, both in number and complexity. This value chain is being as affected by biosecurity concerns as any industry in Australia.

There are many potential opportunities for growth, with a need for investment, workforce, skills and training to take advantage of these opportunities. The opportunities of Aboriginal and Torres Strait Island people to undertake roles at all levels and sectors from business leaders to industry entrants continue to grow.

The Seafood Industries Training Package is effectively addressing skills needs for all sectors, and the recent updating to incorporate digital skills throughout the training package is also delivering results. However, this has not been enough to improve access to training or to attract and retain workers for the sector.

The Aquaculture and Wild Catch Industry Reference Committee has identified key priorities in skills and training for the consideration of industry, including:

- Support for engaging with employers and RTOs to address training delivery barriers to seafood industry qualifications, potentially including the development of nationally consistent assessment and training materials, and participation in industry attraction and retention programs working with the National Careers Institute and relevant federal, state, territory and industry bodies
- Working with the National Skills Commission on accuracy of skills and jobs data in these sectors, including at a regional level, which provides a more accurate representation of skills and training needs than the equivalent at a national or state/territory level
- Playing a key role in an agribusiness, food and fibre industries research and planning project to identify and address skills gaps related to traceability, provenance and blockchain
- Identifying digital skills needs utilising the Digital Workforce Capability and VET framework currently in development (along with other digital capability frameworks).

# Overview of the Aquaculture and Wild Catch Industry and Skills System

'Aquaculture and Wild Catch' includes the industries, sectors and occupations currently within the responsibilities of the Aquaculture and Wild Catch (AWC) Industry Reference Committee (IRC), which is assisted by Skills Impact.

Aquaculture and Wild Catch is included in the Australian and New Zealand Standard Industrial Classification (ANZSIC) division 'Agriculture, forestry and fishing'. This division is used by the Australian Bureau of Statistics (ABS) and various research organisations, notably the National Centre for Vocational Education Research (NCVER), in public data and reports. Published division-level data is seldom broken down into discreet group- or class-level data; hence it is not always possible to provide industry- or sector-specific data. This is reflected in the evidence base used in this report, which frequently utilises division-level statistics to support specific stakeholder feedback and evidence.

In addition, workers in this sector may also be classified under other occupations, including maritime, regulatory and quality assurance classifications, leading to further under-reporting and uncertainty in statistical data.

# Environmental Analysis

## Whole of Value Chain Approach

Australia's reputation for producing sustainable, high-quality and high-value seafood products is a result of effective value chains. The seafood industry value chain encompasses all stakeholders (including up- and down-stream suppliers, fisheries, aquaculture farms, traders, seafood processors and retailers) who are linked in cooperative and collaborative relationships to provide consumers with products and services. Value-adding occurs when there is a change in the form of a product (e.g. preparing, packaging and storing fish supplied by fisheries and aquaculture farms) or through the addition of an attribute to a product (e.g. registering the provenance of fish products). Equally, value-adding occurs during initial operations, such as ensuring ecologically sustainable sources, and further down the supply chain in seafood processing, packaging and traceability tracking.

The *National Agriculture Workforce Strategy* acknowledges Seafood Industry Australia as one of three key associations to lead formal agribusiness training development initiatives (along with the National Farmers' Federation and the Australian Forest Products Association) with a whole of value chain approach that reflects how industries work together to implement resilient and adaptable systems now and into the future[1].

Such value chains are characterised by the critical interdependencies and cooperation required across all stages of the supply chain, which requires a range of technical and employability skills that cross industries. All stages of the value chain are enabled by cross-sectoral skills and knowledge in biosecurity, infection control, traceability, sustainability and safety. Overlaying all of this is a further web of strategic planning, evaluation and learning that is delivered and updated continually. A skilled workforce adds value across all stages of the value chain by implementing efficiencies and digital solutions that help future-proof the industries involved, and increase productivity and profitability.

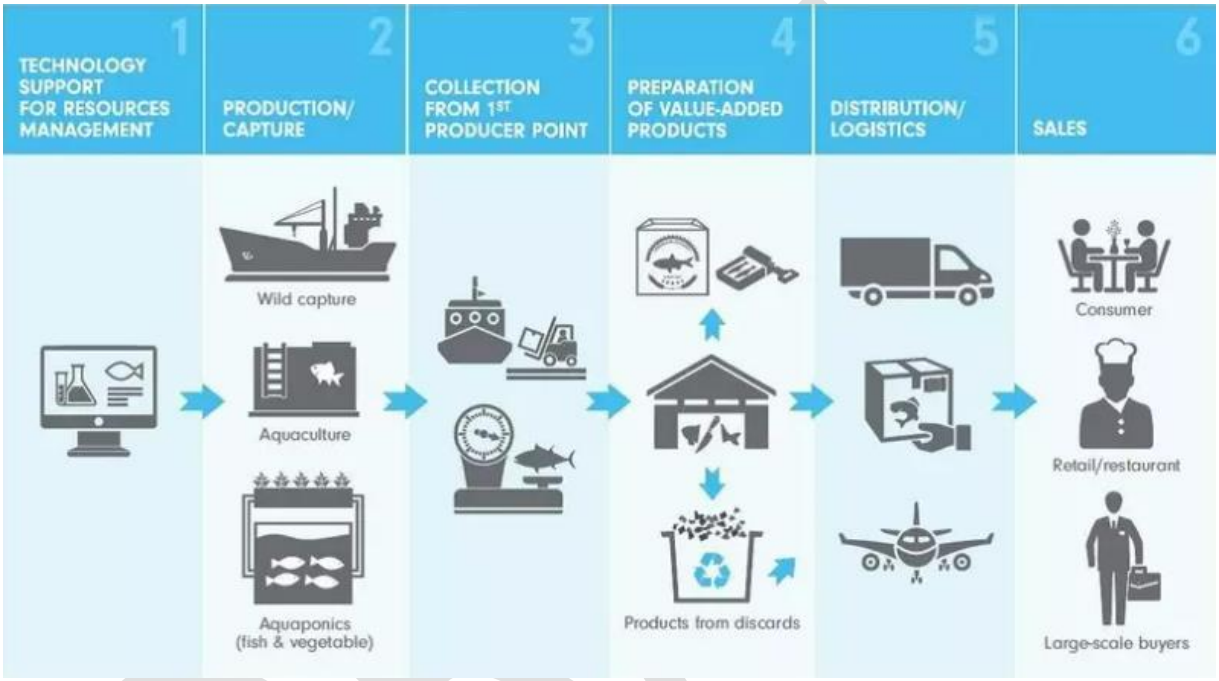
If Australian agribusiness is to become a $100 billion sector, as per the National Farmers' Federation's ambitious target, new approaches will be essential, including a fundamental reimagining of the role of the seafood producers as part of a complex, modern, sophisticated sector that encompasses value-adding,

[1] J. Azarias, R. Nettle & J. Williams (2020); *National Agricultural Workforce Strategy: Learning to excel*; National Agricultural Labour Advisory Committee; Canberra, December.

supply chain considerations, consumer-driven approaches, sustainability issues, and adoption of robotics (including aquabotics) and automation.

Disruptions caused by COVID-19, trade disputes with China, and rising input, fuel[2] and freight costs have highlighted the need to streamline and increase the robustness of Australia's seafood production supply chains, inclusive of risk management strategies to locally produce and process more fresh seafood. Efforts in these areas include primary producers and processors creating economies of scale through improved logistics and aggregating production, processing, storage and distribution to ensure cohesive, agile and resilient value chain systems.

**Figure 1: Adding value across the supply chain**




*Source: Manta Consulting Inc., reproduced by World Economic Forum (2020); Blockchain: the vaccine against future disruption in the seafood industry; https://www.weforum.org/agenda/2020/05/covid-10-seafood-supply-chain-blockchain/; viewed 16/05/2022.*

## Traceability, provenance and blockchain

Over the last five years, multiple Industry Skills Forecasts and Annual Updates prepared by the Aquaculture and Wild Catch Industry Reference Committee have emphasised the importance of traceability, provenance and country of origin labelling for national and international consumer markets, especially for transparency around environmental compliance, food safety, sea life welfare, licensing and prevention of fraud.

Product provenance information is an important response to consumers' demand for transparency. Due to the high proportion of imported seafood in Australian retail, consumers wish to make informed choices over what they buy; for example, imported Asian sea bass accounts for 60% of the barramundi market in Australia despite strong connotations of barramundi being exclusively Australian[3].
Provenance information allows consumers to make ethical choices associated with product carbon footprint, fish stock sustainability and supporting local businesses, while also assessing how products are

[2] https://www.abc.net.au/news/2022-06-17/prawn-season-suffers-from-high-fuel-prices/101160430
[3] Parliament of the Commonwealth of Australia (2022); *Supporting a strong future for Australian aquaculture*; House of Representatives Standing Committee on Agriculture and Water Resources

harvested and processed, including with an adequately trained workforce and accurate species identification.

Since 2006 it has been a legal requirement that seafood sold in Australian retail must clearly display Country of Origin Labelling (CoOL). Along with Seafood Industry Australia and the Australian Government's House Standing Committee on Agriculture and Water Resources[4], the *National Agriculture Workforce Strategy* recommends that CoOL requirements become mandatory in food service settings, including restaurants, cafes and fish and chip shops, to ensure consumers are aware of which products are imported (recommendation 9). At present, only the Northern Territory has regulatory requirements for CoOL in food service settings. In March 2022, consultation began in Queensland over a bill to introduce mandatory seafood CoOL in the hospitality sector[5].

Provenance and CoOL information are supported by traceability systems, which track seafood products through relevant stages of production, processing and distribution, including how it has been grown, handled, packaged and transported. Traceability identifies where there have been potential risks of fraud, contamination or adulteration in the event of product recalls. It also provides evidence of sustainable methods and compliance with relevant regulation at all stages of the value chain. Please see the *Agribusiness, Food and Fibre Industries Skills Report* for more information on traceability systems, including how they are used by Austral Fisheries.

Developing the skills and knowledge required to understand and operate blockchain technology may fulfil industry needs. The World Economic Forum (WEF) describe blockchain as 'the vaccine against future disruption in the seafood industry'[6]. As COVID-19 restrictions anchored fishing fleets, halted seafood processing and left seafood markets with limited supplies, the businesses most vulnerable to disruption were those with dispersed supply chains, involving international freight and a predominance of sales to hospitality venues nationally and internationally. The most resilient seafood businesses were those with local sourcing and an online presence that allowed them to pivot to offer direct sales and delivery. The WEF note that seafood industry operators could benefit from the use of blockchain technology, which facilitates many of the systems and operations that proved to be resilient during pandemic-induced disruptions. Blockchain allows stakeholders across the value chain to manage contracts and transactions, and to see, in real time, the location of a product or shipment, its destination, and additional information such as processing and storage information. It also helps businesses to plan and strategise by providing information on markets, including current buyers and sellers.

## Capital investment and training provision

Capital investment in the seafood industry is essential for lifting productivity and is required across the value chain. Aquaculture has significant growth and diversification potential across its sectors, including through innovation, which requires capital and investment in research and development and for adoption of new techniques and technologies[7].

There are currently a range of mechanisms through which federal and state capital is provided to help advance the seafood industry. These include:

- The Fisheries Research and Development Corporation (FRDC), with funding from the Australian Government, 'invests in research, development and extension activities to increase economic, social and environmental benefits for Australian fishing and aquaculture and the wider community'[8].

[4] Seafood Industry Australia (2022); *'Strong support' recommended for Australia's aquaculture sector*; http://seafoodindustryaustralia.com.au/strong-support-recommended-for-australias-aquaculture-sector/; viewed 17/05/2022.
[5] ABC News (2022); *Seafood country of origin labelling on menus set to be debated in Queensland*; https://www.abc.net.au/news/rural/2022-03-04/seafood-labeling-debate-in-queensland/100879260; viewed 16/05/2022.
[6] World Economic Forum (2020); *Blockchain: the vaccine against future disruption in the seafood industry*; https://www.weforum.org/agenda/2020/05/covid-10-seafood-supply-chain-blockchain/; viewed 16/05/2022.
[7] Parliament of the Commonwealth of Australia (2022); *Supporting a strong future for Australian aquaculture*; House of Representatives Standing Committee on Agriculture and Water Resources; p.48.
[8] FRDC (2022); *Fisheries Research and Development Corporation*; https://www.frdc.com.au/; viewed 16/05/2022.

The FRDC's projects include selective breeding programs, disease management, developing vaccines, and environmental monitoring.

- The Northern Australia Infrastructure Facility was established through the Northern Australia Infrastructure Facility Act 2016 and offers financial assistance to develop economic infrastructure, including for aquaculture, in northern Australia.
- Aquaculture businesses can access capital and loans through the Regional Investment Corporation.
- Through the Institute of Marine and Antarctic Studies, the Tasmanian state government and University of Tasmania formed the Sustainable Research Collaboration Agreement (SMRCA), to support efficient and sustainable management of Tasmania's fisheries and aquaculture through environmental research and development services.
- The Queensland Department of Agriculture and Fisheries conducts research, development and extension, partnering with industry and other stakeholders in areas such as the identification of new species for production.

Financing and capital investment will continue to be a crucial enabler of seafood industry growth, especially in areas such as northern Australia.

Industry stakeholders have noted several challenges to continued growth, including competition between aquaculture and wild catch fisheries, and family aquaculture businesses not having the capacity and knowledge of how to scale-up operations and access funding streams[9]. There is also a need for businesses to develop the infrastructure and skills to ensure sustainable practices, which will safeguard the industry through a social licence to operate and lower commercial risk (see **Ecosystem management, social licence, and consumer markets**, below).

Investment in resources that deliver a more immediate financial return is understandable in industries that have large seasonal workforces; yet there is a rising shortage of people to fill technical and leadership roles and so make decisions on business strategies and the most effective use of technology across the value chain. The value of investing in the skills of the workforce, and ways in which the new industry engagement arrangements will encourage this, are discussed in greater detail in the **Training Summary** below.

## Current crossovers and divisions of the value chain in the VET system

The importance of identifying and monitoring systems that cross over the value chain was highlighted following the heavy rainfalls in New South Wales in April 2022, which forced all oyster harvest areas to be closed by the NSW Food Authority for 21 days due to concerns over sewage spills[10]. These disruptive events require prompt actions be taken and a clear understanding of which links in the value chain are affected so that producers, processors, wholesalers, retailers and consumers can adapt accordingly.

The efficiency of this value chain is largely dependent on the interactions of sectors and the transferable skills of workforces. There is clearly a need for the seafood industry to continue to work with other industries and sectors, both to reinforce and develop new relationships.

To assist planning for this, a long-term objective of the Fisheries Research and Development Corporation (FRDC) is to ensure adequate industry mapping and data, both to reflect how the industry is evolving (including through technological adoption and business environments) and to support its needs, including workforce capabilities development. The FRDC have assessed the seafood industry supply chain and existing Australian data availability to reveal challenges and opportunities for industry decision-makers (see

[9] Parliament of the Commonwealth of Australia (2022); *Supporting a strong future for Australian aquaculture*; House of Representatives Standing Committee on Agriculture and Water Resources; p.53.
[10] ABC News (2022); *NSW oysters off the Easter menu after heavy rain and sewage spills close harvest zones*; https://www.abc.net.au/news/rural/2022-04-13/oysters-off-the-menu-this-easter-nsw-sewage-spills/100987662; viewed 16/05/2022.

Figure 2).

**Figure 2: Seafood industry supply chain and existing Australian data availability**


*Source: FRDC (2017); Navigating an ocean of data and opportunity; https://www.frdc.com.au/fish-vol-25-4/navigating-ocean-data-and-opportunity; viewed 16/05/2022.*

Current cross-overs requiring collaboration include:

- The maritime industry (covered by the *MAR Training Package*) and commercial fishing industries and in particular training to achieve required licences such as meeting coxswains and diving regulations.
- Seafood Processing and Manufacturing
    - Seafood processors collaborate with manufacturing businesses to add value to products, and share skills requirements associated with food safety and handling practices. Some large seafood businesses, notably Tasmanian salmon producers, are vertically integrated and undertake functions across farming, processing, packing and sales.
- Tourism and Hospitality
    - Tourism and hospitality (covered by the *Tourism, Travel and Hospitality Training Package*) very strongly connect with the seafood industry. Many seafood businesses and operators are now creating partnerships to supply goods and services through tourism and hospitality functions, including marine tourism and recreational fishing.
- Transport & Logistics
    - The disruptions of the COVID-19 pandemic, especially during 2020 and 2021, highlighted the risk to the seafood industry from potential airfreight supply chain failures. Exported seafood is usually carried in the cargo hold of commercial flights, but many of these flights were cancelled when international borders were closed. A federally-funded industry assistance package, the International Freight Assistance Mechanism (IFAM), has been helping to restore export activity by flying produce to overseas markets. IFAM was

launched in March 2020 and the Australian Government has extended the initiative until June 2022. Seafood Industry Australia (SIA) CEO Veronica Papacosta has welcomed the extension, stating:

'The $260.9 million extension will allow Australia's wild-catch fishers and aquaculturists to deliver an estimated $3 billion worth of produce to key international markets including Japan, Singapore and Korea. The IFAM extension will provide market certainty to our exporters who rely on air freight, and will help protect jobs in the wild-caught and aquaculture sectors, and countless more positions downstream in postharvest, freight and beyond. Since the IFAM was first announced in March 2020 it has kept our seafood industry connected to our international customers, which not only secures the future of businesses and jobs, but cements our reputation as a reliable trading partner long after COVID-19 has passed.'
*Seafood Industry Australia (2021); Australian seafood industry welcomes IFAM extension; https://seafoodindustryaustralia.com.au/australian-seafood-industry-welcomes-ifam-extension-2/; viewed 17/05/2022.*

## Biosecurity, Invasive Species and Pest Control

The seafood industry has been impacted as much by biosecurity issues as any other industry in Australia. Biosecurity has been increasingly impacting the sectors, with major outbreaks of white spot disease in prawns and Pacific Oyster Mortality Syndrome (POMS) having devastating effects on businesses and highlighting the importance of the knowledge and skills for planning and preparedness should biosecurity incidents occur.

The Australian seafood industry has significant biosecurity controls in place to protect, as far as possible, from the impacts of the most serious pests and diseases, however the diversity of challenges continues to grow. The *National Aquaculture Strategy* identifies biosecurity as one of eight priorities for the sector, emphasising that all states and territories need to foster robust approaches in collaboration with farmers to manage risks[11].

Biosecurity is critical not only for sustaining current operations but also potential industry growth:

'The issue of biosecurity and potential threats from imported disease stands out as a key issue for the industry and for regulators. Strong biosecurity regulations are imperative for the growth of aquaculture because they are a prerequisite for investor confidence, while protecting Australia's reputation for high quality product.'
*Parliament of the Commonwealth of Australia (2022); Supporting a strong future for Australian aquaculture; House of Representatives Standing Committee on Agriculture and Water Resources; p.vi*

The *National Fisheries Plan* details key initiatives to achieve sustainable and healthy fisheries resources, including:

'Implementing systems and building capacity to ensure that biosecurity threats are prevented, detected and managed effectively consistent with the National Biosecurity Statement, including by supporting Agricultural Innovation Australia's key biosecurity-related initiatives.'
*Australian Government (2022); National Fisheries Plan 2022-2030; Department of Agriculture, Water and the Environment, Canberra; p.6*

[11] Department of Agriculture and Water Resources (2017); *National Aquaculture Strategy*; Canberra, August.

The Australian Government's *Aquaculture Farm Biosecurity Plan*[12] guidelines highlight the need for fish health status monitoring and recordkeeping to assist in identifying any emerging disease issues:

- animal movement records (to, within and from the farm)
- materials movement records (including the movement of equipment, vehicles, vessels, feed, water and waste to, within and from the farm)
- observations on health status (e.g. behavioural changes, morbidity and mortality)
- husbandry records (e.g. stock densities, feeding and growth rates)
- application of treatments or vaccinations
- water quality data
- disease testing (e.g. pathology reports).

According to the *Aquaculture Farm Biosecurity Plan*, these requirements must be supported by staff training so that all workers and visitors are informed of their responsibilities associated with biosecurity. This is to ensure the prompt identification of disease, mitigate against the possibility of transmission, follow farm protocols, and enact biosecurity skills standards.

None of the reports referenced here suggest the need to improve VET training package products to meet biosecurity challenges (although there are acknowledged research capabilities and training delivery challenges); however, the Industry Reference Committee will continue to monitor this situation.

# Sustaining Plants and Animals

## The complexity of care and welfare standards

The seafood industry is founded upon maintaining aquatic animal health and ecological sustainability. Looking after aquatic animals and ecological systems, like caring for humans, is fundamentally different to looking after machinery, equipment and infrastructure, and requires skills that factor in biological complexities and differences in living entities. Such practices are closely aligned with biosecurity measures.

The sheer variety of standards and knowledge required to work with individual fish species, for example, makes it difficult to simplify and streamline training products – despite the skills often being similar. Industry stakeholders have emphasised the importance of training package content being designed to enable contextualisation to address this issue.

AQUAPLAN, managed by the Department of Agriculture, Water and the Environment (DAWE), is Australia's national strategic plan for aquatic animal health[13]. Developed and implemented collaboratively by such stakeholders as the seafood industry, the federal government and state governments, AQUAPLAN guides priorities and investment to strengthen the national aquatic animal health system. Its objectives include to raise the productivity and profitability of aquatic animal industries and protect aquatic environments through stronger aquatic animal health management. A review of the 2014-2019 plan commenced in early 2020 however, at the time of this publication, results have not been released.

Within the *AQUAPLAN 2014-2019*, the first two of five key objectives focussed on biosecurity, while the next three concentrated on the roles, resources and skills required for maintaining aquatic animal health:

- Objective 3: Enhancing surveillance and diagnostic services
    - Diagnostic and surveillance roles in aquaculture supports animal health through the early

[12] Sub-Committee on Aquatic Animal Health (2016); *Aquaculture Farm Biosecurity Plan: generic guidelines and template*; Department of Agriculture and Water Resources, Canberra; p.15.
[13] Department of Agriculture (2014); *AQUAPLAN 2014–2019: Australia's National Strategic Plan for Aquatic Animal Health*.

detection of diseases and health management.

- Objective 4: Improving availability of appropriate veterinary medicines
    - The aquaculture industry needs access to reliable and effective veterinary medicines for disease management, animal welfare and industry productivity. These are required for therapeutic treatments, disease prevention, and husbandry (including reproduction and handling). However, the limited availability of registered veterinary medicines is an ongoing and complex issue for the aquaculture industry.
- Objective 5: Improving education, training and awareness
    - This objective emphasises the complexity of care and the multitude of skilled workers across the value chain:

      'Australia's aquatic animal health management systems require trained government and industry personnel for roles in aquatic animal husbandry, veterinary science, pharmacology, immunology, disease diagnostics, epidemiology, biosecurity, emergency management, public policy, industry and media liaison, and specific research disciplines. The availability of appropriately trained and competent personnel to fill these roles directly affects the strength of Australia's aquatic animal health management systems.'
      *Department of Agriculture (2014); AQUAPLAN 2014–2019: Australia's National Strategic Plan for Aquatic Animal Health; p.26.*

While acknowledging the importance of the *Seafood Industry Training Package* to the Australian skills system, the AQUAPLAN warns that training shortcomings may be experienced without adequate funding, resources and access to workplace-based delivery. According to industry stakeholders, such challenges are persistent, particularly because much of the industry is based in regional, rural and remote areas where there are thin VET markets (see **Barriers to employers using nationally recognised training**, below).

# Ecosystem Management

## Sustaining biodiversity

The seafood industry is responsible for skills applied to manage the protection, utilisation, sustainability and health of Australia's marine ecosystems. This is an area of major and critical change given Australia's commitments to address climate change, safeguard at-risk fish stocks and the changing ownership and custodianship of Australian water masses.

Any loss or deterioration in the condition of aquatic ecosystem biodiversity can have severe impacts on societies because it is intrinsic to material welfare, the security of communities, the resilience of local economies, relations among groups in communities, and human and animal health. The leading driver of biodiversity loss in recent decades has been population growth, which requires expanded fishing operations to provide food. For the seafood industry, the challenge is to use increasingly sustainable practices to produce the food we need while conserving and managing biodiversity.

Fish are critical for aquatic ecosystems and are engaged in complex relationships that both constitute and sustain biodiversity[14]. Fish stocks are constantly changing in size and distribution due to factors such as warming waters and commercial fishing, and are continuously monitored by Fisheries Management to ensure ongoing sustainability. The Marine Stewardship Council (MSC) undertake third-party sustainability certification for the seafood industry, based on the rigorous testing of three key elements: sustainable fish stocks, effective fisheries management and minimising environmental impact. In Western Australia, for example, 11 fisheries have MSC sustainability certification, including the first fishery in the world with MSC certification for Western Rock Lobster, and the first joint commercial and recreational fishery certification

[14] Marine Stewardship Council (2022); *Biodiversity and fishing*; https://www.msc.org/what-we-are-doing/oceans-at-risk/biodiversity-and-fishing; viewed 18/05/2022.

for Peel-Harvey Blue Swimmer Crabs[15].

The seafood industry is embracing both traditional knowledge and technological innovation to ensure ongoing viability. A key initiative of the *National Fisheries Plan* is to integrate 'Indigenous ecological and cultural knowledge and practices into fisheries management approaches and harvest strategies, biosecurity and habitat restoration projects'. This includes supporting Aboriginal and Torres Strait Islander peoples to 'protect and manage all sea country through Indigenous ranger programs, including river ranger programs'[16].

The House of Representatives Standing Committee on Agriculture and Water Resources describe how industry innovation is driving environmentally sustainable practices, including through offshore aquaculture and seaweed production (see **Growing and emerging sectors**, below). They also highlight that the aquaculture industry has the potential to achieve greater profitability *and* environmental benefits by investing in regenerative, circular economy projects that minimise and re-use waste from aquaculture systems[17]. A circular economy is founded on such principles as proactively restoring natural systems; designing new products and services that actively minimise pollution and waste; recycling waste and by-product materials; and maximising the lifespan of products. Examples of this in development are:

- Recirculating aquaculture systems (RAS) innovations are offering a way of growing fish in a self-contained, tank-based system with environmental controls, with minimal waste and low volumes of water consumption, bolstered by water being recycled through biological and mechanical filters. This will allow fish to spend more of their lifespan on land before being moved to ocean pens.
- Aquaculture farmers are currently investigating novel approaches for utilising their salmon farming by-products as fertilisers and for pet food.
- The use of aquaculture in the rehabilitation of degraded marine environments. Habitats that were destroyed from overharvesting in the past can be restored using shellfish; for example, in Georges Bay, Tasmania, oyster and mussel growers are working with conservationists to use oyster spat from commercial hatcheries and oyster leases to stimulate natural reproduction and boost oyster populations in local reefs. Such partnerships can be beneficial to both hatchery profitability and conservation efforts and have the potential to be harnessed elsewhere in the recovery of other species and ecosystems[18].

## Ecosystem management, social licence, and consumer markets

Australian consumers are demanding high quality products from industries that have a social licence to operate across the value chain. Social licence corresponds with public perceptions, which, for the seafood industry, relies principally on operators' sustainable practices and environmental conservation.

In recent years, the seafood industry, especially the salmon sector, has responded to negative public perceptions associated with alleged environmental degradation. Maintaining a 'social licence to operate' – public acceptance of an industry and its practices – has become challenging, especially for those businesses looking to expand operations into new locations.

The House of Representatives Standing Committee on Agriculture and Water Resources states that 'responding to consumer and community concerns about environmental standards and the ecological sustainability of aquaculture needs to be a high priority, both for producers themselves and for

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[15] Government of Western Australia (2022); *WA celebrates 10 years of commitment to sustainable fisheries*; https://www.mediastatements.wa.gov.au/Pages/McGowan/2022/03/WA-celebrates-10-years-of-commitment-to-sustainable-fisheries.aspx; viewed 18/05/2022.
[16] Australian Government (2022); *National Fisheries Plan 2022-2030*; Department of Agriculture, Water and the Environment, Canberra; p.9.
[17] Parliament of the Commonwealth of Australia (2022); *Supporting a strong future for Australian aquaculture*; House of Representatives Standing Committee on Agriculture and Water Resources; p.24.
[18] Department of Agriculture and Water Resources (2017); *National Aquaculture Strategy*; Canberra, August; p.23.

governments'[19]. The *National Fisheries Plan* similarly notes that 'Sustainable growth in our fishing, aquaculture and seafood sectors must be accompanied by improvements in social and environmental performance to ensure that all sectors thrive in the long term. This includes valuing and improving the health of the fisheries resources and aquatic ecosystems that these sectors rely on for their long-term success'[20].

Australian seafood businesses are increasingly collaborating with scientists and experts in culturally sustainable practices and conservation and ecosystem management to deliver a greater balance between production, protection and regeneration. Enabling digital technologies, including traceability and provenance systems, are improving access to and the transparency of accurate information about products and production processes. This is proving to be highly beneficial for seafood businesses, who can demonstrate their prowess at addressing issues that engender social licence.

### Climate and carbon

Climate change is changing Australia's sea and freshwater environments, and affecting where, when and how much fish can be grown or caught by the aquaculture and wild catch industries. A direct example of this is the Australian government buying back vessel fishing permits worth $20m in the south-east trawl fishery, partly due to the impacts of climate change on species' population numbers, which are becoming unsustainable at current fishing levels. The south-east trawl fishery, the largest government-managed fin fish fishery, is managed in accordance with harvest policy, which ensures catch limits are determined in consideration of scientific evidence[21].

In light of such challenges to the ongoing viability of fishing businesses, the *National Fisheries Plan* highlights the priority of *adaptation*, which will require support for seafood 'sectors to adapt to, and harness opportunities from, a changing environment'. Sustaining opportunities for businesses to remain viable and grow, while safeguarding the marine ecosystem, requires that the industry 'has the people, skills, systems, technology and connectivity to deliver an increase in productivity'[22].

Austral Fisheries have invested in reducing carbon emissions while increasing productivity. Austral offset its carbon emissions by planting 220,000 native trees in regional Western Australia and, in 2016, were announced as the first seafood business in the world to be certified as carbon neutral.

After determining that the majority of its carbon emissions were from fishing vessels burning diesel, Austral then invested in Cape Arkona, a vessel that utilises hybrid-electric technology and is equipped for operating long-lines, trawling and potting. This versatility, in combination with new engine and gearbox technology to reduce fuel consumption, enables the vessel to travel further and stay longer at sea without the need to refuel[23].

## Digital & Automation Practices

Innovation is considered by many as key to increased productivity and growth in domestic and global seafood market shares. Offshore aquaculture, for example, is cited as having significant potential for increasing industry production levels, but will require increased investment in research and the development

[19] Parliament of the Commonwealth of Australia (2022); *Supporting a strong future for Australian aquaculture*; House of Representatives Standing Committee on Agriculture and Water Resources; p.vi.
[20] Australian Government (2022); *National Fisheries Plan 2022-2030*; Department of Agriculture, Water and the Environment, Canberra; p.2.
[21] The Guardian (2022); *Australian authorities to buy out fisheries, citing climate crisis*; https://www.theguardian.com/environment/2022/may/16/australian-authorities-to-buy-out-fisheries-citing-climate-crisis; viewed 17/05/2022.
[22] Australian Government (2022); *National Fisheries Plan 2022-2030*; Department of Agriculture, Water and the Environment, Canberra; p.13.
[23] Austral Fisheries (2022); *Sustainability*; https://www.australfisheries.com.au/sustainability; viewed 17/05/2022.

of new technology[24]. This could be achieved, in part, through the greater adoption of automation, where technologies complete tasks and activities previously undertaken manually. Rather than making an entire workforce redundant, effective implementation of automation technologies is redefining workforce roles and requires the incremental development of capabilities to operate and service the hardware.

Such advances are already being implemented in Tasmania by businesses such as Tassal and Huon, who are undertaking real-time tasks with off-site operators (see Figure 3). Most environmental monitoring, feeding and surveillance of the salmon is now performed from these central control centres. This improves worker safety, reduces environmental impacts and improves the health and welfare of fish. It is also causing diversification of the seafood industry workforce, with an increasing number of employees with advanced digital literacy, skills in data analysis, and qualifications in fields such as computing and electronics[25].

**Figure 3: Off-site workers at Tassal**


*Reproduced with permission*

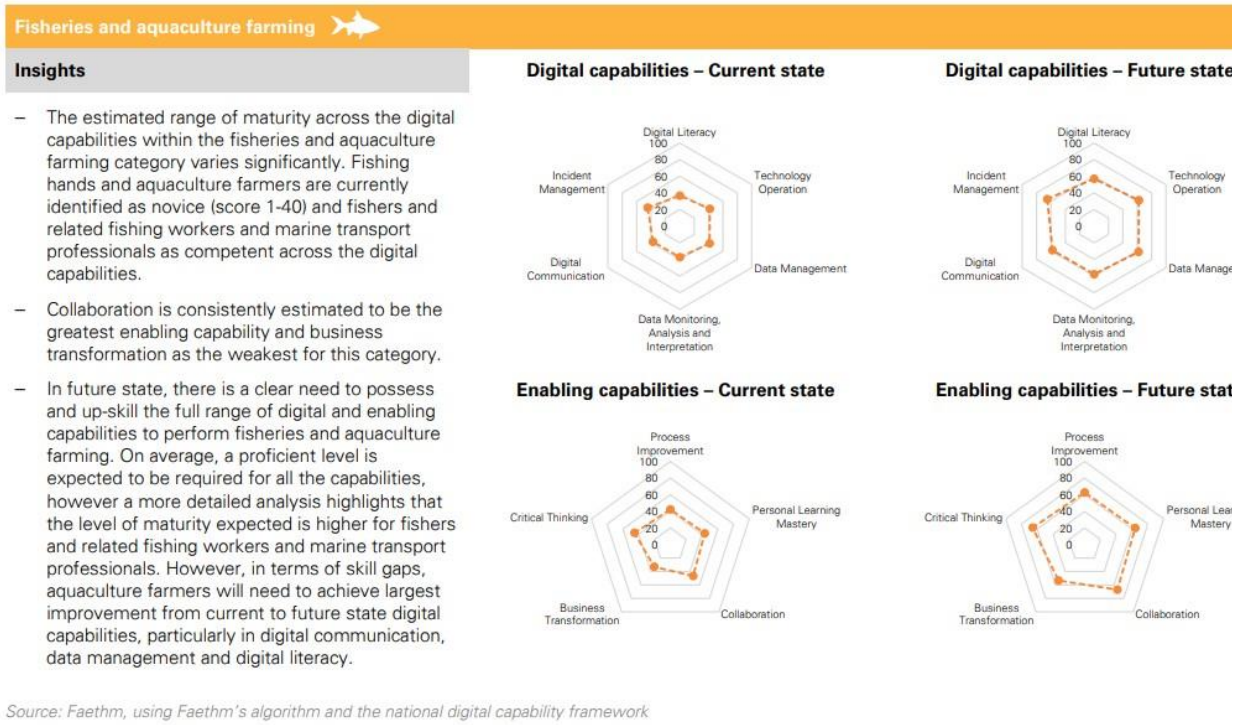
Industry operators have also invested extensively in various technologies, including uncrewed vessels and remote-operated vehicles (ROVs) that undertake on- and under-water operations, either to replace or supplement activities such as manual diving operations, on-deck vessel work, net repairs, harvesting, hatchery work and sample collections.

Developing the seafood workforce's skills to take full advantage of digital practices, automation and robotics, however, is often limited due to the concentration of businesses in regional, rural and remote locations, entailing reduced access to training organisations and digital connectivity issues.
To support industry training opportunities, the Fisheries Research and Development Corporation (RDC), with other RDCs, led the development of an *Agricultural Workforce Digital Capability Framework*[26]. The project was to help address gaps in the abilities of the workforce to meet future demand, while also offering education providers a framework for developing pathways to upskill the workforce and aid decision-making on the adoption of new technologies.

The *Agricultural Workforce Digital Capability Framework* details both the digital capabilities (technical skills) and enabling capabilities (employability skills) that individuals will require to progress in different contexts and roles across the value chain. The framework displays the current digital and enabling capabilities of the fisheries and aquaculture workforce and the future levels to which the workforce must perform for this industry to harness the potential of digital transformation.

[24] Parliament of the Commonwealth of Australia (2022); *Supporting a strong future for Australian aquaculture*; House of Representatives Standing Committee on Agriculture and Water Resources; p.v.
[25] J. Azarias, R. Nettle & J. Williams (2020); *National Agricultural Workforce Strategy: Learning to excel*; National Agricultural Labour Advisory Committee; Canberra, December.
[26] KPMG and Skills Impact (2019); *Agriculture Workforce Digital Capability Framework*

**Figure 4: Megatrends in the agricultural sector and key impacts on the workforce**




*Source: KPMG and Skills Impact (2019); Agriculture Workforce Digital Capability Framework; p.58*

Please also see the *Agribusiness, Food and Fibre Industries Skills Report* for information on the *VET Digital Capability Framework*.

## Food Safety QA & Regulatory Compliance

Australia seafood is internationally renowned for being produced with high levels of safety and freedom from disease. Seafood processors, for example, can source quality produce at competitive prices from the aquaculture and wild catch sectors because of high food security and safety standards that are supported by a strong and stable regulatory system across the value chain, including requirements for traceability and food labelling. This requires high levels of skill, knowledge and collaboration across the different sectors.

The Australian seafood industry is managed under strict guidelines and regulations that cover biosecurity, aquatic animal health, food safety standards, licensing, fisheries permits, environmental management, and market access and trade. Every state or territory manages its own aquaculture and fisheries legislation to regulate production, with some local governments establishing by-laws and planning provisions to support industry activities in specific local government areas.

The Code of Conduct for Responsible Fisheries (the Code), initiated by the United Nations Food and Agriculture Organization Committee on Fisheries, is adopted by over 170 countries, including Australia. The Code is voluntary and provides operators with principles and standards applicable to the conservation, management and development of all fisheries. It also covers the capture, processing and trade of fish and fishery products, fishing operations, aquaculture, fisheries research and integration of fisheries into coastal area management.

Federal and state governments have shared responsibility for the management of Australia's fisheries

resources. The Offshore Constitutional Settlement (OCS) is a formal agreement that deals with Commonwealth and individual state fisheries jurisdictions that manage arrangements for specific fisheries within a single jurisdiction or a joint authority (Commonwealth or state). There are presently three joint authorities, involving the Commonwealth and the Northern Territory, Queensland and Western Australia.

The *Fisheries Management Act 1991* sets out the legislative parts of the Commonwealth's fisheries management framework, including the regulation of fisheries, preparation of fisheries management plans, allocation and management of statutory fishing rights and other concessions, determination of allowable catch, fish receival, compliance and foreign fishing controls, cooperation with the states and the Northern Territory, and satisfying international obligations.

Authority for the aquaculture industry in South Australia, New South Wales, the Northern Territory and Tasmania is managed by their respective Departments of Primary Industry. In Western Australia, duties lie with the Department of Fisheries; the Queensland seafood industry is governed by the Department of Agriculture Fisheries and Forestry; and, in Victoria, the Victorian Fisheries Authority.

Aquaculture operations that operate in, or discharge into, public waters need to comply with rigorous environmental controls, which are continuously monitored by state agencies. Strict food health and environmental standards apply both to aquaculture and wild capture products to ensure Australian seafood is safe to eat and that production does not impact negatively on aquatic environments[27]. Another common regulatory challenge for the seafood industry is access to agricultural and veterinary chemicals (agvet chemicals) for use in aquaculture operations. The Australian Government recently reviewed the agvet regulatory framework to ensure its ongoing fitness for purpose, and made recommended changes to the regulations to streamline and improve access to safe and effective products for industries including aquaculture.

Seafood industry stakeholders have long reported challenges associated with the multiple overlapping state, national and international regulations and legislation. The complexity of this, coupled with regular legal and jurisdictional changes and updates, makes it difficult for fisheries officers, commercial operators, especially small operators, to comply with legislation or new businesses to be established. The House of Representatives Standing Committee on Agriculture and Water Resources have made recommendations to streamline informational services and reduce duplication and red tape, including through the creation of a 'one-stop-shop' regulation management tool[28].

## Regulated occupations in the Agribusiness, Food and Fibre industries

Regulated occupations have legal (or industry) requirements or restrictions that must be adhered to in work performance. Regulated occupations require a licence from, or registration by, a professional association or occupational licensing authority. The National Training Register (training.gov.au) identifies occupations requiring a formal qualification, skill set or unit of competency be held for specific licensing, legislative or certification requirements. Please see **Appendix: Qualifications and Licensing, Legislative or Certification Requirements** for details. Relevant examples are provided below.

Australia is a signatory to the International Maritime Organization (IMO), which governs maritime safety and standards for credentials. Domestic commercial vessel (DCV) safety legislation applies to the fishing and aquaculture fleet to ensure safety measures and consistency in the application of standards to underpin safety at sea and on-board commercial vessels. The sector also has a number of other activities for which high-risk licences are required, particularly in the processing/filleting area, for which operators must have licences to perform those work functions. The seafood industry employs a range of other regulated occupations, including those associated with diving, chemical handling, and vehicle, mobile equipment, crane and forklift operators.

[27] https://www.awe.gov.au/agriculture-land/fisheries/aquaculture/aquaculture-industry-in-australia

[28] Parliament of the Commonwealth of Australia (2022); *Supporting a strong future for Australian aquaculture*; House of Representatives Standing Committee on Agriculture and Water Resources; p.88.

## Workplace and Value Chain Risk Management and Safety Culture

The seafood industry aspires to achieve effective risk management and safety cultures. Numerous strategies are being implemented to support and improve workplace safety outcomes in the seafood industry. Workplace safety is of particular concern due to the specific environments and operations in which people work. Examples of situations requiring heightened safety precautions include:

- deckhands working on fishing vessels
- seafood processors working with knives.

SeSAFE is a seafood industry initiative to promote workplace safety.

**Case study: SeSAFE**

The SeSAFE project commenced in 2018, funded by the Fisheries Research and Development Corporation and the Australian fishing and aquaculture industry. The goal of this initiative is to raise awareness and improve safety performance in the fishing and aquaculture industry Australia wide. It has produced an online safety learning and management system consisting of numerous brief modules designed to deliver essential WHS training to fisheries and aquaculture workers prior to working on the water.

This learning management system (LMS) provides companies and boat owners a simple way to induct individuals in relevant workplace health and safety in a simple online format, including general workplace safety requirements under WHS legislation and specific requirements under Australian Maritime Safety Authority legislation. The learner's comprehension of training material is evaluated by means of simple questions, and they can answer questions multiple times or repeat a module until they attain a desired level of performance. Importantly the online LMS offers a solution to many of the traditional barriers to safety training for fisheries and aquaculture workers, including perceptions about cost, access and timing.

In addition to physical health, mental health challenges are a concern for the seafood industry. The FRDC and Deakin University conducted national research in 2017 that revealed significantly higher rates of poor mental health and psychological distress in the fishing industry than that of the general population.

Contributing factors resulting from the work may include isolation, physical dangers, fluctuating markets, catches and quotas, regulatory changes, job insecurity, red tape and poor public perception. Responses to concerns over mental wellbeing in the seafood industry include:

- Stay Afloat Australia: a national mental health pilot program for the Australian seafood industry, run by Seafood Industry Australia (SIA) and supported with funding from the Australian Government.
- Project Regard: founded by Women in Seafood Australasia (WISA) to open discussions and help remove the stigma surrounding mental ill-health in the industry.

These initiatives are being supported by the *National Fisheries Plan*, which includes among its key initiatives: 'Pursuing a culture promoting safety, diversity and wellbeing, including initiatives to improve mental health'[29].

[29] Australian Government (2022); *National Fisheries Plan 2022-2030*; Department of Agriculture, Water and the Environment, Canberra; p.15.

## Disaster planning, response and recovery

Changing weather patterns and climate-induced disasters, including the flooding experienced in south-east Queensland and north-east New South Wales in February and March 2022, are causing major safety issues as well as social and economic challenges. These threaten the continuity of whole industry sectors, businesses and workforces, and severely impact on peoples' mental health.

The wild catch and aquaculture industries have been affected in various ways, including:

- fishing equipment, such as nets and traps, being swept away by floodwaters
- water quality deterioration causing various problems; for example, hundreds of thousands of fish being killed in the Richmond and Clarence rivers because of mud and debris washed in from flood plains depleting water oxygen levels.
- future catches, including the annual mullet run at Ballina, are likely to be down where flood waters have washed fish out of their usual river habitats[30]
- floods have had a devastating impact on oyster farms in NSW. Land-based depots were submerged, dislodging cultivation gear and causing costly damage to equipment and structures[31]. This caused stock losses, poor water quality (including pollution washed in from cattle farms) and has led some harvesting operations to be halted for months.
- the abalone and sea urchin sectors have also been flood-affected
- adverse weather conditions and events have lowered the supply of seafood making it to market, e.g. the Sydney Fish Market (where demand and prices are both high).

During such times, there is increased demand for workers to carry out response and recovery work to help businesses re-establish disrupted operations; yet many of the casual or seasonal workers who populate the seafood industry may move on to guarantee continued income.

There are also implications for workforce skills because training delivery may be discontinued when RTOs' property and employees are similarly affected by events such as floods. Workplace training delivery is also likely to be halted when businesses are grappling with the response and recovery from extreme events; and affected stakeholders' ability to participate in training package review and development work is curtailed. This situation is exacerbated because fewer workers or trainers will choose to relocate to affected areas, especially when housing and food supplies are disrupted.

Responses to these situations require a well-trained workforce and public awareness. Improving risk management, safety and preparedness strategies is likely to mitigate at least some of the devastating effects of future disasters on both populations and industries. Industry Reference Committees have advised that the Australian skills and training system can do more to facilitate the critical skills for planning, response and recovery, including through the creation of skills sets for swift and targeted upskilling of impacted workers, and leadership skills for people who are entering flood-affected areas to coordinate operations.



[30] ABC News (2022); *Northern NSW floods trigger mass fish kill with hundreds of thousands lining riverbanks, beaches*; https://www.abc.net.au/news/rural/2022-03-17/northern-nsw-floods-lead-to-new-mass-fish-kill/100911272; viewed 17/06/2022.
[31] NSW Oysters (2022); *Flood recovery of oyster industry equipment - March 2021*; https://www.nswoysters.com.au/oysterequipmentrecovery.html; viewed 17/06/2022.

# Industry Summary and Trends

## Workforce, Business & Market Summary

The seafood industry contributes to Australia's food security, health and wellbeing. It employs over 18,000 people and comprises over 6,300 individual businesses. Operations span all states and territories (excepting ACT), and comprise a variety of small, medium and large enterprises. The sectors across these industries are extremely varied, with large salmon producers, as well as niche, specialist and regional operators.

The seafood industry has a total revenue of over $8.5 billion and contributes over $1.6 billion to overall GDP ('industry value added'). The Department of Agriculture, Water and the Environment (DAWE) reports that aquaculture produces 38% of the total volume of Australian seafood and accounts for 51% of total industry value, while wild catch produces 62% of total volume and accounts for 49% of industry value[32].

**Table 1: Industry Financial Activity**

| Training Package-Related Industries | Revenue ($billion) | Industry Value Added ($billion) | Businesses | Employment |
|---|---|---|---|---|
| Seafood Industry (SFI) | $8.57 | $1.63 | 6,304 | 18,069 |

*Source: IBISWorld Industry Wizard*

The House of Representatives Standing Committee on Agriculture and Water Resources notes that seafood consumption across the world has grown significantly over the last decade. While acknowledging the importance of the wild catch sector, limited growth opportunities (in consideration of limited fish stocks and fishing permits) mean that increases in Australian seafood production will likely have to be driven by aquaculture. For this reason, aquaculture 'is the fastest-growing food industry in the world', which, in Australia, will 'help meet domestic demand for seafood, boost exports and provide thousands of additional jobs, especially in regional areas'[33].

The significance of the seafood industries has been underlined by the COVID-19 pandemic. The increased demand for seafood products meant most businesses were classified as belonging to 'essential industries' and remained in operation throughout the pandemic. The *National Agricultural Workforce Strategy* states that the best way of supporting and future-proofing such industries is by preparing all levels of the workforce through 'learning in all its forms, at all levels, in all the relevant parts of the nation'[34].

## Australian seafood producers expanding into new export markets

In 2019-2020, Australia was exporting around half of the seafood it produced, particularly to China (54%), Japan (15%) and Hong Kong (10%)[35]. However, seafood exports have declined by around 8% because of the disruptions of COVID-19 and continuing trade tensions with China, which has significantly impacted rock lobster and other sectors. Industry stakeholders have since warned of the need to diversify export markets to future proof operations.

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[32] Department of Agriculture, Water and the Environment (2022); *Australian fisheries and aquaculture production*; www.awe.gov.au/abares/research-topics/fisheries/fisheries-andaquaculture-statistics/production; viewed 24/05/ 2022.
[33] Parliament of the Commonwealth Of Australia (2022); *Supporting a strong future for Australian aquaculture*; House of Representatives Standing Committee on Agriculture and Water Resources; p.3 & v.
[34] J. Azarias, R. Nettle & J. Williams (2020); *National Agricultural Workforce Strategy: Learning to excel*; National Agricultural Labour Advisory Committee; Canberra, December. CC BY 4.0; p.xiii.
[35] https://www.frdc.com.au/australian-seafood-trade-and-market-access#toc-australian-seafood-exports

Tassal Group, for example, have reported that the COVID-19 pandemic caused their export costs to increase by 120% in 2020 because of travel bans and reduced airfreight opportunities[36]. While praising the Australian Government's International Freight Access Mechanism (IFAM) as a 'lifeline' for aquaculture businesses to continue accessing international markets, Tassal recommends that the aquaculture industry establishes longer-term strategies to safeguard against future disruptions[37]. This includes support for operators to diversify their export portfolios to ensure commercial viability and minimise risk, including in emerging sectors such as coral aquaculture. With the help of the Australian Government (through potential free trade agreements and seafood accords with export partners), new markets could open for businesses, who would then have greater confidence in investing in the infrastructure, employees and workforce development activities that boost regional, rural and remote communities.

Various initiatives and strategies are already underway to help the seafood industry access new markets and capabilities:

- The Agricultural Trade and Market Access Cooperation (ATMAC) program[38], which is part of the Agri-Business Expansion Initiative (ABEI), has been extended to help Australian producers reach new export markets. Successful projects already funded include Seafood Industry Australia (SIA) being awarded an $888,0000 grant to explore new export opportunities in high-value overseas markets, especially for rock lobster and abalone in Asia, the Americas and Europe, and a one-stop-shop digital platform created for seafood exporters to simplify their access to information and resources, and so lift barriers to market participation[39].
- A $1.275m grant being awarded to SIA to develop and expand in global seafood markets. This funding will be directed to existing, new, emerging, and high growth potential markets, informed by the *Seafood Industry Export Market Strategic Plan*[40].
- Free trade agreements have been announced with India[41] and the UK[42] to help industry diversify their markets.

## Growing and emerging sectors

Seaweed farming has been touted by AgriFutures Australia as potentially a $1.5 billion industry by 2040 due to its many possible uses, including for human food, animal feed, soil additive, fertiliser, pharmaceuticals and nutraceuticals, as well as reduction of livestock methane emissions (by up to 90%)[43]. Research is also proceeding to explore its potential use in bioplastics[44], construction materials, and carbon capture. It is estimated that, by 2025, the industry will employ 1,200 people, which could rise to 9,000 by 2040. This emerging sector, therefore, could be a large source of new employment and skills development, become a significant value chain partner for the livestock industries, and support the net zero by 2050 target. At present, there are no commercial-scale seaweed farms in Australia, so this opportunity would require 'the introduction of policy and regulation to allow for ocean cultivation of native seaweeds in offshore zones, the creation of dedicated research and development plans, and investment in emerging

[36] Parliament of the Commonwealth of Australia (2022); *Supporting a strong future for Australian aquaculture*; House of Representatives Standing Committee on Agriculture and Water Resources; p.14.
[37] Parliament of the Commonwealth of Australia (2022); *Supporting a strong future for Australian aquaculture*; House of Representatives Standing Committee on Agriculture and Water Resources; p.14.
[38] Australian Government (2021); *Agricultural Trade and Market Access Cooperation (ATMAC) Program*; https://www.agriculture.gov.au/market-access-trade/atmac; viewed 29/09/2021.
[39] Australian Government (2021); *Joint media release: Seafood exports to scale up*; The Hon. David Littleproud MP; https://minister.awe.gov.au/littleproud/media-releases/atmac-grant-seafood-industry-australia; viewed 29/09/2021.
[40] http://seafoodindustryaustralia.com.au/australias-great-seafood-exports-get-a-boost/
[41] http://seafoodindustryaustralia.com.au/a-significant-leap-forward-for-international-seafood-trade-australian-seafood-industry-welcomes-australia-india-free-trade-agreement/
[42] http://seafoodindustryaustralia.com.au/a-period-of-growth-and-opportunity-australian-seafood-industry-welcomes-uk-australia-free-trade-agreement/
[43] J. Kelly (2020); *Australian Seaweed Industry Blueprint: A Blueprint for Growth; AgriFutures Australia*
[44] https://ecos.csiro.au/could-seaweed-replace-plastic/

discoveries'[45].

The House of Representatives Standing Committee on Agriculture and Water Resources highlights work by the Blue Economy CRC, including its research programs on seafood and marine products, in which a major focus is developing viable and sustainable growth opportunities through offshore aquaculture systems (operations more than three nautical miles from the coast). Informed by offshore aquaculture developments from around the world, notably Norway, where the level of salmon production is hoped to triple from being moved offshore, the CRC has particularly highlighted the potential for finfish, oyster and seaweed aquaculture. However, there are implementation barriers that must be overcome in order to operate in exposed and remote environments. New infrastructure investment and skills will be required to ensure successful feeding, animal husbandry, biosecurity, maintenance, supply chain logistics and energy supply. Dr John Whittington, CEO of the Blue Economy CRC, has reported that, once regulatory frameworks, infrastructure and safety processes have been established, offshore aquaculture could commence within a few years[46].

There are various ongoing projects to assess the viability of new aquaculture ventures, including the CRCNA's exploration of the potential for aquaculture in northern Australia, where there is potential for growing the sectors for tropical prawns and tropical marine white-fleshed fish[47]. Large businesses such as Tassal and Huon are diversifying in line with their business strategies and expanding into the kingfish and prawn sectors.

## Shortage of skilled workers

The seafood industries continue to be constrained by widespread shortages of skilled and inexperienced labour, jeopardising the short- and long-term viability of many businesses.

The National Skills Commission (NSC) regularly reviews the national skills needs of Australia and, from June 2021, has responsibility for releasing a Skills Priority List (SPL) annually. A key element of the SPL is the determination of occupational shortages, when 'employers are unable to fill or have considerable difficulty filling vacancies for an occupation or cannot meet significant specialised skill needs within that occupation, at current levels of remuneration and conditions of employment and in reasonably accessible locations'[48].

Occupational shortages designated by the NSC for the seafood industry are:

| ANZSCO Code | Occupation | Current national shortage overall? | Future demand (five-year period) |
|---|---|---|---|
| 899212 | Fishing Hand | No (shortage in WA) | Moderate |
| 899211 | Deck Hand | No (shortage in NT) | Moderate |
| 231211 | Master Fisher | No (shortage in NT) | Moderate |
| 399911 | Diver | No (shortage in NT) | Moderate |
| 121111 | Aquaculture Farmer | No (shortage in NSW, SA, TAS & NT) | Soft |
| 311311 | Fisheries Officer | No | Moderate |

[45] Parliament of the Commonwealth of Australia (2022); *Supporting a strong future for Australian aquaculture*; House of Representatives Standing Committee on Agriculture and Water Resources; p.18.
[46] Parliament of the Commonwealth of Australia (2022); *Supporting a strong future for Australian aquaculture;* House of Representatives Standing Committee on Agriculture and Water Resources; pp.16-18.
[47] https://www.crcna.com.au/resources/publications/northern-australia-aquaculture-situational-analysis
[48] National Skills Commission (2021); *Skills Priority List Methodology*; p.5

Stakeholders report shortages of skilled workers because of foreign labour and skilled migrant numbers being reduced during the COVID-19 pandemic. As SIA stated in their submission to the National Agriculture Workforce Strategy (NAWS):

> 'Seafood is seasonal and looking for increased workforce coming into spring and summer. October sees the start of the Southern Rock Lobster fishing season. Availability of skilled crews will be restricted by the lack of foreign and transient workers'

The Australian Prawn Farmers Association, meanwhile, notes that some operators have been contemplating suspending production in 2022 due to not being able to obtain workers or to recruit them at affordable pay rates. As businesses struggle to maintain operations, it becomes increasingly challenging to establish solutions for meeting the needs both of the employer and employee in fostering productive and enduring workplace arrangements.

## Workforce management and planning strategies

The potential growth of the seafood industry is limited by the availability of workers. Aquaculture and wild catch businesses require workers at various skill levels, but according to SIA's submission to the House of Representatives Standing Committee on Agriculture and Water Resources, 'a specific breakdown of the number of skilled, semi-skilled and unskilled [inexperienced] workers working in the industry does not exist'[49]. Workforce planning strategies to attract and retain workers are limited by this absence of data, which also impacts on the demand signals for skills and training services.

Such complexities make it imperative for seafood workforce challenges and opportunities to be more clearly articulated through ongoing, extensive consultation and engagement. Such intelligence-gathering and insights would inform decision-making by employers, unions, the National Skills Commission (NSC) and Skills Ministers, and help to drive change and improvements across systems, including industry and education.

Specific programs have already been established to retain and develop workers; for example:

- SeSAFE: an initiative to raise awareness and improve safety performance in the fishing and aquaculture industry across Australia.
- Junior Indigenous Marine and Environmental Cadets Program: provides pathways for young Indigenous people in regional Australia to train and receive formal qualifications in both the marine and environmental industries.

The *National Fisheries Plan* wants to build on such programs, and is targeting greater access to an engaged, skilled workforce by 2030. This includes:

- Developing and embedding effective pathways for people to be engaged and employed in the fishing, aquaculture and seafood sectors, including job creation and growing the industry.
- Promoting diversity in career opportunities and investing in education and training to ensure career succession and participation in fishing, aquaculture and seafood fields, as well as career opportunities in research, habitat protection and restoration.
- Identifying barriers to participation and opportunities for young Australians, including Aboriginal and Torres Strait Islander peoples and communities, to be engaged in the fishing, aquaculture and seafood sectors.

*Australian Government (2022); National Fisheries Plan 2022-2030; Department of Agriculture, Water and the Environment, Canberra; p.15.*

[49] Parliament of the Commonwealth of Australia (2022); *Supporting a strong future for Australian aquaculture;* House of Representatives Standing Committee on Agriculture and Water Resources; p.44.

SIA submitted to the *National Agriculture Workforce Strategy* that a flourishing, skilled and productive seafood sector needs to create greater visibility for the availability of career paths and demonstrate a commitment to skills and training. They recommend enhanced use of technology to facilitate better promotion of career paths and job vacancies, including through an app on their new platform to engage industry and workers in learning and inductions, especially around safety. A mandatory blue card (similar to the building industry's white card) is proposed as part of this development, which would be delivered through the app, and would create a culture of professionalism and safety consciousness for all industry operators, including new entrants. SIA further hope that the app could support RTOs in providing a standardised approach to training, especially through tailored and contextualised resources. Industry-specific content and programs are planned to be coordinated via an extension hub, which will focus on multiple on-the-boat and beyond-the-boat career pathway opportunities.

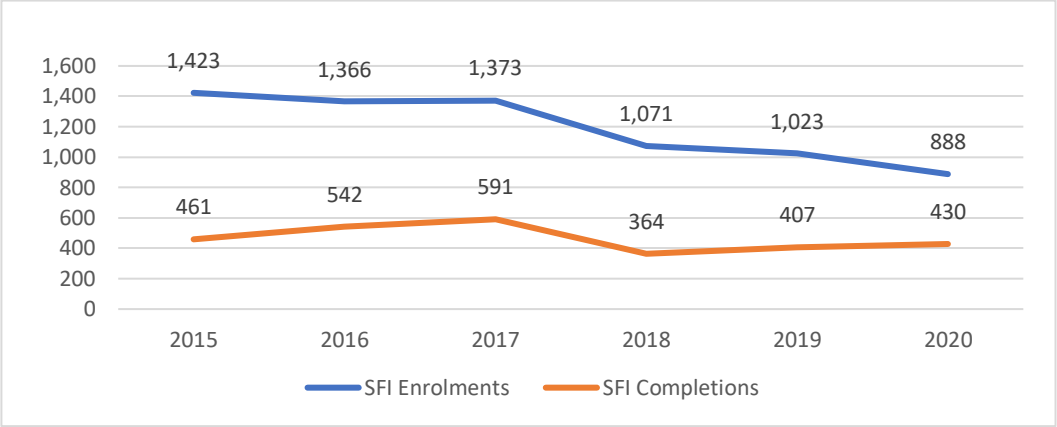
# Training Summary

## VET training products

In 2020, there were 888 enrolments in *SFI Training Package* qualifications.

There were 430 qualification completions in 2020.

**Figure 5: SFI Training Package Qualification Enrolments and Completions by Year**

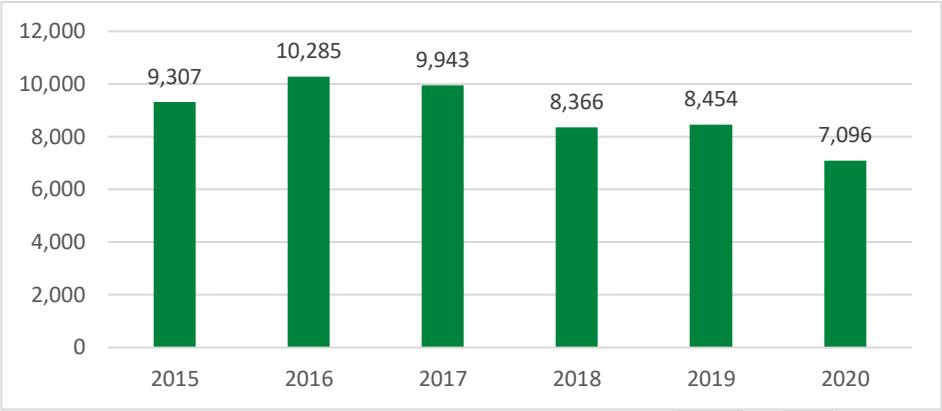



*Source: NCVER VOCSTATS, TVA program enrolments 2015-2020*

The greatest number of qualification enrolments in 2020 were in Tasmania (283), followed by Western Australia (214) and Queensland (130).

In 2020, there were 7,096 enrolments in *SFI Training Package* units of competency (hereafter 'units'). This includes enrolments through qualifications (in any training package), apprenticeships and non-apprenticeships, skill sets and micro-credentials.

**Figure 6: SFI Training Package Unit Enrolments by Year**




*Source: NCVER VOCSTATS, TVA subject enrolments 2015-2020*

*SFI Training Package* units are developed with support from stakeholders from multiple industries, and delivered by the training providers servicing those multiple industries, because of their capacity to be contextualised. Such transferability ensures the training system supports individuals to move easily between related occupations and sectors. SFI units are currently imported into training qualifications outside of the *SFI Training Package* 190 times.

Please see the *Agribusiness, Food and Fibre Industries Skills Report* for additional information on learners' motivations for undertaking formal training. There is also extensive information on agriculture, forestry and fishing employers' tendency of adopting mixed models of training, comprising formal VET and informal workplace-based capabilities development. Employers' choice of training provider is influenced by such variables as local availability of training services, training provider reputation, time constraints, capital (associated with business size and sector) and seasonality.
Products from various training packages are sought out by employers for specific reasons, including for licensing and regulation, safety requirements, machinery operation, business operations and mental health training. The legitimacy of a nationally recognised qualification is not necessarily a motivating factor, though some industry employers' value being involved in the development of training package products and the career pathways that formal participation can unlock[50].

## Barriers to employers using nationally recognised training

Various barriers to employers accessing and engaging with nationally recognised training have been documented. These include the culture and structure of businesses, which may have been owned and operated by families for decades, whose fishing leases and knowledge has been passed down through the generations. There may also be low levels of language, literacy and numeracy skills and a relatively high proportion of workers who are from non-English speaking backgrounds, who may need greater support as part of any training (which can be challenging for RTOs to provide).

There are also challenges associated with the relative absence of RTOs delivering quality training across the dispersed regional areas in which the seafood industries operate. These areas are generally low-profit training environments because there is a double burden of high capital investment requirements (i.e. to deliver the training RTOs must have access to expensive machinery and equipment, ensure significant safety measures, and employ highly proficient people in trainer and assessor roles) and student cohorts being spread over a broad geographic range, leading to low learner-to-trainer ratios in any delivery location.

[50] K. Bowman & V.J. Callan (2021); Engaging more employers in nationally recognised training to develop their workforce - employer interviews - support document 3; NCVER, Adelaide.

As a result, the cost per learner is generally much higher for the RTO than in a metropolitan area and any extra subsidies (location and equity loadings[51]) paid to the RTO to account for these higher delivery costs are reported by many stakeholders as being insufficient[52]. For many RTOs, continuing to deliver training becomes unviable – especially if there are options for its business strategy to instead concentrate on other, high enrolment, low-cost, training packages.

Low profitability entails RTOs have fewer resources with which to develop quality training and assessment delivery. In their submission to the House of Representatives Standing Committee on Agriculture and Water Resources, Petuna Aquaculture noted that RTOs must 'identify areas of weakness' in existing curricula and delivery strategies, including by 'engaging with the industry to develop appropriate learning outcomes'. Petuna Aquaculture further stated that:

> 'RTOs are becoming more and more reluctant to take on new areas of training due to the demanding level of regulation in the sector, including the cost of meeting that regulation. If a business requires training outside the existing scope of training, an RTO needs to be fully compliant in all areas of new delivery before a single student can be enrolled or before a course can even be advertised.'
> *Petuna Aquaculture, Submission 33, p. 5.; in Parliament of the Commonwealth of Australia (2022); Supporting a strong future for Australian aquaculture; House of Representatives Standing Committee on Agriculture and Water Resources; p.45.*

Due to these issues, RTOs are reluctant to fund the update and development of new seafood industry training and assessment materials, and fewer RTOs are entering the training market to deliver *SFI Training Package* products. This reduces the overall supply of seafood industry skills and training, especially in the regional areas where they are most needed. In the relative absence of formal training delivery, enterprises seek alternative training options for their staff, leading to an overall lowering of demand. With both supply and demand suffering, these VET markets are characterised as 'thin'.

The House of Representatives Standing Committee on Agriculture and Water Resources states that 'a key to overcoming skills and labour shortages lies in training and education tailored to industry needs.' They note various opportunities that may emerge from engagement in the formal skills and VET system, and recommend:

> 'Recommendation 3: The Committee recommends that the Commonwealth Government work with the aquaculture industry, training providers and state and relevant Northern Territory government agencies to develop specialised training pathways and profession development programs to strengthen the aquaculture workforce.'
> *Parliament of the Commonwealth of Australia (2022); Supporting a strong future for Australian aquaculture; House of Representatives Standing Committee on Agriculture and Water Resources; p.57.*

The new industry engagement arrangements for Industry Clusters proposed by the Transition Advisory Group[53] point towards activities that would support this recommendation, including:

- Build buy-in across industry by promoting opportunities for employers and learners.
- Form partnerships with training providers and across the training sector to connect national training products with delivery of training on-the-ground and longer-term workforce development.
- Develop resources for training providers, trainers, assessors and employers to improve training and assessment practices, including in-workplace assessment.

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[51] Productivity Commission (2020); *National Agreement for Skills and Workforce Development Review, Interim Report*; p.143
[52] Skills Impact (2021); *Thin Markets and RTO Delivery Challenges*; https://www.skillsimpact.com.au/vetinsights/thin-markets-and-rto-delivery-challenges/; viewed 11/02/2022
[53] Transition Advisory Group (2021); *Transition Advisory Group Final Advice – New Industry Engagement Arrangements*; Australian Government Department of Education, Skills and Employment; p.6.

- Develop learning materials and other resources to support registered training organisations in delivering training to meet workforce and skills needs, particularly within small or thin markets such as regional, rural and remote areas.
- Map learning pathways, encourage work placements and support transition points across the education lifecycle via collaboration with the National Careers Institute, schools and higher education providers.
- Establish mechanisms to monitor employer and learner outcomes from training delivery, including identifying where RTOs are getting good outcomes, to identify opportunities to strengthen the quality of training delivery and pathways.

It should be noted that, to maximise their potential, the new industry engagement arrangements need to be supported by changes to training package policy and process, including qualification reform, to provide innovative opportunities to work across industry sectors with qualifications that work to lift opportunities and productivity levels.

## Rural, Regional & Remote Summary

Seafood producers are largely located in regional locations where access to skilled workers, and resources for inexperienced workers' development, is limited. A lack of infrastructure and services makes moving to some locations an unattractive proposition, and businesses are forced to incentivise potential employees by offering higher wages, which can often be challenging financially.

AgriFutures describe how the contribution of the agriculture, forestry and fisheries industries to regional development is variable across different parts of the country, with an important success driver being the presence of, and further opportunities for, other industries in the value chain. A Darwin seafood processing facility scoping study case study (see below) highlights that food processors often benefit from being located close to their inputs (perishable goods) and can strengthen local economies in partnership with value chain collaborators. In order to retain workers in the regions, such developments must be complemented by meaningful development.
People must want to live and work in the regions, which requires addressing multiple barriers, including liveability, infrastructure, and service provision issues (including education, health and transport).

Developing new businesses and expanding industries in regional, rural and remote areas is an enduring challenge for federal and state governments, business partners, educators and all other stakeholders. It requires inclusive research, realistic scoping studies, pragmatic decision-making, and holistic strategies to develop and sustain the opportunities presented.

A situational analysis conducted by CRCNA[54] established that, by 2030, the aquaculture industry has potential to grow its current production value by five times, which would bring around 1,400 to 2,300 new jobs. The CRCNA assert that this can only occur with ongoing support and planning, infrastructure, research, development and extension, and investment.

[54] CRCNA (2020); *Northern Australia aquaculture situational analysis 2020*

**Case study: Darwin seafood processing facility scoping study**

There is currently limited seafood processing in the Northern Territory, with the majority of NT seafood being sent to southern states for processing. The NT Government engaged KPMG to undertake a scoping study to assess the viability of a Darwin seafood processing facility as a value-adding proposition. KPMG's final report[55] advises that:

- a processing facility presents an opportunity to build a resilient and vibrant industry and promote consistency and quality of product, greater exports, industry co-operation, branding co-development, and research and development;
- low production volumes necessitate a development approach focussed on high value and quality products that are mainly for export: in particular, black jewfish and barramundi (wild-caught) bladders, pearl meat, trepang and pelagic species, with a range of other species that could be smoked or turned into high-value niche products;
- government and industry should continue to co-ordinate and facilitate the discussions required to move forward with an industry-driven project;
- a significant objective for a new facility would be job creation through its on-going operations; and
- change will be a challenge: while industry is supportive of the processing facility concept, seafood processing is not well-established in the NT and will require development of industry operations and culture, including a focus on training. Stakeholder feedback indicated hesitations over a ready access to skilled labour, and recommended that a training facility to upskill the workforce and create jobs be established in collaboration with an RTO.

Realising the potential of these planned investments in the regions is likely to help attract and retain workers. However, such investments can be a risk, particularly where there are not already-established populations and industries, with associated education opportunities that lift the skill levels of local populations and associated lifestyle quality issues. Various studies of regional, rural and remote challenges emphasise educational opportunities as central to a regionalisation agenda. This is because good schools and other educational services are attractive to families considering moving to regions. They also enable social mobility and develop the skilled workers that industries require.

To help address these challenges, Australia's first Regional Education Commissioner was appointed in December 2021 and will oversee implementation of recommendations from the *National Regional, Rural and Remote Tertiary Education Strategy* ('the Napthine Review')[56].

Implementing the recommendations of the Napthine Review will complement the VET reform agenda as well as efforts by regional industries to improve productivity and profitability. The Transition Advisory Group[57] are clear that businesses in regional areas must be adequately represented in the reformed VET system so that appropriate training is delivered where and when it is needed. This requires improving employer engagement with the national training system, creating collaborative relationships between employers and training providers, and working towards longer-term workforce development objectives.

[55] KPMG (2020); Darwin Seafood Processing Facility Scoping Study; Northern Territory Government

[56] Commonwealth of Australia (2019); *National Regional, Rural and Remote Tertiary Education Strategy*.

[57] Transition Advisory Group (2021); *Final Advice – New Industry Engagement Arrangements*; Australian Government Department of Education, Skills and Employment; p.2.

## Aboriginal & Torres Strait Islander Peoples Summary

Australia's Aboriginal and Torres Strait Islander peoples have longstanding and profound cultural connections with the land and sea. The *National Fisheries Plan* recognises that 'Aboriginal and Torres Strait Islander peoples are the first custodians of Australian's marine and freshwater environments', especially with extensive evidence of centuries-old adoption of aquaculture systems[58].

Federal and state governments acknowledge the cultural significance of traditional fishing practices and support the participation of Aboriginal and Torres Strait Islander communities in fisheries management and seafood businesses. A key priority of the *National Fisheries Plan* is for:

> 'Nurturing cultural and customary values and supporting and enabling participation of the Indigenous fishing, aquaculture and seafood sectors in fisheries management and fisheries-related business'
> *Australian Government (2022); National Fisheries Plan 2022-2030; Department of Agriculture, Water and the Environment, Canberra.*

There is a growing recognition of Aboriginal and Torres Strait Islander participation in the seafood industry, which has seen greater business development opportunities, inter-community partnerships and self-determination. The *National Fisheries Plan* commits to four targets to be achieved by 2030, which would contribute to the aims of *Closing the Gap*:

- Cultural fishing is more widely practised by Indigenous people and celebrated by the broader community.
- The fishing, aquaculture and seafood community recognises the customary rights, obligations and values of Traditional Owners.
- Participation of Indigenous people of all ages and genders in commercial and recreational fishing and in fisheries management and monitoring is enhanced, acknowledged and supported.
- Business and employment opportunities for Aboriginal and Torres Strait Islander peoples in the fishing, aquaculture and seafood industry have increased.

*Australian Government (2022); National Fisheries Plan 2022-2030; Department of Agriculture, Water and the Environment, Canberra; p.9.*

There are numerous successful businesses run by Aboriginal and Torres Strait Islander peoples across the seafood industries. For example:

- The Tasmanian government and the Land and Sea Aboriginal Corporation of Tasmania have signed a contract for the latter to formally establish an Aboriginal cultural abalone fishery and fish the 40 state-owned abalone units. This will create at least nine jobs[59].
- In WA, the Murujuga Aboriginal Corporation is partnering with the Pilbara Development Commission, Maxima Pearling Company, and the City of Karratha to examine the viability of farming tropical blacklip rock oysters.
- The Emama Nguda Aboriginal Corporation is commercialising the breeding of giant freshwater prawns ('cherabin') in Derby, WA.
- The Narungga National Aboriginal Corporation has been granted a seaweed farming licence in SA and is working in partnership with CH4 Global to commercialise cultured seaweeds.

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[58] J. Azarias, R. Nettle & J. Williams (2020); *National Agricultural Workforce Strategy: Learning to excel*; National Agricultural Labour Advisory Committee; Canberra, December. CC BY 4.0; p.9.

[59] Premier of Tasmania (2022); *Historic agreement for cultural and commercial abalone fishing*; https://www.premier.tas.gov.au/site_resources_2015/additional_releases/historic_agreement_for_cultural_and_commercial_abalone_fishing; viewed 17/06/2022.

- Tasmania Seafood Pty Ltd is collaborating with Aboriginal communities in the NT to develop hatchery production and ranching of sea cucumbers. This is a profitable and niche product, which is popular in Asian markets and is revitalising a traditional sector in northern Australia.

Activities by Aboriginal and Torres Strait Islander peoples are often at the forefront of emerging sectors, coinciding with national demand for greater transparency around provenance and sustainable practices. The Northern Land Council[60] has stressed the significance of 'flexible, adaptive and creative' undertakings for developing economic activities that are compatible with Aboriginal and Torres Strait Islander skills and approaches.

Through progressive self-determination policies and productive partnership working, there have been numerous cross-sector business achievements over recent years. In the 2020-21 period in northern Australia, the Indigenous Land and Sea Corporation[61] has reported policy development and new opportunities created across projects, including to increase Indigenous representation in the SA tuna fishing industry; expand service networks in rural, regional and remote locations; implement strategies to protect Indigenous traditional knowledge and intellectual property; and monitor business outcomes through a joint venture assessment framework. Such examples highlight the importance of increasing opportunities and recognition for Aboriginal and Torres Strait Islander Peoples' participation across the seafood industries (see, for example, the case study below).

**Case study: Increasing recognition for Aboriginal and Torres Strait Islander Peoples' participation in the fishing industry**

At the 2021 World Fisheries Congress, Matthew Osborne (Program Leader, Aquaculture and Regional Development in Northern Territory Fisheries) promoted recognition of the importance of the fishing industry for Aboriginal and Islander people, and the contributions that they continue to make[62]. Indigenous fishing adds value and diversity to the Australian fishing community in its blending of cultural, recreational, commercial, and environmental practices. It has the ability to connect sectors and support a collective representation of Australia's fisheries.

Various programs have been established in northern Australia, including through funded research dedicated to progressing Indigenous participation in fisheries decision-making, capacity building and economic development. Projects have also been developed and funded across Australia to empower communities and support change, which requires strategies both to impact attitudinal change and regulator policies.

There are recent examples of greater collaboration between Aboriginal and Torres Strait Islander people, government, industry and other fishing stakeholders. These include the development of culturally aligned, community-based fishing operations in the Northern Territory, where Aboriginal people are building coastal fishing businesses and supplying their communities with fresh, affordable seafood. This is resulting in economic development and self-determination opportunities and enabling the continuation of cultural practices.

It must be noted that there are persisting challenges in unlocking opportunities for Aboriginal and Torres

[60] Joint Standing Committee on Northern Australia (2022); *The engagement of traditional owners in the economic development of northern Australia*; Parliament of the Commonwealth of Australia; Canberra, January 2022.
[61] Joint Standing Committee on Northern Australia (2022); *The engagement of traditional owners in the economic development of northern Australia*; Parliament of the Commonwealth of Australia; Canberra, January 2022; pp.78-79 (Kimberley Land Council submission); p.53
[62] FRDC (2021); *Celebrating the story of Indigenous fishing on a world stage*; https://www.frdc.com.au/fish-vol-29-3/celebrating-story-indigenous-fishing-world-stage; viewed 14/02/2022.

Strait Islander peoples due to limited funding and investment for Indigenous aquaculture projects, education provision shortcomings, a lack of tailored resources, and inadequate support for traditional owner organisations to generate substantive outcomes.

# Appendix: Qualifications and Licensing, Legislative or Certification Requirements

| Qualification Title | Licensing, Legislative or Certification requirement |
|---|---|
| Certificate III in Aquaculture | Some SFI and imported units in the elective bank are subject to licensing, legislative or certification requirements, including:<br><br>- occupational diving is regulated independently by each state and territory workplace health and safety authority. Users are advised to check with the relevant authority to confirm current requirements.<br>- the MAR units that appear in the elective bank are subject to licensing and regulatory requirements. These units must be implemented in line with the *MAR Maritime Training Package* and Australian Maritime Safety Authority (AMSA) requirements.<br>- the TLI licensing units must be implemented in line with the *TLI Transport and Logistics Training Package*. |
| Certificate III in Fishing Operations | Some SFI and imported units in the elective bank are subject to licensing, legislative or certification requirements, including:<br><br>- occupational diving is regulated independently by each state and territory workplace health and safety authority. Users are advised to check with the relevant authority to confirm current requirements.<br>- the MAR units that appear in the elective bank are subject to licensing and regulatory requirements. These units must be implemented in line with the *MAR Maritime Training Package* and Australian Maritime Safety Authority (AMSA) requirements.<br>- the TLI licensing units must be implemented in line with the *TLI Transport and Logistics Training Package*. |
| Certificate III in Fisheries Compliance | All work is carried out to comply with workplace procedures, according to state/territory health and safety, food safety, biosecurity and environmental regulations, legislation and standards that apply to the workplace. Licences will be required if operating vessels and vehicles.<br><br>The MAR units that appear in the elective bank are subject to licensing and regulatory requirements. These units must be implemented in line with the requirements of the *MAR Maritime Training Package* and Australian Maritime Safety Authority (AMSA) requirements.<br><br>Statutory/legislative requirements may apply to holders of this qualification and may vary across states and territories. Users are required to check with the relevant jurisdiction for current requirements. |