AQUACULTURE AND WILD CATCH INDUSTRY SECTOR

IRC Skills Forecast and Proposed Schedule of Work

2017–2020

Prepared on behalf of the Seafood Industry Reference Committee for the Australian Industry and Skills Committee.

skillsimpact.com.au

IRC SKILLS FORECAST AND PROPOSED SCHEDULE OF WORK 2017–2020

Purpose

This skills forecast represents the latest industry intelligence and resulting schedule of work of the Seafood Industry Reference Committee (IRC). It was developed through research of national and industry data sources and ongoing input from IRC members and key stakeholders. The report is designed to provide the Australian Industry and Skills Committee (AISC) on the four-year rolling National Schedule of training product development and review work.

The industry intelligence component covers the following topics:

Sector Overview – examining the depth and breadth of the industry and identifying the macro environments that currently challenge and/or provide opportunities for the industry

Employment – reviewing the employment projections by the Department of Employment and outlining the current workforce profile and supply for the industry

Skills Outlook – identifying the key priority skills for the industry and how they can benefit from improvement or development of national skill standards

Training Product Review Work Plan – establishing the scope and timeframe of proposed training package development in line with industry priority skills.

This IRC Skills Forecast and Proposed Schedule of Work 2017–2020 has been produced with the assistance of funding provided by The Commonwealth Government through the Department of Education and Training.

skillsimpact.com.au

CONTENT

Executive Summary

This report provides an overview of workforce development and skills needs for the Australian seafood industry sector. The report was commissioned to support the Australian Industry and Skills Committee (AISC) in developing the four-year rolling National Schedule of training product development and review work. The report is structured, as per the AISC template, in four main sections as follows: sector overview, employment, skills outlook, and training product review plan. Methods of analysis include research of published national and industry data sources and input from Industry Reference Committee (IRC) members and key stakeholders.

The report draws attention to the fact that the demand for seafood grows both nationally and globally, providing this industry with the potential for growth and new business opportunities. The opportunities are also shaped by a number of current government policies such as *Our North Our Future: White Paper on Developing Northern Australia* and free trade agreements, and increasing demand for Australian-farmed and wild-caught seafood. Proximity to Asian markets, and the world-leading quality of Australian seafood, offer a competitive advantage to Australian seafood producers, as do the availability and ongoing development of advanced technologies.

Further, the report discusses the fact that the industry sector's workforce, consistent with many other industry sectors, is reaching the retirement age in higher numbers, creating significant challenges for employers – particularly in respect to their ability to attract people to the industry and develop their skills through on-the-job learning and formal training.

Importantly, the report shows that employers will increasingly seek higher-level skills, both specific and non-specific to the industry, to support more demanding jobs in most workplaces. This is needed because there is growing adoption and application of technologies like genetic improvement techniques for finfish and shellfish; emerging tracking technologies and on-board automation in fishing operations; new approaches for securing the health of Australia's biosecurity; larger and sustainable aquaculture systems; greater interaction with global supply chains; and stronger online presence promoting key features of aquaculture and wild fishing in Australia, among many other innovations. The workforce needs to improve the job-specific skills to support these higher efficiency targets, innovations, and automation/digitisation.

Higher demands are also adding new functions to job roles to support broader processes and outcomes. Operational employees are increasingly required to undertake process and staff management, quality inspection, generation of information/reporting, process improvements, and technical maintenance. Similarly, higher-level skills are required of specialist managers to support strategic developments and targets. Some examples of this include strategic leadership and change management skills, marketing executive skills, developing investment project skills, global supply chain and logistics skills, and other high-level skills.

Summary of key points in each section

Sector overview

- The seafood industry can be described as having four sectors: aquaculture (offshore and onshore), fishing (commercial), seafood processing, and seafood sales and distribution. Compliance is identified as a critical function across all sectors.
- The industry includes more than 7,186 commercial businesses, which collectively employ between 10,000 and 15,000 people. Nearly 70 per cent of these businesses focus on fishing. The industry also involves about 3.4 million Australians in recreational fishing each year, and many Indigenous Australians in customary fishing activities; however, these are not considered sectors for the purpose of vocational skills and training.
- Over 60 per cent of commercial businesses are non-employing operations, and over 30 per cent employ fewer than 20 people. Small businesses generally sell to local markets. Large operators are generally vertically integrated and dominate the larger markets.
- Total sales turnover of the combined aquaculture, commercial fishing and seafood processing sectors increased by 7 per cent (or $303 million) to $4.8 billion between 2013–14 and 2014–15.
- The industry is represented by over 60 peak organisations at a national and state level, including industry associations and a number of other representative organisations such as recreational fishing organisations.
- Key regulations for the industry include or are related to: international instruments concerning fisheries; federal and state government regulations for the management of Australia's fisheries resources; commercial fishing permits; industry codes of conduct; sustainability certification programs; Food Standards Australia New Zealand; marine safety legislation; workplace safety regulations; environmental regulations; and export/import legislations.
- The industry has the following regulated occupations[1] specific to this industry: skippers, officers in charge of a navigational watch, and engineers on a fishing vessel must hold a licence according to the *Marine Orders 51 (Fishing Vessels) 1989* in order to perform duties and functions in relation to a fishing vessel on an overseas voyage. Operators in high-risk jobs, particularly in processing/filleting, must have licences to perform those work functions as an industry requirement.
- Key macro forces that currently challenge and provide opportunities for the industry sectors include:
    - The fishing and aquaculture industry operates in a business environment made more complex due to its dependence on access to publicly managed natural resources. Access to suitable production areas (both land and water) represents a challenge for the industry due to competing users for the available water and land resource base, and complex regulatory systems.
    - Federal government's regional plan for developing Northern Australia, and free trade agreements, which provide access to a diverse range of overseas markets. Such policies are important enabling factors for seafood export developments and the development of large-scale aquaculture farms.

[1] Regulated occupations have legal (or industry) requirements or restrictions to perform the work. Regulated occupations require a license from, or registration by, a professional association or occupational licensing authority.

- There is a growing demand for seafood both nationally and globally, and the potential to increase the productivity and profitability of the industry by developing new markets, and new and value-added products from under-valued or under-utilised species and waste.
- Australia's proximity to Asian markets and the world-leading quality of Australian seafood provide a competitive advantage to the Australian seafood producers. Aquaculture skills provide the sector with a competitive advantage, especially in high-value aquaculture products.
- Access to suitable production areas (both land and water) represents a challenge for the industry due to competing users for the available water and land resource base – i.e. conflict arising between the industry, local communities and recreational users of the waterways.
- Existing and ongoing development of enabling technologies can allow fishers and fish farmers to reduce seafood production costs and improve Australia's future stock supplies. These developments enable Australian seafood to be a more competitive industry both nationally and globally.
- Pest organisms, including translocated species and pathogens, are an increasing threat to Australian fisheries and their ecosystems. They may adversely affect native species or farmed non-endemic species for food and habitat, by predation, or by introduction of disease. With international trade in live aquatic animals, bait fish, aquaculture feeds and foodstuffs, and global logistics and human travel, the risk will continue to rise.
- Increased climate change and variability will change where and how the industry fishes and farms in the future. There will be gains and losses.

Employment

- In 2014–15, an estimated 14,213 people were employed in the commercial fishing and aquaculture industry, with 7,225 employed in fishing enterprises and 6,988 in aquaculture. Of this total, an estimated 10,682 people (75 per cent) worked full-time and 3,530 (25 per cent) part-time.
- Fish wholesaling and seafood processing employed 5,764 people based on the 2011 Census, with 69 per cent (3,981 people) employed in fish wholesaling and 31 per cent (1,783 people) in seafood processing.
- Moderate employment growth is forecast in line with improved seafood production and import volumes.
- About 24 per cent of the industry workforce is likely to retire over the next five years.
- A significant number of the workforce occupies roles specific to the industry, including deck crew, aquaculture workers, divers, marine transport professionals, seafood process workers, wholesalers (including importers and exporters), and sales representatives. A significant part of the workforce is also employed to undertake more general roles such as clerical and administrative work, packing, and delivery vehicle and truck driving.
- Seasonal and overseas workers play an important role in the sector, particularly in the low-skilled work area, remote regional employment and at peak harvest times.

Skills outlook

Priority skills in the seafood industry over the next four years, 2017–2020, are summarised in the following table.

PRIORITY SKILL	DRIVERS	TRAINING PACKAGE SOLUTION [2]

All skills areas across all sectors of the seafood industry require review, updating and development	Drivers are categorised into two distinct areas: industry-specific and cross-industry.
	
	Industry-specific
	
	Limited reviews and updates of the existing *SFI11 Seafood Industry Training Package* over the past 12 years, resulting in in an increasing gap between training package components and changing industry skills requirements.
	
	Biosecurity management is an increasing focus for the industry, with the control of and management of actual and potential disease outbreaks.
	
	Growing adoption and application, at the farm level, of genetic improvement techniques for finfish and shellfish, controlling reproduction, gender and sterility; and new nutritional methods.
	
	Growing use of emerging technologies in the management of operations across all industry sectors.
	
	Considerable changes within both the seafood processing and seafood operations sectors, including changes in technology, legislative and regulatory and market demands, processing of animals, and need for the minimisation/utilisation of bycatch.
	
	The complexity of legislation and regulations, coupled with changes and updates, make it difficult for commercial operators, especially small operators, to comply with the legislative and regulatory environment.
	
	Changing government policy, industry codes of practice, seafood safety and labelling requirements impacting on WHS requirements across the industry.
	
	Cross-industry
	
	Trends in multidisciplinary approaches to natural resource management, which emerge from the need to provide solutions to environmental and sustainability issues.
		• Development of:
		  ○ up to two skill sets
		  ○ up to ten units of competency.
		• Review of:
		  ○ 24 current qualifications
		  ○ 14 skill sets
		  ○ 184 units of competency.

[2] Refer to Appendix A for full list of relevant qualifications and units of competencies

PRIORITY SKILL	DRIVERS	TRAINING PACKAGE SOLUTION [2]
	Strategies for better connectivity with, and service to, domestic and international markets are critical for fisheries and aquaculture operators, including growing adoption of digital technology to support sales and exposure to new and emerging markets. Management and planning capabilities driven by larger and more sustainable aquaculture systems for improved competitiveness in local and global markets.	

A. ADMINISTRATIVE INFORMATION

Name of Applicable Industry Reference Committee (IRC):	Seafood Industry Reference Committee
Name of Applicable Skills Service Organisation (SSO):	Skills Impact Ltd

B. SECTOR OVERVIEW

Sector Description

The seafood industry sector integrates all businesses and agencies that operate in the following sub-sectors:

- Aquaculture (offshore and onshore)
- Fishing (commercial)
- Seafood processing
- Seafood sales and distribution – including wholesale and retail.

Compliance is recognised as a critical function across all sectors identified above. Successful fisheries management depends heavily on achieving public and industry compliance with relevant laws and regulations. This is best achieved when there is close and ongoing cooperation between fishers (recreational and commercial) and compliance agencies, and where there is a high level of awareness and understanding about management arrangements and a sense of shared responsibility and stewardship. Fisheries and Fisheries Compliance Officers are employed by Commonwealth or state regulatory agencies to deliver information and advice on any number of fisheries issues involving recreational and commercial fishers and the wider community. They are also tasked with optimising compliance with laws and associated regulations. Activities include fraud investigation, surveillance and observer operations. In some jurisdictions, some compliance functions are undertaken by police and sea ranger groups.[3]

In 2016 the industry sector included 7,186 commercial businesses (a 1.8 per cent drop from 2015), employing between 10,000 and 15,000 people particularly in regional areas.[4] Of these businesses, 63 per cent were non-employing operations and 34 per cent employed less than 20 people. Also, nearly 70 per cent were fishing companies.

The combined contribution of commercial aquaculture, fishing and seafood processing to the Australian economy includes:[5]

- total sales turnover, which increased by 7 per cent (or $303 million) to $4.8 billion between 2013–14 and 2014–15

[3] National Fisheries Compliance Committee, 2016, *Australian Fisheries National Compliance Strategy 2016–2020*, <*http://www.dpi.nsw.gov.au/__data/assets/pdf_file/0004/663007/445-16-Australian-Fisheries-National-Compliance-Strategy-2016-2020.pdf*>

[4] ABS, 2017, 'Counts of Australian Businesses, including Entries and Exits, Jun 2012 to Jun 2016', <*http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/8165.0Jun%202012%20to%20Jun%202016?OpenDocument*>

[5] ABS, 2016, 'Australian Industry, 2014–15', <*http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/8155.02014-15?OpenDocument*>

- industry value added (IVA), which increased by 10 per cent (or $168 million) to $1.8 billion over the same period.

Relevant Training Package Qualifications

The Training Package for the seafood industry is *SFI11 Seafood Industry Training Package*. SFI11 comprises 24 qualifications, 14 skill sets and 182 units of competency. Some units are imported from the *MAR Maritime Training Package*.

SFI11 QUALIFICATIONS
Qualification Level: Certificate I
Certificate I in Aquaculture
Certificate I in Fishing Operations
Certificate I in Seafood Processing
Qualification Level: Certificate II
Certificate II in Aquaculture
Certificate II in Fishing Operations
Certificate II in Seafood Processing
Certificate II in Fisheries Compliance Support
Certificate II in Seafood Industry (Sales and Distribution)
Qualification Level: Certificate III
Certificate III in Aquaculture
Certificate III in Fishing Operations
Certificate III in Fisheries Compliance
Certificate III in Seafood Processing
Certificate III in Seafood Industry (Environmental Management Support)
Certificate III in Seafood Industry (Sales and Distribution)
Qualification Level: Certificate IV
Certificate IV in Aquaculture
Certificate IV in Fishing Operations
Certificate IV in Seafood Processing
Certificate IV in Fisheries Compliance
Certificate IV in Seafood Industry (Environmental Management)
Certificate IV in Seafood Industry Sales and Distribution

Qualification Level: Diploma

Diploma of Aquaculture

Diploma of Fishing Operations

Diploma of Seafood Processing

Diploma of Fisheries Compliance

Sector Analysis

Sub-sector description and analysis of businesses involved

SUB-SECTOR NAME	AQUACULTURE
SCOPE OF WORK	The sector consists of businesses that breed and farm fish, molluscs and crustaceans, both onshore and offshore. The aquaculture sector has a wide variety of marine and freshwater farming operations and processes mostly related to individual species and location. The aquaculture industry includes fish hatcheries, shellfish hatcheries, marine-based farming systems and land-based farming systems. The top five aquaculture species groups, in order of production value, are: salmonids, tuna, edible oysters, pearl oysters and prawns. Other species groups grown in Australia include: abalone, freshwater finfish (such as barramundi, Murray cod, silver perch), brackish water or marine finfish (such as barramundi, snapper, yellowtail kingfish, mulloway, groupers), mussels, ornamental fish, marine sponges, mud crab and sea cucumber.[6] Aquaculture farms operate under licensing systems that require strict environmental management conditions. Marine-based farms also operate under maritime regulations.
FARMS	There were 1,152 aquaculture farms in Australia in 2016, with the majority operating as small-scale family businesses or businesses employing less than 20 people.[7] The sector also has a small number of operators that are generally vertically integrated, involving hatchery, aquaculture, processing and sales operations, and that dominate the product output in the large markets. **Major aquaculture businesses[8]** • Tassal Group Limited (Australian listed company) • Huon Aquaculture Group Limited (Australian listed company) • Paspaley Pearling Company (private Australian company) • Clean Seas (Australian listed company)

[6] Department of Agriculture and Water Resources, 2016, 'Aquaculture industry in Australia', <*http://www.agriculture.gov.au/fisheries/aquaculture/aquaculture-industry-in-australia*>

[7] ABS, 2017, 'Counts of Australian Businesses, including Entries and Exits, Jun 2012 to Jun 2016', <*http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/8165.0Jun%202012%20to%20Jun%202016?OpenDocument*>

[8] Enterprises listed according to their relative market share or significance in the sector

	• Sarin Group (private Australian company) • Seafarms Group (Australian listed company).
GEOGRAPHICAL LOCATION	The sector spreads across most of Australia. In 2014–15, Tasmania had the largest gross value of production, accounting for 30 per cent of total fisheries production value, followed by Western Australia (20 per cent) and South Australia (17 per cent).[9]
AUTOMATION AND DIGITISATION	Businesses use a range of computer-based technologies in managing their operations, as well as such equipment as automatic feeders, water quality monitoring and testing equipment, laboratory equipment for fish health, grading and sorting equipment, and machinery and complex processing equipment. Many operations also have cold storage facilities (that are temperature controlled) and integrated logistics operations.

SUB-SECTOR NAME	**FISHING**
SCOPE OF WORK	Commercial businesses in this sector are involved in capturing inshore and estuarine, offshore and freshwater fish and seafood products, including finfish, molluscs and crustaceans. Products are sold direct to domestic and international customers as well as seafood processors and seafood wholesalers.
BUSINESSES	There were 4,990 commercial fishing businesses in Australia in 2016.[10] The majority are small-scale family businesses typically employing less than 20 people. There are also several medium-sized operators employing between 20 and 100 people in the sector, including the following examples:[11] • Craig Mostyn Group Pty Ltd • A Raptis & Sons Pty Ltd (Australian private company) • MG Kailis Group (Australian private company) • Ocean Fresh Fisheries Pty Limited and Racovolis Amalgamated Fish Agents Pty Ltd (subsidiaries of NZ-based Sanford Limited) • Stehr Group Pty Ltd (Australian public company) • Australian Fishing Enterprises Pty Ltd (Australian private company) • Geraldton Fishermen's Co-operative.
GEOGRAPHICAL LOCATION	The Fisheries Research and Development Corporation (FRDC), a co-funded partnership between the Australian Government and the fishing industry, provide the following description on the geographical location of the sector: 'Australia's commercial fisheries are diverse, operating from estuaries and bays, across the continental shelf to oceanic waters and, in some cases, on to the high seas. The seafood caught is also diverse, including scallops, prawns and squid, coastal fish such as whiting and flathead, reef fish such

[9] ABARES, 2016, 'Australian Fisheries and aquaculture statistics 2015', <*http://data.daff.gov.au/data/warehouse/9aam/afstad9aamd003/2015/AustFishAquacStats_2015_v1.0.0.pdf*>
[10] ABS, 2017, 'Counts of Australian Businesses, including Entries and Exits, Jun 2012 to Jun 2016', <*http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/8165.0Jun%202012%20to%20Jun%202016?OpenDocument*>
[11] Enterprises listed according to their relative market share or significance in the sector

	as Coral Trout, and oceanic tuna and billfish. Australian fisheries supply fresh seafood for local and domestic markets, as well as exporting high-value products. The sector comprises state fisheries (generally, fisheries operating within three nautical miles from the state's coast) and Commonwealth fisheries (those operating between three and 200 nautical miles from Australia's coastline).'[12]
AUTOMATION AND DIGITISATION	The commercial fishing industry operates with advanced vessel design and technologies, which includes global positioning systems (GPS) and colour sounders, providing real-time updates on tides, weather conditions, and indications of good fishing/catching areas. Internet via satellite is also used to communicate with other vessels and staff on land.

SUB-SECTOR NAME	**SEAFOOD PROCESSING**
SCOPE OF WORK	The sector consists of businesses that process fish or other seafood, via on-board vessels or land-based. Processes include handling animals for live sale, skinning or shelling, grading, filleting, boning, crumbing, battering and freezing of the seafood. Some organisations operate in both this sector and also seafood sales and distribution; e.g. Tassal, who both process and distribute to other wholesalers and wholesalers/retailers who also process.
PRODUCERS	In 2016 there were 203 businesses in the sector, with the majority being small-sized operators who were non-employing or employing fewer than 20 people.[13] The sector also includes a small number of large, vertically integrated seafood companies or diversified food companies with global operations and multiple production sites across Australia; and a number of medium-sized operators with a level of vertical integration into aquaculture and/or fishing and distribution. Some processing does commence on vessels at the time of the catch. **Major seafood processors**[14] • Tassal Group Ltd (Australian public company) • Huon Aquaculture (Australian public company) • Simplot Australia (Holdings) Pty Ltd (subsidiary of US-based JR Simplot Company) • Craig Mostyn Group Pty Ltd • A Raptis & Sons Pty Ltd (Australian private company) • MG Kailis Group (Australian private company) • Safcol Australia Pty Ltd (foreign-owned company) • Angelakis Brothers (Australian private company) • Austral Fisheries (toothfish and icefish).

[12] Fisheries Research and Development Corporation, 2016, 'Overview', <*http://fish.gov.au/Overview/Introduction*>
[13] ABS, 2017, 'Counts of Australian Businesses, including Entries and Exits, Jun 2012 to Jun 2016', <*http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/8165.0Jun%202012%20to%20Jun%202016?OpenDocument*>
[14] Enterprises listed according to their relative market share or significance in the sector

GEOGRAPHICAL LOCATION	Seafood processing operations occur in all Australian states, with processing mainly taking place in plants located in coastal centres close to the fisheries, which are their main domestic suppliers. Some Australian companies operate offshore to reduce costs and to gain greater access to raw materials. Some fish is sent offshore for processing.
AUTOMATION AND DIGITISATION	The sector comprises a large number of traditional land-based processing businesses, but technology is increasingly beginning to impact on a range of processes, particularly for the larger processors. Cryovac technology is common for the larger processors, and processors are increasingly using more specialised equipment for a variety of products such as portion packs. Cold storage and logistics operations are typically computer controlled.

SUB-SECTOR NAME	**SEAFOOD SALES AND DISTRIBUTION**
SCOPE OF WORK	This sector includes businesses that wholesale, distribute and retail fresh, frozen or processed fish or other seafood, including imported product. Wholesalers purchase fish and seafood from the aquaculture and fishing sectors and seafood processors prior to repackaging and/or selling and distributing straight to specialist fish and seafood retailers, supermarkets, food catering companies, cafes, hotels and restaurants for value-adding and/or on-selling. As mentioned previously, some organisations operate in both this sector and also seafood sales and distribution; e.g. Tassal, who both process and distribute to other wholesalers and wholesalers/retailers who also process.
PLAYERS	In 2016 there were 841 fish and seafood wholesalers in Australia. Over 90 per cent of these businesses employ fewer than 20 people, or no staff at all. A number of businesses specialise in export products such as live rock lobsters, whilst others source product through co-operative supply arrangements or through local fish markets, the largest of which is the Sydney Fish Market.
GEOGRAPHICAL LOCATION	Most seafood wholesaling operations occur in New South Wales, Victoria and Queensland, whilst seafood retailing occurs nationally via numerous and diverse outlets.
AUTOMATION AND DIGITISATION	Increasingly, wholesalers are reviewing the best ways of providing products, information and services to the customers, and are adapting to new ways of using collaborative logistics (computerised inventory control systems, tracking and reporting technologies) and digital communication. Selling seafood online, including selling into international markets, is seeing considerable growth.

Relevant Stakeholders

The seafood industry sector is represented by over 60 peak organisations at a national, state or regional level.

Table 1: Peak industry organisations

CATEGORIES – PEAK INDUSTRY ORGANISATIONS	GEOGRAPHICAL REPRESENTATION
INDUSTRY SUB SECTOR ASSOCIATIONS	
AQUACULTURE AND FISHING	
Seafood Industry Australia	NATIONAL
National Aquaculture Council	NATIONAL
Australian Abalone Growers Association (AAGA)	NATIONAL
Australian Barramundi Farmers Association (ABFA)	NATIONAL
Australian Council of Prawn Fisheries	NATIONAL
Australian Marine Finfish Farmers Association (AMFFA)	NATIONAL
Australian Mussel Industry Association (AMIA)	NATIONAL
Australian Prawn Farmers Association (APFA)	NATIONAL
Australian Southern Bluefin Tuna Industry Association	NATIONAL
Australian Trout & Salmon Farmer's Association	NATIONAL
Commonwealth Fisheries Association	NATIONAL
Great Australian Bight Fishing Industry Association	NATIONAL
Northern Prawn Fishery Industry Inc	NATIONAL
Oysters Australia	NATIONAL
Pearl Producers Association	NATIONAL
Small Pelagic Fishery Industry Association (SPFIA)	NATIONAL
South East Trawl Fishing Industry Association	NATIONAL
Southern Shark Industry Alliance	NATIONAL
Sustainable Shark Fishing Association (SSFAssn)	NATIONAL
The Master Fish Merchants' Association of Australia (MFMA)	NATIONAL
NSW Aquaculture Association Inc	NSW
Freshwater Native Fish Association	NSW
NSW Farmers Association – Oyster Branch	NSW
Aquaculture Association of Queensland Inc	QLD
Morton Bay Seafood Industry Association (MBSIA)	QLD
Queensland Aquaculture Industries Federation Inc (QAIF)	QLD
Queensland Crayfish Farmers Association	QLD

CATEGORIES – PEAK INDUSTRY ORGANISATIONS	GEOGRAPHICAL REPRESENTATION
Queensland Seafood Industry Association (QSIA)	QLD
Australian Freshwater Crayfish Grower's Association SA	SA
SA Mussel Growers Association (SAMGA)	SA
South Australian Aquaculture Council (SAAC)	SA
Wildcatch Fisheries SA	SA
Scallop Fishermen's Association of Tasmanian	TAS
Tasmanian Abalone Growers Association (TAGA)	TAS
Tasmanian Salmonid Growers Association (TSGA)	TAS
Tasmanian Shellfish Executive Council (TSEC)	TAS
Australian Freshwater Crayfish Growers Association VIC	VIC
The Victorian Aquaculture Council	VIC
Victorian Abalone Grower's Association	VIC
Victorian Commercial Eel Fisherman's Association	VIC
Victorian Trout Association	VIC
Victorian Scallop Fishermen's Association (VSFA)	VIC
Aquaculture Council of West Australia (ACWA)	WA
Western Rock Lobster Council	WA
Western Australian Fishing Industry Council	WA
SEAFOOD PROCESSING	
Australian Seafood Industry Alliance	NATIONAL
Seafood Importers Association of Australia (SIAA)	NATIONAL
Seafood Processors and Exporters Council (SPEC)	NATIONAL
NSW Seafood Industry Council	NSW
Northern Territory Seafood Industry Council	NT
Queensland Seafood Marketers Association (QSMA)	QLD
Tasmanian Seafood Industry Council	TAS
Seafood Industry Victoria	VIC
CATEGORIES – OTHER	**GEOGRAPHICAL REPRESENTATION**
REGULATORY BODIES	
Australian Fisheries Management Authority (AFMA)	NATIONAL
Australian Maritime Safety Authority	NATIONAL
Department of Agriculture and Water Resources	NATIONAL

CATEGORIES – PEAK INDUSTRY ORGANISATIONS	GEOGRAPHICAL REPRESENTATION
Department of Primary Industries – Fisheries	NSW
Department of Primary Industry and Resources - Fisheries	NT
Department of Agriculture and Fisheries	QLD
Primary Industries and Regions SA	SA
Department of Primary Industries, Parks, Water and Environment – Sea Fishing and Aquaculture	TAS
Agriculture Victoria – Fisheries	VIC
Department of Fisheries	WA
UNION	
National Union of Workers (NUW)	NATIONAL
Maritime Union of Australia	NATIONAL

Industry and Occupational Regulations and Standards

Industry regulations and standards

The Australian seafood industry operates under high levels of regulation. Key regulatory obligations are outlined below.

International instruments

Australia is a signatory to a range of international instruments concerning fisheries. The *United Nations Convention on the Law of the Sea*, 1982 (UNCLOS), sets out detailed rules in relation to Australia's and other state's sovereign rights in the Exclusive Economic Zone (EEZ), including in relation to fisheries. Key supporting instruments are the non-legally binding Food and Agriculture Organisation (FAO) *Code of Conduct for Responsible Fisheries*, and International Plans of Action (IPOA) to:[15]

- prevent, deter and eliminate illegal, unreported and unregulated (IUU) fishing
- reduce fishing (over) capacity
- reduce the incidental catch of seabirds
- conserve and manage sharks.

Federal and state government regulation

Aquaculture and fishing in Australia is managed under strict environmental guidelines. 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.

[15] FRDC and Ridge Partners, 2015, '2014 Australian F&A Sector Overview', <*http://www.frdc.com.au/research/Final_reports/2014-503.20-DLD.pdf*>

The Australian Government has management responsibility for aquaculture where the activities are within Commonwealth-regulated waters. However, multiple national programs for research, quarantine, aquatic animal health, food safety, environmental management, and market access and trade are available for the aquaculture industry.

The state governments regulate domestic fisheries and aquaculture production in their jurisdiction through the issuing of licences, permits, leases and quotas; and through regulations, which cover the environment, animal welfare, water supply and wastewater, monitoring and compliance.

Aquaculture occurs almost exclusively in state/territory waters, although there is likely to be increasing interest in undertaking aquaculture in Commonwealth offshore waters as technology allows aquaculture operations in further offshore areas.

Legislative frameworks

There are two fields of legislation relevant to the Australian seafood industry: Commonwealth and state. The primary legislation governing Commonwealth fisheries management is the *Fisheries Management Act 1991* (FMA) and *Fisheries Administration Act 1991* (FAA).

The Australian Fisheries Management Authority (AFMA) was originally established under the *Fisheries Administration Act 1991* as a statutory authority to be responsible for the efficient management and sustainable use of Commonwealth fish resources. AFMA is now a Commission under the Department of Agriculture and Water Resources, appointing Commissioners with a high level of expertise in the fields, including fisheries management and fishing industry operations, who are responsible for domestic fisheries management.

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. The Act enables AFMA to prepare and determine a Plan of Management for each Commonwealth fishery.

Fisheries under state management are governed by various state Fisheries Acts, with some states (e.g. South Australia and Tasmania) also having established specific aquaculture acts/legislation to facilitate growth and streamline management in this sector.

The fishing and aquaculture sector interacts with other national and international legislations, including:

- *Torres Strait Fisheries Act 1984*, which governs fisheries between Australia and Papua New Guinea
- *Environment Protection and Biodiversity Conservation (EPBC) Act 1999*, involving accreditation of a plan of management and risk assessment for a fishery; and components which seek to protect listed threatened species and ecological communities, and regulate the international movement of wildlife specimens
- *Navigation Act 2012*, regulating ship and seafarer safety
- *Customs Act 1901*, concerning border controls
- *Biosecurity Act 2015*, regarding biosecurity threat from transportation of species across borders and from foreign fishing vessels
- *Migration Act 1958*, regulating detention of illegal foreign fishers
- *FAO Compliance Agreement*
- *United Nations Convention on the Law of the Sea*
- *United Nations Fish Stocks Agreement*
- *Native Title Act 1993*

- food standards rules
- workplace safety legislation.

Commercial fishing permits

The *Fisheries Management Act 1991* enables AFMA to allocate statutory fishing rights or permits to all commercial fishing operators for access to the resources of each Commonwealth fishery. Many fishers have individually tradable quotas (ITQs) or shares of the resource assigned as a proportion of the total allowable catch determined by AFMA each year. Where ITQs are not used, AFMA uses a direct permit system to specify the amount of catch each concession holder can take in a fishing season.

Other provisions of the Act deal with fish receiver permits, (receivers are typically those who accept fish from a boat at landing); scientific fishing permits; foreign fishing; illegal foreign fishing; fishing on the high seas; treaty licences; surveillance and enforcement; and the procedures AFMA must follow in implementing these things.

The issuance of licences, permits and quotas required for aquaculture and fishing in state and territory jurisdictional waters is generally the responsibility of state and territory governments. Most state governments require annual reports on sustainability of the target stocks, adherence to regulatory conditions and environmental monitoring programs. State aquaculture legislation and regulations cover the environment, disease prevention, water supply and wastewater, monitoring and compliance. They also prevent uncontrolled or extensive development.

A sector-specific legislative example is pearl production in Western Australia, currently managed under the *Pearling Act 1990,* with regulations involving state government licensing and quota systems for taking wild stock, leases for establishing a pearl farm or permits for a hatchery.

Industry codes of conduct

The *Code of Conduct for Responsible Fisheries* (the Code), initiated by the United Nations Food and Agriculture Organisation 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.

The *Australian Aquaculture Code of Conduct*, initiated by the Australian Aquaculture Forum, provides principles aimed at maintaining ecological and economic sustainability for the aquaculture industry. The Code requires compliance with regulations, respect for the rights and safety of others, humane treatment of aquatic animals, and promotion of the safety of seafood for human consumption.

Further examples of codes of conduct in the sector include:

- *Aquatic Animal Welfare Overarching Principles*
- *WA Fishing Industry Occupational Health and Safety Code*
- *Environmental Code of Practice for Australian Prawn Farmers*
- *Pearl Diving Industry Code of Practice*
- *EMS for Oyster Farmers in NSW*.

Sustainability certification programs

Fisheries and seafood businesses voluntarily seek independent certification to recognise their sustainable fishing practices and to influence the choices made by people when buying seafood. The Marine Stewardship Council oversees two certification schemes: the *MSC Fisheries Standard* and the *MSC Chain of Custody Standard*. The *MSC Fisheries Standard* measures the sustainability

of wild-capture fisheries and is open to all fisheries globally. The WA Western Rock Lobster fishery was the world's first MSC certified fishery in March 2000. The *MSC Chain of Custody Standard* ensures that MSC products handled through the supply chain are traceable and identifiable from fishery to plate. The MSC's eco-label can be used on packaging to demonstrate the sustainability of the fishery product against third-party certification requirements. The aquaculture sector can be certified by the Aquaculture Stewardship Council.

In addition, the Australian Barramundi Farming Association (ABFA) is rolling out a Sustainability Certification Program to ensure that the farming of barramundi in Australia is ecologically sustainable, eco-efficient and produces a quality product that is internationally competitive.

Many other certification bodies, including Global Aquaculture Alliance and Global Reporting Initiative, offer standards and mechanisms for independent assessment against sustainability standards.

The tuna industry in SA was the first fishery in the world to be ISO14001 accredited. ISO14001 is the International Standard for environmental management, and overrides all other systems in scope and coverage.

Food Standards Australia New Zealand

Strict food health standards apply to both aquaculture and wild capture products. The sector is subject to national food standards and food safety assurance systems enforced by Food Standards Australia New Zealand (FSANZ). Requirements that apply to seafood products include labelling of ingredients, country of origin, nutrition, directions for use, best before date, supplier name and details, maximum residue limits for agricultural chemicals, contaminants, and natural toxins, and maximum levels of food borne micro-organisms.

Export/import legislation

Fish and fish products are 'prescribed' goods under Australian legislation, and as a result, the export of fish and products for human consumption is regulated by Australian's Export Control legislation. The legislation supports the production of safe food and ensures that all food exported complies with Australian Food Standards and any additional importing country requirements. Depending on what part of the export chain the business falls within, exporters and importers of fish and fish products must meet differing requirements.

Regulated occupations in the industry

Australia is a signatory to the International Maritime Organisation (IMO) that governs maritime safety and standards for credentials.

Regulated occupations have legal (or industry) requirements or restrictions to perform the work. Regulated occupations require a license from, or registration by, a professional association or occupational licensing authority.

Maritime Certificates apply to all persons operating vessels either inshore or offshore and are part of the maritime regulatory (licenced) system. Qualifications in training packages must meet the minimum licence standards.

Marine Orders 51 (Fishing Vessels) 1989 sets out the minimum licences required by a person to perform duties and functions in relation to a fishing vessel. Crew members who are required to hold appropriate qualifications include skipper, officer in charge of a navigational watch and engineer on a fishing vessel. Criteria used to determine the licence required for deck and engineer officers[16]

[16] Australia Maritime Safety Authority, 2017, 'Fact Sheet STCW 14 Seafarer Certifications Fishing Vessels', <https://www.amsa.gov.au/forms-and-publications/fact-sheets/amsa1577.pdf>

include the size of the fishing vessel, where it is operating, and the experience and qualifications of the seafarer.

This sector has a number of other activities for which high-risk licences are required, particularly in the processing/filleting area – operators must have licences to perform those work functions. The industry also employs a range of regulated occupations including vehicle, mobile equipment, and crane and forklift operators.

Challenges and Opportunities in the Sector

The Australian seafood industry sector operates in a dynamic environment, largely in a publically owned resource space, shaped by a range of natural factors and policy frameworks at state, national and international levels resulting in ramifications for trade, compliance, skills and training. Access to free trade and knowledge of market requirements have become increasingly important, along with developing new and innovative technologies in order to adapt to changes in land and water availability, biosecurity, and changing climatic conditions. The outlook for the Australian seafood industry sector is positive, with the world's demand for sustainable sources of fish and seafood rising. The challenges and the industry's opportunities for growth are discussed below.

GOVERNMENT POLICIES

Aquaculture, fishing and seafood processing are integral parts of the agribusiness and food processing sectors, which are at the forefront of the Australian government policy agenda. Federal government plans, such as *Our North Our Future: White Paper on Developing Northern Australia,* and other initiatives, including further global trade liberalisation through new free trade agreements, have the potential to support the sector and provide opportunities for expanding its economic activity in key regions (such as Northern Australia) and to provide access to key markets.

Increasing access to a diverse range of overseas markets is an important enabling factor for export developments. Similarly, development of large-scale aquaculture, incorporating the world's best environmental practices, can benefit from more efficient and streamlined management of fisheries and aquaculture operations. A simpler, risk-based regulatory system supporting investments through longer tenure for licence/lease periods, export approvals and environmental approvals can provide stability and further opportunities for investments and for increasing the sector's economic competitiveness in the global markets.

The introduction of numerous marine parks in Commonwealth and state waters has had the effect of restricting the areas commercial fishing and aquaculture can take place. This has led to contraction in some commercial fisheries and slowed investment in the industry due to uncertainty relating to marine park priorities and management.

State governments have also seen the seafood sector, alongside agricultural and food sectors, as a critical contributor to regional growth and exports, supporting it with policies based on state-based industry strategies, investments and action programs.

The challenge for individual companies is to unlock commercial benefits from these government programs and agreements, by becoming export-ready, culturally literate and market-savvy.

This is illustrated by Seafarms Group Limited, which plans to develop, with state and federal government support, the largest aquaculture development in Australia and one of the biggest ventures of its type in the world — a $1.45 billion prawn aquaculture project on Legune Station

pastoral lease near the Western Australia and Northern Territory border. The company expects to deliver the first shipment to Asian markets by 2018.[17]

CLIMATE CHANGE

Climate change is a challenge that fisheries and aquaculture operators will have to increasingly deal with if they are to maintain or improve the current levels of productivity.

Future weather and climate scenarios projected by CSIRO, including temperature, ocean currents, winds, nutrient supply, rainfall, ocean chemistry and extreme weather conditions have the potential to impact significantly on the sector.[18] Changes in sea surface temperature have the potential to present threats for offshore aquaculture and wild fishing by increasing infestations of fouling organisms, pests and nuisance species. Currently, aquatic animal health is a challenge for this industry, with disease outbreaks continuing to be a major risk. The Australian salmon industry is potentially at risk of the effects of global warming, as evidenced by the marine heatwave in 2016.[19]

Productivity of reef fisheries may be reduced by the El Niño–Southern Oscillation effects such as changed ocean temperature and bleached coral. Changes in precipitation and water availability have created competition between this industry and other water users, which as a result generated higher costs in maintaining pond water levels. Lower water quality and salinity changes in fresh water supply caused by drought conditions have also resulted in increased production costs and loss of stock. Increases in the frequency and intensity of storms have also impacted on wild fish catch and stock.

While climate change presents potential threats to aquaculture and wild fishing, it also presents opportunities for developing mitigation planning through diversification and expansion of water resources and more resistant species. A range of options to improve resilience to climate change is provided in the *National Climate and Fisheries Action Plan* and the *National Marine Science Plan*.

BIOSECURITY

The industry's capacity to contribute through export earnings and job creation, especially in regional Australia, is a vital part of our future prosperity. Australia is fortunate to have an aquatic animal sector free from many diseases that cause significant economic impact elsewhere in the world.

It is vital for Australia to maintain a relatively disease-free status to enhance competitiveness and protect Australia's natural resources. However, Australia also has a unique and poorly understood range of endemic pathogens, including local strain variations of pathogens of international concern, which are becoming increasingly important and of significance to export trade. As aquaculture expands, the range of native aquatic animals being farmed is also increasing; in Australia there are approximately 70 aquatic species under aquaculture development, of which 40 are farmed commercially.[20]

An outbreak of the white spot disease (WSD) is currently threatening Australia's farmed prawn industry. White spot disease is caused by White spot syndrome virus (WSSV). It is a disease that causes massive mortality in prawn farms across the globe. WSD first appeared in Taiwan in 1992 and then spread rapidly throughout Asia and then South America. It is a highly contagious viral

[17] Seafarms Group, 2015, 'This little tiger's ready to pounce', <*http://seafarmsgroup.com.au/this-little-tigers-ready-to-pounce/article-sunday-times-20-december-2015*>
[18] CSIRO, 2016, *Climate Change in Australia*, <*https://www.climatechangeinaustralia.gov.au/en*>
[19] Department of the Environment and Energy, 'Climate Change impacts in Tasmania', <*https://www.environment.gov.au/climate-change/climate-science/impacts/tas*>
[20] Crane, M., Dr, Slater, J., *Aquatic Animal Health and Biosecurity Subprogram: Research and Development Plan 2016–2020* (2016 ver 1.0), Fisheries Research and Development Corporation

disease of a wide range of decapod crustaceans other than prawns, including crabs, rock lobsters, slipper lobsters (bugs) and freshwater crayfish. Due to its severity, WSD is a 'listed' disease in the World Organisation for Animal Health (OIE – Office International des Epizooties) Aquatic Animal Health Code that requires nations to notify and control OIE-listed disease outbreaks when they occur. Until WSD was officially diagnosed on prawn farms on 1 December 2016 surrounding the Logan River in Queensland, Australia was one of the few prawn-farming countries in the world that was free of this disease. The disease has resulted in very significant financial losses incurred by prawn farmers, fishers, importers, and a wide range of companies that supply those industries.

Pacific Oyster Mortality Syndrome (POMS) emerged in NSW in 2010 and was confirmed in some Pacific oyster leases on Tasmania's south east coast in February 2016. The disease causes major production and economic losses and is often not detected until oysters start dying in large numbers. The industry has developed a national industry response plan that identifies a suite of actions and R&D priorities to improve the industry's capacity to recover and continue to farm. A selective breeding program is being fast-tracked to enable hatcheries to provide the industry with spat.

MARKET AND TRADE

Australia is a net importer of seafood products as consumer demand for seafood continues to grow nationally and globally. In this context, the sector has the potential and opportunity to expand to help meet domestic and international demand. There are several factors that drive the sector's trade, including the exchange rate, the proximity to the growing fisheries and aquaculture market in Asia, trends and preferences in the domestic and main export markets, and the macroeconomics of Australia and competing exporting countries. They are all important factors contributing to the sector's growth and overall competitiveness in the global market.

Based on ABARES, the gross value of Australia's fisheries and aquaculture sectors grew 12 per cent to $2.8 billion in 2014–2015. Wild-caught rock lobster was the most valuable species group produced in 2014–15. Wild-caught products accounted for 58 per cent ($1.6 billion) of Australian fisheries and aquaculture GVP.[21]

Aquaculture contributed 42 per cent of the value of Australian fisheries and aquaculture production in 2014–2015. The driving factor was the production of farmed salmonids, particularly in Tasmania. Tasmania was the largest Australian producer by value of fisheries and aquaculture products during this period, accounting for 30 per cent of gross value of production in 2014–15. It was followed by Western Australia (21 per cent), South Australia (17 per cent), Commonwealth (13 per cent) and Queensland (11 per cent) fisheries.

In the last decade, domestic seafood supply remained steady, but imports increased to fill the gap between consumption and available domestic supply. Australia's apparent consumption of seafood increased at an average annual rate of 1.2 per cent between 2005 and 2015.

Australia remains a net importer of fisheries and aquaculture products in value terms. In 2014–2015, imports (227,612 tonnes) accounted for an estimated 67 per cent of Australia's total apparent seafood consumption

Australia exports a range of high unit value fisheries and aquaculture products. It is a leading supplier of rock lobster to Hong Kong, China and Vietnam. The increasing demand for Australian native species and the proximity to Asian markets, together with world-recognised seafood quality and

[21] ABARES, 2016, 'Australian fisheries and aquaculture statistics 2015', <*http://data.daff.gov.au/data/warehouse/9aam/afstad9aamd003/2015/AustFishAquacStats_2015_v1.0.0.pdf*>

standards, means Australian aquaculture is competitively positioned to take on high-value aquaculture products. It is expected that Australian seafood exports will increase.

The global fish and seafood market has grown steadily in recent years and is forecast to grow by the same rate (3.9 per cent) between 2015 and 2020, aided by increased health consciousness and the desire for quality seafood among newly affluent consumers in Asia-Pacific.[22]

The Food and Agriculture Organization of the United Nations (FAO) has predicted that by 2018, farmed fish production will exceed wild fisheries production for human consumption, and that by 2021 more than half of the fish consumed globally will be produced by aquaculture.[23] In Australia, a major impediment to the increase of aquaculture is access to suitable production areas (both land and water). This is mostly a concern in coastal regions close to residential areas, where conflict can arise between the industry, local communities and recreational users of the waterways. Also, an additional challenge is the cost of seafood production, which has been relatively high in Australia compared to other countries.[24]

Like many agricultural companies, fishing and aquaculture businesses see opportunities to expand overseas in the coming years. However, their five most significant challenges include:[25]

- high domestic costs in Australia
- adverse exchange rate movements
- increased international competition
- risk of financial or economic crisis in key overseas markets
- rules and regulations in Australia.

RESEARCH, INNOVATION AND APPLIED TECHNOLOGY

Research and development remains the sector's greatest opportunity to improve profitability from fishing and aquaculture operations.

For aquaculture species, integrated studies of genetics, breeding technologies, health management and development of improved feeds are areas where considerable gains can be made. For the wild-catch sector, there are opportunities to engineer new capture technologies and improve practices to improve economic efficiencies and to reduce environmental impact. In the area of food science, there are opportunities to develop new seafood products.

The opportunity to improve aquatic animal health through further research on disease diagnostic capability, surveillance and treatment would also be beneficial for the industry.

Although a great deal of research is generated in the sector through the Fisheries Research and Development Corporation and the work of major institutions (e.g. CSIRO, IMAS, SARDI and the university sector), the challenge is to bridge the gap between research results and application on a vessel or farm site, to realise improvements in quality of catch through handling, breeding, disease management and technological advances that can increase yield while reducing environmental impact.

[22] Industry News Food & Beverage, 2016, 'Global fish and seafood market set to grow through to 2020', <*https://foodmag.com.au/global-fish-and-seafood-market-set-to-grow-through-to-2020*>

[23] Department of Agriculture and Water Resources, 2016, 'Aquaculture industry in Australia', <*http://www.agriculture.gov.au/fisheries/aquaculture/aquaculture-industry-in-australia*>

[24] Fisheries Research and Development Corporation, 2014, 'Aquaculture Sector', <*http://frdc.com.au/environment/Aquaculture/Pages/default.aspx*>

[25] Australia's International Business Survey, 2016, 'Industry Profile Report: Agriculture, Forestry and Fishing', <*https://www.austrade.gov.au/ArticleDocuments/1358/AIBS-2015-agricultural-forestry-fishing-industry-profile.pdf.aspx*>

Greater application of advanced production techniques and technology from research have the potential to reduce seafood production costs and make the Australian seafood industry a more competitive industry, both domestically and internationally; and to 'grow' seafood with the smallest impact on the environment of any primary production sector.

C. EMPLOYMENT

Employment Outlook

In 2014–15, an estimated 14,213 people were employed in the commercial fishing and aquaculture industry, with 7,225 employed in fishing enterprises and 6,988 in aquaculture. Of this total, an estimated 10,682 people (75 per cent) worked full-time and 3,530 (25 per cent) part-time.[26]

Fish wholesaling and seafood processing employed 5,764 people based on the 2011 Census, with 69 per cent (3,981 people) employed in fish wholesaling and 31 per cent (1,783 people) in seafood processing.[27]

The Department of Employment projects that the total employment in the seafood industry sector will grow by about 2 per cent from 2015 to 2020.[28] A significant positive employment growth (9.7 per cent) is anticipated in the fishing sector, and stable employment for the aquaculture sector. Table 3 anticipates a substantial reduction in employment for the seafood processing sector by 2020.

Table 3: Department of Employment Industry Projections – five years to November 2020[29]

INDUSTRY SECTOR	EMPLOYMENT LEVEL	EMPLOYMENT PROJECTIONS		
	Nov 2015	Nov 2020	Growth	
	('000)	('000)	('000)	(%)
Aquaculture	4.5	4.4	0.0	-0.9
Fishing	5.3	5.8	0.5	9.7
Seafood Processing	1.1	0.9	-0.2	-21.6
Total	**10.9**	**11.1**	**0.2**	**1.8**

Description of Workforce Supply

The seafood industry sector is an important employer of people living in coastal areas, particularly in smaller regional centres. The seasonal nature of some activities require access to a large casual workforce.

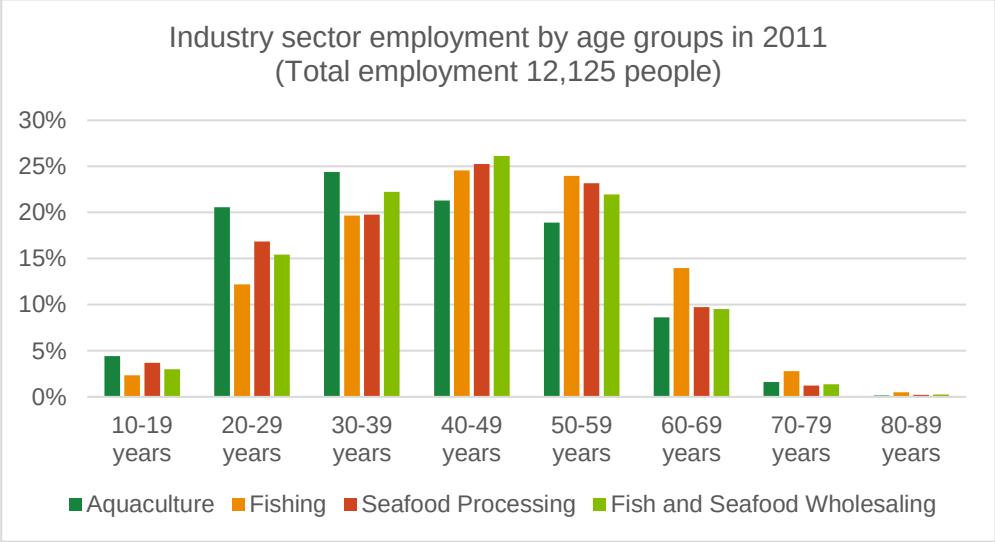
Businesses in this sector will be presented with the challenge of an oncoming wave of retirement as its workforce is ageing. Fishing businesses in particular employ a significant number of people aged between 60 and 80-plus years, and a smaller number of people in the age group 20 to 40 years. A younger workforce is evident in the aquaculture sector (Figure 1).

A little over 40 per cent of the fishing sector workforce (1,235 people) were aged 50 years and over in 2011. About 14 per cent of this group were expected to have retired from the workforce by 2015 and an additional 24 per cent are likely to retire over the next five years. The coming workforce

[26] ABARES, 2016, 'Australian Fisheries and aquaculture statistics 2015', <*http://data.daff.gov.au/data/warehouse/9aam/afstad9aamd003/2015/AustFishAquacStats_2015_v1.0.0.pdf*>
[27] Ibid
[28] Department's projections are based on based on the forecasts and projections set out in the Mid-Year Economic and Fiscal Outlook (MYEFO)
[29] Department of Employment, 2016, 'Industry Employment Projections – Five years to November 2020', <*http://lmip.gov.au/default.aspx?LMIP/EmploymentProjections*>

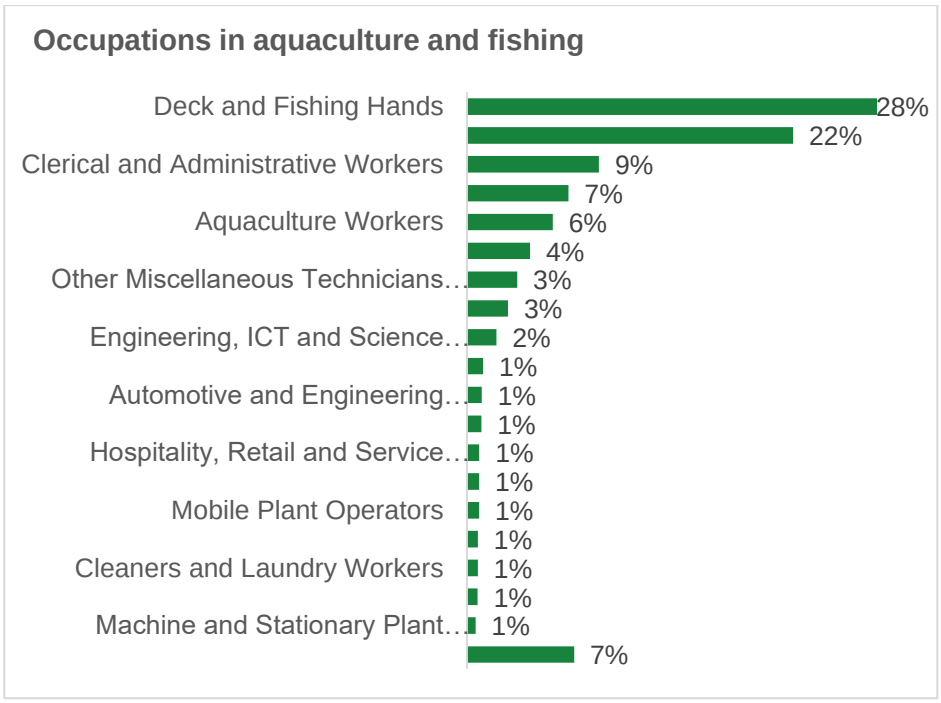
retirement is likely to bring significant job vacancies across the sector and will mean significant efforts from employers to replace these skills. A similar rate of retirement is expected in the next few years for the seafood processing sector and the fish and seafood wholesaling sector.

Figure 1: Industry sector employment by age groups in 201130



Specifically, the current employing occupations in the seafood industry sectors include professions that are discussed in Figure 2 to Figure 4 below.

Figure 2: Occupations and their relative number in the aquaculture and fishing sector[31]



[30] 2011 Census of Population and Housing
[31] Ibid

Figure 3: Occupations and their relative number in the seafood processing sector[32]

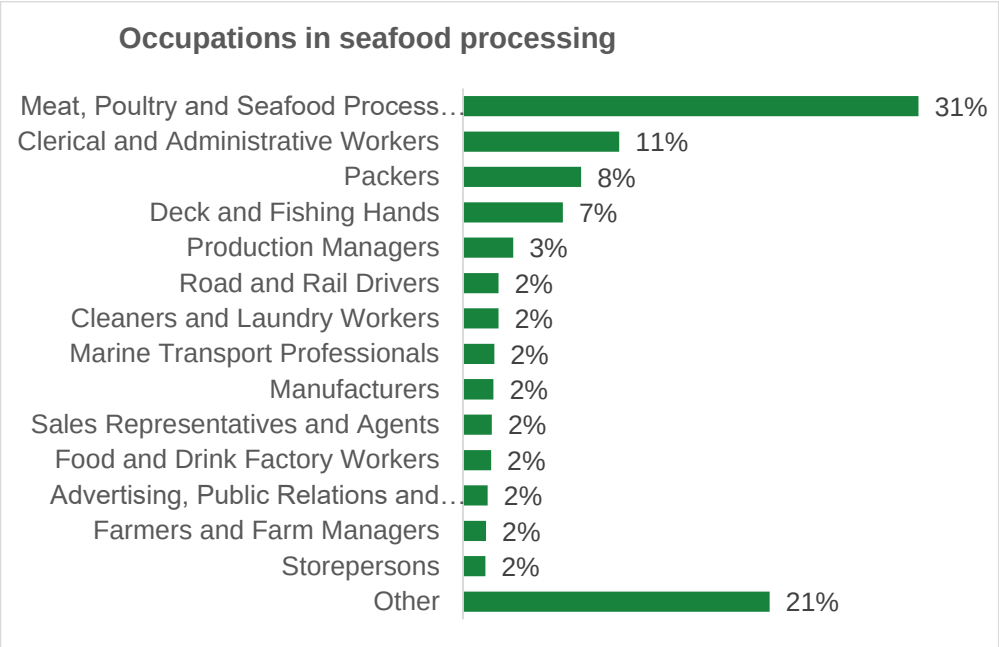
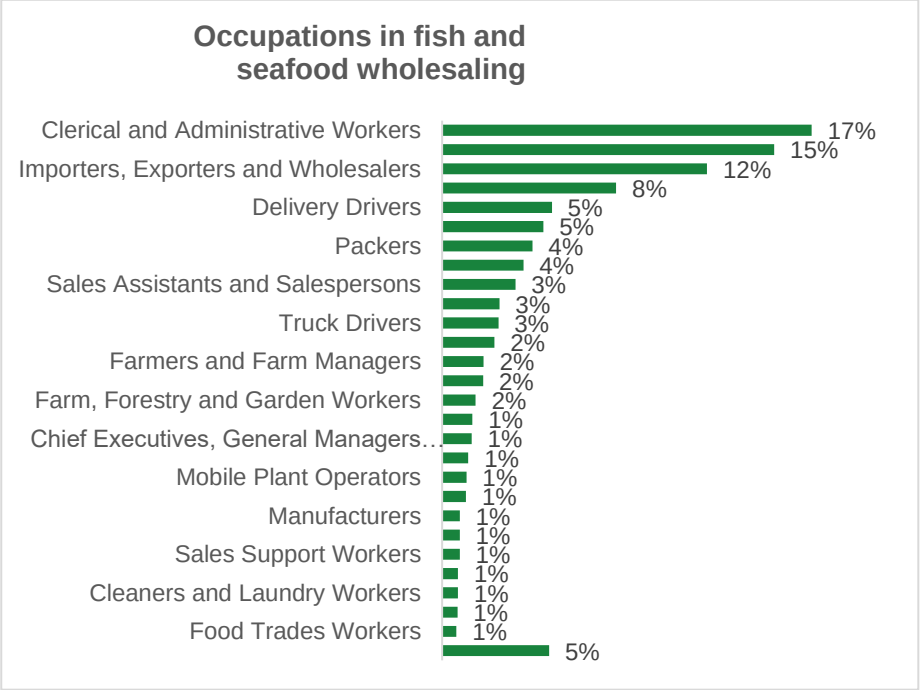


Figure 4: Occupations and their relative number in the fish and seafood wholesaling sector[33]



As shown, a significant number of the workforce occupies roles that are specific to the industry sub-sectors, including deck and fishing hands, aquaculture farmers and workers, marine transport professionals, seafood process workers, wholesalers, including importers and exporters, and sales representatives.

[32] 2011 Census of Population and Housing
[33] 2011 Census of Population and Housing

A significant workforce is also employed to undertake more general roles such as clerical and administrative work, packing, and delivery vehicle and truck driving. The sector also employs people for a range of other jobs such as technicians and trade workers and production managers.

For most technical skills and specific knowledge required in the industry sectors, learning occurs 'on the job' through workforce development activities provided by employers, with the skills generally transmitted from the owner/operator to the crew or workforce.

'On the job' training occurs because gaining industry-specific qualifications before employment commences remains a limited choice among young people and other potential new entrants. The reasons include the requirement for 'sea time' as a regulatory requirement, seasonality, casual employment, uncertain career paths or lack of knowledge about pathways, the view that industry is relatively informal, few registered training organisations offering training opportunities, and the general seasonality of work, amongst other reasons.[34]

Hence, external workforce supply for skilled jobs is consistently low in this industry. In these conditions, the responsibility for engaging young people and existing workers within the sectors, and in specialist training, resides solely with employers.

Seasonal and overseas workers also play an important role in the sector, particularly in the low-skilled work area and at peak harvest times.

[34] FRDC and Ridge Partners, 2015, '2014 Australian F&A Sector Overview', <*http://www.frdc.com.au/research/Final_reports/2014-503.20-DLD.pdf*>

D. SKILLS OUTLOOK

Anticipating future skills needs in the seafood industry is crucial to prepare for and to meet the new demands of aquatic resource sustainability and seafood product markets in Australia. Leading indicators of the current and future skills needs in the sector include:

- trends and/or estimates of workforce supply, skill shortages, employment growth or growing occupations
- future changes in workplace and job design that are driven by innovation at the business and/or industry level as a result of economic, technological, social and environmental factors as well as introduction of new policies and legislations.

This section identifies the priority skills needs in the industry over the next four years (2017–2020) through an analysis of new and estimated future demands placed upon the industry. The section focuses on the skill needs that can benefit from improvement or development of national skill standards, as opposed to market adjustment mechanisms designed to balance the supply and demand for a skilled workforce.

Industry-Specific Priority Skills

The 2017–2020 outlook for skills needs and priorities in the seafood industry is shaped by a range of development trends and factors as outlined below.

Priority skill	Skill description
All skills areas across all sectors of the seafood industry require review, updating and development	Comprehensive and varied skills across all sectors within the seafood industry, including: • seafood processing • wild-caught fishing • aquaculture • seafood sales and distribution • seafood wholesaling • fisheries compliance. **Relevant occupations** Comprehensive coverage of all occupations across all seafood industry sectors. **Drivers** Drivers are categorised into two distinct areas: industry-specific and cross-industry. ***Industry-specific*** Limited reviews and updates of the existing *SFI11 Seafood Industry Training Package* over the past 12 years have resulted in an increasing gap between training package components and changing industry skills requirements driven by a rapidly changing industry. There is a considerable divide between the skill currently delivered under the Training Package and the skills required by industry, hampering industry's ability to respond to challenges and new growth opportunities.

Biosecurity

Biosecurity management is an increasing focus for the industry, with the control of and management of actual and potential disease outbreaks that may impact the industry, including the capability to:

- develop and implement risk minimisation procedures for imported and exported aquatic animals and products
- follow protocols and implement testing and operational procedures to avoid outbreaks and to manage emergency responses in the case of outbreaks, including the use of equipment, record management, contamination minimisation procedures, etc.[35]

Aquaculture

Growing adoption and application, at the farm level, of genetic improvement techniques for finfish and shellfish, controlling reproduction, gender and sterility; and new nutritional methods for marine fish larvae, including selection of dietary/nutritional requirements for salmonids and other seafood species to improve the aquaculture productivity.

Technology

Growing use of emerging technologies in the management of operations across all industry sectors. Technology advances such as navigation systems, advanced fishing systems and farm management systems are introduced over time, requiring increased capability for successful implementation and operational capability.

Seafood processing

Within seafood processing, changes in technology, legislative and regulatory and market demands have seen a number of changes in how seafood is processed. Some of the largest processors also have integrated processing and aquaculture operations; e.g. Tassal. The existing units of competency do not focus on single species or large-scale operations. A number of changes within this sector are currently not reflected in the existing units, skill sets and qualifications.

Fishing operations

Consistent with seafood processing, seafood operations (including wild catch) has seen considerable changes in technology, legislative and regulatory and market demands, including changes in the catching and handling of animals. The minimisation of bycatch of fish, seabirds and other sea animals, and discarding, are issues dealt with across the industry and by regulatory bodies. Methods are being introduced to address these issues, requiring suitable skill development to ensure effectiveness.[36] These changes are not adequately supported by the existing training package components.

Compliance

[35] Crane, M., Dr, Slater, J., *Aquatic Animal Health and Biosecurity Subprogram: Research and Development Plan 2016–2020* (2016 ver 1.0), Fisheries Research and Development Corporation

[36] Australian Fisheries Management Authority, 2017, 'Baycatch reports, publications and ID guides', *<http://www.afma.gov.au/sustainability-environment/bycatch-discarding/bycatch-reports-publications-id-guides>*

The complexity of legislation and regulations, coupled with changes and updates, makes it difficult for commercial operators, especially small operators, to comply with the legislative and regulatory environment. Each operator is required by law to ensure they fully understand relevant legislation and regulations and cannot rely on third-party advice as a defence. As such, tailored programs are required to assist operators in identifying relevant legislation and regulations, interpret them and modify their operation in order to comply.

Work health and safety

Changing government policy, industry codes of practice, seafood safety and labelling requirements impacting on WHS requirements across the industry.

Cross-industry

Environment and sustainability

Trends in multidisciplinary approaches to natural resource management, which emerge from the need to provide solutions to environmental issues created by operational expansion across the industry. Environmental management and sustainability practices need to be strengthened through capability development.

Sales and marketing

Strategies for better connectivity with, and service to, domestic and international markets are critical for fisheries and aquaculture operators, including greater interaction with global supply chains and stronger online presence promoting key features of aquaculture and wild fish farming in Australia. Growing adoption of digital technology to support sales, and exposure to new and emerging markets both domestically and internationally, are driving the need for skills development to support these functions.

Management

There is a need for improved management and planning skills, especially to support larger scale and more sustainable aquaculture businesses to compete effectively in local and global markets. Skills approaches also need to support catching sectors in moving to an economic return model and away from a volume-catch-base approach.

Training package solutions

- Review of 24 current qualifications
- Review of 14 skill sets
- Review of 184 units of competency
- Development of up to two new skill sets
- Development of up to ten new units of competency – this number is to be confirmed during the review process and within the Case for Change.

E. TRAINING PRODUCT REVIEW PLAN 2017–2020

The Industry Reference Committee Training Product Review Plan 2017–2020 for the seafood industry sector is provided in Attachment A.

Time-critical projects

The Seafood Industry Reference Committee identified a need to develop a skill set and unit/s of competency around harvesting and processing of sea urchins, and a review of units related to diving (reflecting the outcomes of the diving review of the SafeWork Australia model regulations) to ensure the needs of industry are being appropriately reflected; this is reflected in the review of fishing operations.

The industry Technical Reference Group (TRG) established specifically for the *SFI11 Seafood Industry Training Package Release 1.0* review identified a requirement to undertake a more in-depth review of content beyond transition activity; that is, a review for the purpose of updating of existing qualifications, skill sets and units of competency or the development of new ones, particularly related to aquaculture, environmental management systems, fisheries compliance and sales and distribution. These will form priority development work in this Work Plan.

The criteria for outlining time-critical projects within the *SFI11 Seafood Industry Training Package* include workplace safety issues, regulatory needs, biosecurity issues (disease outbreak), and qualifications under the VET Student Loans courses list, which can benefit from improvement or development of national skill standards.

The proposed project will involve review or development of new units for the following qualifications under the VET Student Loans:

- SFI50116 Diploma of Aquaculture
- SFI50216 Diploma of Fishing Operations
- SFI50516 Diploma of Seafood Processing
- SFI50416 Diploma of Fisheries Compliance

Interdependencies

No training packages or IRCs interdependencies were identified for the proposed projects in the training product review plan.

Existing Projects

A number of units of competency are currently being checked for compliance against the *2012 Standards for Training Packages* as part of a broader compliance project.

F. IRC SIGNOFF

This IRC Skills Forecast and Proposed Schedule of Work was agreed as the result of a properly constituted IRC decision.

Signed for and on behalf of the **Seafood IRC** by its appointed Chair

John Manson	*JManson*
(Name of Chair)	Signature of Chair
	Date: 28th April-2017

ATTACHMENT A

IRC Training Product Review Plan 2017–2020 for the Seafood Industry Sector

Relevant training package: SFI11 Seafood Industry

Contact details: Skills Impact Ltd., 559A Queensberry Street, North Melbourne VIC 3051

Date submitted to Department of Education and Training: April 28, 2017

YEAR	PRIORITY SKILLS	QUALIFICATION CODE AND NAME	UNIT OF COMPETENCY CODE AND NAME
2017–2018		Development of up to two new skill sets Review of the following qualifications: SFI10111 Certificate I in Aquaculture SFI10211 Certificate I in Fishing Operations SFI10511 Certificate I in Seafood Processing SFI20111 Certificate II in Aquaculture SFI20411 Certificate II in Fisheries Compliance Support SFI20211 Certificate II in Fishing Operations SFI20611 Certificate II in Seafood Industry (Sales and Distribution) SFI20511 Certificate II in Seafood Processing SFI30111 Certificate III in Aquaculture	Development of up to ten new units of competency Review of the following units of competency: SFIAQUA102 Carry out basic aquaculture activities SFIAQUA201 Collect broodstock and seedstock SFIAQUA205 Feed stock SFIAQUA206 Handle stock SFIAQUA209 Manipulate stock culture environment SFIAQUA211 Undertake routine maintenance of water supply and disposal systems and structures SFIAQUA212 Work with crocodiles SFIAQUA213 Monitor stock and environmental conditions SFIAQUA214 Produce algal or live-feed cultures SFIAQUA215 Carry out on-farm post-harvest operations

YEAR	PRIORITY SKILLS	QUALIFICATION CODE AND NAME	UNIT OF COMPETENCY CODE AND NAME
		SFI30411 Certificate III in Fisheries Compliance SFI30211 Certificate III in Fishing Operations SFI30311 Certificate III in Seafood Industry (Environmental Management Support) SFI30611 Certificate III in Seafood Industry (Sales and Distribution) SFI30511 Certificate III in Seafood Processing SFI40111 Certificate IV in Aquaculture SFI40411 Certificate IV in Fisheries Compliance SFI40211 Certificate IV in Fishing Operations SFI40311 Certificate IV in Seafood Industry (Environmental Management) SFI40611 Certificate IV in Seafood Industry Sales and Distribution SFI40511 Certificate IV in Seafood Processing SFI50111 Diploma of Aquaculture SFI50411 Diploma of Fisheries Compliance SFI50211 Diploma of Fishing Operations SFI50511 Diploma of Seafood Processing	SFIAQUA216 Harvest cultured or held stock SFIAQUA217 Maintain stock culture, holding and other farm structures SFIAQUA219 Operate and maintain high technology water treatment components SFIAQUA220 Use waders SFIAQUA221 Control predators and pests SFIAQUA222 Control diseases SFIAQUA301 Oversee and undertake effluent and waste treatment and disposal SFIAQUA302 Construct or install stock culture, holding and farm structures SFIAQUA303 Coordinate stock handling activities SFIAQUA308 Maintain water quality and environmental monitoring SFIAQUA309 Oversee harvest and post-harvest activities SFIAQUA311 Oversee production and maintain algal or live-feed cultures SFIAQUA313 Oversee operations of high technology water treatment components SFIAQUA314 Support hatchery operations SFIAQUA315 Oversee emergency procedures for on-land operations SFIAQUA316 Oversee the control of predators and pests SFIAQUA317 Oversee the control of diseases

YEAR	PRIORITY SKILLS	QUALIFICATION CODE AND NAME	UNIT OF COMPETENCY CODE AND NAME
			SFIAQUA318 Coordinate feed activities
		Review of the following skill sets:	SFIAQUA401 Develop and implement a stock health program
		SFISS00012 Abalone Diver Environmental Management	SFIAQUA402 Coordinate construction or installation of stock culture, holding and farm structures
		SFISS00011 Deckhand Induction	SFIAQUA404 Operate hatchery
		SFISS00001 Environment Management Systems Coordinator	SFIAQUA406 Seed and harvest round pearls
		SFISS00002 Extended Fishing Charter Operator	SFIAQUA407 Coordinate sustainable aquacultural practices
		SFISS00010 Fish Processor Induction	SFIAQUA408 Supervise harvest and post-harvest activities
		SFISS00003 Fisheries Resource Management Observer	SFIAQUA409 Implement, monitor and review stock production
		SFISS00004 Fishing Operator	SFIAQUA410 Implement a program to operate, maintain or upgrade a system comprising high technology water treatment components
		SFISS00005 Industry Leadership – Resource Management Group Membership	SFIAQUA411 Manage water quality and environmental monitoring in enclosed systems
		SFISS00006 Industry Leadership – Sector Representation	SFIAQUA413 Develop emergency procedures for an aquaculture enterprise
		SFISS00007 Industry Leadership Strategic Development	SFIAQUA414 Implement low water exchange microbial floc technologies
		SFISS00008 Limited Fishing Charter Operator	SFIAQUA501 Develop a stock nutrition program
		SFISS00009 Net Construction and Repair	SFIAQUA502 Develop and implement an aquaculture breeding strategy
		SFISS00013 Senior Deckhand	SFIAQUA503 Establish an aquacultural enterprise
			SFIAQUA504 Plan environmentally sustainable aquacultural practices
			SFIAQUA505 Plan stock health management

YEAR	PRIORITY SKILLS	QUALIFICATION CODE AND NAME	UNIT OF COMPETENCY CODE AND NAME
		SFISS00014 Skipper	SFIAQUA507 Plan and design water supply and disposal systems SFIAQUA508 Plan and design stock culture or holding systems and structures SFIAQUA509 Develop stock production plan SFIAQUA510 Select, plan or design a system or facility utilising high technology water treatment components SFIAQUA511 Culture new aquaculture species SFIAQUA512 Develop and implement an aquaculture genetic breeding program SFIAQUA513 Manage a farm based aquaculture research trial SFICOMP201 Undertake a local operation SFICOMP202 Conduct field observations SFICOMP203 Promote sustainable use of local marine and freshwater environments SFICOMP204 Present evidence in a court setting SFICOMP205 Communicate effectively in cross-cultural environments SFICOMP302 Exercise compliance powers SFICOMP308 Monitor fish catches for legal compliance SFICOMP310 Operate off-road vehicles SFICOMP315 Support the judicial process SFICOMP317 Facilitate effective communication in the workplace

YEAR	PRIORITY SKILLS	QUALIFICATION CODE AND NAME	UNIT OF COMPETENCY CODE AND NAME
			SFICOMP318 Perform administrative duties SFICOMP401 Administer the district office SFICOMP402 Plan the surveillance operation SFICOMP403 Operate and maintain surveillance equipment SFICOMP404 Operate an observation post SFICOMP405 Perform post-surveillance duties SFICOMP406 Perform mobile surveillance SFICOMP407 Undertake prosecution procedures for magistrate's court SFICOMP409 Plan and undertake patrol operations SFICOMP410 Promote fisheries management awareness programs SFICOMP411 Implement aquaculture compliance SFICOMP412 Operate in remote areas SFICOMP413 Maintain operational safety SFICOMP415 Board vessel at sea SFICOMP501 Conduct an investigative audit SFICOMP502 Contribute to fisheries management SFICOMP503 Undertake the prosecution in a trial SFICORE101 Apply basic food handling and safety practices SFICORE103 Communicate in the seafood industry SFICORE106 Meet workplace health and safety requirements

YEAR	PRIORITY SKILLS	QUALIFICATION CODE AND NAME	UNIT OF COMPETENCY CODE AND NAME
			SFIDIST202 Retail fresh, frozen and live seafood SFIDIST301 Wholesale product SFIDIST401 Buy seafood product SFIDIST402 Analyse domestic seafood market opportunities SFIDIST403 Analyse international seafood market opportunities SFIDIST404 Develop and provide information about seafood product SFIDIST501 Export product SFIDIST502 Import product SFIDIVE309 Work effectively as a diver in the seafood industry SFIDIVE310 Perform diving operations using SSBA SFIDIVE311 Perform diving operations using SCUBA SFIDIVE312 Undertake emergency procedures in diving operations using SSBA SFIDIVE313 Undertake emergency procedures in diving operations using SCUBA SFIDIVE314 Dive using a compression chamber SFIDIVE315 Perform underwater work in the aquaculture sector SFIDIVE316 Perform underwater work in the wild catch sector SFIEMS201 Participate in environmentally sustainable work practices SFIEMS301 Implement and monitor environmentally sustainable work practices

YEAR	PRIORITY SKILLS	QUALIFICATION CODE AND NAME	UNIT OF COMPETENCY CODE AND NAME
			SFIEMS302 Act to prevent interaction with protected species SFIEMS401 Conduct an internal audit of an environmental management system SFIEMS501 Develop workplace policy for sustainability SFIFCHA301 Develop information and fishing charter trips SFIFCHA302 Operate an inshore day charter SFIFCHA501 Plan and manage extended fishing charter trips SFIFISH202 Cook on board a vessel SFIFISH203 Maintain, prepare, deploy and retrieve trawls to land catch SFIFISH204 Maintain, prepare, deploy and retrieve pots and traps to land catch SFIFISH205 Maintain, prepare, deploy and retrieve drop lines and long lines to land catch SFIFISH206 Maintain, prepare, deploy and retrieve hand operated lines to land catch SFIFISH207 Maintain, prepare, deploy and retrieve beach seines, mesh nets or gill nets to land catch SFIFISH208 Maintain, prepare, deploy and retrieve purse seines to land catch SFIFISH209 Maintain the temperature of seafood SFIFISH210 Assemble and repair damaged netting SFIFISH211 Provide support for diving operations

YEAR	PRIORITY SKILLS	QUALIFICATION CODE AND NAME	UNIT OF COMPETENCY CODE AND NAME
			SFIFISH214 Contribute to at-sea processing of seafood SFIFISH215 Apply deckhand skills aboard a fishing vessel SFIFISH309 Construct nets and customise design SFIFISH310 Adjust and position fishing gear SFIFISH311 Operate vessel deck machinery and lifting appliance SFIFISH312 Perform breath-hold diving operations SFIFISH402 Manage and control fishing operations SFIFISH403 Develop fishery optimisation strategies SFILEAD401 Develop and promote knowledge of the industry sector SFILEAD402 Negotiate effectively for the sector SFILEAD403 Demonstrate commitment and professionalism SFILEAD407 Provide expert information to a resource management group SFILEAD408 Analyse information to develop strategic seafood management options SFILEAD409 Negotiate collective outcomes within the resource management group process SFILEAD501 Develop and promote industry knowledge SFILEAD502 Shape strategic thinking SFILEAD503 Cultivate productive working relationships SFILEAD504 Plan and achieve change and results

YEAR	PRIORITY SKILLS	QUALIFICATION CODE AND NAME	UNIT OF COMPETENCY CODE AND NAME
			SFILEAD505 Communicate with influence SFILEAD507 Provide corporate leadership SFIOBSV301 Monitor and record fishing operations SFIOBSV302 Collect reliable scientific data and samples SFIOBSV304 Analyse and report onboard observations SFIPROC101 Clean fish SFIPROC102 Clean work area SFIPROC105 Fillet fish and prepare portions SFIPROC106 Work with knives SFIPROC201 Head and peel crustaceans SFIPROC202 Process squid, cuttlefish and octopus SFIPROC203 Shuck molluscs SFIPROC302 Handle and pack sashimi-grade fish SFIPROC304 Boil and pack crustaceans SFIPROC305 Slaughter and process crocodiles SFIPROC401 Evaluate a batch of seafood SFIPROC402 Maintain hygiene standards while servicing a food handling SFIPROC403 Follow basic food safety practices SFIPROC404 Apply and monitor food safety requirements

YEAR	PRIORITY SKILLS	QUALIFICATION CODE AND NAME	UNIT OF COMPETENCY CODE AND NAME
			SFIPROC405 Oversee the implementation of a food safety program in the workplace SFIPROC406 Develop food safety programs SFIPROC407 Conduct internal food safety audits SFIPROC501 Manage seafood processing production units SFIPROC502 Produce technical reports on seafood processing systems SFIPROC503 Analyse seafood packaging requirements SFIPROC504 Design and manage a product recall SFIPROC505 Develop and implement a seafood waste utilisation strategy SFIPROC601 Establish costs and conditions for sale of seafood product SFIPROC602 Plan and manage seafood and related product concept development SFIPROC603 Develop and manage seafood and related product production trials SFIPROC604 Plan and develop formulations and specifications for new seafood product SFIPROC606 Develop and implement energy control systems in seafood processing environments SFIPROC607 Prepare work instructions for new seafood processing tasks SFIPROC608 Provide practical and commercial advice to seafood users

YEAR	PRIORITY SKILLS	QUALIFICATION CODE AND NAME	UNIT OF COMPETENCY CODE AND NAME
			SFIPROC609 Monitor the seafood business environment to determine threats and opportunities SFIPROC610 Establish and manage effective external relationships SFIPROC611 Participate in a media interview or presentation SFISHIP201 Comply with organisational and legislative requirements SFISHIP202 Contribute to safe navigation SFISHIP205 Maintain marine plant SFISHIP206 Operate a small vessel SFISHIP207 Operate and maintain outboard motors SFISHIP208 Operate low powered diesel engines SFISHIP211 Prepare for maintenance SFISTOR202 Receive and distribute product SFISTOR203 Assemble and load refrigerated product SFISTOR204 Prepare, pack and dispatch stock for live transport SFISTOR205 Prepare, pack and dispatch non-live product SFISTOR301 Operate refrigerated storerooms SFIWHS301 Implement WHS policies and guidelines SFIWHS501 Establish and maintain the enterprise WHS program ***Total for review*** ***184***