AUSTRALIAN SEAFOOD INDUSTRY SECTOR

IRC Work Plan 2016-2019

Prepared on behalf of the Seafood Industry Reference Committee for the Australian Industry Skill Council

THE SEAFOOD INDUSTRY REFERENCE COMMITTEE WORK PLAN 2016-2019

Purpose

This workforce development and skills needs analysis represents the latest industry intelligence and resulting work plan 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 advise the Australian Industry and Skills Council (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

An analysis of the depth and breadth of the industry and identification of the macro environmental forces that currently challenge and / or provide opportunities for the industry

Employment

A review of employment projections by the Department of Employment and an outline of the current workforce profile and supply for the industry

Skills Outlook

Provides insights into the key trends that could potentially drive changes in workplace design and identification of key priority skills and skilled labour shortages for the industry.

The training product review work plan – at the end of the report – draws on the industry intelligence, reports and various points of engagement with industry associations, employers and training providers.

The Industry Reference Committee Work Plan 2016-2019 has been produced with the assistance of funding provided by The Commonwealth Government through the Department of Education and Training.

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 food supply, of which seafood is significant component, and exponential population growth provides 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 the White Paper on Developing Northern Australia and free trade agreements, increasing demand for Australian native aquaculture and fish species, including proximity to Asian markets, and availability and ongoing development of advanced technologies.

Further, the report describes 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 to support more demanding jobs in most workplaces and skills for advanced technologies to increase operational efficiency and production. This occurs because businesses respond to opportunities with growing adoption and application of genetic improvement techniques for finfish and shellfish, new treatments and therapies to control viruses, parasites and other pathogens to manage aquatic animal health, new nutritional methods for marine fish larvae, larger and sustainable aquaculture systems, and greater interaction with global supply chains and stronger online presence promoting key features of aquaculture and wild fishing in Australia, among many other innovations.

Examples of new job functions for operational employees include process and staff management, quality inspection, generation of information/reporting, process improvements, and technical maintenance. Similarly, higher level skills will be required of specialist managers to support strategic developments and targets. Such examples 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 five sectors: aquaculture (offshore and onshore), fishing (commercial), seafood processing, fisheries compliance and seafood wholesaling.
- The industry includes more than 7,315 commercial businesses who collectively employ around 15,000 people. Nearly 70 per cent of these businesses focus on fishing. In addition, the sector 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 less 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 11.1 per cent (or $455 million) to $4.5 billion between 2012-13 and 2013-14.
- 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, national regulatory bodies and sustainability certification 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, engineers on a fishing vessel must hold a licence according to the *Marine Order 51 (Fishing vessels) 1989* in order perform duties and functions in relation to a fishing vessel on an overseas voyage; and operators in high risk jobs particularly in processing/filleting must have licences to perform those work functions as an industry requirement
- Key macro forces which currently challenge and provide opportunities for the industry sectors include:
  - Federal government's regional plan for developing Northern Australia and Free Trade Agreements which provide access to a diverse range of overseas markets are important enabling factors for the seafood export developments and development of large scale aquaculture farms.
  - Climate change, which creates both threats and opportunities for the aquaculture and wild fishing such as generating negative effects on the productivity of reef fisheries leading to improved resilience to climate change.
  - Demand for seafood, which continues to grow nationally and globally, which provide opportunities to increase domestic seafood supply as replacement for imports that have been used over the years to fill the gap between demand and available domestic supply.
  - Proximity to Asian markets, together with well recognised Australian seafood quality and standards around the world, resulting in Australian seafood producers being competitively positioned. Aquaculture skills in Australia allows a competitive edge in high value aquaculture products.
  - Access to suitable production areas (both land and water), represents a challenge through competing users to available water and land resource base – i.e. arising conflict between the industry, local communities and recreational users of the waterways.
  - Existing and ongoing development of enabling technologies, which potentially allow fishers and fish farmers to reduce seafood production costs enabling Australian seafood to be a more competitive industry, both domestically and internationally.

Employment

- 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.

[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.

- A significant number of the workforce occupies roles specific to the industry including deck crew, aquaculture workers, 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 peak harvest times.

Skills outlook

A summary of development trends in the seafood industry sectors, which determine new demands for skills, and the proposed training package projects to support these skill needs are provided in the following table.

DRIVER	SKILLS OUTLOOK	TRAINING PACKAGE PROJECT
Industry changes driven by technology potentially reducing production costs and creating a competitive industry both domestically and internationally.	Higher and value-added skills, which will be required from both operational and specialist management employees and are driven by higher efficiency targets, innovation and automation/digitisation of some work activities in most workplaces and jobs.	In-depth review of content for all qualifications, skill sets and units of competency beyond transition with amendments, changes and development of content as required.
Evolving skills across the industry driven by emerging technology and processes requiring a higher skill levels at the operational level.	At the operational level, skills demand includes a range of skills in the following areas: Science Technology Engineering and Mathematics (STEM), compliance, and leadership.	Review of all qualifications, skill sets and units of competency within the training package to ensure STEM skills are embedded. This will occur at the time of specific reviews in the various sub-sectors as identified in Attachment A.
Demand for seafood, which continues to grow nationally and globally and proximity to Asian markets. Aquaculture skills in Australia allows a competitive advantage in high value aquaculture products.	Higher level supply chain and logistics skills required to support lean, fast, reliable, transparent and collaborative relationships with key suppliers and customers and with other companies, including competition and research organisations.	Review sales and distribution qualifications, skill sets and units of competency in terms of current and emerging job roles.
Changing markets and demand requiring a higher level response to customers to assist with growth.	Higher level skills in relation to customer service – i.e. specific product and brand knowledge, working with data and data analysis, negotiation, digital marketing and digital commercialisation approaches.	Review sales and distribution qualifications, skill sets and units of competency in terms of current and emerging job roles with a focus on higher level customer service skills.

Demand for seafood, which continues to grow nationally and globally, which provide opportunities to increase domestic seafood supply as replacement for imports. Climate change, which creates both threats and opportunities for aquaculture and wild fishing. Access to suitable production areas, both land and water, which are becoming a scarce commodity requiring more efficient management.	Current skill needs priority in the industry include a range of specialist skills and general skills such as harvesting and processing new species (eg: sea urchins), shellfish hatchery, quality control, fisheries compliance and environmental management, environmental certification, and emerging practices and skill needs for aquaculture, sales and distribution, and seafood processing.	Development of new skills set for sea urchins Inclusion of animal welfare management. Inclusion of units to emphasise catching seafood to maximise economic return Review fisheries compliance and environmental units of competency Development of skill sets to support environmental certification systems. Review aquaculture qualifications and units in terms of current and emerging job roles Review of seafood processing qualifications, skill sets and units of competency in terms of current and emerging job roles.

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. SECTOROVERVIEW

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
- Fisheries compliance
- Seafood wholesaling.

In 2015 the industry sector included more than 7,315commercial businesses, employing around 15,000 people, particularly in regional areas.[2,3]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[4]:

- Total sales turnover, which increased by 11.1 per cent (or $455 million) to $4.5 billion between 2012-13 and 2013-14.
- Industry value added (IVA), which increased by 17.1 per cent (or $249 million) to $1.7billion over the same period.

Relevant Training Package Qualifications

The Training Package for the seafood industry isSFI11 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 SEAFOOD INDUSTRY TRAINING PACKAGE 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

[2] ABS, Labour Force, Australia, Detailed, Quarterly, Cat No 6291.0.55.003
[3] ABS, Counts of Australian Businesses, including entries and exits, June 2015, Cat No 816502
[4] ABS, Australian Industry, 2013-14, Cat No 8155.0.

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 farming operations and processes mostly related to individual species and location. Aquaculture industry include fish hatcheries, shellfish hatcheries, marine based farming systems and land based farming systems. The largest sector is the marine based farming sector. Aquaculture farms operate under licensing systems that require strict environmental management conditions. Marine based farms also operate under maritime regulations.
FARMS	There were 1,170 aquaculture farms in Australia in 2015, with the majority operating as small scale family businesses or businesses employing less than 20 people[5]. The sector also has a small number of large operators. These large operators are generally vertically integrated, involving hatchery, aquaculture, processing and sales operations, and dominate the product output in the large markets.

[5] ABS, Counts of Australian Businesses, including entries and exits, June 2015, Cat No 816502

	Major aquaculture business[6] • Tassal Group Limited (Australian listed company) • Huon Aquaculture Group Limited (public Australian company) • Paspaley Pearling Group (private Australian company) • Clean Seas (public Australian company) • Sarin Group (private Australian company) • Seafarms Group (Australian listed company)
GEOGRAPHICAL LOCATION	The sector spreads across most of Australia with a large number of businesses in New South Wales, South Australia, Queensland and Victoria. The majority of large aquaculture operators are concentrated in Tasmania, South Australia and Western Australia.
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 as well as 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, crustaceans, prawns, rock lobsters, oysters and also pearls. Products are sold direct to domestic and international customers as well as seafood processors and seafood wholesalers.
BUSINESSES	There were 5,083 commercial fishing businesses in Australia in 2015[7]. The majority are small scale family businesses operated by owners or businesses employing less than 20 people. There are also several medium-size operators in the sector, including the following examples[8]: • 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)
GEOGRAPHICAL LOCATION	Fishing businesses are present in all Australian states and are prevalent in Western Australia and Queensland which have the largest number of fishing businesses, due to the large area of coastline and number of sea ports in these states.

[6]Enterprises listed according to their relative market share or significance in the sector
[7] ABS, Counts of Australian Businesses, including entries and exits, June 2015, Cat No 816502
[8]Enterprises listed according to their relative market share or significance in the sector

AUTOMATION AND DIGITISATION	The Commercial fishing industry operates with advanced vessel design and technologies that includes GPS global positioning systems (GPS) and colour sounders which provide real-time updates on tides, weather conditions, and indicates 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 both on-board vessels and land based. Processes include handling animals for live scale, skinning or shelling, grading, filleting, boning, crumbing, battering and freezing of the seafood. This class also includes units mainly engaged in operating vessels which gather and process fish or other seafood. Industry believes that seafood processing will not contract, this is in conflict with ABS data however ABS groups seafood processing with meat and poultry processing and as such may not be a true reflection of the seafood industry. Data may also be distorted due to the high level of casualization of the workforce.
PRODUCERS	In 2015 there were 217 businesses in the sector, with the majority small-size operators who were non-employing or employing fewer than 20 people.[9]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-size 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[10]** • Tassal Group Ltd (Australian public company) • Huon Aquaculture (Australian public company) • Geraldton Fishermens COOP • 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)
GEOGRAPHICAL LOCATION	Seafood processing operations occurs 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

[9]ABS, Counts of Australian Businesses, including entries and exits, June 2014, Cat No 816502
[10]Enterprises listed according to their relative market share or significance in the sector

	companies operate offshore to reduce costs and to gain greater access to raw materials. Some fish is sent off-shore for processing.
AUTOMATION AND DIGITISATION	The sector comprises a large number of traditional land based processing businesses but increasingly technology is beginning to impact on a range of processes particularly for the larger processors. Cryo-vac technology is common for the larger processors and increasingly processors are 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	**FISH AND SEAFOOD WHOLESALING**
SCOPE OF WORK	This sector includes businesses that wholesale fresh, frozen or processed fish or other seafood, including imported product. They purchase fish and seafood from the aquaculture and fishing sectors, and from seafood processors. These products may be repackaged or sold straight to specialist fish and seafood retailers, supermarkets, food catering companies, cafes, hotels and restaurants.
PLAYERS	In 2015 there were 845 fish and seafood wholesalers in Australia. Over 90% of these businesses employ fewer than 20 people or no staff at all. A number of businesses specialise in export product eg. live rock lobsters whist 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.
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. The sale on seafood online, including into international markets, is seeing considerable growth.

Relevant stakeholders

The seafood industry sector is represented by over60 peak organisations at a national and state or regional level. These organisations include 51industry associations and a number of other representative organisations including, recreational fishing organisations, national regulatory bodies, sustainability certification organisations, industry services bodies and networks and the union for industry workers.

Table 1: Peak industry sector organisations

CATEGORIES	GEOGRAPHICAL REPRESENTATION
INDUSTRY SUB SECTOR ASSOCIATIONS	
AQUACULTURE & FISHING	
National Seafood Industry Alliance	NATIONAL
National Aquaculture Council	NATIONAL
Australian Abalone Growers Association (AAGA)	NATIONAL
Australian Barramundi Farmers Association (ABFA)	NATIONAL
Australian Marine Finfish Farmers Association (AMFFA)	NATIONAL
Australian Mussel Industry Association (AMIA)	NATIONAL
Australian Prawn Farmer's Association (APFA)	NATIONAL
Australian Southern Bluefin Tuna Industry Association	NATIONAL
Australian Trout & Salmon Farmer's Association	NATIONAL
Commonwealth Fisheries Association	NATIONAL
Fisheries Research and Development Corporation	NATIONAL
Great Australian Bight Fishing Industry Association	NATIONAL
Northern Prawn Fishery Industry Inc	NATIONAL
Oysters Australia	NATIONAL
Pearl Producer's 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
Queensland Aquaculture Industries Federation Inc (QAIF)	QLD
Queensland Crayfish Farmer's Association	QLD
Australian Freshwater Crayfish Grower's Association SA	SA
SA Mussel Grower's Association (SAMGA)	SA
South Australian Aquaculture Council (SAAC)	SA
Wildcatch Fisheries South Australia	SA
Scallop Fishermen's Association of Tasmanian	TAS
Tasmanian Abalone Grower's Association (TAGA)	TAS
Tasmanian Salmonid Growers Association (TSGA)	TAS
Tasmanian Shellfish Executive Council (TSEC)	TAS

Australian Freshwater Crayfish Grower's Association VIC	VIC
The Victorian Aquaculture Council	VIC
Victorian Abalone Grower's Association	VIC
Victorian 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 Industry Association (QSIA)	QLD
Queensland Seafood Marketers Association (QSMA)	QLD
Tasmanian Seafood Industry Council	TAS
Seafood Industry Victoria	VIC
Western Australian Fishing Industry Council (WAFIC)	WA
REGULATORY BODIES	
Australian Fisheries Management Authority (AFMA)	NATIONAL
Australian Maritime Safety Authority	NATIONAL
Department of Agriculture and Water Resources - Fisheries	NATIONAL
Department of Primary Industries - Fisheries	NSW
Department of Primary Industry and 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 NETWORKS AND SERVICES BODIES	
Fisheries Research and Development Corporation (FRDC)	NATIONAL

Industry and occupational regulations and standards

Industry regulations and standards

Australian seafood industry operates under high level 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[11]:

- 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 which 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 Australian Government has no direct management responsibility for aquaculture. 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.

[11] FRDC and Ridge Partners, 2015, 2014 Australian F&A Sector Overview

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 seeks to protect listed threatened species and ecological communities; as well as to 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*
- 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 and 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*, initiated by the United Nations Food and Agriculture Organisation Committee on Fisheries initiated (the Code), 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 MCS products handled through the supply chain are traceable and identifiable from fishery to plate. The MSC's ecolabel 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, suppliers 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 Order 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 a 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[12] 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 processing/filleting area, and 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 world's best

[12] https://www.amsa.gov.au/forms-and-publications/fact-sheets/amsa1577.pdf

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 to 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 the 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.[13]

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 has the potential to impact significantly on the sector.[14] Changes in sea surface temperature has the potential to present threats for off-shore aquaculture and wild fishing by increasing infestations of fouling organisms, pests and nuisance species. Currently, aquatic animal health is a challenge for this sector, 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[15].

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 has created competition between this industry and other water users and 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 has also resulted in increased production costs and loss of stock. Increases in the frequency and intensity of storms has 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 are provided in the *National Climate and Fisheries Action Plan* and the *National Marine Science Plan*.

[13] Seafarms Group, 2015, Project Sea Dragon: Article – Sunday Times – 20 December 2015. [www] http://seafarmsgroup.com.au/category/news/

[14]

[15] https://www.environment.gov.au/climate-change/climate-science/impacts/tas

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.

In the last decade, domestic seafood supply declined but imports increased to fill the gap between demand and available domestic supply. Farmed salmonids, predominantly from Tasmania, increased significantly in terms of value and volume over the period, yet the demand for wild-caught and aquaculture tuna, prawn and abalone production dropped.

In 2013–14, imports (237 511 tonnes) accounted for an estimated 69 per cent of Australia's total apparent seafood consumption, up from 66 per cent in 2012–13. Nevertheless, the sector exported an estimated 46 per cent of its production value in 2013–14.[16] It is expected that the Australian seafood export marketing will increase.

Australia exports a range of high unit value fisheries and aquaculture products. It is also a leading supplier of southern bluefin tuna to Japan, abalone to Hong Kong and China, and live lobster products to China and Hong Kong.

ABARES forecasts that export earnings from fisheries and aquaculture products will be around $1.7 billion in 2016–17, which is similar to 2015–16. Export earnings for rock lobster are forecast to rise (up 3 per cent) as a result of strengthening demand from China, and fall for salmonids (down 9 per cent) as prices respond to a recovery in the world supply. Export earnings for tuna are expected to remain around the same as in 2015–16. The value of Australian fisheries exports is projected to be around $1.6 billion (in 2015–16 dollars) in 2020–21.[17]

The increasing demand for Australian native species and the proximity to Asian markets, together with world recognised seafood quality and standards, means Australian aquaculture is competitively positioned to take on high value aquaculture products. 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.[18] 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. [19]

Like many agricultural companies, fishing and aquaculture businesses see opportunities to expand overseas in the coming years. However, their most significant challenges include[20]:

- A lack of information on local regulations in overseas markets
- Customer payment issues in overseas markets
- Tariffs, quotas and imports duties in overseas countries
- A lack of information on local culture, language and business practices
- Customs costs and/or delays

[16] ABARES, 2014, Australian fisheries and aquaculture statistics 2014
[17] ABARES, 2016, Agricultural commodities – vol. 6 no. 1. March quarter 2016
[18] Department of Agriculture and Water Resources, 2016, Aquaculture industry in Australia. [www] http://www.agriculture.gov.au/fisheries/aquaculture/aquaculture-industry-in-australia
[19] Fisheries Research and Development Corporation, 2014, Aquaculture Sector. [www] http://frdc.com.au/environment/Aquaculture/Pages/default.aspx
[20] Australia's International Business Survey, 2014, Industry Report. Agriculture

- Licences, permits and product standards in overseas countries
- The value of the Australia dollar
- Transport/freight costs from Australia to overseas markets.

RESEARCH, INNOVATION AND APPLIED TECHNOLOGY

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

This is especially the case for aquaculture species through integrated studies of genetics, physiology, health, aqua feeds, environments and food science. 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 funding grants from the Fisheries Research and Development Corporation and the work of major institutions (eg: CSIRO, IMAS, SARDI), the challenge is to bridge the gap between research results and application on 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.

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

The Department of Employment projects[21]that the total employment in the seafood industry sector will grow by 3 per cent from 2014 to 2019. A significant positive employment growth (6.5 per cent) is anticipated in the aquaculture sector and stable employment for the fishing sector. The figure (Table 3) anticipate a substantial reduction in employment for the seafood processing sector by 2019

Table 3: Department of Employment Industry Projections – five years to November 2019[22]

INDUSTRY SECTOR	EMPLOYMENT LEVEL	EMPLOYMENT PROJECTIONS		
	Nov 2014 ('000)	Nov 2019 ('000)	Growth ('000)	(%)
Aquaculture	9.3	9.9	0.6	6.5
Fishing	5.3	5.4	0.0	0.7
Seafood Processing	1.9	1.7	-0.2	-10.2
Total	**16.5**	**17**	**0.5**	**3.0**

Description of Workforce Supply

The seafood industry sector is an important employer of people living in coastal areas with a larger population. There is a large casual workforce in response to the seasonal nature of some activities.

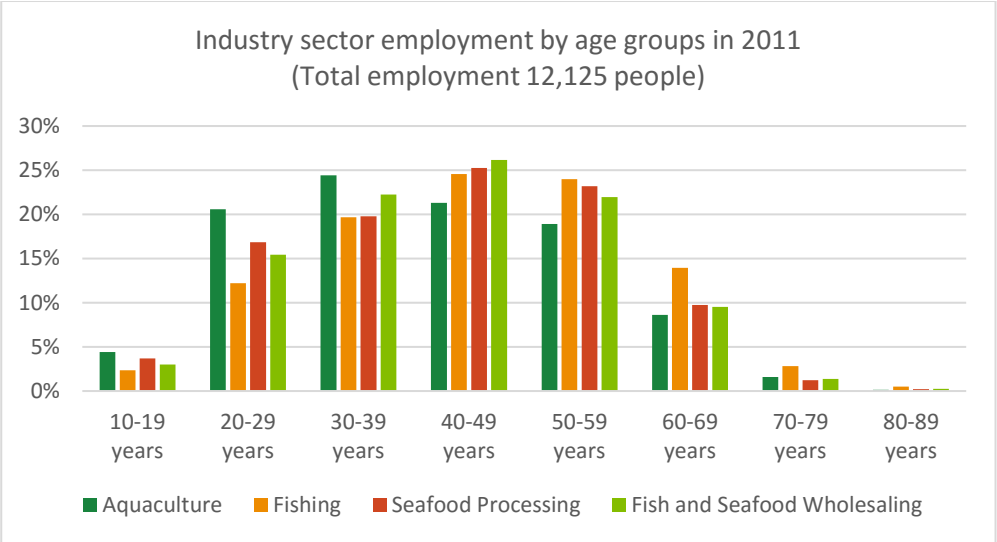
Businesses in this sector will be presented with the challenge of an oncoming wave of retirement as its workforce is aging. Fishing businesses in particular employ a significant number of people aged between 60 and 80 plus years and a smaller number of people in the age group 20 to 40 years. A younger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

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

[21] Department's projections are based on based on the forecasts and projections set out in the Mid-Year Economic and Fiscal Outlook (MYEFO)

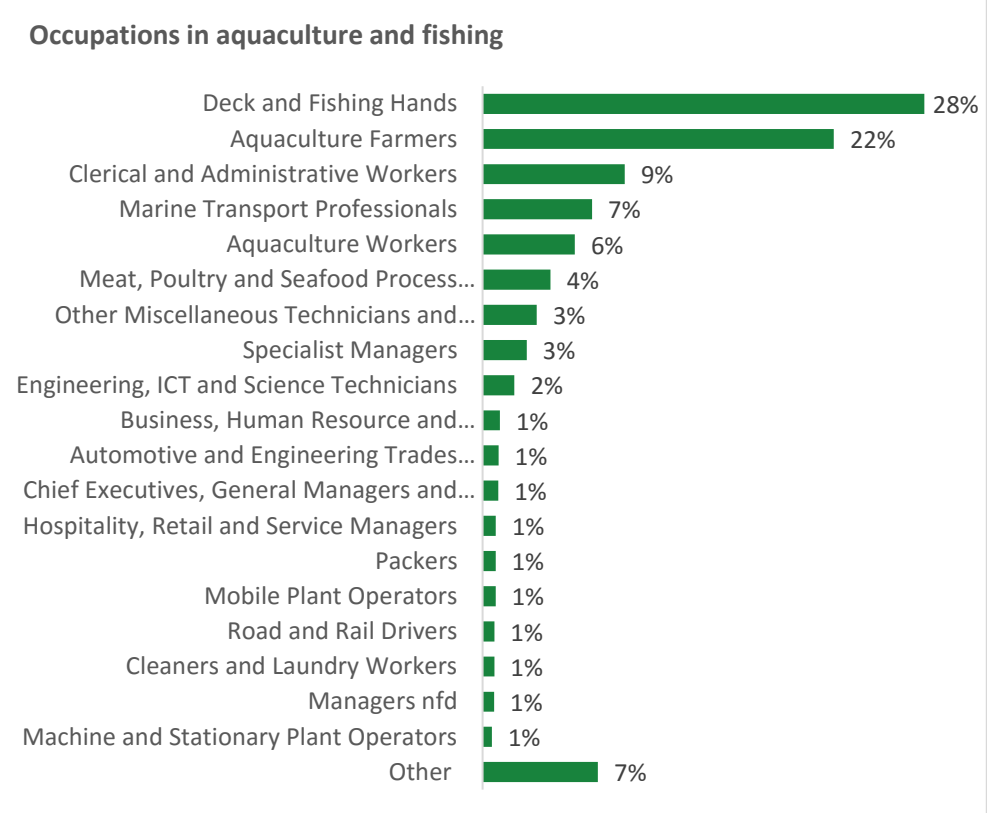
[22]Department of Employment, Industry Employment Projections, 2015 Report. Release date: March 2015. http://lmip.gov.au/default.aspx?LMIP/EmploymentProjections

Figure 1: Industry sector employment by age groups in 2011[23]



Specifically, the current employing occupations in the food, beverage and pharmaceutical industry sector include professions that are configured in Figure 2 to Figure 4 below.

Figure 2: Occupations and their relative number in the aquaculture and fishing sector[24]



[23]2011 Census of Population and Housing
[24]2011 Census of Population and Housing

Figure 3: Occupations and their relative number in the seafood processing sector[25]

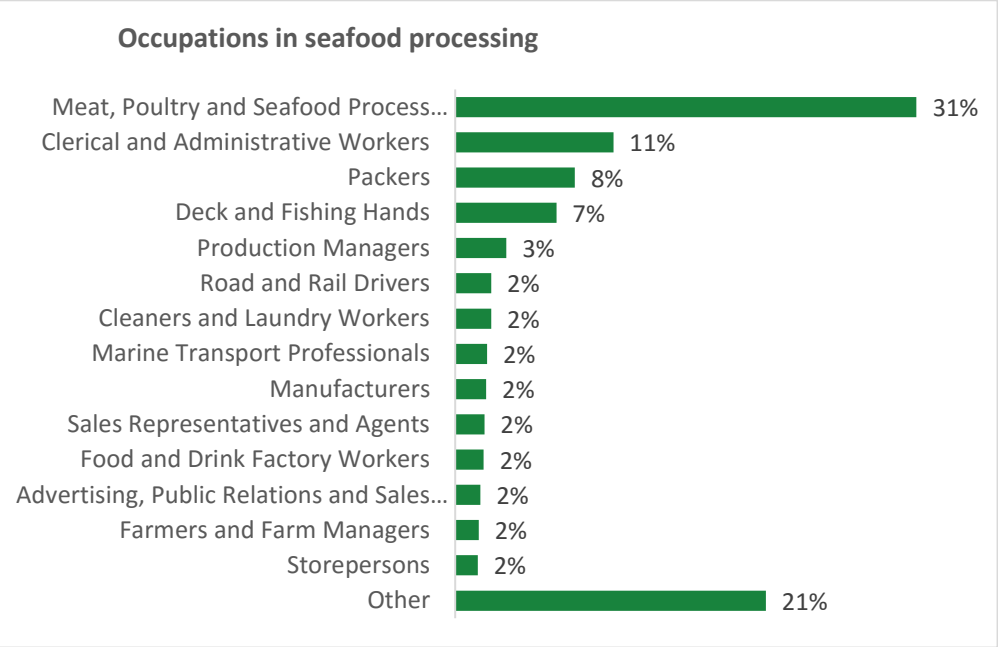
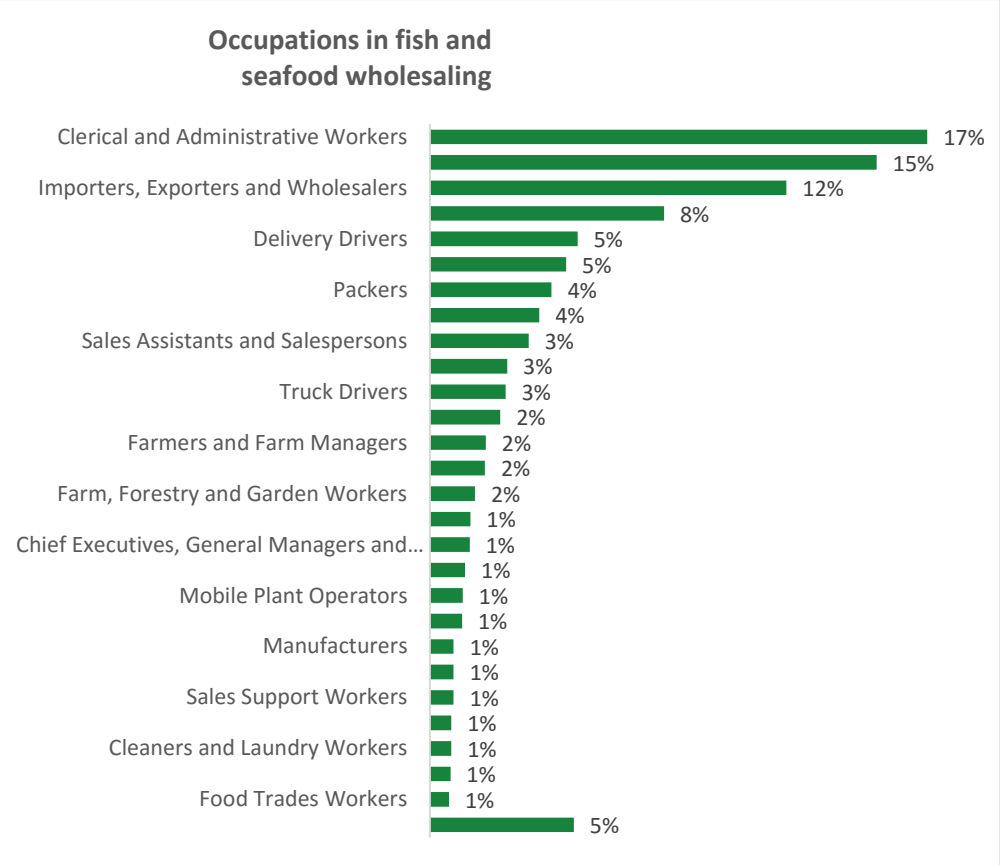


Figure 4: Occupations and their relative number in the fish and seafood wholesaling sector[26]



[25]2011 Census of Population and Housing
[26]2011 Census of Population and Housing

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.

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.

'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 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 others.[27]

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 with 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 peak harvest times.

D. SKILLS OUTLOOK

Future changes in workplace and job design are generally driven by business challenges, the introduction of new policies and legislation, and innovation at the business and industry level.

At the business level, innovation may involve introduction of new or improved technologies and processes, new or improved ways to deliver services, and new work organisation, including new job demands and job control (i.e. more complex and diversified tasks involving greater autonomy). Work organisation involves also a better interaction between internal and external stakeholders through integration of supportive technologies.

Trends in Workplace Design/Job Design[28]

At a high level, value-added skills will be driven by higher efficiency targets, innovation and automation/digitisation of some work activities in most workplaces and jobs. In addition, skills for advanced technologies and more product knowledge will be required into the future as the sector moves to increase operational efficiency and production. Higher level management skills will also grow in importance as well as higher level supply chain skills and marketing skills including working with data and data analysis, negotiation, digital marketing and digital commercialisation approaches to manage markets and demonstrate sustainability credentials to consumers and the broader community.

[27] FRDC and Ridge Partners, 2015, 2014 Australian F&A Sector Overview
[28] This section is based on feedback from IRC meetings, desktop research and broader stakeholder consultation via the website

Skills to adapt and respond to climate change challenges, changing government policies, industry code of practices and WHS procedures will be also critical for the sector.

Key development trends and business challenges likely to change jobs and drive capacity building in the seafood sector include the examples outlined below.

Aquaculture

The Northern Australia region, spanning Western Australia, Northern Territory and Queensland, has become a key area of focus for governments to enable streamlined policies for effective management of fisheries and aquaculture operations and a variety of infrastructure developments in the future. An expected trend toward larger and sustainable aquaculture systems, in response to a need for improved competitiveness on local and global markets including both fish hatcheries and shellfish hatcheries.

Recognition at the farm level of the growing importance of developing investment projects, controlling economic resources, and understanding how to manage human resources, as a way of securing more investment and providing capabilities to manage growing operations

The key changes in job and skills demand are likely to include growing management skills to deal with a more complex business environment and the co-management of fisheries. Skills development in relation to working with data collection and analysis, negotiation, digital marketing and digital commercialisation approaches, seafood processing and value adding and vessel operations and marine engineering will also emerge.

Aquatic animal health

Growing attention provided to aquatic animal health through national initiatives (i.e. AQUAPLAN 2014-2019), involving approaches to strengthen national first-response capability to cover plants, terrestrial animals, aquatic animals and marine pests, and ensure a sufficient number of trained personnel can be rapidly deployed in response to a disease outbreak

Genetics and breeding

Growing adoption and application, at the farm level, of genetic improvement techniques for finfish and shellfish, controlling reproduction, gender and sterility, and genomics; new treatments and therapies to control viruses, parasites and other pathogens to manage aquatic animal health; and new nutritional methods for marine fish larvae, including selection of dietary/nutritional requirements for salmonids and other seafood species.

Emerging skill needs include genetics, selective breeding and biotechnology, hatchery technologies, aquatic biosecurity - pest and disease prevention, diagnostics and emergency response, aquatic animal behaviour, health, welfare and management

Emerging technologies

Emerging technologies based on microalgae culture, with applications in cosmetics and pharmaceutics, human and feedstock nutrition, and environmental applications such as renewable energy (as a source of raw materials for biodiesel production), wastewater bioremediation, carbon capture from industrial flue gases, and microalgae can be used also as organic fertilizer

Skills needs for advanced technologies and more product knowledge as the sector moves to increase operational efficiency and production are expected to emerge. Additional higher, value-adding focused skills will drive the need to meet higher efficiency targets, innovation and automation/digitisation of some work activities, workplaces and jobs. The higher level skills required of employees, include language literacy and numeracy and digital skills, data analysis, better business management skills, WHS compliance skills, government policy compliance skills, leadership skills and communication skills.

Connecting to markets

Strategies for better connectivity with, and service to, domestic and international markets will become the norm 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.

The key changes in job are likely to require higher level supply chain and logistics skills to support lean, fast, reliable, transparent and collaborative relationships with key suppliers, customers and other companies, including competitors and research organisations Retail knowledge of seafood products, sustainable productions systems and seafood health benefits will emerge as skills needs.

In addition, emerging skills and knowledge will include marketing, particularly in relation to addressing consumer concerns regarding fish retailing and resource allocation; issues affecting the seafood supply chains and the ability to demonstrate sustainability credentials to consumers and the broader community. Market research, social media, marketing and brand development skills will also be required.

Resource management

Trends in whole of ecosystem approaches to natural resource management will impact on skills required for scientific data capture, assessment and modelling, skills to adapt and respond to climate change challenges. Skills of sea rangers to provide services to research and resource management agencies are also becoming a focus.

Workplace Health and Safety

Workplace health and safety remains a focus across the sector placing a focus on WHS procedures and skills in interpreting and implementing them.

Increasing compliance requirements

In addition, changing government policy, industry codes of practice, seafood safety and labelling requirements will drive emerging skills needs in certification auditing (internal and external), compliance and regulation, food safety and handling, quality assurance and supply chain management including traceability

Business management

Continual changes in fisheries management is seeing greater emphasis on catching seafood to maximise economic return rather than maximum weight caught. This is a significant culture change within some sectors of the seafood industry. This entails training in new skills in market/catch analysis, cost management and profit assessment.

A review for the purpose of updating of existing qualifications, skill sets and units or the development of new ones within the training package will be required to be undertaken over the four duration of the Work Plan.

Key priority skills in the sector workforce

The seafood industry sector has nominated key priority skill needs for the workforce in fisheries compliance and environmental management, and environmental certification. In addition, the sector has prioritised emerging practices and skill needs for aquaculture, sales and distribution, and seafood processing. New competencies are needed for a range of existing and emerging areas such as Sea Urchins processing, Cockles and Octopus. Consideration needs to be given to the aging workforce and the impact this has on skills needs and general impact of remoteness of work location on attracting suitable employees.

	Generic workforce skills ranked in order of importance for Seafood (Most important skill =1 least important skill = 12)
1	Managerial / leadership
2	Entrepreneurial
3	Environmental and sustainability
4	Technology
5	Financial Understanding
6	Data analysis
7	Design mindset / Thinking critically / System thinking / Solving problems
8	Learning agility / Information Literacy / intellectual autonomy and self-management
9	Communication/ Virtual collaboration / Social intelligence
10	STEM (Science Technology Engineering Mathematics)
11	LLN (Foundation skills of literacy and numeracy)
12	Customer Service/ Marketing

E. TRAINING PRODUCT REVIEW PLAN 2016-19

The Industry Reference Committee Training Product Review Plan 2016-19 for the seafood industry sector is provided in Appendix A.

Explanation

Australian Industry Skills Committee (AISC) commissioned project

The AISC has commissioned further work on the draft *SFI Seafood Industry Training Package*. The work will focus on Assessment Conditions to ensure that the Training Package meets Standard 6 of the *Standards for Training Packages, 2012*.

Time critical issues and interdependencies

The Seafood Industry Reference Committee identified an immediate need to develop a skill set and units 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.

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 or the development of new ones across the training package including, but not restricted to, aquaculture, environmental management systems, fisheries compliance and sales and distribution. These will form priority development work in this Work Plan.

Training products scheduled for review more than once in four years

The Seafood Industry Reference Committee does not anticipate reviewing any products more than once in the four-year period. **Note**: All *SFI Seafood Industry Training Package Release 1.*0 units will be reviewed in the Attachment A projects. They are not expected to be reviewed again over the four-year period, except for addressing specific improvement issues raised by industry.

Training products with contentious or lengthy review

The Quality Assurance (QA) author raised some issues with Agrifood Skills regarding the performance evidence statements and assessment conditions in the *SFI Seafood Industry Training Package Release 1.*0 units of competency across all sectors.

The Seafood Industry Reference Committee will work to ensure unit compliance with Standard 6 of *Standards for Training Packages, 2012* as outlined in the *SFI Seafood Industry Training Package Release 1.0 Quality Report*.

F. IRC SIGNOFF

This Work Plan 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: 28/09/2016

ATTACHMENT A

IRC Training Product Review Plan 2016-19 – Seafood Industry Sector

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

Date submitted to Department of Education and Training: 29 September 2016

Planned review start (Year)	TP name	TP code	Qualification name	Qualification code	Unit of competency name	UOC code
2016						
Seafood						
	Seafood Training Package	SFI	All qualifications		**AISC commissioned work** • in-depth review of content beyond transition activity as noted in *SFI Seafood Industry Training Package Release 1.0 Case for Endorsement* • amendments as required in *SFI Industry Training Package Release 1.0 Quality Report*: · rewriting of assessor conditions to comply with Standard 6 of *Standards for Training Packages, 2012*. · rewriting of performance evidence and knowledge evidence to comply with Standard 6 of *Standards for Training Packages, 2012*.	

Planned review start (Year)	TP name	TP code	Qualification name	Qualification code	Unit of competency name	UOC code
	Seafood Training Package	SFI	**Fishing Operations and Seafood Processing** Certificate II in Fishing Operations Certificate III in Fishing Operations Certificate IV in Fishing Operations Certificate II in Seafood Processing Certificate III in Seafood Processing Certificate IV in Seafood Processing	 SFI20216 SFI30216 SFI40216 SFI20516 SFI30516 SFI40516	**Sea Urchins** Develop a new skill set and new units of competency around sea urchins to support growth in activity in response to international trade. **Other Areas** Inclusion of animal welfare management in line with Aquatic Animal Welfare Overarching Guidelines and associated guidance material. Inclusion of units to emphasise catching seafood to maximise economic return rather than maximum weight caught. This will require new skills in market/catch analysis, cost management and profit assessment.	TBA
	Seafood Training Package	SFI	**Fisheries compliance and environmental management** Review qualifications in terms of current and emerging job roles, and adequacy of packaging to achieve a suitable outcome (Diploma) Certificate II in Fisheries Compliance Support Certificate III in Seafood Industry (Environmental Management Support)	 SFI20416 SFI30316 SFI30416	**Review fisheries compliance and environmental units of competency**: • in-depth review of content beyond transition activity as noted in SFI Release 1.0 Case for Endorsement Undertake a local operation Conduct field observations Promote sustainable use of local marine and freshwater environments Present evidence in a court setting Communicate effectively in cross-cultural environments Exercise compliance powers Monitor fish catches for legal compliance Operate off-road vehicles with towed equipment	 SFICOMP201 SFICOMP202 SFICOMP203 SFICOMP204 SFICOMP205 SFICOMP302 SFICOMP308 SFICOMP310

Planned review start (Year)	TP name	TP code	Qualification name	Qualification code	Unit of competency name	UOC code
			Certificate III in Fisheries Compliance	SFI40316	Support the judicial process	SFICOMP315
					Gather, collate and record information	SFICOMP316
			Certificate IV in Seafood Industry (Environmental Management)	SFI40416	Facilitate effective communication in the workplace	SFICOMP317
					Perform administrative duties	SFICOMP318
			Certificate IV in Fisheries Compliance	SFI50416	Administer the district office	SFICOMP401
					Plan the surveillance operation	SFICOMP402
			Diploma of Fisheries Compliance		Operate and maintain surveillance equipment	SFICOMP403
					Operate an observation post	SFICOMP404
					Perform post-surveillance duties	SFICOMP405
					Perform mobile surveillance	SFICOMP406
					Undertake prosecution procedures for magistrate's court	SFICOMP407
					Plan and undertake patrol operations	SFICOMP409
					Promote fisheries management awareness programs	SFICOMP410
					Implement aquaculture compliance	SFICOMP411
					Operate in remote areas	SFICOMP412
					Maintain operational safety	SFICOMP413
					Manage own professional performance	SFICOMP414
					Board vessel at sea	SFICOMP415
					Conduct a fisheries management compliance audit	SFICOMP501
					Contribute to fishery management	SFICOMP502
					Undertake the prosecution in a trial	SFICOMP503
					Participate in environmentally sustainable work practices	SFIEMS201
					Implement and monitor environmentally sustainable work practices	SFIEMS301
					Act to prevent interaction with protected species	SFIEMS302
					Conduct an internal audit of an environmental management system	SFIEMS401

Planned review start (Year)	TP name	TP code	Qualification name	Qualification code	Unit of competency name	UOC code
					Develop workplace policy for sustainability Skill set and units to cover climate change adaptation	SFIEMS501 TBA
	Seafood Training Package	SFI	**Environmental certification** Develop Skill Set to support environmental certification systems	TBA	To be identified as part of business case	
2017						
2017	Seafood Training Package	SFI	**Aquaculture** Review qualifications in terms of current and emerging job roles Certificate I in Aquaculture Certificate II in Aquaculture Certificate III in Aquaculture Certificate IV in Aquaculture Diploma of Aquaculture	 SFI10116 SFI20116 SFI30116 SFI40116 SFI50116	**Review aquaculture of competency:** Carry out basic aquaculture activities Collect broodstock and seedstock Feed stock Handle stock Manipulate stock culture environment Undertake routine maintenance of water supply and disposal systems and structures Work with crocodiles Monitor stock and environmental conditions Produce algal or live-feed cultures Carry out on-farm post-harvest operations Harvest cultured or held stock Maintain stock culture, holding and other farm structures	 SFIAQUA102 SFIAQUA201 SFIAQUA205 SFIAQUA206 SFIAQUA209 SFIAQUA211 SFIAQUA212 SFIAQUA213 SFIAQUA214 SFIAQUA215 SFIAQUA216 SFIAQUA217

Planned review start (Year)	TP name	TP code	Qualification name	Qualification code	Unit of competency name	UOC code
					Operate and maintain high technology water treatment components	SFIAQUA219
					Use waders	SFIAQUA220
					Control predators and pests	SFIAQUA221
					Control diseases	SFIAQUA222
					Oversee and undertake effluent and waste treatment and disposal	SFIAQUA301
					Construct or install stock culture, holding and farm structures	SFIAQUA302
					Coordinate stock handling activities	SFIAQUA303
					Maintain water quality and environmental monitoring	SFIAQUA308
					Oversee harvest and post-harvest activities	SFIAQUA309
					Oversee production and maintain algal or live-feed cultures	SFIAQUA311
					Oversee operations of high technology water treatment components	SFIAQUA313
					Support hatchery operations	SFIAQUA314
					Oversee emergency procedures for aquaculture operations	SFIAQUA315
					Oversee the control of predators and pests	SFIAQUA316
					Oversee the control of diseases	SFIAQUA317
					Coordinate feed activities	SFIAQUA318
					Develop and implement a stock health program	SFIAQUA401
					Coordinate construction or installation of stock culture, holding and farm structures	SFIAQUA402
					Operate hatchery	SFIAQUA404
					Seed and harvest round pearls	SFIAQUA406
					Coordinate sustainable aquacultural practices	SFIAQUA407
					Supervise harvest and post-harvest activities	SFIAQUA408

Planned review start (Year)	TP name	TP code	Qualification name	Qualification code	Unit of competency name	UOC code
					Implement, monitor and review stock production	SFIAQUA409
					Implement a program to operate, maintain or upgrade a system comprising high technology water treatment	SFIAQUA410
					Manage a water quality and environmental monitoring program	SFIAQUA411
					Develop emergency procedures for an aquaculture enterprise	SFIAQUA413
					Implement low water exchange microbial floc technologies	SFIAQUA414
					Develop a stock nutrition program	SFIAQUA501
					Develop and implement an aquaculture breeding strategy	SFIAQUA502
					Establish an aquacultural enterprise	SFIAQUA503
					Plan environmentally sustainable aquacultural practices	SFIAQUA504
					Plan stock health management	SFIAQUA505
					Plan and design water supply and disposal systems	SFIAQUA507
					Plan and design stock culture or holding systems and structures	SFIAQUA508
					Develop stock production plan	SFIAQUA509
					Select, plan or design a system or facility utilising high technology water treatment components	SFIAQUA510
					Culture new aquaculture species	SFIAQUA511
					Develop and implement an aquaculture genetic breeding program	SFIAQUA512
					Manage a farm based aquaculture research trial Inclusion of animal welfare management in line with Aquatic Animal Welfare Overarching Guidelines and associated guidance material.	SFIAQUA513

Planned review start (Year)	TP name	TP code	Qualification name	Qualification code	Unit of competency name	UOC code
					Inclusion of shellfish hatchery in existing units or development of new units.	
2017			**Sales and distribution** Review qualifications in terms of current and emerging job roles Certificate II in Seafood Industry (Sales and Distribution) Certificate III in Seafood Industry (Sales and Distribution) Certificate IV in Seafood Industry Sales and Distribution	 SFI20616 SFI30616 SFI40616	**Review sales and distribution units of competency:** Prepare, cook and retail seafood products Retail fresh, frozen and live seafood Wholesale product Buy seafood product Analyse domestic seafood market opportunities Analyse international seafood market opportunities Develop and provide information about seafood product Export product Import product Receive and distribute product Assemble and load refrigerated product Prepare, pack and dispatch stock for live transport Prepare, pack and dispatch non-live product Operate refrigerated storerooms	 SFIDIST201 SFIDIST202 SFIDIST301 SFIDIST401 SFIDIST402 SFIDIST403 SFIDIST404 SFIDIST501 SFIDIST502 SFISTOR202 SFISTOR203 SFISTOR204 SFISTOR205 SFISTOR301

Planned review start (Year)	TP name	TP code	Qualification name	Qualification code	Unit of competency name	UOC code
2017			**Seafood processing** Review qualifications in terms of current and emerging job roles Certificate I in Fishing Operations Certificate I in Seafood Processing Certificate II in Seafood Processing Certificate III in Seafood Processing Certificate IV in Seafood Processing Diploma of Seafood Processing	 SFI10216 SFI10516 SFI20516 SFI30516 SFI40516 SFI50516	**Review seafood processing of competency:** Clean fish Clean work area Fillet fish and prepare portions Work with knives Head and peel crustaceans Process squid, cuttlefish and octopus Shuck molluscs Handle and pack sashimi-grade fish Boil and pack crustaceans Slaughter and process crocodiles Evaluate a batch of seafood Maintain hygiene standards while servicing a food handling area Follow basic food safety practices Apply and monitor food safety requirements Oversee the implementation of a food safety program in the workplace Develop food safety programs Conduct internal food safety audits Manage seafood processing production units Produce technical reports on seafood processing systems Analyse seafood packaging requirements Design and manage a product recall Develop and implement a seafood waste utilisation strategy Establish costs and or conditions for sale of seafood product	 SFIPROC101 SFIPROC102 SFIPROC105 SFIPROC106 SFIPROC201 SFIPROC202 SFIPROC203 SFIPROC302 SFIPROC304 SFIPROC305 SFIPROC401 SFIPROC402 SFIPROC403 SFIPROC404 SFIPROC405 SFIPROC406 SFIPROC407 SFIPROC501 SFIPROC502 SFIPROC503 SFIPROC504 SFIPROC505 SFIPROC601

Planned review start (Year)	TP name	TP code	Qualification name	Qualification code	Unit of competency name	UOC code
					Plan and manage seafood and related product concept development	SFIPROC602
					Develop and manage seafood and related product production trials	SFIPROC603
					Plan and develop formulations and or specifications for new seafood product	SFIPROC604
					Develop and implement energy control systems in seafood processing environments	SFIPROC606
					Prepare work instructions for new seafood processing tasks	SFIPROC607
					Provide practical and or commercial advice to seafood users	SFIPROC608
					Monitor the seafood business environment to determine threats and opportunities	SFIPROC609
					Establish and manage effective external relationships	SFIPROC610
					Participate in a media interview or presentation	SFIPROC611
2018						
2018			**Fishing operations** Review qualifications in terms of current and emerging job roles and previous enrolment in qualifications. Certificate II in Fishing Operations Certificate III in Fishing Operations Certificate IV in Fishing Operations	 SFI20216 SFI30216 SFI40216 SFI50216	**Review fishing operations units of competency:** Work effectively as a diver in the seafood industry Perform diving operations using SSBA Perform diving operations using SCUBA Undertake emergency procedures in diving operations using SSBA Undertake emergency procedures in SCUBA diving operations Perform compression chamber diving operations Perform underwater work in the aquaculture sector Perform underwater work in the wild catch sector	 SFIDIVE309 SFIDIVE310 SFIDIVE311 SFIDIVE312 SFIDIVE313 SFIDIVE314 SFIDIVE315 SFIDIVE316

Planned review start (Year)	TP name	TP code	Qualification name	Qualification code	Unit of competency name	UOC code
			Diploma of Fishing Operations		Develop information and advice on fishing charter trips	SFIFCHA301
					Operate an inshore day charter	SFIFCHA302
					Plan and manage extended fishing charter trips	SFIFCHA501
					Cook on board a vessel	SFIFISH202
					Maintain, prepare, deploy and retrieve trawls to land catch	SFIFISH203
					Maintain, prepare, deploy and retrieve pots and traps to land catch	SFIFISH204
					Maintain, prepare, deploy and retrieve drop lines and long lines to land catch	SFIFISH205
					Maintain, prepare, deploy and retrieve hand operated lines to land catch	SFIFISH206
					Maintain, prepare, deploy and retrieve beach seines, mesh nets or gill nets to land catch	SFIFISH207
					Maintain, prepare, deploy and retrieve purse seines to land catch	SFIFISH208
					Maintain the temperature of seafood	SFIFISH209
					Assemble and repair damaged netting	SFIFISH210
					Provide support for diving operations	SFIFISH211
					Contribute to at-sea processing of seafood	SFIFISH214
					Apply deckhand skills aboard a fishing vessel	SFIFISH215
					Construct nets and customise design	SFIFISH309
					Adjust and position fishing gear	SFIFISH310
					Operate vessel deck machinery and lifting appliance	SFIFISH311
					Perform breath-hold diving operations	SFIFISH312
					Locate fishing grounds and stocks of fish	SFIFISH401
					Manage and control fishing operations	SFIFISH402
					Develop fishery optimisation strategies	SFIFISH403

Planned review start (Year)	TP name	TP code	Qualification name	Qualification code	Unit of competency name	UOC code
					Comply with organisational and legislative requirements Contribute to safe navigation Maintain marine plant Operate a small vessel Operate and maintain outboard motors Operate low powered diesel engines Prepare for maintenance	SFISHIP201 SFISHIP202 SFISHIP205 SFISHIP206 SFISHIP207 SFISHIP208 SFISHIP211
2018				TBA	**Review core and cross sector units of competency:** Apply basic food handling and safety practices Communicate in the seafood industry Work effectively in the seafood industry Meet workplace health and safety requirements Develop and promote knowledge of the industry sector Negotiate effectively for the sector Demonstrate commitment and professionalism Provide expert information to a resource management group Analyse information to develop strategic seafood management options Negotiate collective outcomes within the resource management group process Develop and promote industry knowledge Shape strategic thinking Cultivate productive working relationships Plan and achieve change and results Communicate with influence	 SFICORE101 SFICORE103 SFICORE105 SFICORE106 SFILEAD401 SFILEAD402 SFILEAD403 SFILEAD407 SFILEAD408 SFILEAD409 SFILEAD501 SFILEAD502 SFILEAD503 SFILEAD504 SFILEAD505

Planned review start (Year)	TP name	TP code	Qualification name	Qualification code	Unit of competency name	UOC code
					Demonstrate personal drive and integrity Provide corporate leadership Monitor and record fishing operations Collect reliable scientific data and samples Collect routine fishery management data Analyse and report on-board observations Implement WHS policies and guidelines Establish and maintain the enterprise WHS program	SFILEAD506 SFILEAD507 SFIOBSV301 SFIOBSV302 SFIOBSV303 SFIOBSV304 SFIWHS301 SFIWHS501